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Achieving Strategic Advantages in
Long-Term, Buyer-Supplier Relationships:
A Longitudinal Investigation

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Consequences. The synergistic payoffs from developing strategic advantages together include the realization of strategic advantages, higher joint profits, and the development of unique, idiosyncratic assets. These results are synergistic, in that they are greater than either member would have been able to achieve alone.

Key Results and Implications for Management

The results suggest a number of implications for management.

Common goals can act as substitutes for trust. If there is a low level of trust between the buyer and supplier, the two can still work together and achieve synergistic results. In this case, the members will look at the extent to which they share similar goals. Similar goals are important because they provide an assurance that the partner will work toward joint benefit and not pursue individual gains that may be detrimental to the relationship. Hence common goals, like trust, assure each partner of "fair pie division."

Trust is an important factor, but not entirely necessary. Trust is an important factor in the process of working closely together. Some payoffs, such as the attainment of strategic advantages is facilitated earlier when trust is present. However, synergistic results can still be achieved without a high level of trust. If trust is low, idiosyncratic assets may act as "credible commitments" early in the relationship that assure the other of the partner's commitment to joint goals.

Complementary competencies are an important factor in the decision to work closely together. It is not sufficient for buyers and suppliers to bring a set of abilities to the relationship. It is the complementarity of the abilities, skills, and knowledge of the partners that helps the buyer and supplier to achieve synergistic results between them.

There are clear payoffs from working closely together, and these payoffs are sustainable over time. Buyers and suppliers who decide to work closely together to develop strategic advantages are generally successful at achieving these advantages, increasing joint profits, and creating unique assets. These outcomes provide a powerful basis from which the buyer and supplier can continue to work together in the future, and a competitive edge over other buyers and suppliers in the marketplace.

Differences in Perspectives:

For suppliers, similar goals play a dynamic role in their willingness to work closely together in the future. Common goals are a key consideration for suppliers in the decision to work closely with a buyer, and a powerful predictor of whether they will continue to develop strategic advantages with the buyer in the future. To them, it is important to know that they are moving in the same direction as their customer.

For buyers, complementary competencies play a dynamic role in determining whether to continue working closely with a supplier in the future. For buyers, complementary competencies are an important factor in their decision to develop strategic advantages with a supplier, and in their decision to continue developing such advantages in the future. These competencies provide powerful assurances that the supplier has the necessary abilities to successfully expand the "size of the pie" between the parties.

Collectively, the results point to the purposive nature of developing strategic advantages together. Such close relationships are economically driven and not interpersonally driven. Interpersonal factors such as trust can signal important information under uncertainty, but as members become more familiar with each other and certain about their situation, continued development of strategic advantage depends heavily upon member competencies and goals. Even in the absence of trust, development of strategic advantages is possible, provided that the necessary competencies are present.

ACKNOWLEDGMENT

INTRODUCTION

The development of strategic advantages -- positions of superior performance -- is key to a firm's survival. Recently, there has been a growing interest among both practitioners and academics in strategic advantages developed through buyer-supplier relationships. Such advantages are particularly long-lasting relative to advantages created through product differentiation, brand loyalty, or technological superiority, because they are created in the context of a dyadic exchange relationship that is inherently difficult for competitors to observe and duplicate.

Consider the following example. When Intel and Ford work together to design a unique microprocessor that optimizes the performance of a new Ford automobile, the Ford car is able to provide superior value compared to a General Motors (GM) car using a standard microprocessor available to all automobile manufacturers. Both Ford and Intel benefit from the investment in this idiosyncratic microprocessor. Ford sells more cars and Intel sells the microprocessors used in the cars. To match the automobile performance achieved through the Ford-Intel relationship, General Motors must build a similar relationship with Intel or another microprocessor supplier to develop a microprocessor that optimizes its car design. Building such a relationship takes considerable time and effort and involves tacit, complex, and specific information of both firms. Since it is unobservable by competing dyads, the resulting competitive advantages accruing to the dyad are sustainable over a long period of time.

Despite the possibility of attaining strategic advantages through buyer-supplier relationships there is surprisingly little systematic work on how buyers and suppliers develop and maintain strategic advantages together. The primary contributors to date have been consulting companies. In marketing, much of the work related to this topic has focused on characteristics of satisfactory relationships (i.e., J. C. Anderson & Narus 1990; E. Anderson & Weitz 1989; Crosby, Evans, & Cowles 1990; Heide & John 1990), without explicitly focusing on the attainment of strategic advantage. In the past five years alone the field has witnessed an outpouring of studies on topics such as trust (Andaleeb 1992; Ganesan 1994; Moorman, Zaltman, & Deshpande 1992, Moorman, Deshpande, & Zaltman 1993), performance (Kumar, Stern, & Achrol 1992; Noordeweir, John, & Nevin 1990), commitment (E. Anderson & Weitz 1992; Morgan & Hunt 1994), and communication/influence (Mohr & Nevin 1990; Boyle, Dwyer, Robicheaux, & Simpson 1992; Ganesan 1993; Scheer & Stern 1992), as key aspects of strong relationships. The understanding of how strategic advantage is developed between independent firms in the value chain represents an opportunity to lead or at least participate in the evolution of this new form of interorganizational exchange.

In addition to understanding how strategic advantage is developed between buyers and suppliers, there is a need to understand interorganizational relationship dynamics over time. Despite the constant calls for longitudinal studies and the recognition that relationships have their own life-cycles and phases (cf., Dwyer, Schurr, & Oh 1987), no one has ever attempted to examine a sample of ongoing buyer-supplier

relationships at two points in time. As a result, there are unanswered questions about the correct causal ordering of variables. Because of the cross sectional nature of industrial buying research, proponents of each view are able to point to empirical studies that support both sides of the question.

The purpose of this study is to address the gap in our understanding of the development of strategic advantages in long term, buyer-supplier relationships. In the next section, a conceptual framework involving potential antecedents and consequences of developing strategic advantages is presented. Although clearly not exhaustive in its consideration of all potential antecedents and consequences, the framework highlights key constructs identified from past work in industrial organization, economics, marketing, law, and social psychology literatures. The data collection process and analysis used to test and refine the model are then outlined. Finally, the results are presented and implications for management discussed.

A FRAMEWORK FOR DEVELOPING STRATEGIC ADVANTAGES

The focus of this study is on long term, vertical relationships between original equipment manufacturers (OEMs) and their suppliers. Hence, joint ventures, horizontal relationships, and vertically integrated relationships are not considered in this study. The unit of analysis is the buyer-supplier dyad.

Developing Strategic Advantages

An overview of the basic strategic advantage process is depicted in Figure 1. The central construct is the active development of strategic advantages. This behavior is formally defined as, "the extent to which the dyad engages in activities aimed at achieving strategic advantages" (Jap & Weitz 1994). Another way to think of this construct is to essentially view it as _efforts_ to expand the pie, via the creation of strategic advantages over competing dyads in the marketplace.

FIGURE 1
Overview of the Strategic Advantage Process Model

ANTECEDENTS
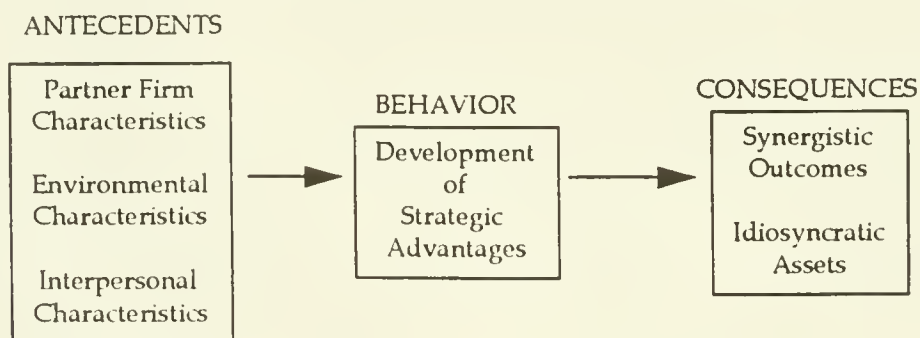
Because of the explicit focus on the attainment of strategic advantages, this construct is not equivalent to cooperation or joint action, concepts that have appeared in past work on buyer-supplier relationships. These latter constructs merely describe the _nature_ of the relationship, not the objective to develop strategic advantage. Cooperation is basic to any successful exchange, the development of strategic advantages is not. Joint action refers to the overlap in roles that may occur between a buyer and a supplier (Guetzkow 1966; Heide & John 1990; Laumann, Galaskiewicz, & Marsden 1978). Mere observance of joint action or cooperation does not necessarily mean that the dyad is focused on developing strategic advantage. Hence, the strategic advantage development construct in this framework differs from other similar constructs in the literature in that the behavior occurs with the _motivation_ of jointly achieving strategic advantages.

Developing strategic advantages together creates interdependence between the firms involved. This interdependence can be beneficial, in that both parties may be

able to achieve synergistic outcomes that would not have been achievable in the absence of the partner. However, it can also pose opportunities for greater loss as the stakes involved are greater than they would be in the absence of the partner. There is a loss of individual autonomy and new uncertainties due to necessary reliance on the other party are raised. As such, the decision to develop strategic advantages is likely to be driven by the perceived rewards and costs, or expectations of rewards and costs from engaging in such behavior.
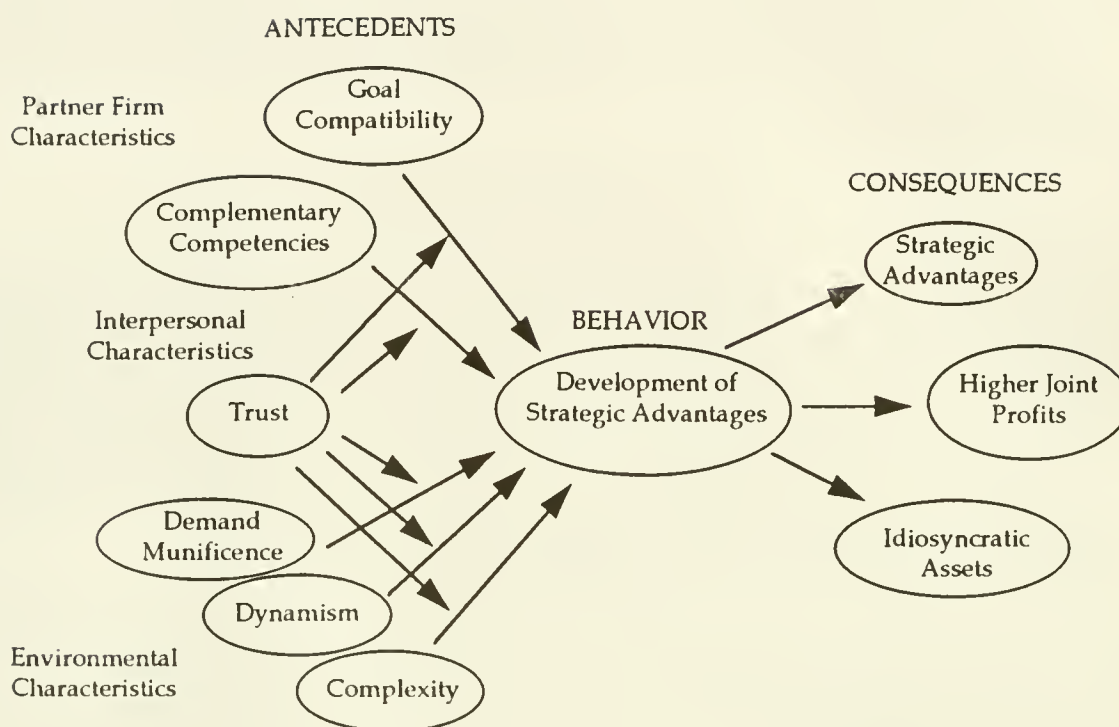
Antecedents to Developing Strategic Advantages

The decision to develop strategic advantages is often shrouded in uncertainty. Firms may experience doubts as to whether the other firm is the best firm for their needs and whether the payoffs from becoming interdependent are attainable. Hence, there are advantages and disadvantages inherent in their choice of a partner and it is not always clear what the payoff will be. In interpersonal relationships, coping with uncertainty is a critical challenge in relationships and a major motivational force in shaping the individuals' mental representations of their partners (cf., Brehm 1988; Brickman 1987; Holmes & Rempel 1989; Murray & Holmes 1993).

The same is true for the value chain members who are contemplating developing strategic advantages together. Firms can gain insight into the specific nature of the costs and benefits associated with the decision to become interdependent by evaluating various antecedent characteristics of the relationship such as technological capabilities, organizational changes in systems and skills, commitment, financial strength, consistent performance, close communication, etc. (Jap 1992). In this study, three classes of antecedent variables are examined, based on past work in the channels, organizational behavior, economics, and social psychology literatures and interviews with channel members: partner firm characteristics, environmental characteristics, and interpersonal characteristics. Their specific components are illustrated in Figure 2.

The groups of antecedents were chosen primarily because they represent different aspects of the channel relationship -- the interfirm aspect, the influences of the external environment, and the social aspect -- that are likely to impinge upon the dyad's decision to develop strategic advantages together. Although clearly not exhaustive, the antecedents selected here represent a first step in understanding how strategic relationships can result in synergistic outcomes for the dyad.

FIGURE 2
The Basic Conceptual Model

ANTECEDENTS

Partner Firm
Characteristics

Goal
Compatibility

Complementary
Competencies

CONSEQUENCES

Interpersonal
Characteristics

BEHAVIOR

Strategic
Advantages

Trust

Development of
Strategic Advantages

Higher Joint
Profits

Demand
Munificence

Dynamism

Idiosyncratic
Assets

Environmental
Characteristics

Complexity

Ellipses indicate latent nature.

Partner Firm Characteristics

As channel members consider whether to develop strategic advantages together, one of their main concerns is whether they will realize a fair return from becoming interdependent. Two aspects of this uncertainty involve the synergistic benefits and returns to the dyad (the degree to which the pie will be expanded) and the returns to the individual firms (the fairness in splitting the pie). As such, members will look for key characteristics of the partnering firm that will help to reduce their uncertainty about their returns from the relationship.

There is a paucity of empirical and conceptual work on selecting an appropriate partner with which to develop strategic advantages. A review of past research on supplier selection and prestudy interviews with purchasing agents indicated that there are two important factors that need to be taken into consideration when deciding whether to work closely to develop strategic advantages with a supplier: the degree to which the partnering firm has compatible strategic goals and its ability to provide complementary competencies or resources that will enhance the likelihood of goal achievement.

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Goal compatibility. Goal compatibility refers to the extent to which firms perceive the possibility of simultaneous goal accomplishment (Eliashberg & Michie 1984; John & Reve 1982; Schmidt & Kochan 1977). Firms are more likely to engage in the development of strategic advantages when they have similar goals because they provide an assurance that firms will pursue similar directions and not pursue goals which are advantageous to one party's competitive position at the expense of the partner. As goals between member firms become increasingly aligned, there is a strong incentive to form a close relationship so that members can exploit joint potential and effectively safeguard past investments (Heide & John 1988).

Complementary competencies. Partner selection might also occur on the basis of distinct capabilities, knowledge, and resources that provide for the possibility of a complementary relationship. To "complement" another individual means to supply another's lack or "to fill out or complete" another's performance (*Webster's Dictionary*). Hence, complementary competencies refer to the degree to which the firms are able to 'fill out or complete' each other's performance by supplying distinct capabilities, knowledge, and resources that enhance the likelihood of goal achievement (J. C. Anderson & Narus 1990). By working closely with partners possessing complementary abilities and resources, both firms are able to reach objectives that would have been unattainable if they had worked alone and hence, expand the pie of benefits available to the dyad.

Partner firm characteristics, in and of themselves, provide incentives to the dyad to work closely to develop strategic advantages together. These factors are useful in determining the potential rewards of working closely together. Essentially, they operate as main effects on the likelihood that buyers and suppliers will develop strategic advantages together. In a latter section, an important moderator of these effects is hypothesized and the nature of the interaction is explained in greater detail.

Environmental Characteristics

Along with concern about the magnitude of the positive increase from working together, the members also need to understand the potential in their local environment for exploiting the unique combination of capabilities, assets, and knowledge present between them. The environment plays an important role in impacting the potential rewards from activities directed toward gaining strategic advantage. In this study, three aspects of the environment considered are demand munificence, dynamism, and complexity.

Demand munificence. Munificence is the extent to which the environment can support sustained growth in terms of absorbing and providing the dyad with necessary resource opportunities (Starbuck 1976). In the channels literature, munificence has typically been examined with respect to demand (Achrol, Reve, & Stern 1983; Etgar 1976; Guiltinan 1974). When the demand for the dyad's products is high, there is an

incentive to work closely together to develop better ways of meeting the demand over competing dyads. Hence, demand munificence raises the potential benefits to be gained from working closely to develop strategic advantages.

Dynamism. Dynamism describes changes in product and competitor strategies that occurs frequently and is difficult to predict (Achrol & Stern 1988). When the environment is constantly changing, decision-making and coordination across the dyad becomes increasingly difficult for members to manage individually. Dynamism raises environmental uncertainty for the dyad. As such, a dynamic environment provides an incentive to develop closer relations in order to cope with the environment and meet the dyad's decision-making and coordination needs.

Complexity. Complexity involves both the heterogeneity of external forces affecting resources and their levels of concentration in the environment. When heterogeneity in the environment surrounding the dyad is high, member firms tend to increase cooperative behavior and develop closer linkages with their partners (Achrol et al. 1983). Like dynamism, complexity increases environmental uncertainty for the dyad and provides an incentive to work closely together in order to better cope with and manage the environment.

The original intention was to examine the dynamic role of these three aspects of the environment on the dyad's decision to develop strategic advantages (see Jap 1995). However, estimating a one factor scale for environmental complexity was problematic and estimation of the basic structural model at both time periods indicated that the remaining factors were nonsignificant predictors of the decision to develop strategic advantages. Although this may appear counterintuitive, it can be explained by the fact that the scales measured the dyadic environment and not the industry environment that surrounds the entire firm, in keeping with the unit of analysis, a buyer-supplier dyad. It could be that the dyad environment -- typically an SBU level environment -- has less effect on the dyad than the industry environment. Post study interviews with managers appear supportive of this conclusion. It seems that the environment impacts the dyad through broad, organizational directives that are decided upon by corporate executives in response to industry conditions. In light of the limited role that the local dyadic environment appeared to play in explaining the central phenomenon, the development of strategic advantages, the environmental effects were eliminated from the final model. Because of space constraints, full discussion of the hypothesized environmental effects are eliminated from the following sections.

Interpersonal Characteristics

Along with the concern over whether the pie of benefits will expand and how the environment will affect its size, there is also some concern over how the expanded pie will be divided between the partners. Since the members are typically unable to specify in advance what the expanded pie size will be and since some benefits may

only be realized in retrospect, assurances of fair pie division can be extremely important in determining whether the development of strategic advantages is worthwhile. In such an ambiguous situation, members are not able to rely on legal contracts to specify and account for all possible contingencies. As a result, the social or interpersonal relationship between the boundary-spanning members of the two firms can become important in determining whether the firms will develop strategic advantages.

Recently, there has been a growing interest in the role of personal relationships between boundary-spanning members in the conventional channel. Personal relationships have been found to shape economic outcomes in a number of studies on interorganizational exchange in a number of contexts such as: the publishing industry (Coser, Kadushin, & Powell 1982), international joint ventures (Doz 1988; Hakansson & Johanson 1988; Walker 1988), and small to mid-sized textile firms in Italy (Lorenzoni & Ornati 1988).

In an inductive field study of dyadic relationships in high-growth entrepreneurial firms, Larson (1992) found that personal relationships and reputations (trust), coupled with a knowledge of the firm's skills and capabilities, shaped the context for new exchanges between firms by reducing risks and uncertainty about the motives and intentions of the other member. One can imagine that if the interpersonal relationship between boundary-spanning members is characterized by conflict and distrust, this could act as an impediment to potential interorganizational outcomes.

Trust. In light of this, trust is hypothesized to play a key moderating role in determining whether firms will develop strategic advantages. Trust is defined as the ability to reliably predict the actions of the other party in the relationship and the belief that the other partner will not act opportunistically if given the chance to do so (Andaleeb 1992; J. C. Anderson & Narus 1990; Deutsch 1958; Ganesan 1993; Lindskold 1978; Zucker 1986).

Trust is key to the engagement in activities directed toward the development of strategic advantage. Individuals who trust each other are more willing to share relevant ideas and comprehensive information (Bialeszewski & Giallourakis 1985; Moorman et al. 1992; Zand 1972), clarify goals and problems (Zand 1972) and tend to approach the relationship with a problem-solving orientation (Golembiewski & McConkie 1975; Zand 1972). As trust is developed between the parties, the individuals' perceptions and expectations of relationship continuity will increase (E. Anderson & Weitz 1989), and members are able to communicate more efficiently than dyads in which trust is low (Aldrich & Pfeffer 1976; E. Anderson & Weitz 1989; Knapp 1978; Ouchi 1980). In the interpersonal relationship literature, studies have shown that as a relationship develops, feelings of mutual responsibility for the other party's outcome increases, and parties explore mutually beneficial activities (Altman & Taylor 1973; Levinger 1980; Levinger & Snoek 1972; Taylor 1979).

Trust as a moderator of strategic advantage development. Trust has been examined recently in channel relationship research, and as a critical aspect of interorganizational exchange (cf., Morgan & Hunt 1994). Academics and practitioners collectively agree that trust plays a key role in close, partnering relationships. This increasing interest tends to foster an implicit belief that trust is a necessary component of strategic relationships. In this study, trust is not viewed as a necessary or sufficient condition for the development of strategic advantage. Instead, it is seen as an important facilitator of strategic advantage in that it moderates the effects of partner firm characteristics.

This is to say that interpersonal relationships between boundary-spanning individuals can enhance or impede the emphasis placed on developing strategic advantage. For example, suppose a firm wants to devise new ways to take cost out of its distribution system to another firm. The firms perceive significant potential benefits accruing to both firms. Once it identifies potential partners who have similar goals and complementary competencies, the firm will have a preference to work with companies that it has developed a positive history of experience with, or in other words, those companies with which the firm has trusting relationships with because it has greater chances of gaining a fair return from their strategic advantage development activities. If interpersonal relationships are marked by a great deal of suspicion, distrust, and latent conflict, the firms will be less likely to benefit from working together, even when the potential interorganizational benefits are great.

H1a: Trust moderates the effects of goal compatibility on the development of strategic advantages.

H1b: Trust moderates the effects of complementary competencies on the development of strategic advantages.

Consequences of Developing Strategic Advantages

Buyers and suppliers engage in pie-expansion activities with the hope of achieving synergistic results. Although success is not always guaranteed, one would expect that dyads who engage in strategic advantage development activities generally realize the synergistic results hoped for. In this study, three such outcomes are examined: strategic advantages, higher joint profits, and the development of idiosyncratic assets. Strategic advantages (i.e., superior access to resources, key technological knowledge and development, etc.) are advantages that are impossible to acquire alone and puts the dyad in a better position to carry out its strategies. Joint profits are the profits that result from joint efforts, as opposed to those profits earned by the efforts of one firm alone.

Developing strategic advantages should lead to the creation of idiosyncratic assets to support the relationship. These assets may be tangible, such as manufacturing facilities, or intangible, such as a newly developed capability, skill, or technology that

enables the achievement of strategic advantages. These assets maximize the joint transaction value between the dyad by sustaining and supporting the created synergy between the firms (cf., Zajac & Olsen 1993).

H2a: Developing strategic advantages leads to the achievement of strategic advantages over competing dyads.

H2b: Developing strategic advantages leads to higher joint profits.

H2c: Developing strategic advantages leads to idiosyncratic assets.

The Longitudinal Conceptual Model

One of the central goals of this study is to understand the development of strategic advantages over time. It could be that the relationship between variables posited thus far are likely to change over the course of the relationship, because as time passes, learning occurs and member attitudes, goals, and opinions are typically updated as a function of these changes.

Hence, what was appropriate at the earlier in the relationship may become less appropriate or less important over time as members' knowledge of the other increases. If the roles of the variables change over time, then firms must also change their approach to managing these variables in order to insure the maximum joint benefit possible from the relationship.

The main interest in the longitudinal theoretical model is still centered around the development of strategic advantages. The basic process model of Figure 2 minus the environmental effects is replicated over time, creating the full longitudinal model of Figure 3.

Intermediary Effects Between Time One and Two

As the dyad works closely together to develop strategic advantages, they learn more about each member's needs, goals, future intentions, and capabilities. All of this information is used to update their perceptions, attitudes, and expectations of the other member.

*Effects on goal compatibility.* The fruits of success at time one--strategic advantages and joint profits--are likely to influence perceptions of partner firm characteristics in time two. When strategic advantages are gained, confidence between the members is strengthened and familiarity increases. Gulati (1995) shows that when this happens, firms tend to move away from cautious contracting to looser practices in

their relationship. As familiarity increases, members might realize new and potential areas for working together in the future, hence, increased goal compatibility.

> H3a: Strategic advantages gained and the achievement of joint profits at time one increases perceptions of goal compatibility at time two.

> H3b: The achievement of joint profits at time one increases perceptions of goal compatibility at time two.

FIGURE 3
The Longitudinal Conceptual Model
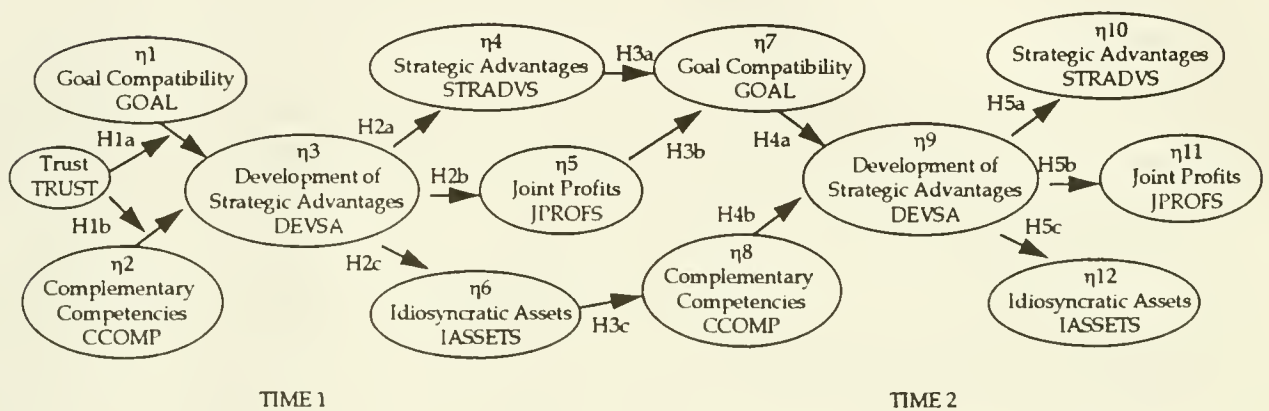
Ellipses indicate latent nature.

Correlations between constructs over time (i.e., $\phi82$, CCOMP at time 1 and time 2) and error terms are not depicted, for simplicity of presentation. However, they were explicitly estimated.

Effect on complementary competencies. Complementary competencies at time two are hypothesized to be affected primarily by the presence of idiosyncratic assets at time one; however, the direction of the effect is unclear. Idiosyncratic assets may affect complementary competencies by increasing or decreasing them. Increases can occur if the assets help the firms to improve the unique competencies that already exist in the relationship. However, this is rather unlikely in the current context. Returning to the Ford-Intel example, this would mean that Ford becomes better at manufacturing cars and Intel becomes better at designing computer chips as a result of working together.

Instead, it's more likely that the process of working closely together requires the two firms to share details of their competencies that would not have ordinarily been shared. As firms learn more about each other's competencies, the uniqueness of the

abilities each firm brings to the relationship decreases and a new asset is created. Hence, the presence of relationship-specific assets in time one decreases the level of unique, complementary competencies brought to bear on the interorganizational relationship in time two.

> H3c: The presence of idiosyncratic assets at time one decreases complementary competencies at time two.

Developing Strategic Advantages Over Time

Partner firm characteristics are likely to still be key factors in the decision over time. However, the moderating effects of trust are likely to be reduced over time. This is because trust is a powerful assurance when decision-making is made under high uncertainty and risk. When the situation is highly uncertain, individuals are motivated to learn from and incorporate any new or relevant information that may help reduce uncertainty. However, when uncertainty decreases, people become more comfortable in the situation and will avoid situations that might confront them with new or potentially inconsistent information (Sorrentino, Holmes, Hanna, & Sharp 1995).

When firms have limited experience in developing strategic advantages together, trust acts as a very powerful pledge--an implicit contract of good intentions-- such that members are willing to infer an optimistic outlook regarding the consequences of depending on each other and are likely to have a greater sense of security in working together. Over time, trust may become a less powerful predictor of developing strategic advantages, since members have concrete interactional information on each other. Their shared experiences, the idiosyncratic assets that are created, and the increase in perceived environmental based benefits bind the relationship and make less tangible commitments or assurances such as trust less important.

All of this is not to say that the role of goal compatibility or complementary competencies becomes less important. In fact, their effects on the likelihood of developing strategic advantages should not change. In and of themselves, they provide incentives for the development of strategic advantages. Hence, goal compatibility and complementary competencies are still expected to be positively related to the likelihood that the firms will work closely together, however, their effects at time two are hypothesized to no longer be moderated by trust.

> H4a: The effect of goal compatibility on the development of strategic advantages at time two are not moderated by trust.

> H4b: The effect of complementary competencies on the development of strategic advantages at time two are not moderated by trust.

The consequences of developing strategic advantages at time two are hypothesized to lead to synergistic outcomes and idiosyncratic assets in a similar manner as in time one. Hence, working closely together to develop strategic advantages should result in advantages over competing dyads, increased joint profits, and the creation of idiosyncratic assets.

> H5a: The development of strategic advantages at time two leads to the attainment of strategic advantages.
>
> H5b: The development of strategic advantages at time two leads to higher joint profits.
>
> H5c: The development of strategic advantages at time two leads to idiosyncratic assets.

STUDY METHOD

Research Setting and Sample

The Firms

The vertical dyads examined in this study were manufacturing companies and their suppliers. Access to the participating firms was provided by the Marketing Science Institute (MSI) and the Institute for the Study of Business Markets (ISBM) at Pennsylvania State University. Each firm was offered an executive summary, presentation of results, and customized analyses in return for their participation. The procurement divisions of four Fortune 50 manufacturing companies agreed to participate--a computer manufacturer, a photography equipment manufacturer, a chemical manufacturer, and a brewery.[1] Each of these companies was asked to identify corresponding suppliers as potential participants in the study.

The Transactional Relationships

The surveyed dyads represented significant purchasing arrangements, as shown in Table 1. The respondents had worked with each other 3.7 years[2] on average and annually purchased over $63 million in materials and services. This represented approximately 27% of the supplier's total annual sales in the category. Nearly 60% of the purchases typically made were a mixture of first-time, routine, and modified routine purchases.

Unit of Analysis

Since the unit of analysis is the channel dyad, the measures used in this study were designed to tap aspects of the mutual relationship between the firm, not the individual perceptions of the two firms, since the focus of the conceptual model is on joint, mutually shared activities and outcomes, not potential asymmetries between the two firms. This means that the surveys were designed with the intent of using individual buyer and supplier representatives as independent informants of the constructs in the model, i.e., they completed identical items tapping the nature of the mutual relationship between the firms. The use of multiple informants in this manner allows for assessment of the construct validity of the organizational properties measured and partitioning of error variance into trait, informant, and random error variances.

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[1] All four companies have requested that their identities be kept anonymous.

[2] Anecdotal evidence suggests that firms need approximately four years of doing business together to learn enough about each other's goals, intentions, and trustworthiness to feel comfortable about the possibility of working closely together.

TABLE 1

Characteristics of the Exchange Relationship

Characteristic	Mean (standard deviation)
Annual level of purchases	$ 63,592,374[*]
[*] adjusted for outliers	($ 413,181,403)
Percentage of supplier's annual sales in product category	26.8% (31.9%)

	Frequency of response (% of total)
Product category purchased	
capital equipment	58 (21%)
maintenance, repair, and operating supplies	41 (15%)
sub assemblies	29 (11%)
components	59 (22%)
services	44 (16%)
raw materials	3 (1%)
packaging	19 (7%)
Buytype	
complex, first time purchases	36 (15%)
routine, meant to restock	69 (28%)
mixture of first time, routine, and modified routine purchases	144 (58%)

Informant Characteristics

Informants were manufacturing buyers and supplier representatives. In order to maximize the sample size and minimize potential adverse effects of informant attrition at time two, buyers were asked to report on two supply relationships. These relationships did not necessarily need to be strategic, nor did they have to involve their largest suppliers. However, the buyers were asked to select relationships that were maximally different (e.g., a positive and a negative relationship) if possible, so that range restriction on the measures would not inhibit model estimation.

Buyers were asked to identify the supplier representative in each supplier firm that they interacted with most frequently on a regular basis, with the one stipulation that the representative be a person with whom they have had frequent interaction with for at least one year.[3]

Informant competency. The buyers had 11 years of experience in purchasing on average, and had been with their present companies 21 years on average, both are positive indicators of informant competency. The supplier representatives averaged 15 years of experience and had been with their companies 14 years on average, also positive indicators of competency. At the end of the time two questionnaire, informants were asked specific competency questions such as, "How knowledgeable are you about the level of trust in your firm's relationship with this firm?" Their responses were marked on 7-point Likert scales (1=Not Very Knowledgeable, 7=Very Knowledgeable). The average responses to these scales for buyers and suppliers was 5.6.

Procedure

Time One

Two hundred buyers from the four firms were surveyed, creating an initial sampling frame of 400 dyadic relationships. These questionnaires were mailed to the buyers along with a pre-addressed, postage-paid envelope, a cover letter from the researcher and a memorandum from corporate executives that explained the purpose of the study, stressed the need for participation, and assured confidentiality of all responses. Each survey required approximately fifteen minutes to complete.

In the survey, buyers were asked to supply the names and addresses of supplier companies and representatives who met the aforementioned criteria--maximally different relationships that have been ongoing for at least one year. The buyers then returned the questionnaires directly to the researcher and similar questionnaires were sent to the named supplier along with a self-addressed, postage-paid envelope, and cover letters from the researcher and corporate executives. The supplier survey required ten minutes to complete.[4]

Thirty-one of the buyers were eliminated from the sample for various reasons: some had been recently reassigned or didn't work with suppliers on a long term basis, or simply refused to complete the surveys. Two hundred seventy-five buyer surveys

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[3] Preliminary interviews with buyers during the survey pretest indicated that they typically required at least one year of interaction with a supplier representative to feel comfortable about making reports on the level of interpersonal trust present in the relationship.

[4] The difference in time required is accounted for by the fact that the buyer had to supply the supplier's name, the representative's name and address.

were returned (a 75% response rate) and 220 corresponding supplier surveys were completed (an 80% response rate).

Time Two

The use of a longitudinal design raises the issue of the appropriate time lag. A review of 27 longitudinal studies in organizational management indicates little consistency on an appropriate time interval (Williams & Podsakoff 1989). Typically, lags are chosen out of convenience, not theory. A one year lag was used in this study, partly out of convenience, but also because pretest interviews with buyers suggested that there appears to be a lot of variation in possible outcomes within a one year period. Some informants told of relationships disintegrating within a one-year period of time, while other reported little change. At time two, the buyers and suppliers who returned surveys in the initial data collection were again sent cover letters, memorandums, and surveys in a similar fashion to time one. This survey was essentially identical to the time one survey.

Of the 275 buyers and 220 suppliers surveyed, 42 buyers and 12 suppliers changed representatives and were no longer working with the same buyer or supplier representative from time one, two supplier surveys were returned to the sender and no forwarding addresses could be found, two buyers and four suppliers refused completion of the survey, and ten purchasing relationships were terminated over the one year period. Collectively, this represents a 20% attrition rate for buyers, and a 13% rate for suppliers. 167 buyer surveys and 154 supplier surveys were used in the time two analysis. In total, 80% of the buyers and 83% of the suppliers at time one responded to the second survey

Questionnaire and Scale Development

Measurement

Measure development was based on the procedure recommended by Nunnally (1978). All constructs were measured with multiple-item, 7-point Likert scales in simple terms using the language commonly employed by the informants. Scales for constructs with no precedent in the literature (e.g., the development of strategic advantages and complementary competencies) were created for the purpose of this study. Scale items and measures for constructs that have appeared before in the channels literature were adapted and used whenever possible. All the scales for the constructs used in this study (with the exception of complementary competencies and environmental variables) were used previously in a nationwide study of purchasing agents (Jap & Weitz 1994), where they demonstrated acceptable levels of reliability and construct validity. The items were identically worded for both the buyer and supplier.

DATA ANALYSIS

Structural equation modeling in a two-step approach was used to assess scale development and model testing issues (Anderson & Gerbing 1988). The first step involved measurement validation, and the second step involved tests of substantive relationships.

Measure Development

Confirmatory factor analysis techniques were used to assess measurement issues via full-information maximum-likelihood (MLE) techniques in LISREL 8.03 (Jöreskog & Sörbom 1993). The technical details and results of this analysis are provided in Appendix A.

Measurement models for the constructs were estimated for buyers and suppliers separately and construct invariance was demonstrated across the two groups as well as across time. The results indicated convergent and discriminant validity among constructs at the monomethod level, indicating that the measures were measuring what they were intended to measure and not measuring what they were not intended to measure.

A joint measurement model was estimated in which the buyer and supplier responses were used as indicators for the constructs in the structural model. However, the results indicated the presence of substantial informant bias in the pooled data as well as perceptual differences. Given the lack of fit in the joint measurement model and subsequent assessments of potential sources of the informant bias, it was impossible to go to the next step of estimating a joint structural model in which buyer and supplier responses are used as indicators of the constructs.

It is important to note that the problem at this point is the pooling of data, and not the measures themselves. This inability to pool the data across multiple informants is a common occurrence in the channels literature when multiple informants are utilized (J. C. Anderson & Narus 1990; John & Reve 1982; Kumar et al. 1993; Phillips 1981), with the exception of Bagozzi and Phillips (1982) and J. C. Anderson (1987). More research is needed that explicitly investigates the factors that lead to this lack of model fit.

In light of this, the analysis strategy took a different turn. All subsequent analyses were estimated for buyers and suppliers separately, and the results compared across the groups. The rationale was that although the pooled data across the dyad could not be used, the degree to which buyers and suppliers saw the phenomenon similarly could still be assessed.

Structural Model Analysis

The model in Figure 3 is a structural model that specifies the causal relations of the constructs to one another, as well as all the measurement relationships previously discussed. Appendix B outlines the technical details of estimating this structural model.

The strategy for evaluating the structural relationships between the constructs was an incremental model-building approach: The basic strategic advantage development process model of Figure 2 was estimated independently at time one and two for buyers and suppliers. Since structural equation modeling techniques were initially developed for the estimation of linear systems of equations, a median split on trust was used to divide the sample and allow assessment of any moderating effects of trust.

The completely standardized parameter estimates for the model are presented in Table 2. Hypotheses 2a-c, 3c, 4a, 5a, and 5c were confirmed for buyers and suppliers. A reverse interaction was observed for hypothesis 1a, while the support was mixed between buyers and suppliers on all other hypotheses. An overview of the tests of substantive relationships is depicted in Table 3.

Saturated models, which are the next most likely unconstrained models, were estimated to assess the degree to which alternative explanations of the data might provide a better fit. These tests supported the causal ordering of the variables proposed in the conceptual framework.

TABLE 2
Longitudinal Structural Model Parameter Estimates

EFFECT	BUYERS		SUPPLIERS	
	HIGH TRUST	LOW TRUST	HIGH TRUST	LOW TRUST
Time 1				
H1a: GOAL -> DEVSA	-0.03	0.12***a	0.28***b	0.51***abc(.1)
H1b: CCOMP -> DEVSA	0.72***abc(.1)	0.57***b	0.40***	0.38***
H2a: DEVSA -> STRADVS	0.70***abc	0.39***	0.47***c(.1)	0.52***b
H2b: DEVSA -> JPROFS	0.54***	0.41***	0.38***	0.36***c
H2c: DEVSA -> IASSETS	0.73***b	0.76***ab	0.24***	0.49***a
Time 2				
H4a: GOAL -> DEVSA	0.12***c	0.12***	0.46***bc	0.46***b
H4b: CCOMP -> DEVSA	0.64***b	0.83***abc	0.31***	0.34***
H5a: DEVSA -> STRADVS	0.51***b	0.51***c	0.36***	0.43***
H5b: DEVSA -> JPROFS	0.56***abc	0.35***b	0.30***a	0.13*
H5c: DEVSA -> IASSETS	0.69***b	0.80***bc	0.39***	0.41***
Intermediate				
H3a: STRADVS -> GOAL	0.17***b	0.18***b	0.00a	-0.18***
H3b: JPROFS -> GOAL	0.28***a	0.01	0.25***a	-0.02
H3c: IASSETS -> CCOMP	-0.44***	-0.38***	-0.16***	0.19***ab
Correlations Between Time 1 & 2 Constructs				
$\phi71$	0.29***	0.65***	0.13***	0.75***
$\phi82$	1.20***	1.08***	0.40***	0.06
$\phi93$	0.74***	0.93***	0.58***	0.68***
$\phi10,4$	0.53***	0.61***	0.49***	0.63***
$\phi11,5$	0.64***	0.50***	0.59***	0.55***
$\phi12,6$	0.33***	0.90***	0.16*	0.56***

All estimates are completely standardized.
*.1 **.05 ***.01 indicate parameter significance.

a   Significantly greater (α=.05) than corresponding estimate within-group (high trust buyers vs. low trust buyers).
b   Significantly greater (α=.05) than corresponding estimate across groups (e.g., high†trust buyers vs. high trust suppliers).
c   Significantly greater (α=.05) than corresponding estimate over time (e.g., high trust buyers at time 1 vs. high trust buyers at time 2).

a(.1), b(.1), c(.1) are marginally significant (α=.10) comparisons.

TABLE 3
Summary of Hypotheses and Results

#	Hypothesis	Result for Buyers	Result for Suppliers
	Time One		
1a	Trust moderates the effects of goal compatibility on the development of strategic advantages.	Reverse Support	Reverse Support
1b	Trust moderates the effects of complementary competencies on the development of strategic advantages.	Supported	Not Supported
2a	Developing strategic advantages leads to the achievement of strategic advantages over competing dyads.	Supported	Supported
2b	Developing strategic advantages leads to higher joint profits.	Supported	Supported
2c	Developing strategic advantages leads to idiosyncratic assets.	Supported	Supported
	Intermediate Effects		
3a	Strategic advantages gained at time one increases perceptions of goal compatibility at time two.	Supported	Not Supported
3b	The achievement of joint profits at time one increases perceptions of goal compatibility at time two.	Partial Support	Partial Support
3c	The presence of idiosyncratic assets at time one decreases complementary competencies at time two.	Supported	Supported
	Time Two		
4a	The effect of goal compatibility on the development of strategic advantages at time two are not moderated by trust.	Supported	Supported
4b	The effect of complementary competencies on the development of strategic advantages at time two are not moderated by trust.	Reverse Support	Supported
5a	The development of strategic advantages at time two leads to the attainment of strategic advantages.	Supported	Supported
5b	The development of strategic advantages at time two leads to higher joint profits.	Supported	Partial Support
5c	The development of strategic advantages at time two leads to idiosyncratic assets.	Supported	Supported

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RESULTS

Collectively, the results point to the purposive nature of developing strategic advantages together. Such close relationships are economically driven and not interpersonally driven. Interpersonal factors such as trust can signal important information under uncertainty, but as members become more familiar with each other and certain about their situation, continued development of strategic advantage depends heavily upon member competencies and goals. Even in the absence of trust, development of strategic advantages is possible, provided that the necessary competencies are present.

Antecedents

Environmental Factors

The environment appears to have little impact on the dyad's decision to develop strategic advantages. Although at first glance, this seems counter to past work on the effects of the environment in the organizational behavior literature, the result can be explained by the fact that the environment measured in the present study was the local, SBU-level environment immediately surrounding the informants and not the corporate level environment surrounding the firm. This latter environment is what has been measured most frequently in past organizational behavior research.

Goal Compatibility

A reversal of the hypothesized interaction at time one was observed for goal compatibility. It appears to be a stronger predictor of developing strategic advantages under low trust than under high trust. This could be because goal compatibility acts as an important assurance under uncertainty--similar goals assure the members that the other will "walk the same path" and not act opportunistically if given the chance to do so. However, when trust is high, goal compatibility is consistent, but not necessarily diagnostic information in the decision to become interdependent upon each other. At time two, goal compatibility was an important predictor of whether the dyad continued to develop strategic advantages, regardless of the level of trust.

Complementary Competencies

Complementary competencies was a strong predictor of whether the dyad worked closely together at both time periods, regardless of trust. Evidently, complementary competencies are strong assurances that the payoffs from working closely together will be achieved. The hypothesized interaction with complementary competencies at time one was observed only for buyers. For them, a high level of trust

and the presence of complementary competencies created a more powerful incentive for developing strategic advantages than when trust was low.

Consequences

The most robust results of the study were with respect to the outcomes of developing strategic advantages. The payoffs are clearly available for buyers and suppliers. When the dyads work closely together, they are able to achieve strategic advantages over competing dyads and increased joint profits. The process also is a strong predictor of the creation of relationship-specific, idiosyncratic assets.

Because of the median split approach used, interaction effects between trust and the development of strategic advantages on the consequences were observable. Although not explicitly hypothesized, one such result is noted here because it suggests an interesting and unexpected finding that may be a potential area for future research. When trust was high, the development of strategic advantages was a stronger predictor of the attainment of strategic advantages at time one than at time two. It could be that trust facilitates this desirable outcome, early in the relationship. Hence, trust appears to play a dynamic role throughout the strategic advantage development process; it moderates firm characteristics and consequences initially, and then plays less of a role over time.

Intermediary Results Between Time 1 and Time 2

For both buyers and suppliers, joint profits earned at time one increased goal compatibility when trust was high, but not when trust was low. Evidently, trust has a significant effect on how perceptions are shaped. When trust is high, members make other consistently positive inferences--goal compatibility is high. When trust is low, members feel less secure, and even after higher joint profits are achieved, higher goal compatibility is not inferred. These results are consistent with findings in interpersonal research that says that individuals tend to adopt outlooks or expectations that are consistent with prior beliefs (cf., Bowlby 1977, Holmes & Rempel 1989; Johnson & Rusbult 1989; Kelley & Thibaut 1978).

The creation of idiosyncratic assets in time one generally led to decreases in complementary competencies at time two. Evidently, during the process of working together, these competencies become less unique as members learn more about each other. The relationship-specific assets that are created are meant to support the goals and objectives of the mutual relationship--the attainment of strategic advantages, and not necessarily the strengthening of individual competencies.

Differences in Perspectives

It is also interesting to note differences in perspectives between buyers and suppliers that occur at time one and two. For buyers, complementary competencies have greater effects on the likelihood that the dyad will develop strategic advantages together, while goal compatibility has a greater effect for suppliers. Early in the relationship, the effect of complementary competencies on the development of strategic advantages is enhanced for buyers when trust is high. Whether or not the supplier has similar goals is less important than whether the supplier is able to provide a needed competency. Later in the relationship, the competencies become an important reason for continuing to develop strategic advantages when trust is absent. These competencies provide powerful assurances, particularly when trust is low, that the payoffs from working together are attainable.

On the other hand, goal compatibility has a greater effect on the supplier's willingness to develop strategic advantages than complementary competencies, regardless of the level of trust at both time one and two. Suppliers need to please their customers. For them, it is less important that their customer has complementary competencies, since they are trying to support the customer's agenda and needs. The fruits of success--strategic advantages and joint profits appear to operate differently for buyers and suppliers. For buyers, gaining strategic advantages in time one increases goal compatibility at time two. This was not true for suppliers.

In summary, the results support the causal ordering depicted in Figure 3. The structural model analysis suggests that the development of strategic advantages is a valid mediator between the antecedents and consequences at time one, and the antecedents and consequences at time two. There is also evidence for the mediating role of the antecedents at time two between the consequences of time one and the development of strategic advantage at time two. Saturated models consisting of alternative explanations of the data were also estimated. Across all four groups, the hypothesized structural model provided a more reasonable and parsimonious explanation of the data than the saturated models did.

CONCLUSIONS

Contributions of the Research

This research advances our understanding of strategic advantage development in buyer-supplier relationships in a number of ways. To begin with, it points to the role of strategic advantage development as a mediating factor of key relationship outcomes such as strategic advantages, increased joint profits, and idiosyncratic asset creation.

This study also points to the importance of similar goals in the decision to work closely together. Goal compatibility provides important assurances of nonopportunistic behavior early in the relationship if members do not trust each other. Over time, common goals provide an important reason for the dyad to continue to develop strategic advantages regardless of the level of trust present in the relationship.

This study is one of the first to posit complementary competencies as a key interorganizational construct. Although a number of practitioners point to the importance of competencies in buyer-supplier relationships, there is no systematic work to date on complementary competencies and their role in expanding the size of the pie between member firms. These competencies provide powerful assurances to the members of successful pie expansion and are important predictors of the dyad's decision to develop strategic advantages over time.

By focusing on mutual trust, the study highlights the importance of interpersonal relationships in the interorganizational process of developing strategic advantages. Moreover, this is the first marketing study to examine the dynamic role of interpersonal trust in interorganizational relationships. Trust is shown to be a clear moderator of whether firms work closely to develop strategic advantages early in the relationship. Over time, it is an important facilitator of key outcomes such as the attainment of strategic advantages.

Trust also shapes the inferences that are made between time one and two. When trust is high, members perceive increased goal compatibility as the result of earning joint profits. Thus, high trust leads members to generate consistently positive inferences. When trust is low, earning joint profits has no effect on perceptions of goal compatibility. This result is consistent with findings in interpersonal research.

Our knowledge of the role of idiosyncratic assets in interorganizational relationships has also been expanded as a result of this research. Idiosyncratic assets are useful in helping to expand the size of the pie between firms. Instead of being a liability to firms that should be minimized, as in the transaction cost analysis view, idiosyncratic assets represent a means by which a relationship that is mutually beneficial to both firms can also simultaneously satisfy the individual interests of each firm (Zajac & Olsen 1993). Idiosyncratic assets form the structure of the relationship

surrounding the dyad's exchange and increases their willingness to engage in joint activities (Heide 1990). By creating idiosyncratic assets, members realize that termination of the relationship for nonsubstantial or insignificant reasons can be very costly (Williamson 1985). When trust is low, assets can be used as credible signs of one's commitment to the relationship(E. Anderson & Weitz 1992).

Finally, channel researchers have long advocated the need for longitudinal designs in understanding interorganizational dynamics, yet to date, no one has ever undertaken such a task. In this study, an attempt has been made to understand the joint relationship between two firms using informants from both sides of the relationship and analyzing their reports over time.

Implications for Management

The results suggest a number of implications for management. First, the decision to develop strategic advantages is not solely a matter of trust. If there is a low level of interpersonal trust in the relationship, firms can still work together and be assured that the other firm will not act opportunistically by examining the other firm's goals in the relationship. If their goals are similar--i.e., provide a superior value product to the market place, reduce lead time to market by x number of days or weeks, etc.--then the pie can still be successfully expanded.

Second, the results clearly indicate that complementary competencies are an important aspect of developing strategic advantages together. These competencies provide powerful assurances that the other member has the necessary abilities to expand the joint pie size. This is particularly true for buyers in the absence of trust at time one.

Third, the results also indicated differences in perspectives between buyers and suppliers. It is helpful for buyers to know that goal compatibility is a key consideration for suppliers who are considering working more closely with a customer. Suppliers tend to be less concerned about skill complementarity and more concerned with goal congruency. To them, it is important to know that they are moving in the same direction as their customer.

For suppliers, it is useful to know that complementary competencies are the most important factor to buyers in determining whether they will work closely with a supplier. Since buyers generally have more control than suppliers over who to work closely with, knowing that a supplier has a complementary competency and is trustworthy resulted in the buyer being more willing to develop greater interdependence with the supplier. In this way, trust becomes diagnostic information about whom to work with in developing strategic advantages. Also, achieving strategic advantage over competing dyads tends to strengthen the buyers' perceptions of goal compatibility, which is an important factor in determining whether the buyer will continue to develop strategic advantages with the supplier in the future.

Fourth, there are clear payoffs from working closely together. When buyers and suppliers become interdependent in the development of strategic advantage, strategic advantages over competing dyads are achieved, joint profits are increased, and the creation of idiosyncratic assets are necessary. This provides a powerful basis from which the dyad can continue to work together in the future. Other competing dyads in the marketplace who have not yet worked closely to develop strategic advantages still must go through the time, effort, and occasional frustration involved to reach the same level of intimacy between their firms. Hence, the relationship itself can potentially become a key source of sustainable advantage.

APPENDIX A
MEASUREMENT

Scale development procedures require an assessment of construct validity, or the extent to which an observation measures the concept it is intended to measure. The goal of measure validation is to demonstrate the internal consistency, reliability, and unidimensionality of the constructs.

Confirmatory factor analysis was used in the measurement analysis because it allows for explicit representation of the degree of correspondence between observed measures and concepts. A first-order, single-factor model for each set of congeneric items per construct was estimated using full-information maximum-likelihood (MLE) techniques in LISREL 8.03 (Jöreskog & Sörbom 1993).

Table A1 contains the scale items, factor loadings, standard errors, and reliabilities for the latent constructs for buyers and suppliers separately at time one and two. Reliability was estimated using the reliability formula of Jöreskog (1971). This expression is superior to coefficient alpha in that it does not assume equal item reliabilities within a confirmatory factor analysis context and will not underestimate the reliabilities when the scale is comprised of a small number of items. As a rule, factor loadings (λ) should be approximately .6 and higher in value, and standard errors ($\theta\delta$) approximately .4 or less (Bagozzi & Yi 1988).

The measurement models were initially estimated for buyers and suppliers separately. Each buyer survey was treated as an independent response throughout the analysis in this study in order to provide the large sample size necessary for stable parameter estimation. The statistical properties of MLE estimators are asymptotic, require information from higher order moments, and are only true for large samples. The complete data analysis was also conducted with truly independent buyer surveys--only one reported relationship per buyer (n=129), and the results were not significantly different, so the multiple responses from buyers were retained.

Convergent and Discriminant Validity

Convergent validity refers to the degree to which multiple attempts to measure the same concept are in agreement. This is indicated in Table A1 by factor loadings with t-values of two or more.

Discriminant validity is the degree to which measures of different concepts are distinct. This was initially assessed with a stringent test of discriminant validity developed by Fornell and Larcker (1981). Table A2 contains summary information on the measurement models, completely standardized correlation matrix between constructs, and means for each construct for buyers and suppliers, respectively. Correlations that did not meet the Fornell & Larcker test are underlined in the table.

The chi-square difference test proposed by Jöreskog (1971) was then conducted on these pairs and in every case, the constructs were shown to be significantly different.

The overall chi-square is a likelihood ratio statistic testing a hypothesized model against the alternative that the covariance matrix is unconstrained. Although useful in gaining information about a statistically false model, the chi-square test is well known for its sensitivity to sample size. Hence, the measurement model chi-square should not be taken too seriously as an indicator of overall model fit.[5]

Bentler's (1990) comparative fit index (CFI) is a goodness of fit index that is able to avoid the extreme under- or over- estimation in small samples that tends to occur with the LISREL indices, or Bentler & Bonnet's (1980) normed fit index and non-normed fit index. The CFI ranges in possible values between zero and one, indicating a lack of fit and perfect fit between the theoretical model's covariance matrix to the observed covariance matrix, respectively.

Collectively, there is evidence of convergent and discriminant validity for all the constructs for the separate buyer and supplier groups as well as a good measurement model fit to the data.

Construct Equivalence Across Buyers and Suppliers

The next step was to show construct equivalence across the two groups. This was demonstrated using a series of nested models in which scaling, measurement error, and covariance equality was assessed. The results supported construct scaling and measurement error invariance across buyers and suppliers.

Longitudinal Measurement Model

The final step in the measurement evaluation was to show equivalent measurement properties among the constructs over time. The longitudinal measurement model is a special case of the general multi-trait multi-method (MTMM) and longitudinal models. Dynamic measurement equivalence was assessed via a series of nested tests designed to show invariance of trait loadings, item-specific loadings, and random error over time. All of these test were passed, showing evidence of factor invariance over time. One advantage of the longitudinal model is that it allows for estimation of item-specific error. In a cross-sectional study, this component is typically lumped into the random error term. The consequence of this is reduced reliability of the individual item and any resulting composite scores involving the item. These error terms were found to be relatively small when estimated in the longitudinal model.

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[5] The chi-square will be more useful when nested, alternative structural models are tested against each other in Appendix B.

Given the cross-sectional and longitudinal measurement model evidence thus far, an attempt was made to pool the independent buyer and supplier responses into a dyadic measurement model that tapped a single construct. A correlated uniqueness model (Bagozzi & Yi 1993; Kenny 1979; Kenny & Kashy 1992; Marsh 1989), based on MTMM approaches developed in psychology, was estimated for each construct.

The minimization process for strategic advantages and idiosyncratic assets was problematic, making it impossible to recover the parameter estimates in these two models. Parameter estimates were obtained in the trust and development of strategic advantage models, but identification problems inhibited calculation of parameter significance tests. Collectively, the pattern of these results and the loading estimates indicated that substantial informant bias exists in the pooled data.

Informant bias may have resulted for various reasons. First, bias tends to increase when informants are asked to make complex social judgments concerning aspects of the relationship (John and Reve 1982), as they did here. Second, the informants were likely to use different information or events to form social judgments or give different weights to different information. Third, there was also significant differences in perception between buyers and suppliers. Alternative sources of informant bias such as informant competency were also assessed, but the results indicated that the observed bias was not due to a lack of competency.

Given the lack of fit in the correlated uniqueness model, and subsequent assessments of potential sources of the informant bias, it was impossible to go to the next step of estimating a dyadic structural model in which the buyer and supplier responses are used as independent indicators of the constructs in the structural model.

TABLE A1
Scale Items, Factor Loadings, Standard Errors, and Reliabilities at Time Two

All estimates are based on the correlation matrix as input.
T-values are listed directly below each parameter estimate.

BUYERS N=275 T1, 167 T2

	TIME 1		TIME 2	
GOAL COMPATIBILITY (Reliability = .87 T1, .89 T2)	λ	θδ	λ	θδ
They share the same goals in the relationship.	.85	.28	.81	.34
	16.7	8.1	12.4	7.3
They have compatible goals.	.84	.29	.90	.19
	16.6	8.2	14.5	5.1
They support each other's objectives.	.81	.34	.85	.28
	15.7	9.0	13.2	6.8

	TIME 1		TIME 2	
COMPLEMENTARY COMPETENCIES (Reliability = .80 T1, .81 T2)	λ	θδ	λ	θδ
They have complementary strengths that are useful to their relationship.	.77	.40	.86	.27
	14.6	9.5	13.4	6.6
They contribute different resources to the relationship that help them achieve mutual goals.	.78	.39	.81	.34
	14.8	9.3	12.4	7.5
They have separate abilities that, when combined together, enable them to achieve goals beyond their individual reach.	.71	.50	.63	.60
	12.8	10.3	8.8	8.6

	TIME 1		TIME 2	
TRUST (Reliability = .89 T1, .89 T2)	λ	θδ	λ	θδ
Our promises to each other are reliable.	.84	.29	.90	.18
	17.0	10.0	15.0	7.0
We are very honest in dealing with each other.	.85	.27	.93	.13
	17.4	9.8	17.4	5.9
We trust each other.	.91	.17	.92	.16
	19.3	8.3	15.4	6.6

λ = factor loading
θδ = standard error

	TIME 1		TIME 2	
TRUST (continued)	λ	θδ	λ	θδ
We would go out of our way to help each other out.	.90	.19	.77	.41
	18.9	8.8	11.6	8.4
We consider each other's interests when problems arise.	.83	.31	.82	.32
	16.8	10.1	12.9	8.1

	TIME 1		TIME 2	
DEMAND MUNIFICENCE (Reliability = .66 T1, .57 T2)	λ	θδ	λ	θδ
The demand for the supplier's product(s) is high.	.48	.71	.77	.41
	5.9	8.9	6.9	2.8
The demand for the buyer's product(s) is high.	.90	.36	.48	.77
	7.6	3.0	5.2	7.7

	TIME 1		TIME 2	
DYNAMISM (Reliability = .75 T1, .77 T2)	λ	θδ	λ	θδ
Marketing practices in our industry are constantly changing.	1.1	-.14	.82	.33
	7.2	-.44	7.5	2.2
The product mixes in our industry changes frequently.	.39	.84	.76	.43
	5.0	10.1	7.2	3.2

	TIME 1		TIME 2	
DEVELOPMENT OF STRATEGIC ADVANTAGES (Reliability = .84 T1, .86 T2)	λ	θδ	λ	θδ
They work on joint projects tailored to their needs.	.67	.56	.76	.42
	11.9	10.6	11.3	8.1
They work together to exploit unique opportunities.	.81	.35	.78	.39
	15.5	9.0	11.8	8.0
Both companies are able to come up with innovative solutions to problems.	.74	.45	.80	.36
	13.7	10.0	12.1	7.8
Both companies are always looking for synergistic ways to do business together.	.77	.40	.79	.38
	14.6	9.6	12.0	7.9

	TIME 1		TIME 2	
STRATEGIC ADVANTAGES (Reliability = .80 T1, .75 T2)	λ	θδ	λ	θδ
They have gained strategic advantages over their competitors.	.72	.48	.78	.38
	13.2	9.7	11.6	7.2

STRATEGIC ADVANTAGES (continued)	TIME 1		TIME 2	
	λ	$\theta\delta$	λ	$\theta\delta$
The relationship has not resulted in strategic advantages	.60	.63	.51	.74
for them. (R)	10.2	10.7	6.7	8.8
They have gained benefits that enable them to compete	.78	.40	.71	.49
more effectively in the marketplace.	14.4	9.0	10.1	8.0
The relationship has not resulted in strategically important	.71	.49	.61	.62
outcomes. (R)	12.7	9.9	8.4	8.5

JOINT PROFITS (Reliability = .82 T1, .86 T2)	TIME 1		TIME 2	
	λ	$\theta\delta$	λ	$\theta\delta$
They have achieved a high level of joint profits between	.83	.32	.89	.21
them.	15.2	6.7	14.1	5.4
They have generated a lot of profits together.	.81	.35	.90	.20
	14.7	7.3	14.3	5.0
They have increased joint profits shared between them.	.67	.55	.67	.55
	11.6	9.9	9.5	8.4

IDIOSYNCRATIC ASSETS (Reliability = .75 T1, .76 T2)	TIME 1		TIME 2	
	λ	$\theta\delta$	λ	$\theta\delta$
If this relationship were to end, they would be wasting a	.67	.57	.65	.58
lot of knowledge that's tailored to their relationship.	11.1	9.3	8.8	8.2
If either company were to switch to a competitive buyer or	.76	.42	.75	.43
vendor, they would lose a lot of the investments made in	13.2	7.5	10.8	7.3
the present relationship.				
They have invested a great deal in building up their joint	.71	.50	.74	.45
business.	12.1	8.7	10.1	7.4

SUPPLIERS N=220 T1, 154 T2

	TIME 1		TIME 2	
GOAL COMPATIBILITY (Reliability = .79 T1, .89 T2)	λ	$\theta\delta$	λ	$\theta\delta$
They share the same goals in the relationship.	.80	.36	.87	.25
	13.6	8.8	13.3	6.7
They have compatible goals.	.85	.28	.83	.31
	15.0	8.0	12.5	7.3
They support each other's objectives.	.93	.13	.87	.24
	17.4	4.9	13.3	6.7

	TIME 1		TIME 2	
COMPLEMENTARY COMPETENCIES				
(Reliability = .78 T1, .75 T2)	λ	$\theta\delta$	λ	$\theta\delta$
They have complementary strengths that are useful to their relationship.	.76	.42	.71	.49
	11.9	8.5	9.9	8.0
They contribute different resources to the relationship that help them achieve mutual goals.	.79	.37	.83	.30
	13.0	7.7	12.2	6.3
They have separate abilities that, when combined together, enable them to achieve goals beyond their individual reach.	.64	.59	.56	.68
	9.5	9.4	7.4	8.5

	TIME 1		TIME 2	
TRUST (Reliability = .89 T1, .93 T2)	λ	$\theta\delta$	λ	$\theta\delta$
Our promises to each other are reliable.	.82	.33	.74	.46
	13.9	7.7	10.4	8.1
We are very honest in dealing with each other.	.78	.39	.82	.32
	12.8	8.4	12.3	7.5
We trust each other.	.83	.32	.92	.16
	14.0	7.6	14.6	5.7
We would go out of our way to help each other out.	.70	.50	.88	.22
	11.2	9.0	13.8	6.7
We consider each other's interests when problems arise.	.78	.39	.88	.22
	13.0	8.3	13.7	6.7

	TIME 1		TIME 2	
DEMAND MUNIFICENCE (Reliability = .68 T1, .65 T2)	λ	$\theta\delta$	λ	$\theta\delta$
The demand for the supplier's product(s) is high.	.61	.62	.68	.54
	7.9	7.5	7.0	4.9
The demand for the buyer's product(s) is high.	.82	.33	.73	.47
	9.8	3.0	7.4	4.1

	TIME 1		TIME 2	
DYNAMISM (Reliability = .55 T1, .34 T2)	λ	$\theta\delta$	λ	$\theta\delta$
Marketing practices in our industry are constantly changing.	.50	.46	1.0	.00
	5.4	3.1	5.7	-.01
The product mixes in our industry changes frequently.	.73	.62	.58	.66
	6.4	9.7	4.8	4.8

	TIME 1		TIME 2	
DEVELOPMENT OF STRATEGIC ADVANTAGES (Reliability = .82 T1, .85 T2)	λ	$\theta\delta$	λ	$\theta\delta$
They work on joint projects tailored to their needs.	.61	.63	.81	.35
	9.3	9.6	11.7	7.1
They work together to exploit unique opportunities.	.75	.42	.80	.36
	12.2	8.8	11.6	7.2
Both companies are able to come up with innovative solutions to problems.	.75	.44	.70	.52
	12.2	8.7	9.5	7.9
Both companies are always looking for synergistic ways to do business together.	.78	.39	.75	.44
	12.9	8.4	10.5	7.6

	TIME 1		TIME 2	
STRATEGIC ADVANTAGES (Reliability = .78 T1, .78 T2)	λ	$\theta\delta$	λ	$\theta\delta$
They have gained strategic advantages over their competitors.	.70	.51	.83	.32
	10.4	8.7	12.0	6.2
The relationship has not resulted in strategic advantages for them. (R)	.64	.59	.52	.73
	9.1	9.2	6.5	8.3
They have gained benefits that enable them to compete more effectively in the marketplace.	.73	.47	.82	.33
	11.9	7.9	11.7	6.4

	TIME 1		TIME 2	
STRATEGIC ADVANTAGES (continued)	λ	$\theta\delta$	λ	$\theta\delta$
The relationship has not resulted in strategically important	.68	.54	.56	.69
outcomes. (R)	10.4	8.7	7.1	8.3

	TIME 1		TIME 2	
JOINT PROFITS (Reliability = .86 T1, .83 T2)	λ	$\theta\delta$	λ	$\theta\delta$
They have achieved a high level of joint profits between	.91	.19	.91	.17
them.	16.0	4.7	13.4	3.1
They have generated a lot of profits together.	.85	.26	.78	.39
	14.4	6.2	10.9	6.5
They have increased joint profits shared between them.	.68	.54	.67	.55
	10.9	9.4	8.9	7.7

	TIME 1		TIME 2	
IDIOSYNCRATIC ASSETS (Reliability = .63 T1, .75 T2)	λ	$\theta\delta$	λ	$\theta\delta$
If this relationship were to end, they would be wasting a	.51	.74	.68	.53
lot of knowledge that's tailored to their relationship.	6.9	9.2	8.9	7.3
If either company were to switch to a competitive buyer or	.68	.54	.73	.47
vendor, they would lose a lot of the investments made in	9.4	7.1	9.7	6.8
the present relationship.				
They have invested a great deal in building up their joint	.62	.62	.70	.50
business.	8.5	8.1	9.3	7.1

Measurement Models and Correlation Matrices, Means,
and Standard Deviations at Time One

BUYERS MEASUREMENT MODEL χ^2(df): 626(224)
BENTLER'S CFI   .88
CORRELATION MATRIX (completely standardized)

	Mean	Std Dev	1	2	3	4	5	6
1 GOAL	5.1	1.1	1					
2 CCOMP	5.2	.93	.81	1				
3 DEVSA	5.0	1.0	.78	.91[a]	1			
4 STRADVS	4.9	1.1	.71	.82[a]	.77	1		
5 JPROFS	4.3	1.2	.48	.44	.49	.63	1	
6 IASSETS	4.7	1.2	.36	.57	.57	.61	.44	1

SUPPLIER MEASUREMENT MODEL χ^2(df):626(224)
BENTLER'S CFI   .88
CORRELATION MATRIX (completely standardized)

	Mean	Std Dev	1	2	3	4	5	6
1 GOAL	5.4	1.2	1					
2 CCOMP	5.5	.98	.87[a]	1				
3 DEVSA	5.3	1.1	.84[a]	.30	1			
4 STRADVS	5.4	1.1	.70	.33	.82[a]	1		
5 JPROFS	4.4	1.2	.62	.25	.57	.62	1	
6 IASSETS	5.7	.92	.56	.32	.68	.73	.51	1

All correlations are significant at alpha=.05, with the exception of those marked with a
"b."

[a] Failed to meet Fornell and Larcker (1981) test of discriminant validity.

GOAL = goal compatibility
CCOMP = complementary competencies
DEVSA = development of strategic advantages
STRADVS = strategic advantages
JPROFS = joint profits
IASSETS = idiosyncratic assets

Table A2 (continued)

Measurement Models and Correlation Matrices, Means,
and Standard Deviations at Time Two

BUYERS MEASUREMENT MODEL χ^2(df): 626(224)
BENTLER'S CFI   .88
CORRELATION MATRIX (completely standardized)

	Mean	Std Dev	1	2	3	4	5	6
1 GOAL	5.0	1.1	1					
2 CCOMP	5.1	.86	.83	1				
3 DEVSA	5.0	1.0	.77	.27	1			
4 STRADVS	4.8	.93	.69	.21	.87[a]	1		
5 JPROFS	4.4	1.1	.59	.15[b]	.73	.84[a]	1	
6 ASSET	4.7	1.2	.54	.27	.89[a]	.91[a]	.73	1

SUPPLIERS MEASUREMENT MODEL χ^2(df): 389(224)
BENTLER'S CFI .92
CORRELATION MATRIX (completely standardized)

	Mean	Std Dev	1	2	3	4	5	6
1 GOAL	5.3	1.1	1					
2 CCOMP	5.4	.89	.96[a]	1				
3 DEVSA	5.2	1.1	.90[a]	-.01[b]	1			
4 STRADVS	5.5	.91	.68	.04[b]	.74	1		
5 JPROFS	4.6	1.2	.64	.04[b]	.55	.62	1	
6 ASSET	5.9	.84	.66	.10[b]	.75	.87[a]	.52	1

All correlations are significant at alpha=.05, with the exception of those marked with a
"b."

[a] Failed to meet Fornell and Larcker (1981) test of discriminant validity.

GOAL = goal compatibility
CCOMP = complementary competencies
DEVSA = development of strategic advantages
STRADVS = strategic advantages
JPROFS = joint profits
IASSETS = idiosyncratic assets

APPENDIX B
STRUCTURAL TESTS

The structural model specifies the causal relations of the constructs to one another, in addition to the specification of the observed indicators to their latent variables. As before, latent variables are used in estimating the model.

However, there were two important changes from the estimation approach used with the measurement models. Because of the complexity of the model and the reduced sample size in time two, a single indicator for each construct was used instead of multiple indicators. A multiple indicator analysis of the longitudinal model would require the estimation of 131 parameters, whereas a single indicator composite model with identifying restrictions would involve 37. Identifying restrictions (James et al 1982, Kenny 1979, Rogosa 1979) were also placed on the model to constrain the measurement aspect of the model and helps decrease the likelihood of nonconvergence in the estimation process or improper solutions.

The second change is that generalized least squares (GLS) estimation was used instead of maximum-likelihood (MLE). MLE involves a more complicated nonlinear fitting function and explicit solutions are not always found. Like MLE, GLS provides asymptotically efficient, consistent estimates with asymptotic multinormal distributions so that tests of statistical significance are possible (Browne 1982; Browne 1984). This makes GLS a superior choice over two- or three-stage least squares. All of the structural model estimation was conducted in SAS (1989), release 6.08, which tends to be more robust with respect to GLS estimation than LISREL.

Structural equation modeling techniques were initially developed for the estimation of linear systems of equations. Only recently have researchers developed techniques for the estimation of nonlinear latent variable relationships (Jaccard & Wan 1995; cf., Kenny & Judd 1984). Given the interest in the moderating role of trust on all of the antecedent variables in this study, application of the Jaccard and Wan (1995) technique would be extremely complicated and greatly increase the number of parameters to be estimated.[6] This could be problematic given the sample size and complexity of the longitudinal model.

Instead, a median split on trust was used to designate "high" and "low" levels and the longitudinal structural model of Figure 3 was estimated separately in both groups. This was done for buyers and suppliers separately, resulting in four groups in which the structural model is estimated--high trust buyers, low trust buyers, high trust suppliers, and low trust suppliers.

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[6] Their approach would involve estimation of four additional latent variables representing the interaction of trust with each antecedent, each involving four cross-product indicators, and their effects on strategic advantage development.

Structural Model Evaluation

Table B1 contains the model summaries for the longitudinal structural model and alternative saturated models. Since CFIs can increase simply by estimating more parameters, the parsimonious normed fit index (PNFI) (James et al 1982) is also presented as an aid in assessing structural model tests. The PNFI is essentially a normed fit index penalized for the loss of degrees of freedom from estimating more parameters. This index provides a realistic assessment of how parsimonious the model is in its use of the data in achieving the goodness of fit of the CFI.

The CFIs for the buyers structural models were high, approximately .9 for high and low trust, indicating a good fit to the data. The CFIs for suppliers were satisfactory, .71 and .84. This could be due to the fact that single indicators were estimated, instead of a multiple indicator model. When multiple indicator models were estimated at the cross sectional level, the fit indices improved significantly.

Saturated Model Evaluation

The mediating role of the development of strategic advantage construct was assessed via a series of saturated models, displayed in B1. These models contained additional, alternative links and were evaluated to see whether the alternative model does a better job of accounting for the data. For example, If goal compatibility is not mediated by the development of strategic advantages, a model in which the links between goal compatibility and strategic advantages ($\beta41$), joint profits ($\beta51$), and idiosyncratic assets ($\beta61$) should provide a better account of the data.

The chi-square differences were all significant, excepting one, and the CFIs are improved a point or two. However, the PNFIs virtually always decreased with the saturated models, indicating that the improvement in fits are primarily due to the estimation of additional parameters, and not because the parameters represent a superior specification of the structural model.

The mediating role of the antecedents at time two was also assessed. To test whether goal compatibility mediates strategic advantages gained, an additional effect ($\beta94$) between strategic advantages gained and the development of strategic advantages at time two is estimated. Similar procedures were conducted for joint profits ($\beta95$) and idiosyncratic assets ($\beta96$) at time one. Unlike before, the chi-square differences were not always significant, since only one additional parameter is being estimated. The CFIs for buyers vary one or two points, and the supplier CFIs remain unchanged. However, the PNFIs for the saturated models decreased in three out of the four groups (buyers low trust, suppliers high and low trust) and remained the same in the fourth group (buyers high trust). Collectively, the saturated model results indicate that the hypothesized structural model of Figure 3 provides a better explanation of the data than any of these non-mediating, alternative explanations.

Longitudinal Model Summaries

BUYERS HIGH TRUST

MODEL	χ^2	df	CFI	PNFI	χ^2 diff	df diff
Structural	782	57	0.88	0.75	-	-
Saturated:						
$\beta41, \beta51, \beta61$	711	54	0.89	0.72	71	3
$\beta42, \beta52, \beta62$	672	54	0.89	0.73	110	3
$\beta10,7 \ \beta11,7 \ \beta12,7$	767	54	0.88	0.71	15	3
$\beta10,8 \ \beta11,8 \ \beta12,8$	769	54	0.88	0.71	13	3
$\beta94$	947	56	0.85	0.71	-165	1
$\beta95$	687	56	0.89	0.75	95	1
$\beta96$	662	56	0.90	0.75	120	1

BUYERS LOW TRUST

MODEL	χ^2	df	CFI	PNFI	χ^2 diff	df diff
Structural	494	57	0.96	0.83	-	-
Saturated:						
$\beta41, \beta51, \beta61$	436	54	0.97	0.79	58	3
$\beta42, \beta52, \beta62$	414	54	0.97	0.79	80	3
$\beta10,7 \ \beta11,7 \ \beta12,7$	481	54	0.97	0.79	13	3
$\beta10,8 \ \beta11,8 \ \beta12,8$	490	54	0.96	0.79	4 [a]	3 [a]
$\beta94$	456	56	0.97	0.82	38	1
$\beta95$	475	56	0.97	0.82	19	1
$\beta96$	487	56	0.97	0.82	7	1

All χ^2 are significant except for those marked with "[a]"

The saturated models have additional (named) effects estimated.

SUPPLIERS HIGH TRUST

MODEL	χ^2	df	CFI	PNFI	χ^2 diff	df diff
Structural	943	57	0.71	0.60	-	-
Saturated:						
β41, β51, β61	848	54	0.74	0.59	95	3
β42, β52, β62	867	54	0.73	0.59	76	3
β10,7 β11,7 β12,7	899	54	0.72	0.58	44	3
β10,8 β11,8 β12,8	851	54	0.74	0.59	92	3
β94	940	56	0.71	0.59	3 [a]	1 [a]
β95	940	56	0.71	0.59	3 [a]	1 [a]
β96	934	56	0.71	0.59	9	1

SUPPLIERS LOW TRUST

MODEL	χ^2	df	CFI	PNFI	χ^2 diff	df diff
Structural	684	57	0.84	0.72	-	-
Saturated:						
β41, β51, β61	586	54	0.86	0.70	98	3
β42, β52, β62	488	54	0.89	0.72	196	3
β10,7 β11,7 β12,7	611	54	0.86	0.69	73	3
β10,8 β11,8 β12,8	583	54	0.87	0.70	101	3
β94	670	56	0.84	0.71	14	1
β95	682	56	0.84	0.70	2 [a]	1 [a]
β96	665	56	0.84	0.71	19	1

All χ^2 are significant except for those marked with "[a]"

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