Interrelationships among key aspects of the organizational procurement process

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Abstract

For decades, there has been research on specific buying approaches and procedures used by organizational customers. Yet, there has been only limited effort to conceptualize the key higher order constructs that characterize organizational buying as a process. It is therefore useful to evaluate the simultaneous interrelationships among different aspects of the overall procurement process and how they vary with characteristics of the purchase situation. This research addresses these issues. We draw on structural equation modeling techniques and use a sample of 636 purchases to develop and test a parsimonious integrative model of interrelationships among key aspects of the procurement process. In general, our results support our model of the procurement process, including relationships among purchase importance, extensiveness of choice set, buyer power, reliance on procedural controls, a proactive focus on long-term strategic issues, search for information, and the use of formal analytical tools.
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1. Introduction

Corporations have come to view procurement as a strategic-level concern in developing competitive advantage—and organizational buying has become more sophisticated and professional (Dobler & Burt, 1996; Gadde & Håkansson, 1993; Smeltzer & Siferd, 1998). For business-to-business marketers, survival and success hinges on making effective judgments about how customers approach vendor selection decisions. The recognition of buying and selling as critical components of firm success is reflected in the progression of scholarly research. Beginning with Webster (1965) and Sheth (1973), scholars identified constructs relevant to organizational buying and later focused on important topics such as the decision-making unit, channel relationships, and buyer–seller negotiations (Sheth, 1996; Ward & Webster, 1991). Dramatic changes in the literature surfaced in the 1980s as scholars characterized buyer–seller interactions on a continuum from transactional to relational exchanges or from hierarchies to markets (Dwyer, Schurr, & Oh, 1987; Webster, 1992). Subsequent research emphasized buyer–seller interactions and a rich body of research on relationship marketing followed. This includes research on working partnerships (Anderson & Narus, 1990) and the interactions, relationships, and networks involved in buyer–seller exchanges (Anderson, Håkansson, & Johanson, 1994; Cannon & Homburg, 2001; Metcalf, Frear, & Krishnan, 1992; Turnbull, Ford, & Cunningham, 1996).

In light of the evolution in scholarly thinking about organizational buying, it is constructive to recognize the breadth and diversity of vendor choice situations in practice and to develop a theoretical basis from which to view alternative perspectives on buyer–seller exchanges. This brings to the forefront the need to address some basic, yet unanswered questions about organizational procurement. For example, while there has been substantial scholarly work to examine search effort in organizational buying, there is little research on how the search for information integrates with the procurement process as well as how search influences decision-making. More broadly, research that considers the procurement process

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from a holistic perspective, as opposed to isolating component parts, complements our understanding of the parts by revealing how those parts fit together. Thus, to improve our understanding of the procurement process, we need an integrative approach to modeling that considers the interrelationships among purchasing constructs that are important in both classic and contemporary views on organizational buying.

Drawing on literature from marketing and related disciplines, we develop an integrated model and a set of hypotheses concerning the simultaneous interrelationships among approaches used in organizational procurement decisions and the influence of key characteristics of the purchase situation. Specifically, we address the extent to which buyers search for information, rely on procedural controls, adopt a proactive (long-term strategic) focus, and employ formal analytical tools in the vendor selection process; our model controls for important characteristics of the purchase situation, including the extensiveness of the choice set, buyer power, and purchase importance. We note control relationships that are well established and we highlight new relationships or those with mixed results in the literature. We make an empirical contribution by testing the structure of the interrelationships specified in the model across a wide range of purchase situations.

We start with a brief overview of the conceptual model and then we define the model constructs—discussing both normative theories and positivist empirical evidence relevant to the relationships. Next, we describe the methods used to collect and analyze the data and to test the relationships in the model. We then present the results of the study and evaluate (1) how well the conceptual model represents the overall structure of the empirical data, (2) estimates of specific relationships among constructs in the model, and (3) alternative formulations of the model. The paper concludes with a discussion of the limitations and implications of the research. We consider recent advances in procurement and suggest avenues of continued research in light of developments in buying practices and our research findings.

2. The conceptual model

During the past decade, much of the focus in the practitioner press and the scholarly literature has been on the trend toward and benefits of closer buyer–seller relationships. As a result, there has been substantial progress in developing an understanding of important, and often complex, relational aspects of long-term bonds between vendors and customers. Nonetheless, there is increasing recognition that buying firms do not always want or need close ties with all their suppliers (Cannon & Perreault, 1999; Wilson, 1995), even for important purchases. Further, relationships may be enduring and reflect cooperative efforts even when other aspects of a close relationship (such as sharing of information or linked operations) are not present. In many cases, exchanges are short-lived, and involve non-relational governance mechanisms (Heide, 1994; Lambe, Spekman, & Hunt, 2000). These hybrid modes of buyer–seller relationships may take a variety of different forms

(Buvik & John, 2000) that have implications for how a given purchase is made.

In practice then, there continue to be a variety of different types of buyer–seller interactions, and buyers make vendor choices with a wide range of approaches. While a buyer may develop a long-term strategic supply alliance for some purchase requirements, in another purchase the buyer may execute transaction-based exchanges to achieve operational efficiencies. Similarly, on the marketing side, sellers employ a range of strategies from national account management to transaction-oriented customer service centers or e-commerce order systems. Viewed overall, buyer–seller interactions involve a range of purchase episodes (from simple to complex) that may take place in a mix of different types of relationships that range from limited to extensive (Gadde & Håkansson, 1993; Håkansson, 1982).

Because of the variety of different types of purchases, purchase approaches, and relationships, most empirical research on organizational buying has focused on inputs or outputs for purchase decisions in specific contexts (for example, for one type of product, industry, stage in the purchase decision, or type of purchasing situation). An advantage of this approach is that it is sometimes possible to provide deeper insights about one purchasing approach when a researcher can hold constant some of the factors that vary across purchase situations. On the other hand, the common reliance on this approach across many studies can be a disadvantage, especially if characteristics of the purchasing situation shown in one study to have an important impact on certain purchase activities are often not considered (nor used as control variables) in other research. Further, when the focus of research is on one aspect of procurement practice–such as the search for information, use of formal vendor analysis models, or how many people are involved–it limits the insight that is available about the interrelationships among the varied aspects of the overall procurement process. Of course, in some situations a certain aspect of the procurement process (or purchasing task) may be an end unto itself, whereas in other situations the same task may be prerequisite to other activities that lead to a more refined or detailed vendor choice decision. In practice, procurement decisions do not always follow the steps frequently conceptualized in the literature (i.e., search, evaluation, selection) and the vendor selection process may not be linear (Patton, 1996). While the dynamic relationships among various buying activities, decision heuristics, and buyer perceptions have previously been considered (*c.f.*, Wilson, McMurrian, & Woodside, 2001), there is little empirical work that tests normative theorizing about activities in the buying process and how they are related. Indeed, Tanner has expressed the concern that because of the lack of attention in this arena the organization buying literature has "left a rich stream of research behind" (Tanner, 1999, p. 245).

The conceptual model in Fig. 1 addresses these issues. As suggested at the top of the figure, the model considers the simultaneous interrelationships among four aspects of the procurement process and how they vary depending on key characteristics of the buying context. This model serves as an organizing framework for our paper and also delimits the scope
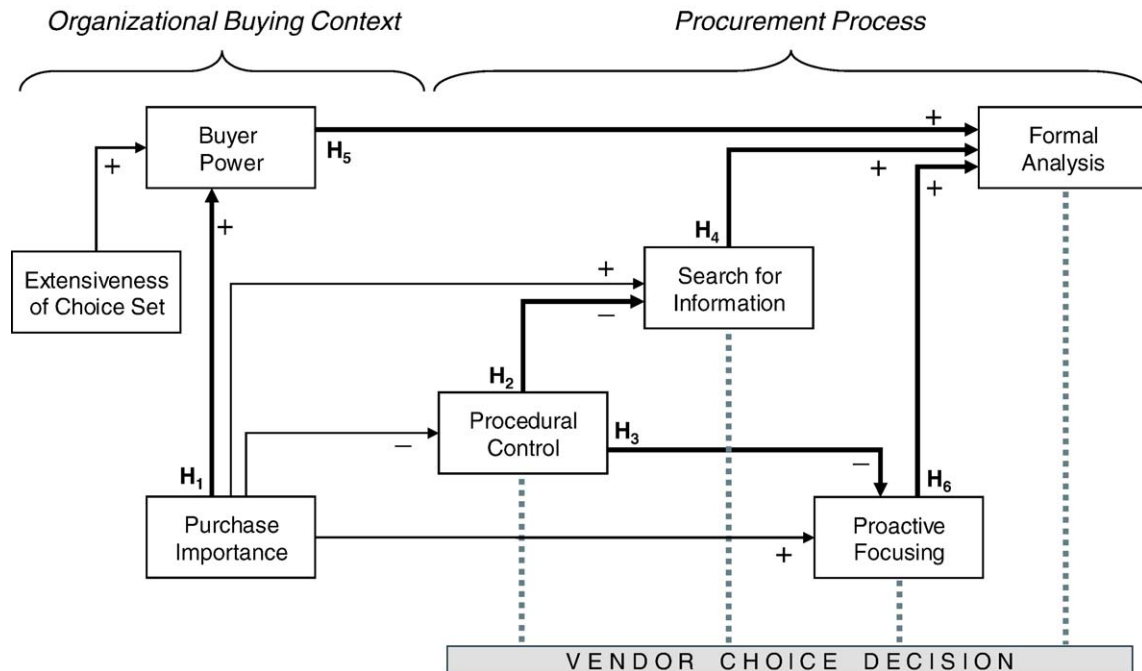
Fig. 1. Schematic overview of conceptual model. Bold lines highlight 6 focal hypothesized relationships between constructs; other (lighter) lines indicate relationships included for control.

of the empirical research. We narrowed our scope to these critical constructs based on an extensive review of the literature and pretest interviews with purchasing professionals. Our objective was to control for constructs that represent important and recurring issues and activities related to organizational buying that are common across different types of purchases (not just, for example, purchase variables that are relevant to a certain industry, product, approach, buying center composition, or the like). Of course, this also suggests that some variables and relationships in the model have previously been considered in the conceptual and empirical literature. For completeness, we include these and treat them as "control" relationships since there has been little effort to look simultaneously at the interrelationships among these constructs or how crucial aspects of the purchase situation impact them.

The model specifies four underlying facets of the procurement process. Decision makers focus their efforts on these underlying activities of the buying process to improve vendor choice and purchase outcomes. *Procedural control* is the extent to which the evaluation of a source of supply is guided by previous experience—including established policies, procedures, or transaction norms. *Search for information* is the purchaser's effort at scanning the internal and external business environment to identify or monitor evidence relevant to the purchase decision. *Proactive focusing* is the extent to which the purchasing evaluation and selection is based on long-range needs and objectives of the firm. *Formal analysis* involves efforts to apply formal analytical tools to evaluate a supply alternative. The model also includes three situational factors that prior research indicates are crucial in shaping the procurement process in different contexts. Two of these factors–*extensiveness of the choice set* and *buyer power*–

characterize the procurement market in which the firm is selecting a vendor. On the other hand, *purchase importance* is a fundamental characteristic of the purchasing task.

The model in Fig. 1 does not concentrate on a single dependent variable, but rather highlights the hypothesized interrelationships among different facets of the procurement approach. The bold lines between constructs indicate the six focal hypotheses, while the others indicate the control relationships included for completeness. Considered as an integrated set, these interrelationships reflect a *purchasing process*. The dotted lines leading from each of the buying process constructs indicate the vendor selection decision may be made at any point in the process (i.e., with little or no attention to other facets of the process). The empirical test of the model is based on how firms actually approach decisions—and under what conditions. In this way, the situational factors serve as control variables that help explain the structure of interrelationships among procurement activities.

3. Theoretical background

The best way to motivate the choice of constructs and the included structural relationships among them is to consider the various ways they have been treated in the literature. The literature provides a number of comprehensive discussions of organizational buying (cf., Johnston & Lewin, 1996; Sheth, 1996; Ward & Webster, 1991). In addition, there are many published studies that include both normative logic and positivist theories relevant to the conceptual model in Fig. 1. Thus, we focus our review on theory and empirical studies that are most directly related to the constructs and relationships highlighted in the model. Rather than presenting an in-

depth discussion of each variable, and then going back to discuss the proposed relationships, we instead discuss each relationship in turn—introducing and explaining the constructs as the model unfolds. Although we present the logic for relationships between pairs of constructs (as represented by the lines in Fig. 1), the separate relationships are treated simultaneously as an integrated set that represents an overall procurement process.

3.1. Organizational buying context

The model conceptualizes the organizational buying context in terms of both market and task characteristics that influence the procurement process. As shown in the integrative model in Fig. 1, these contextual variables are related among themselves as well as being related to the underlying dimensions of the procurement process. Two aspects of the procurement market (*extensiveness of choice set* and *buyer power*) define relevant aspects of the "atmosphere" of the transaction (Håkansson, 1982). The *extensiveness of choice set* reflects the number of alternatives (products or suppliers) that are potentially able to meet the purchasing need (Cannon & Perreault, 1999). Related to this conceptualization, the industrial organization literature provides insights regarding seller concentration and its impact on the competitiveness of markets (Porter, 1981; Scherer, 1980) (for a review of applications to marketing, see Rindfleisch & Heide, 1997). In the context of procurement, however, choice set is not simply the inverse of seller concentration in a particular product-market. For example, buyers might view rivets, chemical adhesives, screws, and welding as alternative ways of meeting a "fastening" need. Consequently, research on switching costs incorporates prior commitments to a particular technology or to a particular vendor relationship through idiosyncratic investments and social and structural bonds, which tend to reduce the potential to consider alternatives (Weiss & Heide, 1993; Wilson & Mummalaneni, 1986). Thus, not only product differentiation within a product market–but also substitutability of products–is relevant to the extensiveness of choices in a procurement context. This is in contrast to the actual number of suppliers on a vendor list—which is an outcome rather than an antecedent of an organizational buying decision (Homburg & Kuester, 2001).

Buyer power reflects the profitability and attractiveness of a sale to the buying firm by one or more suppliers, and the suppliers' desire for the customer's business. Various perspectives on industrial organization (Porter, 1980), organizational buying (Corey, 1978a), channels (Etgar, 1976), buyer–seller relationships (Wilson, 1995), and purchasing (Dobler & Burt, 1996) argue that a firm's power to control sources of supply is an important variable for understanding organizational decision-making. In the procurement context, *buyer power* reflects the purchasing firm's ability to command favorable outcomes in the supply market (Anderson & Narus, 1990; Ganesan, 1994) including terms of sale (for example, unit price paid and financing arrangements), seller concessions (i.e., adherence to strict quality control specifications), and transfer of risk to the seller.

Fig. 1 reflects the logic that a more extensive choice set will lead to greater buyer power. A model of key elements of the purchase process should include and control for this hypothesized relationship because it is accepted in traditional (normative) microeconomic views of competition (Scherer, 1980), positivist theories of inter-organizational relationships, and research reported in the organizational buying literature. With a broad choice set and greater competition among sellers, buyers may gain concessions by playing one vendor against another. This is consistent with the resource-dependence perspective on buyer–seller relationships (Aldrich & Mindlin, 1978; Pfeffer & Salancik, 1978) and more recent work in organizational buying on the way switching costs reduce the buyer's choices and power (Weiss & Heide, 1993). When a lack of choice leads to a dependency (Cannon & Perreault, 1999), companies may seek strategic alliances or partnerships as a way of "locking in" a supplier and thus counteract an otherwise weak position (Iyer, 1996). Furthermore, in the context of distributor–manufacturer relationships, firms have diminished influence (less power) over working partners when there is greater relative dependence (less choice) over the partner firm (Anderson & Narus, 1990). Even with the trend toward a reduction in the number of suppliers, companies are still concerned with an adequate choice set—only a small number (12%) of purchases are sole sourced (Presutti, 1992) and buyers often solicit bids from multiple vendors (Patterson & Dawes, 1999).

The model includes *purchase importance* as a control variable because it is a primary characteristic of the purchasing task. *Purchase importance* is the buyer's assessment of the strategic significance of the purchase—reflecting not only the direct costs of a purchase, but also the impact of the purchase outcome on the buying firm's competitive advantage, strategy, and relationships with its own customers. Purchase importance has been widely discussed in the literature as a key determinant of organizational buying behavior (Cannon & Perreault, 1999; Newall, 1977; Sheth, 1973; Spekman, Kamauff, & Myhr, 1998; Wilson, Lilien, & Wilson, 1991). Nevertheless, although this construct is generally accepted in the literature (and relationships to some other constructs are well documented), it is critical to a complete model of the procurement process. We therefore include a number of relationships that are familiar as well as considering the relationship of *purchase importance* in ways that shed additional light on its impact.

The model in Fig. 1 shows a link for a hypothesized relationship between *purchase importance* and *buyer power*. This direct relationship suggests that when the purchase is important to the organization, a clear incentive exists to work to increase buyer power. For example, there is empirical evidence that buyers spread important purchases among multiple suppliers—as a means to gain a power position (Homburg & Kuester, 2001). Moreover, when the dollar value of the purchase is significant, vendors are more eager for the sale. This fosters competitiveness among suppliers, makes information more transparent, motivates the buyer toward tougher negotiations, and therefore gives the buyer more power over the outcomes—especially price (Homburg & Kuester, 2001). This hypothesis is

therefore based on both normative logic and related research on organizational buying:

H1. For procurement decisions with higher levels of purchase importance, there will be greater buyer power related to the purchasing process.

3.2. Underlying dimensions of the procurement process

As shown in Fig. 1, both *extensiveness of choice set* and *purchase importance* influence the procurement process indirectly through *buyer power*. At the same time, however, *purchase importance* has direct influence on several underlying dimensions of the procurement process. Below, we discuss the direct impact of *purchase importance* and *buyer power* as well as the interrelationships among the various aspects of the procurement process. This section is organized in terms of the intermediate dependent variables in the integrative model: *procedural control, search for information, proactive focusing* and *formal analysis*.

3.2.1. Procedural control

Procedural control is the extent to which established policies, procedures, or transaction precedents guide the purchasing evaluation. This is similar to "decision rules" (Johnston and Lewin, 1996) and "process heuristics" (Wilson et al., 2001) but is in contrast to choice heuristics or evaluative criteria. Procedural control may be formal (such as procedure manuals or automatic inventory replenishment) or informal (reflected in organizational memory that drives the use of a specific purchasing approach) (Draper, 1994). Some informal "rules of thumb" are consistent across different situations even when no formal procedures exist (Mitchell, 1990; Noel, 1989). Since prior relationships are part of organizational memory, these previous exchanges are also implicit in the procedural control construct (Joshi & Arnold, 1998).

We hypothesize that *purchase importance* has a direct, negative impact on *procedural control*. This relationship is supported by normative logic and inferred from a number of research studies although it has not been explicitly tested in an integrative model. Dobler and Burt (1996) suggest that less important purchases rely on "standard operating procedures" to reduce purchasing effort and costs while maintaining organizational consistency. Similarly, because less important buying decisions are delegated down the organization, the decision may be programmed or automated (Reve & Johansen, 1982). On the other hand, if the savings from automated decision-making is small relative to the total value of the purchase, or if there is downside risk to applying standard procedures, there will be less reliance on procedural control. For example, when investments of assets are involved (i.e., an important decision), management has fewer procedural controls on which to base decisions and will need to customize contractual safeguards (Buvik & John, 2000).

While *purchase importance* directly influences *procedural control*, procedural control in turn has an impact on both the

search for information and the extent of *proactive focusing* in the procurement process.

3.2.2. Search for information

Consistent with the literature, we conceptualize *search for information* as the purchaser's effort at scanning the internal and external business environment to identify or monitor issues relevant to the purchase decision. This effort includes various sources of information on topics such as the level of quality required, alternative vendors or products, and capabilities of the supplier(s). Webster (1965) was among the first to provide a detailed discussion of information search and both Jackson, Keith, and Burdick (1987) and Moriarty and Spekman (1984) provide useful reviews of early work in this area. Empirical research into organizational buying continues to include aspects of search behavior because of its relevance to both buyers and sellers (Spekman, Stewart, & Johnston, 1995).

There is widespread support, from a number of different perspectives, for the idea that *purchase importance* is positively related to *search for information*. Purchase importance is a central aspect of decision risk and the collection of additional information significantly reduces risk (Sheth, 1973; Stump & Heide, 1996). Buying center studies reinforce this view; buying centers are larger and involve more communication (both indicators of search for information) for important purchases (McQuiston, 1989; Moriarty & Bateson, 1982). Moreover, the relationship between importance and search is supported by field research (Dawes, Dowling, & Patterson, 1993). While this relationship is not new or unique, it is important that it be explicit in the model because of its centrality in the buying process.

As shown in Fig. 1, we also hypothesize a negative relationship between the use of *procedural control* and *search for information*. Firms establish procedural controls so decisions are made according to predetermined decision heuristics and therefore little new information is sought. For example, in the straight re-buy situation, there is little or no search for information (Anderson, Chu, & Weitz, 1987; Bunn, 1993; Robinson, Faris, & Wind, 1967). Procedural control may also limit the search for alternatives (Heide & Weiss, 1995). For example, buyers often screen current suppliers sequentially, rather than simultaneously (Feldman & Cardozo, 1969). Further, when bidding is the established practice for a particular product, little additional information is required (Reve & Johansen, 1982). Moreover, since procedural control is often based on previous decisions, past interactions contribute to trust and less search is needed (Lambe et al., 2000). On the other hand, buyers held accountable for decision outcomes tend to collect more information—perhaps to justify their decisions when there are no procedural controls on which to fall back (Doney & Armstrong, 1996). Based on the logic from these various sources in the literature, we hypothesize:

H2. When there is greater procedural control related to the focal purchase, there will be less search for information for that particular buying decision.

3.2.3. Proactive focusing

The literature on procurement has focused substantial attention on the need for industrial organizations to view procurement from an integrative, whole-firm point of view (cf., Burt, 1984; Leenders & Blenkhorn, 1988; Smeltzer & Siferd, 1998). *Proactive focusing* is the extent to which the purchasing evaluation and selection of a source of supply focus on long-range needs of the firm. A large portion of purchasing managers are "strategically oriented" (Spekman et al., 1995)—attesting to the relevance of this construct in a procurement context. Relevant issues include strategic purchasing objectives, consistency of supply, and future profitability. These considerations drive procurement decisions related to long-term contracts, multiple-sourcing and cooperative efforts between customers and vendors (Gadde & Mattson, 1987; Williamson, 1979).

The logic for a positive relationship between *purchase importance* and *proactive focusing* is intuitively compelling and perhaps even obvious, but that also means it should be explicit in a model of the overall procurement process—especially since the relationship has been largely ignored in other empirical work. Purchase importance, by its very nature, implies that strategic concerns should be relevant (Iyer, 1996; Leenders & Blenkhorn, 1988). Since transaction costs are high for important purchases, firms work to protect themselves from future opportunism (Nooteboom, 1996; Williamson, 1985). Proactive initiatives may involve integration of ownership, or in the case of purchase agreements, credible commitments (Walker & Weber, 1984). Firms take a strategic orientation with regard to important purchases as a basis for competitive advantage (Porter, 1980, 1985). Consequently, higher-level executives–with a broader "whole firm" point of view–are more likely to be involved in important purchases (Bonoma, 1982; Corey, 1978b).

While purchase importance raises the level of proactive focusing, as shown in the integrative model in Fig. 1, the presence of *procedural control* reduces attention to *proactive focusing*. This makes sense because procedural controls are based on previous situations and precedents which lead to decisions made automatically with little incremental focus on contingency or long-term planning issues. In fact, the purpose of operating procedures or decision heuristics is to free management's time to focus on more relevant contingencies surrounding other purchases (Dobler & Burt, 1996). Elaborate materials requirement planning systems and just-in-time production systems (Frazier, Spekman, & O'Neal, 1988) eliminate the need to consider and ponder the strategic issues for day-to-day purchases. We therefore hypothesize:

H3. When there is greater procedural control related to the focal purchase, there will be less proactive focusing for that particular buying decision.

3.2.4. Formal analysis

Attention to analytical tools in industrial purchasing has increased dramatically over the years (Naumann, 1983; Schwartz, Scannell, & Sullivan, 2001). *Formal analysis* is the extent to which the decision involves formal analytical tools to evaluate supply alternatives. Such tools include cost analysis, inventory control and replenishment models, simulation, make or buy analysis, and various types of sensitivity (spreadsheet) analysis—and more recently, software programs (Schwartz, et al., 2001). As the model in Fig. 1 shows, the buyer's use of formal analysis techniques relates to the amount of relevant information that can be pulled together, the extent to which the seller is pressured (i.e., buyer power) to provide inputs to the analysis, and the energy created by a proactive approach.

First, we hypothesize a positive relationship between the *search for information* and the subsequent use of *formal analysis*. The main advantage of analytical techniques is to structure information, make the information parsimonious, and thereby simplify decision-making. Consequently, analysis tools are used when information relevant to a decision is extensive or complex. This relationship makes intuitive sense and is supported by evidence from several empirical studies. For example, buyers collect data on supply market trends and then use statistical procedures to extrapolate forecasts (Browning, Zabriskie, & Huellmantel, 1983)—often including others in the organization to gather information and evaluate technical aspects (Reve & Johansen, 1982). Just-in-time ordering, materials requirement planning, and other procurement systems are possible–not simply because of information technologies–but also because of the availability of analytical tools to make the information meaningful.

H4. When there is greater search for information relevant to the focal procurement decision, there will be more formal analysis applied for that particular buying decision.

We also hypothesize that formal analysis will be greater among strong buyers relative to weak sellers. The rationale for this relationship is implied by Porter's work on competitive cost advantage (Porter, 1981, 1985), and is explicitly addressed by Corey (1978a). The relative costs of performing analysis are reduced for powerful buyers because they are able to use the information to promote seller cost reductions, aid suppliers where necessary with technology development, and encourage integrative bargaining concessions (Clopton, 1984) that in turn leverages their own advantage in the market. Powerful buyers are also more likely to do formal analysis on a purchase decision because they can extract needed information, such as detailed cost data, from their suppliers (Schwartz et al., 2001).

H5. Procurement decisions characterized by higher levels of buyer power will involve greater effort at formal analysis for the focal purchase.

Finally, we hypothesize that buying organizations focusing on proactive issues are more likely to use specialized purchase analysis tools to assess contingency plans and long-term issues. Organizational norms for rationality dictate that buyers use formal analysis techniques to plan for future contingencies—including both risks and opportunities (Doney & Armstrong, 1996; Staw, 1980). Thus, buyers evaluate vendors by calculating the potential for cost reductions, quality improvements, or service benefits (Robinson et al., 1967) rather than by simply looking for the lowest price per unit (Feldman &

Cardozo, 1969). *Formal analysis* tools are useful for considering the ability of the vendor to meet long-term goals and contingency factors such as the handling of delays and conflicts during the contract period (Reve & Johansen, 1982). Moreover, strategically oriented proactive buyers analyze a broader set of evaluative criteria (including, for example, value-in-use and production efficiency) (Spekman et al., 1995).

H6. When the focal procurement involves more proactive focusing, there will be greater efforts at formal analysis for that particular buying decision.

In sum, the hypotheses reflected by the relationships shown in Fig. 1 relate to both direct and indirect influences on the key aspects of the procurement process. Some of these relationships have been documented previously, but our approach is to go beyond evaluation of bivariate relationships in isolation and instead to develop an integrative model that accounts for past research, incorporates more complex covariance among the set of constructs, and at the same time retain a reasonable level of parsimony. In the next section, we describe the research methods used to collect the data and to test the model. Following that, we report the findings and then turn to a discussion of the implications for managerial practice and future research.

4. Research methods

The process model shown in Fig. 1 was tested with data from a sample of purchases representing a wide range of products, industries, and purchase situations. We used structural equation modeling (SEM) with maximum likelihood parameter estimation to assess the psychometric properties of measures, test the fit of the structural model, and estimate the size of effects associated with the hypothesized relationships. There is a rich tradition of applications of SEM in the marketing literature (cf., Baumgartner & Homburg, 1996) and it is well suited for a simultaneous set of relationships (Steenkamp & Baumgartner, 2000). Of particular interest here, the use of SEM also makes it possible to fix the effect parameters (path coefficients) at zero for potential paths between constructs that are not represented in the model. This approach also allows explicit assessment of alternative model specifications (Sörbom, 1989).

4.1. The sample

The sample frame consisted of members of the Institute of Supply Management (which was previously known as the National Association of Purchasing Management). Although others outside of purchasing may be involved in the procurement process, at least one purchasing professional usually plays a role in decisions—and by the nature of their job responsibilities, purchasing professionals have a broad base of knowledge about purchasing decisions (Venkatesh, Kohli, & Zaltman, 1995). In-depth personal interviews and pretests prior to the final survey confirmed the purchasing executives were knowledgeable about the topics addressed in the questionnaire

and were able to provide informed responses. Out of 1832 delivered questionnaires, 636, or 35%, were returned completed. A comparison of the respondents with Institute of Supply Management membership data revealed no evidence of non-response bias relative to demographic characteristics. Table 1 provides more details of the characteristics of the respondents, their firms, and the focal purchase.

4.2. Specifying the focal purchase decision

The unit of analysis is a specific transaction for which the buyer/respondent was recently involved in a purchase decision. While each purchase focuses on a particular transaction, it may be part of an on-going vendor relationship. Particular transactions are therefore episodes that encompass past relationships

Table 1
Sample characteristics

Respondents			
Job Responsibility [a]		Years in Purchasing [a]	
Buyer	17.7%	≤ 5 years	22.8%
Purchasing Agent	13.3%	6–9 years	19.3%
Purchasing Manager	30.0%	10–15 years	29.4%
Director or Vice President	11.6%	11–20 years	12.9%
Other	27.6%	≥ 21 years	15.6%
Dollar Responsibility [a]		Certified Purchasing Manager [a]	
≤ $5 million	27.7%	Yes	73.3%
$6–10 million	15.3%	No	26.7%
$11–20 million	17.4%		
$21–49 million	11.2%		
≥ $50 million	18.3%		

Buying Firm			
Number of Employees (Organization)		Industry	
1–199	31.4%	Manufacturing	57.3%
200–499	21.9%	Services	24.4%
500–999	13.7%	Distribution	10.3%
1000–4999	23.0%	Other	8.0%
≥ 5000	10.0%		
Number of Employees (Purchasing Dept.)			
1–2	20.4%		
3–4	22.9%		
5–10	29.9%		
11–50	22.4%		
≥ 51	4.5%		

Characteristics of Focal Purchase Decision			
Buy Class Category		Competitive Bidding	
New Task	17.6%	Yes	32.6%
Modified Rebuy	19.0%	No	67.4%
Straight Rebuy	33.4%		
		Multiple Sourcing	
Type of Agreement		One Vendor	73.6%
New Contract	28.0%	Spread Among Vendors	26.4%
Previous Contract	22.5%		
No Contract	49.5%	First Time From Vendor	
		Yes	13.4%
		No	86.6%

[a] The frequency distribution of this variable is similar to that of membership of the Institute of Supply Management.

and anticipate future relationships (Gadde & Håkansson, 1993). To be certain the sample represented a broad cross section of purchases, the respondent was directed to think about the "last purchase" that he or she personally worked on (regardless of how many other people were involved) and to respond to all questions with regard to that purchase only. The respondent provided descriptive information about the purchase, responded to scale items measuring the research variables with respect to the focal purchase, and then gave general information about the organization and the respondent.

4.3. Scale development and measurement evaluation

The construct scales (and questionnaire instructions) were developed and refined through a series of personal interviews and two pretest surveys. Based on a review of relevant literatures (i.e., industrial marketing, purchasing, industrial organization, organizational behavior, strategy), we first developed a comprehensive list of contextual variables (both market and task characteristics) and then a separate list of the underlying aspects of the procurement process. The lists were honed down and modified through several cycles of literature review and in-depth interviews. Multiple scale items were developed to correspond to each construct. All items had seven response steps or cues (anchored at either strongly disagree/strongly agree or not at all/very much). Some were negatively worded and then reverse coded in the analysis stage. Two measurement pretests ($n=49$ and $n=141$) adhered to standard psychometric guidelines to edit, delete, and add items.

For the final set of items and scales, we used a two-step structural equation modeling (SEM) approach (Anderson & Gerbing, 1988). This approach fits confirmatory factor models to evaluate the measurement properties of items (indicators) and unobservable constructs, and then estimates the parameters and fit properties of the overall structural model (taking measurement error into consideration). Table 2 lists the final scale items for each of the constructs in the model.

When evaluating a multi-construct measurement model with SEM (confirmatory factor analysis) approaches, it is conventional to compute and evaluate several different measures of fit. SEM produces better estimates with large samples, but with a large sample a statistically significant chi-square is expected. That is the case with this model, which produces a χ^2 of 666.03 with 329 *df* ($p<0.01$). We therefore relied on other widely accepted SEM fit indices (Bollen & Long, 1993), especially the comparative fit index (CFI) and incremental fit index (IFI) that Fan and Wang have shown to be less sensitive to sample size (Fan & Wang, 1998). All the fit indices (GFI=0.93, AGFI=0.91, CFI=0.95, IFI=0.95 and RMSEA=0.04) indicate either a "close fit" or "adequate fit" between the hypothesized measurement model and the sample covariance matrix (Bollen, 1989).

SEM also encompasses approaches for estimating composite (construct) reliability (cf., Fornell & Larcker, 1981) as well as individual item reliabilities. These statistics are provided for each of the scales and items in Table 2. Bagozzi and Yi (1988) suggest that a construct reliability estimate greater than or equal

Table 2
Scale items and measurement model results

	Construct reliability	Lamda loading
Extensiveness of choice set [a]	0.84	
We were able to choose from among many vendors for this purchase		0.89
There were many vendors who could have supplied what we need [b]		0.85
Many vendors would have been suitable for this product		0.80
When it came to selecting the specific product, there were not many options [b]		0.43
Buyer power [a]	0.79	
The suppliers were really competing to make this sale to us		0.83
We had much bargaining power in this purchase situation		0.74
The supplier was really motivated in making this sale to us		0.67
The vendor we choose gave us a much better deal than most of their customers		0.53
Purchase importance [a]	0.78	
This purchase was a major financial commitment for our organization		0.80
Compared to other purchases, high level approval was required		0.66
This purchase influenced many aspects of our organization		0.66
Considering all of the purchases that I am involved in, this one was not very important [b]		0.63
Procedural control [a]	0.79	
This organization didn't have an established way of doing things for this purchase situation [b]		0.79
We didn't have clear-cut rules about how to make this purchase [b]		0.76
Responsibility was not clearly defined for the accomplishment of each step of the purchase procedure in this situation [b]		0.61
When the need arose, there were no existing guidelines about how to fill it [b]		0.61
Search for information [c]	0.84	
To what extent did you or others specifically search for information on the reliability of supplier(s)?		0.89
To what extent did you or others specifically search for information on capabilities of supplier(s)?		0.83
To what extent did you or others specifically search for information on the level of quality required?		0.66
To what extent did you or others specifically search for information on the alternative sources of supply?		0.59
Proactive focusing [a]	0.70	
We considered how this purchase would impact the organization's long-range profitability		0.78
It was not necessary to consider long-range purchasing objectives when making this purchase [b]		0.61
Future plans were not an important issue in this purchase decision [b]		0.59
We didn't need to develop plans for possible supply distribution [b]		0.43

Table 2 (continued)

	Construct reliability	Lamda loading
Formal analysis [c]	0.73	
To what extent was economic analysis used on this purchase?		0.76
To what extent was value analysis used on this purchase?		0.72
To what extent was cost analysis used on this purchase?		0.54
To what extent was spread sheet analysis used on this purchase?		0.50

[a] Seven-point response cues anchored at strongly disagree (1) and strongly agree (7).

[b] Responses to this item were reverse scored.

[c] Seven-point response cues anchored at were not at all (1) and very much (7).

to 0.6 reflects adequate fit. The construct reliability estimates for the constructs in this research all exceed that criteria and range from 0.70 (for proactive focusing) to 0.84 (for both extensiveness of the choice set and search for information). In structural equation modeling, an item's reliability estimate is equal to the proportion of variance in the item that is explained by its proposed latent construct (Bollen, 1989); this is the square of the standardized factor coefficient (the measurement parameter *lamda* reported in Table 2). In general, parameters over 0.40 indicate items that are internally consistent with other items for the scale. All twenty-eight *lamda* values in Table 2 are above 0.40 (ranging from 0.43 to 0.89), which provides evidence of convergent validity.

To evaluate the convergent and discriminate validity of the constructs we also used χ^2 difference tests to compare a one-factor model (e.g., covariance constrained to 1.0) with a two-factor model for all the items and for each possible pair of constructs. In every case, the two-factor model provided a significantly better fit than the one-factor alternative. This demonstrates divergence between all pairs of constructs.

In addition, to evaluate item/scale discrimination, we computed the correlation of each item with a composite of the other items comprising its intended scale (that is, item-adjusted total correlations) as well as the correlation of the items with all other scales. This analysis results in a total of 196 item-to-scale correlations. The item-to-total adjusted correlation was larger than the correlation of an item to the other scales in each case except one. Moreover, with 196 correlations, a single exception would be expected just based on chance. Thus, there is good evidence of item-scale discrimination, which also supports the use of the items to represent these constructs.

5. Results

Table 3 provides correlations, means, and standard deviations for all of the scales. Numbers in parentheses give the probability associated with a two-tailed test of the hypothesis that the bivariate correlation is, within sampling variance, equal to zero. These statistics provide a simple overview of the bivariate relationship between each pair of constructs considered in the model. However, in contrast, we compute estimates of the multivariate relationships implied by the purchase process model portrayed in Fig. 1 based on the complete matrix of 378 variances and covariances among all individual scale items. This approach allows for simultaneous estimation of measurement parameters and path coefficients adjusted for measurement error.

Fig. 2 provides the maximum likelihood estimates for the structural equation model. In Fig. 2, the solid lines between constructs (in circles) indicate statistically significant effects, while dashed lines represent non-significant effects. The path coefficient and associated probability is adjacent to each hypothesized path, and the explained variance (squared multiple correlation or SMC) is provided for each endogenous variable. The measurement parameters for all items are also shown.

The fit statistics for this model indicate a strong overall fit with the structure suggested by the proposed model (Fig. 1). Specifically, for the overall model χ^2 is 750.8 with $df = 340$ ($p < 0.001$), GFI is 0.92, AGFI is 0.91, CFI is 0.94, IFI is 0.94, and RMSEA is 0.04.

While the model is parsimonious, it explains a substantial portion of the variance in four of the five endogenous variables-proactive focusing ($R^2 = 0.65$), search for information

Table 3

Product moment correlations, means and standard deviations for procurement context and process variables [a]

Construct	Extensiveness of choice set	Buyer power	Purchase importance	Procedural control	Search for information	Proactive focusing	Formal analysis
Extensiveness of choice set	1.00						
Buyer power	*0.28* (<0.001) [b]	1.00					
Purchase importance	−0.15 (<0.01)	**0.38** (<0.001)	1.00				
Procedural control	0.05 (.23)	−0.04 (0.36)	*−0.24* (<0.001)	1.00			
Search for information	0.14 (<0.01)	0.45 (<0.001)	*0.37* (<0.001)	**−0.02** (.56)	1.00		
Proactive focusing	−0.08 (0.04)	0.37 (<0.001)	0.55 (<0.001)	**−0.11** (<0.001)	0.40 (<0.001)	1.00	
Formal analysis	0.08 (0.04)	**0.36** (<0.001)	0.42 (<0.001)	−0.11 (<0.01)	**0.43** (<0.001)	**0.36** (<0.001)	1.00
Mean	4.18	4.51	3.81	5.47	5.53	4.64	3.73
Standard deviation	1.65	1.37	1.60	1.41	1.48	1.53	1.68

[a] Correlations for focal hypothesized relationships are in bold font and for control relationships are in italic font; other correlations are not represented by direct relationships in the model.

[b] Values in parentheses are the (upper bound) of the probability associated with the statistical test that the correlation is equal to 0 (two-tailed tests based on 636 observations).
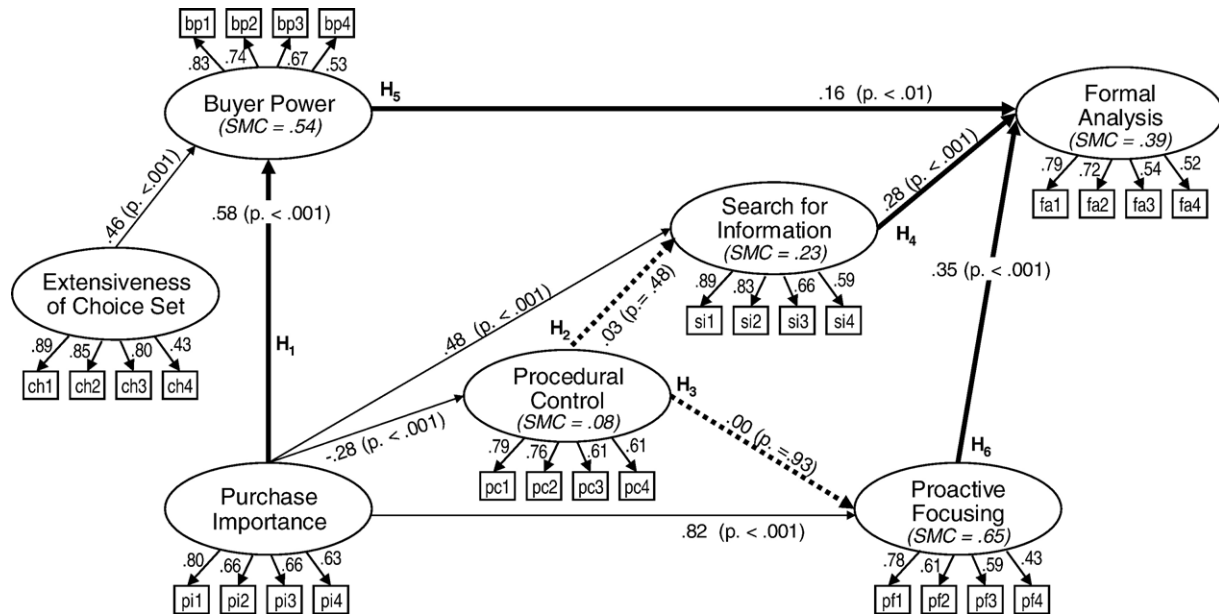
Fig. 2. Results of structural equation modeling of hypothesized effects.

($R^2 = 0.23$), buyer power ($R^2 = 0.54$), and formal analysis ($R^2 = 0.39$). However, the model accounted for only 8% of the variance in procedural control.

5.1. Results of direct effect hypotheses

Four of the *focal hypothesized relationships* are statistically significant and in the direction predicted. Proactive focusing and search for information both significantly influence the level of formal analysis. In fact, the path coefficients for proactive focusing (0.35, $p < 0.001$) and search for information (0.28, $p < 0.001$) suggest that that they have roughly equal influence on formal analysis. The amount of *formal analysis* employed in the procurement process is also greater when the customer firm has greater buyer power, as reflected by the statistically significant path coefficient (0.16, $p < 0.01$). Additionally, buyer power is greater when the transaction involves an important purchase (0.58, $p < 0.001$).

In contrast, the hypothesized relationship between procedural control and search for information (0.00, $p = 0.93$) and proactive focusing (0.03, $p = 0.48$) were not statistically significant.

Consistent and complementary to previous research findings, the results confirm the four *control relationships*. Purchase importance has a statistically significant effect on procedural control (-0.28, $p < 0.001$), search for information (0.48, $p < 0.001$), and proactive focusing (0.82, $p < 0.001$). As predicted based on theory, this effect is enhanced when the customer has a more extensive choice set; the path coefficient between extensiveness of the choice set and buyer power is 0.46 ($p < 0.001$). *Purchase importance* has a strong direct effect (0.82, $p < 0.001$) on the procurement process through proactive focusing and accounts for 65% of the variance in the buyers' efforts to consider long-range, strategic issues. The assessment of discriminant validity demonstrates that purchase importance

and proactive focusing are distinct constructs, so the strength of this relationship suggests that important purchases trigger distinct efforts to protect the firm's future interests (for example, even if the purchase has been made the same way in the past). This implies that there is rarely a transaction that is viewed as short-term if it truly involves an important purchase. Consistent with the model, there is a statistically significant, negative relationship between purchase importance and procedural control, but the size of the coefficient (-0.28, $p < 0.001$) suggests a more moderate influence by purchase importance here than on other key aspects of the procurement process.

5.2. Consideration of alternative model structure

The model proposed in Fig. 1 is parsimonious and provides a good fit in explaining the covariances among all of the individual items for all of the constructs. However, it is useful to consider possible alternative model structures that might explain the observed relationships, particularly relationships constrained to be zero in the model tested. For example, the motivation for considering alternative models is illustrated by the non-significant findings for procedural control—which raise questions about the possibility that procedural control may be influenced by (or have an influence on) other constructs where a relationship was not hypothesized in Fig. 1.

There are various empirical and conceptual approaches for developing and testing alternative models. One approach, as discussed in more detail by Sörbom (1989), is to evaluate the modification indices produced by the SEM estimation process. Conceptually, the modification indices pinpoint ways in which the fit of the model would improve if relationships excluded from the model were included (that is, potentially meaningful path coefficients were not constrained to be zero but rather were freely estimated). Sörbom (1989) suggests as a rule of thumb that a modification index that is 5.0 or greater may highlight a

potential significant relationship that can be specified in an expanded model, the fit of which can be compared with the simpler model.

Following this approach, we evaluated the modification indices for the (original) model in Fig. 2. For each pair of constructs where no relationship is hypothesized, there is a modification index that indicates how fit might change if the constraint of no relationship was relaxed. For example, the modification index between procedural control and formal analysis is near zero (0.007, with a parameter change of −0.004). The lack of covariation between procedural control and constructs other than purchase importance is not because of a lack of variation in procedural control (see Table 3). So, in general, these results imply that procedural control "stands alone" as an end in itself relative to the other procurement process approaches. While procedural control is somewhat more common with less important purchases, the role it plays varies widely from company to company regardless of buying power or extensiveness of the choice set.

The modification indices are also consistent with aspects of the model that imply that purchase importance has pervasive effects—but that its relationship with formal analysis is mediated. Specifically, the modification index for the (possible) direct path between purchase importance and formal analysis is very small (0.20), so including that path in the model would results in a trivial (0.02) change in the parameter. In the same vein, the modification indices do not suggest direct relationships between extensiveness of the choice set and any of the purchase process constructs once the relationship between choice set and buyer power is taken into consideration.

However, the modification index associated with a potential direct relationship of search for information on buyer power is 22.7; similarly, the modification index for the relationship of search for information on proactive focusing is 4.5. Thus, it is sensible to evaluate an alternative model that includes these additional direct effects.

Table 4 compares the results of the alternative model with the original model. The improvement in fit for the alternative model is statistically significant ($p < 0.01$), and the path coefficients for the added relationships (Table 4) are as well. Further, no modification indices for relationship paths were above 2.4. Thus, the model hypothesized in Fig. 1 is improved somewhat by including these two additional direct relationships involving search for information. On the other hand, including these paths in the model resulted in only minor changes in other parameter estimates. Specifically, as shown in Table 4, allowing for an indirect effect of purchase importance through proactive focusing on search for information resulted in a path coefficient for the direct relationship between purchase importance and search for information that was somewhat smaller (0.28) but still statistically significant ($p < 0.001$).

Table 4
Parameter estimates for relationships in proposed and alternative structural models

Models (proposed relationship)	Proposed model estimates (p value)	Alternative model estimates (p value)	Related literature
Proposed structural model			
Focal hypothesized relationships			
H₁: Purchase importance⇒Buyer Power (+)	+0.58 (<0.001)	+0.46 (<0.001)	Cannon & Perreault, 1999; Homburg & Kuester, 2001; Newall, 1977; Sheth, 1973; Wilson et al., 1991
H₂: Procedural control⇒Search for information (−)	0.03 (0.48)	N/A	Anderson et al., 1987; Bunn, 1993; Doney & Armstrong, 1996; Heide & Weiss, 1995; Lambe et al., 2000; Reve & Johansen, 1982; Robinson et al., 1967
H₃: Procedural control⇒Proactive focusing (−)	0.00 (0.93)	N/A	Dobler & Burt, 1996; Frazier et al., 1988
H₄: Search for information⇒Formal analysis (+)	+0.28 (<0.001)	+0.26 (<0.001)	Browning et al., 1983; Reve & Johansen, 1982
H₅: Buyer power⇒Formal analysis (+)	+0.16 (<0.01)	+0.16 (<0.01)	Clopton, 1984; Corey, 1978a; Porter, 1981, 1985; Schwartz et al., 2001
H₆: Proactive focusing⇒Formal analysis (+)	+0.35 (<0.001)	+0.36 (<0.001)	Doney & Armstrong, 1996; Feldman & Cardozo, 1969; Reve & Johansen, 1982; Robinson et al., 1967; Spekman et al., 1995; Staw, 1980
Control relationships (based on literature)			
Extensiveness of choice set⇒Buyer power (+)	+0.46 (<0.001)	+0.46 (<0.001)	Aldrich & Mindlin, 1978; Anderson & Narus, 1990; Cannon & Perreault, 1999; Iyer, 1996; Pfeffer & Salancik, 1978; Weiss & Heide, 1993
Purchase importance⇒Procedural control (−)	−0.27 (<0.001)	−0.27 (<0.001)	Buvik & John, 2000; Dobler & Burt, 1996; Reve & Johansen, 1982
Purchase importance⇒Search for information (+)	+0.47 (<0.001)	+0.24 (<0.001)	Dawes et al., 1993; McQuiston, 1989; Moriarty & Bateson, 1982; Sheth, 1973; Stump & Heide, 1996
Purchase importance⇒Proactive focusing (+)	+0.82 (<0.001)	+0.72 (<0.001)	Bonoma, 1982; Corey, 1978b; Iyer, 1996; Leenders & Blenkhorn, 1988; Nooteboom, 1996; Porter, 1980, 1985; Walker & Weber, 1984; Williamson, 1985
Alternative model specification	Modification Index		
Relationships added to model			
Buyer power⇒Search for information	22.7	0.36 (<0.001)	Empirically derived relationship based on modification index
Search for information⇒Proactive focusing	4.5	0.16 (<0.01)	Empirically derived relationship based on modification index

Taking all of the analyses into consideration, the original model, while parsimonious, provides a good explanation of the overall set of relationships observed among the constructs involved in the procurement process. The results for the revised model highlight two additional relationships involving search for information—and suggests that it plays an even more pervasive role in the purchasing process than has been addressed in the literature.

6. Discussion

These results provide an integrative view of empirically observed relationships among key aspects of the procurement process that have implications for managers and for future research. Before discussing these issues, however, it makes sense to overview the major limitations of this research.

6.1. Limitations

Potential limitations of this research concern the unit of analysis, reliance on a single-respondent, constraints of the SEM procedures, and the cross-sectional design. The unit of analysis–and the central focus in this research–is the purchase itself (i.e., a specific transaction or "episode"). Thus, there are issues important to industrial buying that are beyond the scope of what was studied. For example, we have not measured or analyzed the role of such variables as individual differences among decision makers (e.g., decision making styles, tolerance for uncertainty, skill levels), organizational characteristics (e.g., size, complexity, or "success"), or specifics of the buyer–seller interaction (e.g., transaction time, negotiation styles, influence patterns). On the other hand, using a parsimonious set of variables, the model does a good job of explaining much of the variance in several procurement process constructs across a large and diverse set of purchase situations. Thus, in the future when researchers are studying questions about variables outside the context of this research these results will help provide an informed basis for more complete specification of relevant models.

While our measurement analysis indicates reliable and valid measures, it is a limitation that all measures are based on data reported by a single respondent in each firm and purchase situation. Others inside or outside the sampled organizations might characterize the purchase situation differently. This issue has been debated in the literature and different approaches for getting inputs from different respondents have been proposed. However, the most basic issue is whether other respondents have better or more complete information. Here the respondent was a purchasing professional who had personal involvement in the purchase decision and who by the nature of his job responsibilities was in a good position to provide informed inputs about key purchasing issues. Other people with functional-area expertise may have participated in a purchase decision, but our focus is on the purchase decision per se. It is for this reason that most published research on organizational buying has relied on the inputs from a purchasing professional.

We applied SEM procedures to test linear relationships, but non-linear relationships that are either consistent or inconsistent with the hypotheses may not have been detected. While the fit of the model proposed here is good, and analysis of modification indices is consistent with the conclusions drawn from the model, other variations on the proposed model might be consistent with the observed data. However, for completeness, we provide the summary data in Tables 2 and 3 which makes it possible for other researchers to evaluate the feasibility of alternative formulations.

Finally, the research is based on cross-sectional data. The sample is large relative to most research in this arena and it also represents a wide variety of different companies and purchase situations, but it does not provide a direct basis for testing time-varying effects that may be important and relevant to understanding industrial purchasing.

6.2. Managerial implications

Our findings have implications for both buyers and sellers operating in business markets related to the interrelationships among purchasing constructs that are important in both classic and contemporary views on organizational buying. When buyers confront important purchases, they are likely to go beyond any pre-established procedural controls, to engage in both more long-range proactive focusing and increased search for information. In the modern context, sellers often seek long-term trust-based relationships with buying organizations. Over time, procurement processes supporting such relationships are often governed by procedural controls. However, when a focal purchase becomes an important one from the buyer's perspective (e.g. a major financial commitment, involves high level of decision-making authority, or influences many aspects of the purchasing organization), the purchasing organization is likely to conduct greater search for information regardless of existing procedural controls. Furthermore, on such important focal purchase occasions, the propensity of buying organizations to adopt a more long-term temporal outlook compounds the potential risk and rewards for sellers, as such decisions may foreshadow shifts in the procurement process.

Moreover, when confronting important focal purchases, our results indicate that buyers will work to develop a stronger power position and this outcome will be accentuated when the buyer has viable alternatives. Marketers must keep in mind, however, the asymmetry between purchase importance from the customer's point of view and the seller's point of view. A purchase that is a crucial sale to a vendor may be relatively unimportant to the customer. Since communication and information sharing are implicit costs to buying firms, efficiency is a relevant consideration (Cannon & Homburg, 2001). A buying firm is less likely to search for information or do formal analysis if a purchase is not important or relevant to proactive focusing, but a seller who can provide information *and* supporting formal analysis may prompt new attention to the purchase. The analysis here does not reveal a relationship between procedural control and search for information. So, even if a firm makes a purchase based on procedures accepted in the

past it is not more or less likely to rely on formal analysis. If such returns are the objectives of management policy, alternative policy might be employed or simple reliance on purchase importance as a motivator would be consistent with our findings.

In addition to supporting our notion that some previous research generalizes beyond its original contexts (e.g. within a specific industry), this research advances and simultaneously tests four new focal relationships. First, consistent with Homburg and Kuester (2001), we provide theoretical rationale and empirical evidence in support of the aforementioned positive relationship between a purchase importance and buyer power.

Second, our findings support the notion that greater search for information is positively related to the conduct of formal analysis thereby integrating and supporting previous research by Browning et al. (1983) and Reve and Johansen (1982). An implication is that the increased quantity and complexity of information influencing purchasing decisions may lead to a heavier reliance by buyers on more formal analytical tools. Tools that help buyers to better access and analyze information during the conduct of the procurement process are needed-especially for important purchase situations that lead to greater search for information.

Third, building on rationale advanced by Clopton (1984) and Schwartz et al. (2001), we found that in the presence of greater buyer power, purchasers tend to rely more on formal analytical tools. Such tools can help them to better differentiate alternative outcomes across prospective solutions across a broader range of competitive selling organizations. Additionally, since such tools can help buyers to forecast the outcomes of integrative solutions proposed by sellers, it can help them to achieve better bargaining positions with those sellers—including demands that sellers propose integrative as opposed to distributive solutions.

Fourth, we found that longer-term outlooks foster a heavier reliance on formal analytical tools, which helps integrate some of the logic advanced in previous organizational procurement research (Doney & Armstrong, 1996; Feldman & Cardozo, 1969; Robinson et al., 1967; Spekman et al., 1995; Staw, 1980). Formal analytical tools are needed in situations characterized by increased proactive focusing by the purchaser. With a general trend towards longer term outlooks in buyer–seller relationships, increasing investments from both buyers and sellers in analytical technology tools and techniques should be expected as such investments promise potential for returns.

6.3. Future research

In designing research relevant to organizational buying, the researcher must make difficult decisions about the sample, respondent, purchase setting, and what variables to measure and model. It is never possible to include all the measures that are potentially relevant to the topic being studied. As a result, there are usually trade-offs that involve (sometimes) implicit assumptions about the nature of the purchase. This research simultaneously measures and evaluates key aspects of the procurement process that are relevant to a broad range of purchases. It also evaluates the impact of situational control factors that impact the interrelationships among these factors. Thus, the empirical relationships documented here are potentially important in the design of research on a wide variety of topics relevant to organizational buying. For example, our results suggest that much of the impact of extensiveness of the choice set on the purchase process occurs through buyer power rather than directly. As such, work which looks at extensiveness of the choice set as a potential predictor (without considering buying power) is likely to draw conclusions that are incomplete or even misleading. Similarly, one might conclude that procedural control would result in less search for information; in fact, this hypothesis was developed based on the existing literature. However, the results here show that there is scant evidence for a relationship between procedural control and search for information (after controlling for the effect of purchase importance)—or for that matter other aspects of the procurement process.

The fact that procedural control tends not to be systematically related to other aspects of the procurement process also suggests that it is an area that warrants more research and finer-grained specification. At a basic level, sellers in business markets and scholars who study these markets need a better taxonomy of the different types of procedural controls that may operate in different companies and purchase situations.

In the model tested in this paper, purchase importance impacted the search for information, which in turn, influenced formal analysis. The integrative model shows how these constructs are imbedded within the complexity of the procurement process. Thus, buying power is enhanced when there is a more extensive choice set (more competing suppliers and/or alternative product solutions) and the purchase represents an important decision. Buyers may try to solidify their power position by either sole sourcing (becoming an important customer to one vendor) or by splitting orders among competing vendors (to keep vendors "on their toes") (Presutti, 1992). Considered in the context of the buyer power and purchase importance relationship, it is also reasonable to theorize that over time buying firms will actively seek to build greater power in the procurement market by expanding their choice set. Thus, even when closer buyer–seller relations seem to indicate more sole sourcing, buyers continue to develop and maintain a range of relationships as protection against contingencies, facilitate the search for information, and quantify criteria relevant to value analysis.

The results here suggest that reliance on procedural control will be greater for less important purchases. However, the variance explained is relatively low and no relationships are observed between procedural control and other aspects of the procurement process. One possible explanation of this unexpected finding is that the relationships depend on the extent to which adequate information for buyer decisions and a consideration of proactive issues related to the purchase are part of institutionalized procedures. For example, buying center research indicates that more formalized structures exist when the purchase is more important (Lau, Goh, & Phua, 1999). Our

conceptualization of procedural control, however, includes both the ability to apply formalized procedures as well as more informal "rules of thumb." Thus, there may be an important distinction to be made in future research with regard to passive and active aspects of the buying process. "Passive" search for information and passive proactive focusing may be driven by institutionalized procedures that are performed regularly. On the other hand, "active" search and proactive focusing is highly visible effort that is conducted in a discovery mode and therefore is iterative and lacking predetermined steps. Our research, however, focuses only on the active component.

Yet, procedural control is an important issue because it characterizes many purchase decisions. Thus, more research that identifies variables that moderate or mediate relationships and effects of procedural control could be very useful. A greater understanding of procedural control would also open the door for more focused research on the ways that organizational learning impacts buyer–seller relationships and specific episodes (Håkansson, Havila, & Pedersen, 1999). Logically then, on-going buyer–seller relationships can be viewed as the accumulation of a number vendor choice situations occurring across the entire continuum from transactional to relational.

Theories of organizational learning have been applied in the marketing literature to the new product development area (Moorman & Miner, 1997), but has seen sparse attention in the area of buyer–seller relationships. Research that provides a deeper insight on these issues has the potential to be important in shaping promotion efforts aimed at business customers.

While much recent research focuses on the "relational" aspects of buyer–seller arrangements, there has been tremendous growth in the number of purchase transactions that rely on some form of (interactive) e-commerce, especially the use of reverse auctions and on-line bidding (Deeter-Schmelz, Bizzan, Graham, & Howdyshell, 2001; Hawk, 2001; Sicaras, 2000). The persistent practice of seeking multiple competitive bids indicates the adversarial model of doing business still dominates in many markets (Patterson & Dawes, 1999). Yet, many firms are now expanding their decision criteria to include evaluation of value factors other than just price. There is a need for more work on the approaches to *formal analysis* that buyers use to quantify and evaluate this information. It is perhaps tempting to think of these e-commerce situations as "completely different," but when viewed from the perspective of the process model here it is yet another application of customers seeking more power and information to do a better job of making important purchases.

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