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Authors(s)	Nyaga, Gilbert N.; Lynch, Daniel F.; Marshall, Donna; Ambrose, Eamonn
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POWER ASYMMETRY, ADAPTATION, AND COLLABORATION IN DYADIC RELATIONSHIPS INVOLVING A POWERFUL PARTNER

Gilbert Nyaga, Daniel Lynch, Donna Marshall and Eamonn Ambrose (accepted in Journal Supply Chain Management December 2012)

ABSTRACT

Buyer supplier relationships involve dyadic interactions, but there is a dearth of empirical dyadic analysis of relationships. While relationships with a power balance between partners do exist, relationships typically occur in the context of power asymmetry. This study examines how perceptions of power use and prevailing relationship quality in dyadic relationships characterized by substantial power asymmetry affects behavioral and operational outcomes. Hierarchical regression is used to analyze data from dyadic survey of relationships of a brand-name buying organization and its suppliers. Results indicate that power use affects partner behavior and operational performance, but the nature of the relationship dictates which power sources are most appropriate. In addition the mediation effect of power imbalance shows that both relational and transactional factors can play an important role in supply chain exchanges.

Key words: *Dyadic relationships, Power asymmetry, Adaptation, Collaboration, Relationship quality*

POWER ASYMMETRY, ADAPTATION, AND COLLABORATION IN DYADIC RELATIONSHIPS INVOLVING A POWERFUL PARTNER

Introduction

Managing supply chain relationships continues to be a challenge for many firms even as such relationships become more prevalent in contemporary business practice. Increasingly, companies of different sizes, providing a variety of products and services and with distinct organizational cultures have to work with other companies in complex supply chain networks. The firms often need to change their business processes and systems in order to accommodate the needs of their relationship partners. This may also involve joint activities in which supply chain partners share information, routines, planning, costs, etc. Such adaptive and collaborative activities enable relationship partners to develop transactional efficiencies, which may enable them to appropriate greater returns than they could generate individually (Dyer & Singh, 1998). However, the presence of power asymmetry in such relationships affects partner adaptive and collaborative behavior, in part because it may encourage opportunism or the stronger partner may use its advantage to appropriate greater value in the relationship.

Power asymmetry in supply chain relationships is an important area for research since differences in power among partners are generally inevitable. As Belaya, Gagalyuk, and Hanf (2009) point out, the nature of power in supply chain relationships presupposes an asymmetrical distribution of power among partners because of differences in expertise, size, switching costs, dependence, contract structure, etc. The powerful partners may assume greater influence in the supply chain network thereby providing some stability or they may leverage their power advantage at the expense of weaker partners. Thus, power asymmetry does not necessarily portend conflict in supply chain relationships but it does create greater risks and challenges for the weaker party. For example, the weaker firm may be more vulnerable to opportunism because it may not have effective mechanisms to monitor or influence the stronger partner's performance. Due to its weak position in the relationship, it is also likely to comply with stronger partner requests for fear of losing business. Where partners make relationship specific adaptations, the presence of power asymmetry may amplify the risks and potential for conflict, disaffection, and relationship termination. Since power asymmetry in supply chain relationships is inevitable, there is need to understand the nature of and effects of power structure so as to provide win-win situations for all partners in the supply chain exchange or network (Cox, 2004).

Recent studies on the use of power and influence in supply chain relationships have focused on its effects on relationship commitment (Zhao et al., 2008), relationship strength (Maloni & Benton, 2000; Benton & Maloni, 2005), opportunism (Brown, Grzeskowiak & Dev, 2009), compliance (Payan & McFarland, 2005), value creation (Terpend et al., 2008), and performance (Crook & Combs, 2007). With few exceptions (i.e., El-Ansary & Stern, 1972; Wilkinson, 1979), the studies have mostly examined one side of the relationship dyad. In a departure from this, this study examines dyadic relationships involving a brand name high-tech firm and its suppliers to determine how power structure and the underlying relationship quality in dyadic settings influence partners' adaptive behavior (i.e., willingness to adapt processes or systems to suit partners' needs), collaborative behavior (i.e., willingness to collaborate in joint activities with supply chain partners), and ultimately operational performance. Past studies suggest that adaptive behavior enables a firm to build social credit or indebtedness, which it may

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then use to extract favorable transactional terms or compliance from partners (Griffith et al., 2006; Zhang, Henske & Griffith, 2009). Moreover, it may also enable the firm to build better bargaining power because of higher switching costs (Crook & Combs, 2007) and the social credit that may make the partner feel obligated to reciprocate the commitment shown through adaptive behavior.

However, although relationship specific adaptations and collaboration between buyers and suppliers have received attention in the literature (Hallen et al., 1991; Anderson & Weitz, 1992; Doney & Cannon, 1997; Min et al., 2005; Daugherty et al., 2006; Gulati & Sytch, 2007), their mediating role in relationships characterized by substantial power asymmetry has not been conclusively determined. For example, the effect of reward power, coercive power, and legal power in relationships has been mixed – positive in some studies (Benton & Maloni, 2005) and negative or non-significant in others (Zhao et al., 2008). Indeed, the influence of power structure on a relationship partner's willingness to adapt processes or systems given the prevailing relationship quality has not received much attention.

In addition, the notion that exercise of power is more important than structure of power relations (Frazier & Summers, 1986; Crook & Combs, 2007) is rarely addressed in as far as it influences relationship partners' willingness to adapt and/or collaborate. Firms have power to the extent that other firms depend on them for resources (Pfeffer & Salancik, 1978; Crook & Combs, 2007). These resources include financial, expertise, information, services, legitimacy, or status as well as one firm's possession of attributes (e.g., attractiveness) or rightful claims (e.g., contract obligations) that may motivate its partners to comply (Dwyer, Schurr, & Oh, 1987). Firms may use their power advantage to coerce their partners to do what they would otherwise not do or they may forbear use of power and still get better results. However, although the use of power advantage may be beneficial to the stronger partner in terms of enabling it to appropriate greater relationship value, it may negatively impact the value generating potential of the relationship and/or irrevocably damage to the relationship (Gulati & Sytch, 2007; Johnson et al., 1993). Consequently, it is not merely the possession of power that may drive partner adaptation and collaboration; rather, it is the way that power advantage is perceived to be exercised and in what context.

Most studies on use of power in supply chain relationships examine one side of the relationship dyad, which limits evaluation of perceptual congruence (Anderson & Weitz, 1992) between partners. Several studies suggest that partners have differences in their perceptions and expectations in supply chain relationships (Corsten & Kumar, 2005; Gundlach, Achrol & Mentzer, 2005; Nyaga, Whipple & Lynch, 2010) and these differences may have significant negative effects on performance. In effect, perceptions of power and how it is used may not be shared across the relationship dyad and could significantly influence buyers' and suppliers' willingness to adapt, their willingness to collaborate, and operational performance. Thus, this study examines the effects of power asymmetry, considered inevitable in supply chain relationships, on partners' adaptive behavior, collaborative behavior, and operational performance.

The next section is a review of theoretical foundations of the conceptualized relationships and literature on study constructs. Next, research methodology is presented followed by discussion of results. Finally, managerial and theoretical implications, and opportunities for future research are presented.

Theoretical Background and Hypotheses

We premise this study on the *social exchange theory* (SET) and *transaction cost economics* (TCE) frameworks. SET stipulates that the basic motivation for interfirm interactions is seeking of rewards and avoidance of punishment (Blau, 1964; Emerson, 1976). TCE stipulates that firms seek, from a feasible set of alternatives, the arrangement that safeguards their relationship at the lowest total cost (Williamson, 1983; Rindfleisch & Heide, 1997). A major premise of SET is that positive exchange interactions over time produce relational exchange norms that govern the exchange relationship, that is, the relationship between supply chain partners is an effective means of governance of the exchange (Lambe, Wittmann & Spekman, 2001). In counterargument, TCE stipulates that the risk of partner opportunism creates need for formalized governance structures, that is, the risk of opportunism limits the effectiveness of relational governance in exchange relationships (Lambe, Wittmann & Spekman, 2001; Rindfleisch & Heide, 1997). Consequently, SET does not explain transactional governance mechanisms while TCE does not explain relational governance.

Although SET implicitly assumes no opportunism (Lambe, Wittmann & Spekman, 2001), it is possible that norms may contribute to opportunism if one party takes advantage of trust between partners to advance its agenda (Moorman, Zaltman & Deshpande, 1992). This is especially likely where one partner has made relationship specific adaptations and substantial power asymmetry exists. Moreover, SET may not adequately explain supply chain relationships that are short-term since such relationships may not have developed trust and reciprocal indebtedness needed to sustain relational norms (Lambe, Wittmann & Spekman, 2001). In such cases, the partners may have to rely on transactional governance mechanisms. As such, there is need to examine SET (relational governance) and TCE (formal governance) as complementary theories in studying supply chain relationships. Since in this study we examine both relational factors (collaborative behavior) and transactional factors (adaptive behavior), we refer to both SET and TCE theories to support our hypotheses.

SET focuses on norms of reciprocity where partners cooperate in relationships with the expectation of giving and receiving rewards (Blau, 1964; Emerson, 1976; Lambe, Wittmann & Spekman, 2001). Thus, firms calculate the reward to be derived in a relationship whether in the short-term or long-term, and on this basis, adjust their behavior and actions toward their partner. In effect, the more an action by a partner in a supply chain exchange is rewarded or yields benefits, the more likely that it will be repeated (Griffith, Harvey & Lusch, 2006). Conversely, the more an action in a relationship is punished or fails to produce the expected benefits, the less likely that it will be repeated in future. SET has been applied as a theoretical basis in examining several buyer-supplier relationship issues including cooperation, integration, power and dependence, procedural and distributive justice, and relational norms (Griffith, Harvey & Lusch, 2006; Kaufman & Carter, 2006; Narasimhan et al., 2009; Zhang, Henke, & Griffith, 2009).

The notion of reciprocity implies that partners may feel obligated to reciprocate certain actions by the other party irrespective of existing power imbalance. For example, when firms make process, product or service adjustments to help out their partners, the recipient firms become indebted, not necessarily contractually but socially. The resulting social "indebtedness" may influence the partners' willingness to make substantial relationship specific adaptations in

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future transactions or to engage in joint activities with the partner. We argue that buyers' and suppliers' willingness to make relationship adaptations and collaborate in joint activities is influenced by social obligations that develop during their transactions over time. These social obligations are developed and/or embedded in the prevailing power structures and relationship dynamics between the partners. As such, there is a need to understand the impact of different power sources and relationship quality on adaptive and collaborative behaviors, and ultimately on performance.

TCE is one of the most widely used theories in the study of governance arrangements in inter-firm relationships. Of particular interest in this study is TCE's notion of asset specificity, which applies to relationship specific adaptations (Cannon & Perreault, 1999). Asset specificity is described as the most critical dimension for describing transactions (Williamson, 1985). Asset specificity is 'the big locomotive to which transaction cost economics owes much of its predictive power' (Williamson, 1985: 56). Asset specificity refers to the degree to which assets that support a given transaction are tailored to it and cannot be redeployed easily outside of a particular exchange relationship (Geyskens, Steenkamp & Kumar, 2006). Given their idiosyncratic nature, specific assets create a safeguarding problem because market competition can no longer serve as a restraint against opportunism by relationship partners (Rindfleisch & Heide, 1997; Geyskens, Steenkamp & Kumar, 2006). Thus, asset specificity may lead to a shift in power position between supply chain partners and may encourage opportunism, which makes it difficult for parties in the exchange to achieve their goals (Lonsdale, 2001).

However, presence of relational norms such as solidarity, flexibility, etc., in buyer-supplier relationships can reduce hazards of opportunism because norms prescribe behavior required to maximize joint payoffs (Rokkan, Heide & Wathne, 2003; Rindfleisch & Heide, 1997; Wever et al., 2012). Williamson (1983) argues that relationships involving high levels of mutual adaptation can be governed by the hostage model in which specific assets by both partners mitigate opportunism. However, in relationships with significant power asymmetry, relationship specific adaptation puts the weaker partner at a greater degree of vulnerability to opportunism. The powerful firm may calculate that it can leverage is power advantage to gain more at the expense of the weaker firm. Furthermore, powerful firms are likely to have greater relationship monitoring and surveillance capabilities, which provide additional safeguards (Shervani, Frazier & Challagalla, 2007). With fewer alternatives, the weaker partner could be coerced to perform tasks or incur costs on behalf of the stronger partner.

We discuss study constructs and hypotheses in the context of the two theories in the following sections. Figure 1 illustrates the conceptual model and the proposed hypotheses.
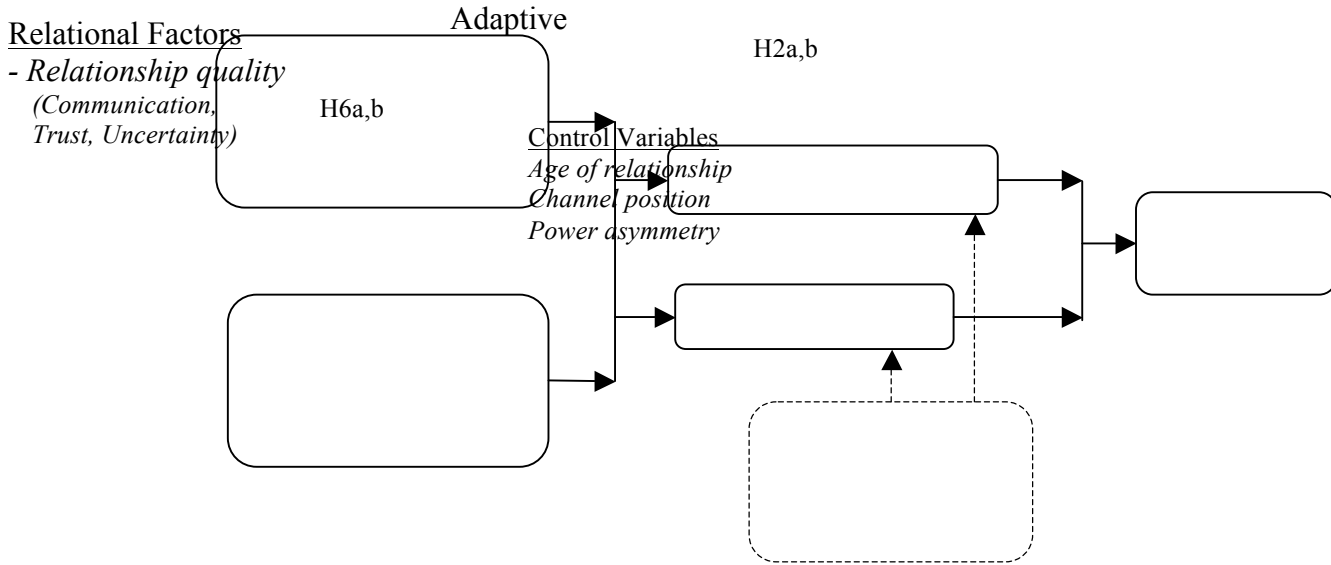
Power Sources
- *Non-mediated power*
- *Mediated power*
- *Reward power*

H3a,b; H4a,b; H5a,b

H1

Collaborative

FIGURE 1

Operational
Performanc

Conceptual Model

Relational Factors
- *Relationship quality*
  *(Communication,
  Trust, Uncertainty)*

Adaptive

H6a,b

H2a,b

Control Variables
*Age of relationship
Channel position
Power asymmetry*

Operational Performance

Firms invest substantial time and resources in developing, maintaining, and improving their supply chain relationships because such relationships offer demonstrable benefits in terms of operational and financial performance. Past studies suggest that collaborative supply chain relationships are often associated with better performance including cost reductions, better coordination, reduced inventory, and increased fill rates (Whipple & Frankel, 2000; Daugherty et al., 2006; Nyaga, Whipple, & Lynch, 2010; Thomas, Fugate, & Koukova, 2011). Wang, Kayande and Jap (2010) argue that there is need for firms to have a positive evaluation of their partner's performance in order to justify involvement in collaborative initiatives. That is, there must be some performance advantages in order for firms to engage in the potentially risky and time-intensive collaboration (Johnson et al., 1993).

Firms collaborate with supply chain partners in order to access critical resources, mitigate transactional complexity, and improve performance (Zacharia, Nix, & Lusch, 2009; Fawcett et al., 2011). Often times, such collaboration requires the firms to make adjustments to their processes, products or services to meet specific needs of their partners. In effect, adaptation and collaboration in supply chain exchanges enhance the partners' ability to coordinate processes and transactions, which ultimately improves operational effectiveness. However, there is always the likelihood that performance improvements will not be realized in specific relationships.

Additionally, although adaptive and collaborative behaviors are expected to result in mutual gains, the gains may not be fairly shared among the partners. Past studies suggest that buyers and suppliers often have perceptual differences with regard to relationship structure and performance (Nyaga, Whipple & Lynch, 2010). Such perceptual differences can negatively affect the relationship because it may create dissatisfaction, conflict, disproportionate efforts, and ultimately relationship collapse (Anderson & Weitz, 1992; Gundlach, Achrol & Mentzer, 1995).

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In buyer-supplier relationships characterized by substantial power asymmetry, such perceptual incongruence may be magnified. For example, the weaker partner may express a higher degree of dissatisfaction if it perceives the stronger partner as appropriating more value. This is especially likely where the firm has invested in process, product or service adaptations to meet the powerful partner's requirements. As a result, it may be less inclined to put effort in the relationship, which may negatively affect performance.

Where the stronger partner forgoes use of its power, the weaker firm may be more compliant since the powerful firm signals a greater degree of benevolence and reliability (Crook & Combs, 2007; Frazier & Summer, 1986). Corsten and Kumar (2005) found that while retail buyers and their suppliers both benefited from collaboration, suppliers had a greater feeling of inequity with regard to such benefits. Moreover, power advantage may balance out as different partners in the relationship may possess alternative power sources – one party may have an expertise power advantage but its partner may have a legitimate or coercive power advantage, which when simultaneously used may create some level of stability or deterrence. In line with these findings in the extant literature, we expect that buyers and suppliers will express differences in their satisfaction with operational performance attributed to their adaptive and collaborative behavior.

Collaborative Behavior

Increasingly, firms are collaborating in a wide range of organizational activities including joint planning, cost control, quality improvement, developing cross-functional processes, goal setting, performance measurement, etc. (Gulati & Sytch, 2007; Heide & John, 1990; Min et al., 2005; Sanders & Premus, 2005; Zacharia, Nix, & Lusch, 2009). Collaboration allows firms to access and deploy resources that they do not have (Zacharia, Nix, & Lusch, 2009), gain synergistic rewards, and develop idiosyncratic capabilities that facilitate increased relational rents (Dyer & Singh, 1998). Past studies suggest that collaborative behavior is associated with reduced transactional costs, improved visibility, high service level, increased flexibility, achievement of shared goals, high levels of motivation in relationship, and mutual gains (Daugherty et al., 2006; Gulati & Sytch, 2007; Min et al., 2005).

Several factors engender collaborative behavior between buyers and suppliers. For example, trusting partners tend to engage in collaborative activities because each partner demonstrates a willingness to rely on and be vulnerable to the other based on positive expectations regarding the other party's behavior (Malhotra & Lumineau, 2011; Poppo, Zhou, & Ryu, 2008). As Rokkan, Heide and Wathne (2003) argue, reciprocity that is inherent in collaborative relationships may discipline partners in that parties expect future pay-offs to be substantially higher than short-term payoffs from opportunism. Moreover, relational norms in exchange relationships may "provide mutually agreed upon means of controlling behavior without the difficulties created by using power" (Lambe, Wittmann & Spekman, 2001, p. 11). As such, collaborative behavior is likely to enhance reciprocity and indebtedness among partners as stipulated in SET, which minimizes risks of exploitation and enhances performance in the exchange.

Collaborative behavior focuses on preservation and continuity of the relationship even when pure self-interest might suggest otherwise (Bercovitz, Jap, & Nickerson, 2006). It allows supply chain partners to align their expectations and behavior thereby minimizing conflict,

misunderstandings, increasing commitment to mutual goals, and realizing expected performance improvements. As Bercovitz, Jap and Nickerson (2006) note, it is the match or deviation between the realized and expected cooperative norms in an exchange that drives performance. That is, the alignment facilitated by collaborative behavior enables firms to coordinate better, minimize partner opportunism, reduce safe guarding/monitoring costs, and realize maximum joint payoffs in the exchange. Consequently, collaborative behavior facilitates improved operational performance to the extent that it enables partners to coordinate their operations better, match their expectations, and align their processes so as to enhance transactional efficiency and effectiveness. Thus, we hypothesize that:

> *Hypothesis 1:* The greater the collaborative behavior of an actor in a dyad, the higher the supply chain partner's satisfaction with operational performance.

Adaptive Behavior

Generally, firms in business relationships are expected to adapt to each other to the degree that they are dependent on each other's resources (Hallen et al., 1991). For example, suppliers routinely adapt their processes and products to meet specific needs of their most important customers. Likewise, manufacturers configure their products and production systems in response to changes in components suggested by their leading suppliers. Thus, adaptations involve significant investments by one or both relationship partners in terms of time, money, and process adjustments. These adaptations enable partners to improve efficiencies and effectiveness in respective operations. Therefore, adaptations provide value to the extent that they reduce costs, increase revenues, or create dependence (Anderson & Weitz, 1992; Cannon & Perreault, 1999). In effect, adaptations are done in order to improve transactional effectiveness in supply chain exchanges and ultimately improve operational performance.

According to SET, firms may make process, product, or service adaptations to meet partner requirements in the hope that the relationship partner will reciprocate with more favorable transaction terms. For example, a supplier may customize its processes for a specific buyer with a view to securing commitments for substantial business increase from the buyer or extended contractual arrangements. Adaptations also enable firms to develop efficiencies in their transactions, build unique capabilities, and accumulate resources that are idiosyncratic to the relationship (Dyer & Singh, 1998). For example, adaptation can create a lock-in whereby a firm locks out competitors from accessing or dealing with a significant buyer or supplier. Conversely, as stipulated in TCE, such a lock-in may enable the receiver to appropriate more value through opportunistic means (Rokkan, Heide, & Wathne, 2003). This suggests that adaptations have potential to promote opportunism (TCE argument) or discourage opportunism because they promote trust, indebtedness, and cooperative norms (SET argument). Where a firm responds to a partner's adaptive behavior with increased trust and cooperative norms, the relationship will be characterized by greater collaboration and mutuality. Such a relationship will have fewer conflicts, misunderstandings, and opportunism. Therefore, adaptations can be viewed as signal of a firm's desire to collaborate and its expectation that the partner will reciprocate in the exchange.

Adaptations may involve or require joint action between buyer and supplier representatives, which means that it may positively affect a firm's willingness to engage in collaborative activities with its supply chain partners. Moreover, adaptation may promote

interdependency that may generate positive economic value in terms of inter-project spillovers (i.e., transactional efficiencies in a specific relationship, and leveraging specific knowledge and efficient interorganizational routines developed in one relationship in relationships with other firms) (Gulati & Sytch, 2007; Kang, Mahoney, & Tan, 2009; Stuart, Hoang, & Hybels, 1999). Consequently, adaptive behavior is expected of firms engaged in supply chain relationships and has a positive effect on operational performance and partners' collaborative behavior. Indeed, it is the *raison d'être* for firms' willingness to engage in potentially risky adaptations in supply chain relationships. Thus, we hypothesize that:

> *Hypothesis 2a:* The greater the adaptive behavior of an actor in a dyad, the higher the supply chain partner's satisfaction with operational performance.

> *Hypothesis 2b:* The greater the adaptive behavior of an actor in a dyad, the higher the supply chain partner's collaborative behavior.

The Effect of Power Sources

Power in supply chain relationships may be viewed as the ability of one firm to influence the other firm. French and Raven (1959) in their seminal work classified power into five sources: expert, referent, coercive, legal legitimate, and reward power. Recent studies have used this framework to classify power sources in supply chain research (Maloni & Benton, 2000; Zhao et al., 2008). These power sources are further grouped into non-mediated and mediated power. *Non-mediated* power sources are more relational and positive and consist of expert and referent power (Benton & Maloni, 2005). The target (recipient) firm decides whether and how it will be influenced by the firm wielding the power (Zhao et al., 2008). *Expert power* is present when one firm has specific expertise and knowledge that the other firm desires. Palmatier et al. (2006) posit that when firms interact with a competent partner, they receive increased value, their relationship becomes more important, and they invest more effort to strengthen and maintain it. Thus, expertise becomes a source of power since the competent firm will wield significantly higher influence on the partner. *Referent power* exists when one firm admires the way another conducts its operations and therefore values being identified with it.

Past studies indicate that both expert and referent power positively affect supply chain relationships mediators such as trust and commitment (Crook & Combs, 2007; Maloni & Benton, 2000; Zhao et al., 2008). Indeed, all studies that examine expert and referent power show a positive effect on relationship mediators or outcomes investigated. That both constructs have similar effect is not surprising. A firm that has high expertise in an industry also tends to be highly respected by its customers and competitors. As its expertise becomes reputed, the firm's power base often becomes more referred. In effect, expert and referent power are merely different sides of the same coin.

Mediated power sources include coercive, legal legitimate, and reward power. They involve "influence strategies that the source specifically administers to the target" with an "intention to bring about some direct action" (Benton & Maloni, 2005). Their application is deliberately controlled by the firm exercising the power, i.e., the firm offering punishment decides whether, when, and how to use its power (Zhao et al., 2008). *Coercive power* exists when one firm has the ability to exert punishment to influence another firm. *Legal legitimate power* exists when one firm uses its judiciary right to influence another based on contractual

(legal) agreements. *Reward power* exists where one firm has the ability to offer rewards intended to influence the target firm.

Whereas Benton and Maloni (2005) argue that mediated power sources represent competitive and negative uses of power, their effect on relationship mediators and outcomes have been mixed – positive, neutral, or negative in different studies. Coercive power consistently shows a negative effect, legal legitimate power shows a negative or no effect, and reward power shows a positive effect in most studies (Benton & Maloni, 2005; Maloni & Benton, 2000; Zhao et al., 2008). While coercive legal legitimate power sources often reflect explicit forms of coercion, reward power may be viewed as an implicit form of coercion since withholding reward is an act of punishment for non-compliance or failure to achieve set performance goals. However, reward power can also be viewed as a positive incentive to encourage performance improvement where both parties gain – the reward giver gets better results and the receiving firm gets the reward. Consequently, reward power can have both a coercive and non-coercive effect.

Firms use their power to gain favorable exchange terms, greater share of relationship benefits, or to coerce partners to do what they would otherwise not do (Pfeffer & Salancik, 1978). According to Frazier and Rody (1991), a high level of power in an exchange relationship is likely to lead its possessor to act opportunistically. However, Crook and Combs (2007) argue that stronger relationship partners may forgo use of power to instead share gains. As Frazier and Summers (1986) found, powerful manufacturers tend to use coercive strategies only when other types of influence have failed to produce satisfactory results. Belaya et al. (2009) posit that power can be used as an "effective tool in coordinating and promoting harmonious relationships, resolving conflicts, and therefore, enhancing performance of the whole supply chain network." That is, while some studies suggest that power asymmetry may foster instability and conflict (Lawler & Yoon, 1996), such asymmetry may indeed promote stability, as is the case in supply chain networks where a powerful focal firm (i.e., Wal-Mart) plays a major role of coordinating other parties. Consequently, the use of power in supply chain relationships has contrasting effects. Table 1 illustrates the different outcomes of power use in the extant literature.

TABLE 1
Relationship between power, its use, and effect on relationship

Power source	Effect on relationship	Supporting Literature
Mediated	Favorable exchange terms or greater share of relationship benefits.	Pfeffer and Salancik 1978; Frazier and Summers 1986; Frazier and Rody 1991
	Underperformance (i.e., conflict, dissension, opportunism, relationship termination, etc).	Lusch 1976; Gaski 1984; Frazier and Summers 1986; Johnson, et al. 1993; Morgan and Hunt 1994; Benton and Maloni 2005

	Improved performance; compliance; satisfaction; improved reputation; spillover benefits; long-term shift in power balance and dependence.	Maloni and Benton 2000; Jonsson and Zineldain 2003; Crook and Combs 2007; Gulati and Sytch 2007; Kang, Mahoney and Tan 2009
Non-mediated	Improved performance; compliance; satisfaction; improved reputation; spillover benefits; long-term shift in power balance and dependence.	Maloni and Benton 2000; Jonsson and Zineldain 2003; Crook and Combs 2007; Gulati and Sytch 2007; Kang, Mahoney and Tan 2009

On one hand, power can promote supply chain relationships. Past studies show that when power is not used exploitatively or coercively, there is an overall improvement in relationships (Frazier & Summers, 1986; Maloni & Benton, 2000; Jonsson & Zineldain, 2003; Crook & Combs, 2007). For example, when a more powerful partner forbears use of power, it signals to the weaker party that the partner is reliable, values the relationship, and is unlikely to act opportunistically (Crook & Combs, 2007). Indeed, Japanese automakers (i.e., Toyota and Honda) have a history of collaborative approach in dealing with their suppliers (Liker & Choi, 2004). Whereas US automakers generally pursued a confrontational approach, the Japanese competitors adopted a collaborative approach that resulted in suppliers expressing more satisfaction in their relationships with the car makers.

In contrast, suppliers of US automakers grudgingly responded to the companies' requests, which meant that they were unlikely to offer important suggestions or sacrifice on behalf of the car makers. Jonsson and Zineldin (2003) argue that non-mediated power sources tend to increase the value of relationships because they increase the level of cooperation. This is because weaker firms seek to identify with the competent firms or industry leaders and in so doing, gain some spillover effects such as reputation of being a supplier to a brand name firm (Kang, Mahoney, & Tan, 2009). Thus, we expect that in relationships characterized by non-mediated power imbalance, the firm with less expertise and reverence (weaker firm) will embrace more adaptive and collaborative behaviors, and may put more effort in enhancing the relationship. The firm may be more willing to make relationship specific adaptations as a mechanism to appropriate more value (i.e., expertise and enhanced reputation). In addition, since the firm gains from the stronger firm's expertise and reputation, non-mediated power is likely to be positively associated with improved operational performance. Therefore, we hypothesize that:

Hypothesis 3a: The greater the non-mediated power use by an actor in a dyad, the higher the supply chain partner's collaborative behavior.

Hypothesis 3b: The greater the non-mediated power use by an actor in a dyad, the higher the supply chain partner's adaptive behavior.

On the other hand, exploitative use of power in supply chain relationships can lead to dissension, resentment, conflict, dissatisfaction, underperformance, and unwillingness to participate (Lusch, 1976; Gaski, 1984; Frazier & Summers, 1986; Jonsson & Zineldin, 2003; Benton & Maloni, 2005). As Morgan and Hunt (1994) argue, a coerced party is not likely to remain in the relationship for the long term. The weaker firm is also likely to take greater precaution and seek mechanisms to reduce its vulnerability, which may ultimately undermine the relationship (Bucklin & Sengupta, 1993). Johnson et al. (1993) posit that coercive use of power leads to decreasing value creation in a relationship even though a powerful firm may appropriate

more value, that is, the "pie size" diminishes with use of coercion. In essence, mediated power may create short-term value for the power wielder, but the overall effect is reduced relationship value since the weaker party may become unwilling to adapt processes/services, to cooperate, may retaliate, or may engage in costly litigation and conflicts.

Past studies show that mediated power, whether through legalistic threats (legal power) or outright coercion (coercive power), negatively affects relationship commitment (Maloni & Benton, 2000; Zhao et al., 2008). However, since reward power shows different results from the other sources of mediated power, we examine reward power as a separate factor influencing adaptive and collaborative behavior. We expect that when firms perceive that their relationship partners are using coercive and/or legal power, they will be less willing to embrace adaptive and/or cooperative behavior. Indeed, mediated power can be viewed as a form opportunism since the coercing party often expects to gain at the expense of the weaker firm. In contrast, when a partner offers reward, it is likely to encourage positive perceptions by partners, which could lead to an improved relationship and superior performance. Indeed, rewards may reinforce the relationship by enhancing the notion of reciprocity as stipulated in SET – the recipient of the reward will feel obligated to perform according to the expectations of the partner. Consequently, the firm may calculate that it is in its best interest to make adaptations and collaborate with the partner so as to continue receiving the rewards. Therefore, we hypothesize that:

Hypothesis 4a: The greater the mediated power use by an actor in a dyad, the lower the supply chain partner's collaborative behavior.

Hypothesis 4b: The greater the mediated power use by an actor in a dyad, the lower the supply chain partner's adaptive behavior.

Hypothesis 5a: The greater the reward power use by an actor in a dyad, the higher the supply chain partner's collaborative behavior.

Hypothesis 5b: The greater the reward power use by an actor in a dyad, the higher the supply chain partner's adaptive behavior.

The Effect of Relationship Quality
The nature of the relationship between supply chain partners plays an important role in determining the level of their involvement in joint activities with partners and their willingness to make process, product or service adaptations. In particular, relationship quality has been shown to positively affect performance and attendant relational benefits (Athanasopoulou, 2009). Relationship quality represents the overall relationship in an abstract manner – rather than as specific dimensions of the relationship (e.g., trust) given that it may be difficult to distinguish between the specific relational dimensions and/or to isolate the impact of the specific relational dimensions (Nyaga & Whipple, 2011). It represents the "overall caliber of relationship ties and their overall impact on outcomes" (Palmatier, 2008). Thus, it is conceptualized as a higher-order construct consisting of two or more first-order factors (Crosby, Evans, & Cowles, 1990; Kumar, Scheer, & Steenkamp, 1995; Nyaga & Whipple, 2011; Richey, Tokman, & Dalela, 2010; Ulaga & Eggert, 2006). That is, it captures a collection of different attributes such as trust,

commitment, communication, etc., that cumulatively indicate the caliber of the relationship ties between partners.

Although different factors are used as dimensions of relationship quality (Athanasopoulou, 2009), we use communication quality, trust, and uncertainty in this study. *Communication* refers to the formal, as well as informal sharing of meaningful and timely information between firms. It helps supply chain partners to establish norms, values, and expectations in a given relationship (Ireland & Webb, 2007). Communication quality, which includes aspects such as accuracy, adequacy, credibility, timeliness, and completeness of information exchanged between supply chain partners (Mohr & Spekman, 1994) is a key indicator of relationship quality. *Trust* refers to the extent to which relationship partners perceive each other as credible and benevolent (Ganesan, 1994). Past studies suggest that trust is a key determinant of relationship success (Corsten & Kumar, 2005; Geyskens, Steenkamp, & Kumar, 1999; Poppo, Zhou, & Ryu, 2008). Since trust encourages greater openness, favorable attitudes, greater alignment of incentives or expectations, and reduced opportunism, it is expected that greater levels of trust are associated with higher relationship quality. *Uncertainty* captures the difficulty that decision makers experience when predicting the outcomes of transactions with relationship partners in terms of the likely benefits and costs (Gao, Sirgy, & Bird, 2005). The level of uncertainty in a relationship may reflect the extent to which partners consult, communicate, or seek to understand each other. Therefore, it is reflective of relationship quality. When viewed jointly, the three elements (communication quality, trust, and uncertainty) are a good reflection of the overall quality of relationships in supply chain exchanges.

Relationship quality is expected to influence the degree to which supply chain partners are willing to engage in adaptive and collaborative behavior. For example, partners are more likely to engage in joint problem solving and make process adjustments to help out the partner in high quality relationships. Absence of a quality relationship or where partners perceive the relationship in a low light (low quality) means these partners are more likely to engage in opportunistic behavior, may not view the relationship as a long-term engagement, may not put effort toward strengthening it, and the expected relationship benefits may not be realized. Indeed, the very basis of supply chain relationships is that by working collaboratively with supply chain partners, firms will gain more than they otherwise would individually. Therefore, relationship quality is an important determinant of firms' willingness to adapt or collaborate with supply chain partners because it minimizes opportunism (TCE argument), facilitates better coordination, and enhances relational norms (SET argument). We hypothesize that:

> *Hypothesis 6a:* The higher the perception of relationship quality by an actor in a dyad, the greater the supply chain partner's collaborative behavior.

> *Hypothesis 6b:* The higher the perception of relationship quality by an actor in a dyad, the greater the supply chain partner's adaptive behavior.

Research Method

Sampling and Data Collection

We collected data for this study using an online survey of executives of a large high-tech buying firm (across multiple strategic business units that operate independently) and its

suppliers. We identified potential respondents in the high-tech firm for the buyer sample and then obtained their respective contact executives in supplier firms for the supplier sample. For the buyer sample, we asked 25 commodity (buying) councils across different business units to each nominate their top ten suppliers by value. Each business unit has its own commodity council. We identified 163 key contacts (executives) from the nominated relationships (i.e., key contacts in relationships between the firm and its suppliers). We sent out buyer survey invitations to these 163 executives. We obtained 157 responses, which represents a 96% response rate. For the supplier sample, we asked the 157 buyer respondents to identify their counterparts (key contacts) in the supplier firms. In other words, we asked the buyer executives to identify their contact persons in supplier firms for each relationship. We obtained 155 supplier contacts. We sent out supplier survey invitations to these contacts and obtained 121 responses, which represents a 78% response rate. Thus, the data consisted of 121 buyer-supplier dyads. One of the reasons why response rates were very high is that we got the buy-in of senior buyer executives and some supplier executives before sending out the surveys. We use the dyadic data (121 dyads) in our analysis.

We sent out two email reminders to respondents in both samples (buyer and supplier surveys). We tested for non-response bias by comparing early and late respondents (Armstrong & Overton, 1977). Based on t-test and ANOVA analysis, we found no significant differences; therefore, non-response bias does not appear to be a concern. Moreover, since the response rates were 96% and 78% for the two samples, it is unlikely that non-response bias would significantly influence our results (Dyer & Hatch, 2006; Zhang, Henke, & Griffith, 2009).

The respondents varied in their experiences and time in the company. 66.9% of buyer respondents and 72.9% of supplier respondents had worked for more than ten years in the industry. 53.6% of buyer respondents and 48.6% of supplier respondents had been in their current position for at least four years. In over 90% of the relationships, the buyers and suppliers had dealt with each other for at least three years. This shows that the respondents had substantial experience and knowledge of the industry and their company's relationships with its partners (buyers/suppliers).

Measures

We adopted survey measurement items used in past studies: power constructs (expert, referent, coercive, legal legitimate, and reward) (Maloni & Benton, 2000); communication quality (Mohr & Spekman, 1994); trust (Ganesan, 1994); uncertainty (Gao, Sirgy, & Bird, 2005); adaptive behavior (Jonsson & Zineldin, 2003); collaborative behavior (Ellinger, Daugherty, & Keller, 2000); and operational performance (Jonsson & Zineldin, 2003). We made some adjustments to the instruments as appropriate to fit in the context of interest. We used a seven point Likert Scale (where 1 = "strongly disagree" and 7 = "strongly agree") for all measures.

We operationalized mediated and non-mediated power sources, and relationship quality as second-order factors. As noted earlier, non-mediated power consists of expert and referent power sources while mediated power consists of coercive and legal legitimate power sources (Benton & Maloni, 2005; Zhao et al., 2008). The relationship quality second-order construct consists of communication quality, trust and uncertainty factors. These are common dimensions of relationship quality in the extant literature (Athanasopoulou, 2009; Crosby, Evans, & Cowles, 1990; Ulaga & Eggert, 2006). To analyze the suitability of using a second-order construct, we

performed four confirmatory factor analysis models for each construct (Mishra & Shah, 2009). The results of these tests are shown in Table 2.

First, we grouped all items of the first order factors together as reflective of a single construct (Model 1a, Model 2a, and Model 3a, for non-mediated power, mediated power, and relationship quality, respectively). Second, we separated the items to represent distinct factors (Models 1b, 2b, and 2c, respectively). Third, we allowed the items of the distinct first-order factors to correlate (Model 1c, 2c, and 3c, respectively). Finally, we tested second-order factor with the first-order factors as reflective measures (Model 1d, 2d, and 3d, respectively). The suitability of using the second-order construct is ascertained if the fourth model (first-order factors as reflective measures) has a significantly better fit than the previous models. As results in Table 2 indicate, the fit indices for Model 1d, Model 2d, and Model3d are better than the preceding models for each second-order factor in both buyer and supplier samples. However, the chi-square and fit indices differences between Model 2c and 2d are not substantial while Model 3c and 3d have the same chi-square and fit indices in both buyer and supplier samples. In cases where the difference in chi-square and fit measures of two nested models is not significant, the superiority of one model is established by examining the significance of second-order factor loadings (Mishra & Shah, 2009). We established that the standardized loadings for second-order factor reflective measures (Models 2d and 3d) are substantially higher (>0.50) and significant ($p<0.01$) than factor loadings for Models 2c and 3c (indeed, almost twice as large in both models). Consequently, there is adequate support for use of second-order factors.

TABLE 2
Second-Order Factor Measurement Models

Power Source	Buyer Sample					Supplier Sample				
	χ^2 (df)	NNFI	CFI	IFI	RMSEA	χ^2 (df)	NNFI	CFI	IFI	RMSEA
Non-mediated										
Model 1a	63(9)	0.399	0.640	0.653	0.224	29 (9)	0.876	0.926	0.927	0.137
Model 1b	30(9)	0.765	0.859	0.864	0.140	82(9)	0.555	0.733	0.739	0.261
Model 1c	14(8)	0.924	0.959	0.961	0.080	17(8)	0.940	0.968	0.969	0.096
Model 1d	7(7)	0.995	0.998	0.998	0.021	9(7)	0.983	0.992	0.992	0.052
Mediated										
Model 2a	86(9)	0.515	0.715	0.721	0.267	106(9)	0.540	0.724	0.729	0.300
Model 2b	39(9)	0.815	0.889	0.892	0.167	23(9)	0.933	0.960	0.961	0.115
Model 2c	10(8)	0.987	0.993	0.993	0.045	13(8)	0.972	0.985	0.985	0.075
Model 2d	7(7)	0.997	0.999	0.999	0.020	11(7)	0.977	0.989	0.990	0.067
Relationship quality										
Model 3a	367(54)	0.592	0.666	0.671	0.220	419(54)	0.366	0.481	0.490	0.238
Model 3b	87(54)	0.956	0.964	0.965	0.072	78(54)	0.958	0.966	0.906	0.061
Model 3c	56(51)	0.993	0.994	0.995	0.029	62(51)	0.979	0.984	0.984	0.043
Model 3d	56(51)	0.993	0.994	0.995	0.029	62(51)	0.979	0.984	0.984	0.043

We also measured asymmetry in perceptions of power between buyers and suppliers. We ascertained, using paired sample t-tests, that the means of these antecedent factors were significantly different between buyers and suppliers. We computed asymmetry in two ways, for individual samples (buyer and supplier) and for the dyadic sample (derived from the average of buyer and supplier responses in each dyad). First, for individual samples, we determined power and relationship quality advantage by calculating the differences in perceptions of power and relationship quality between the buyer and supplier in each dyad (Gulati & Sytch, 2007). For example, for buyer power advantage, we subtracted supplier value from buyer value and recorded the difference if buyer value is greater than supplier value and zero if supplier value is greater. We repeated this process to compute supplier advantage (i.e., subtracted buyer value from supplier value for each dyad). We coded the computed variables as non-mediated power asymmetry, mediated power asymmetry, and reward power asymmetry.

Second, for the dyadic sample, we computed the absolute difference between buyer's and supplier's perceptions of power in each dyad (Van der Vegt et al., 2010). That is, we calculated the difference between buyer and supplier perceptions of power and recorded the absolute value disregarding direction of difference. We coded the computed variables similar to individual samples: non-mediated power asymmetry, mediated power asymmetry, and reward power asymmetry. Overall, the amount of asymmetry ranged from 0 to 3.17, 3.84, and 5.00, for non-mediated power, mediated power, reward power, and relationship quality, respectively. Higher scores indicate more power.

To mitigate potential common method bias problems, we designed the questionnaire with several subsections so that respondents had to pause and read instructions for each subsection (Podsakoff et al., 2003). We performed Harman's single-factor test (Podsakoff & Organ, 1986) and the unmeasured latent single-method approach (Podsakoff et al., 2003) to test for common method variance. We loaded all variables to a principle component factor analysis. The factor analysis showed that the first factor accounted for 14.5% and 14.6% of total variance in buyer and supplier samples, respectively (with Varimax rotation), suggesting that common method bias is not a major concern. We also performed a confirmatory factor analysis while allowing first-order factors to load on an unmeasured latent common methods variance factor (Podsakoff et al., 2003). The introduction of the latent single method factor did not change the model fits and estimates substantially, which further confirms that common method bias was not a major problem in the study.

To test for construct reliability, we computed coefficient alpha, composite reliability, and average variance extracted values for each construct. All values for each construct exceed the recommended benchmarks: Cronbach's alpha values are greater than 0.70 (Nunnally, 1978); composite reliability values are greater than 0.60 (Fornell & Larcker, 1981); and average variance extracted values are greater than 0.50 (Hair et al., 2006). Table 3 shows the means, standard deviations and correlations for both buyer and supplier samples. The measurement items, construct reliability, and factor loadings are shown in Appendix 1. To assess discriminant validity, we compared the average variance extracted for each construct with its shared variance with other constructs (square of correlations between the constructs) (Fornell & Larcker, 1981). The average variance extracted for each construct is greater than the squared inter-correlations between every pair of constructs in both samples. Thus, discriminant validity is established.

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TABLE 3
Buyer and Supplier Samples Correlations, Means, and Standard Deviations

			Supplier Sample										
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
		Mean	5.9	5.4	3.8	4.2	3.6	5.8	5.8	4.8	3.6	4.8	5.9
Buyer Sample	*Mean*	*Std Dev*	0.82	1.00	1.38	1.44	1.17	0.92	1.05	1.12	1.34	1.10	0.92
1. Expert Power	5.7	0.93		.61**	-.28**	-.04	.14	.36**	.40**	.27**	.39**	.43**	.33**
2. Referent Power	3.9	0.90	.35**		-.21*	.15	.25**	.41**	.38**	.11	.44**	.42**	.34**
3. Coercive power	2.6	1.06	-.31**	-.16		.31**	.24**	-.30**	-.36**	-.17	-.30**	-.34**	-.18*
4. Legal Power	3.3	1.12	-.26**	-.04	.48**		.38**	.12	-.15	-.04	.04	-.03	.01
5. Reward Power	3.2	1.03	-.07	.24**	.49**	.44**		-.08	-.01	.06	.24**	.23*	.01
6. Communication	5.2	1.08	.34**	.17	-.33**	.02	-.28**		.30**	.16	.22*	.33**	.55**
7. Trust	5.7	0.91	.52**	.34**	-.33**	-.19*	-.03	.35**		.22*	.17	.45**	.28**
8. Uncertainty	5.2	0.96	.38**	.14	-.49**	-.21**	-.40**	.37**	.31**		.12	.36**	.23*
9. Adaptation	5.1	1.23	.36**	.45**	-.34**	-.11	.03	.20*	.49**	.25**		.38**	.13
10. Collaboration	4.7	1.06	.46**	.46**	-.33**	-.15	-.02	.31**	.46**	.24**	.42**		.32**
11. Performance	5.4	1.04	.50**	.35**	-.45**	-.28**	-.11	.34**	.55**	.43**	.48**	.42**	

* p<.05   ** p<.01

Analysis and Discussion

We performed a mean difference test to determine perceptual differences across samples (i.e., determine if and which factors are statistically different between buyer and supplier samples) and hierarchical regression analysis to test hypothesized relationships (Hair et al., 2006). The paired T-test results (Table 4) show that supplier sample means are generally higher than buyer sample means for most constructs except adaptive behavior. A significance level of 0.003 was chosen for individual T-test so that the cumulative significance level across 14 tests would not exceed 0.05. The higher values for supplier sample power constructs indicate that generally, suppliers perceive the buyer to have greater power in all dimensions (excluding expert power for which the difference is not significant). This is because in the survey, respondents reported perceptions of their partner's power, not their own power. Trust, uncertainty, expert power and collaborative behavior are not significantly different across the samples, which implies that both buyers and suppliers view collaboration as mutual. The mean for performance is higher in the supplier sample, which suggests that suppliers perceive that they achieve greater operational performance.

TABLE 4

T-test Results

Construct	Buyer mean	Supplier mean	Mean difference	*p*-value
Expert power	5.7	5.9	-0.19	.046
Referent power	3.9	5.4	-1.49	.000
Legal power	3.3	4.2	-0.83	.000
Coercive power	2.6	3.8	-1.26	.000
Reward power	3.2	3.6	-0.45	.002
Communication	5.2	5.8	-0.56	.000
Trust	5.7	5.8	-0.04	.719
Uncertainty	5.2	4.8	0.34	.014
Adaptive behavior	5.1	3.6	1.46	.000
Collaborative behavior	4.7	4.8	-0.08	.516
Operational performance	5.4	5.9	-0.46	.000
Non-mediated power	*5.4*	*5.67*	*-0.84*	*.000*
Mediated power	*4.8*	*4.00*	*-1.04*	*.000*
Relationship quality	*3.0*	*5.74*	*-0.31*	*.000*

* Second-order factors are italicized.

To test the conceptual model, we performed hierarchical regression analysis. We averaged the item response values for each construct. We mean centered (Z-score) construct values to mitigate any possible effects of multicollinearity (Aiken & West, 1991). We controlled for channel position (i.e., is firm a buyer or a supplier), age of relationship, non-mediated power asymmetry, mediated power asymmetry, and reward power asymmetry. We checked the variance inflation factor (VIF) to test for potential collinearity problems (Hair et al., 2006) and determined that it was not a concern. We examined evidence of mediation effect (Baron & Kenny, 1986; Gelfand, Mensinger & Tenhave, 2009; Sobel, 1982; Zhao, Lynch & Chen 2010). We specified the following regression models:

1. *Adaptive behavior* $= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon_1.$
2. *Collaborative behavior* $= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon_1.$
3. *Operational performance* $= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon_1.$

    Where:

    X_1 = Age of relationship
    X_2 = Channel position
    X_3 = Non-mediated power asymmetry
    X_4 = Mediated power asymmetry
    X_5 = Reward power asymmetry
    X_6 = Non-mediated power

X_7 = Mediated power
X_8 = Reward power
X_9 = Relationship quality
X_{10} = Adaptive behavior
X_{11} = Cooperative behavior

The regression results are shown in Table 5. The R^2 values indicate that the above models (shown as M3, M7, and M12 in Table 5) explain 47%, 39%, and 39% of variance, respectively. The results show that both collaborative behavior and adaptive behavior do not significantly affect operational performance in the presence of power and relationship quality factors.. Therefore, H1 and H2a are not supported.

TABLE 5

Regression Results – Combined Buyer and Supplier Dataset

	Adaptation			Collaboration				Performance				
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Power Factors												
Non-mediated power	.104†	-.020	.309**	.448**	.272**	.269**	.295**	.513**	.321**	.321**	.308**	.262**
Mediated power	-.504**	-.469**	-.180*	-.318**	-.246**	-.179**	-.176*	-.126*	-.047	-.051	-.042	-.143
Reward power	.245**	.272**	.173*	.171**	.225**	.187**	.216**	.061	-.001	.001	.008	.031
Relational Factors												
Relationship quality		.161*	.107†		.338**	.315**	.321**		.369**	.370**	.355**	.359**
Mediating Factors												
Adaptive Behavior						.143*	.150*			-.009	-.016	.074
Collaborative Behavior											.049	.040
Control Variable												
Channel position			-.644**				.035					.200*
Age of relationship			.125*				.016					.000
N-Mediated P. asymmetry			.040				-.068					-.125†
Mediated P. asymmetry			.003				.002					.111
Reward P. asymmetry			.011				-.044					-.043
F value	21.0**	17.4**	22.5**	33.1**	35.1**	29.9**	14.9**	28.8**	33.2**	26.4**	22.1**	13.2**
R^2	.209	.227	.466	.294	.372	.388	.391	.266	.359	.359	.360	.387
Adj. R^2	.200	.214	.445	.285	.361	.375	.365	.257	.348	.345	.344	.358
ΔR		.018*	.238**		.078**	.016*	.004		.092**	.000	.002	.027†

We were surprised that adaptive behavior did not show a significant effect on performance. It is likely that firms view adaptation as only benefiting their partners and they do

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not associate it with improved operational performance.   We performed an additional investigation to determine whether the level of adaptation (low vs. high) may show variation in effect on operational performance. We created and used a dummy variable with low adaptation as the reference (i.e., low level = 0, high level =1). Results of this analysis showed that when level of adaptation is high, operational performance improves by 17% over low adaptation. Overall, the results suggest that while collaborative and adaptive behaviors affect performance, it is relationship quality and the partner's expertise and reputation that most significantly influence operational performance. These results underscore the important role that perceptions of the relationship, and indeed, the quality of the relationship plays in high value supplier exchanges.

Collaborative behavior is significantly affected by adaptive behavior, power source, and relationship quality. Their effect does not seem to be affected by age of relationship or channel position. That adaptive behavior has a significant effect ($b = 0.150$) is not surprising since by making relationship specific adaptations, firms signal to their partners that they are in the relationship for the long-term and are therefore willing to collaborate in joint activities. Thus, H2b is supported. Non-mediated, mediated, and reward power sources significantly affect collaborative behavior ($b = 0.448$; $b = -0.318$, and $b = 0.171$, respectively). Therefore, H3a, H4a and H5a are supported. Overall, the results underscore the importance of perceptions of power use in influencing supply chain partners' willingness to collaborate.

Relationship quality significantly and positively affects collaborative behavior ($b = 0.321$). Therefore, H6a is supported. This underscores findings in past studies that the quality of the relationship does indeed enhance firms' willingness to engage in collaborative activities with their supply chain partners. Communication enables partners to share their expectations, clarify information, and iron out any misunderstandings more amicably. It also minimizes decision making uncertainty brought about by lack of knowledge regarding a partner's action or performance. This reduces delays in transactions often caused by a lack of or poor information. Moreover, trust alleviates concerns that supply chain partners may have with regard to potential loss of proprietary information (Grovier & Saeed, 2007) and vulnerability to opportunism.

Adaptive behavior is affected by power sources. Mediated and reward power sources have strong effect ($b = -0.504$ and $b = 0.245$, respectively) on partners' willingness to adapt processes, products or services in a supply chain exchange. Non-mediated power effect is weak, though it increases substantially (to $b = 0.309$) when relationship quality is introduced in the model. Relationship quality positively effects adaptive behavior ($b = 0.161$). Therefore, H3b, H4b, H5b and H6b are supported. It appears that for firms to engage in potentially risky adaptations, there has to be incentive of some form. The incentive may be in the form of a firm's expertise and reputation that a partner seeks to leverage or specific rewards. However, the effect is weaker when control variables are introduced in the model.

Specifically, the strong negative effect of channel position on adaptive behavior suggests that the effect of power sources and relationship quality is much lower ($b = -0.644$) for suppliers compared to buyers. That is, suppliers do not believe that the buyer makes substantial process or service adaptations to accommodate supplier requests or needs. Since the survey response refers to perceptions of partners' adaptive behavior, the results suggest that suppliers engage in adaptive behavior much more than the buyers. On the other hand, suppliers perceive their performance as better (b = 200) compared to buyers. This implies that there is significant disparity between buyers and suppliers with regard to perceptions of each party's willingness to

make adjustments requested by the partner as well as on operational performance. The age of relationship is also significant ($b = 0.125$), suggesting that the longer the relationship between the buyer and supplier, the greater the effect of power sources and relationship quality on adaptive behavior. Non-mediated power asymmetry has weak negative effect on operational performance ($b = -0.125$), which suggests that firms with greater expertise and referent power over their partners might view their operational performance as less than expected given their power advantage.

We further examined the relationships at the dyad level. We performed the hierarchical regression using the dyadic data sample (results are shown in Table 6). We computed average values for each buyer-supplier dyad across the constructs to create the dyadic sample. These results yielded several interesting findings. In particular, unlike in the combined sample results (Table 5), in the dyad level analysis, (1) adaptive behavior positively and significantly affects performance, (2) adaptive behavior has no significant effect on collaborative behavior, and (3) non-mediated power has a weak effect on collaborative and adaptive behaviors.

It appears that operational performance in high value relationships is enhanced when both parties make adaptations. That is, if both partners make necessary process or service adaptation, it improves their ability to coordinate and increases operational efficiency. Moreover, such mutual adaptation has the effect of enhancing collaborative behavior, which may reduce uncertainty and risk of opportunism as both parties have a greater stake in the exchange. Surprisingly, the effect of non-mediated power on collaborative and adaptive behavior is weak when relationship quality is introduced in the model (M2 and M6). It is likely that non-mediated power advantage is undermined when the quality of the relationship is high since with non-mediated power, partners choose to be influenced. In this case, non-mediated power influence is suppressed as firms feel more comfortable or confident about their partners in the exchange.

TABLE 6

Regression Results – Dyadic Dataset

	Adaptation			Collaboration				Performance				
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Power Factors												
Non-mediated power	.420**	.286**	.200†	.448**	.224*	.200†	.201†	.479**	.186†	.148	.143	.141
Mediated power	-.209*	-.179*	-.168†	-.249**	-.219*	-.197*	-.192*	-.151†	-.111	-.078	-.073	-.106
Reward power	.175*	.217*	.212*	.169*	.213*	.187*	.183*	-.076	-.019	-.059	-.063	-.037
Relational Factors												
Relationship quality		.333**	.322**		.348**	.306**	.309**		.453**	.392**	.385**	.380**
Mediating Factors												
Adaptive Behavior						.118	.124			.184*	.180*	.202*
Collaborative Behavior											.023	.020
Control Variable												
Age of relationship			.142†				-.004					-.070
N-Mediated P. asymmetry			.041				-.031					-.076
Mediated P. asymmetry			.020				-.024					.120
Reward P. asymmetry			.039				-.013					-.102
F value	15.6**	15.2**	8.3**	19.9**	19.4**	16.0**	8.6**	17.2**	20.5**	17.8**	14.7**	9.4**
R^2	.286	.345	.369	.338	.401	.410	.412	.306	.414	.436	.437	.461
Adj. R^2	.268	.322	.324	.321	.380	.384	.364	.288	.394	.412	.407	.412
ΔR		.058**	.025		.063**	.009	.002		.108**	.022*	.023	0.024

Managerial and Theoretical Implications

This study has several managerial implications for high value relationships. First, both buyers and suppliers need to be aware of their power positions and choices. Buyers and suppliers respond positively to non-mediated power use and to rewards and incentives, but negatively to mediated power use. Thus, effective relationship management calls for managers in both buyer and supplier firms to be aware of their power position and to use the appropriate type of influence based on the relationship power structure. The effect is greater for buyers than suppliers, suggesting that buyers are less likely to make adaptations to accommodate specific needs of their suppliers unless prevailed upon based on suppliers' power advantage. These results suggest that supply chain partners make processes/product adaptations only if or when they have to. But by adapting, firms significantly enhance their supply chain partners' collaborative behavior and improve operational performance. Indeed, as dyad level analysis suggests, making mutual adaptation can greatly enhance both parties' collaborative behavior and operational performance.

In past studies where there are less dominant buyers (Anderson & Weitz, 1992) or large or more powerful buyers (Lai et al., 2009), the expertise and reputation of the buyer does not affect the suppliers as they do not have to trust the buyer. This study shows that expertise and reputation have considerable impact on both buyers' and suppliers' willingness to adapt and collaborate. Both buyers and suppliers need to believe that the other party is knowledgeable, reputable, and capable of providing the desired goods and/or services (Palmatier, Dant, & Grewal, 2007). The positive effect of non-mediated power asymmetry on adaptive behavior suggests that leveraging a firm's expertise and reputation may enhance its partner's willingness to make process or product adaptations.

While past studies suggest that mediated power use has different effects among buyers and suppliers, and varies in different contexts (Zhao et al., 2008; Yeung et al., 2009), this study shows that exercise of coercive and legal power has a strong negative effect on buyers' and suppliers' collaborative behavior in high value relationships. Typically, if one party perceives the other party as coercive, it is likely to retaliate by refusing to make specific adaptations or to collaborate in joint activities. Such actions signal that coercion will not be tolerated. Managers need to avoid using coercive tactics in supply chain exchanges as such actions may be counter-productive. As observed in past studies (Gulati & Sytch, 2007; Johnson et al., 2003), use of coercion in a supply chain exchange diminishes the value generating potential of the relationship even though the powerful party may gain initially.

Similar to Zhou et al. (2008), we found that reward power has a positive effect in supply chain relationships. Specifically, use of rewards and incentives may be a tangible signal from the partner that they are in the relationship for the long-term and ultimately that the partner values the relationship (Narasimhan et al., 2009). Rewards may signal the power advantaged firm's willingness to share relationship gains, which subsequently incentivizes partners to reciprocate the positive action (reward) as stipulated by SET. Results suggest that firms with considerable dominance and brand equity cannot rely solely on their expertise and/or reputation to induce high value suppliers to make relationship specific adaptations or to collaborate in joint activities. Instead, they need to provide formal incentives such as supplier awards, bonuses, or performance incentive schemes. Such incentives enhance reciprocity and collaboration because the recipient of the reward is likely to accommodate partner requirements in order to continue receiving rewards (Kaufmann & Carter, 2006). Such incentives make partners feel that they have a say in the relationship, that they can see "what is in it" for them. Moreover, the resulting positive view of the relationship may serve as deterrence against opportunism.

Second, relationship quality was shown to significantly affect adaptive behavior, collaborative behavior and operational performance. Indeed, it has the strongest effect of all the factors examined. Good relationships reduce conflict and misunderstandings among supply chain partners as well as create a conducive environment for transactional effectiveness. Managers need to put in place mechanisms to develop and sustain high quality relationships with their top suppliers as it is one of the most important components in buyer-supplier exchanges. Firms in high quality relationships where effective communication and trust are entrenched will also tend to make necessary adaptations to enhance the exchange. They will be willing to invest more in collaborating on joint activities with their partners. It is important that managers strive to develop congruence in perceptions of and/or expectations in the relationship as greater discrepancies in relationship quality (asymmetry) negatively affect adaptive behavior.

Third, collaborative and adaptive behaviors are important aspects of a supply chain exchange. Collaboration significantly affects operational performance. It is also instructive that such collaboration and adaptation may have other indirect effects in the relationship. For example, through collaboration and adaptation, partners signal their commitment to the relationship and desire to invest in the relationship for the long-term. While this may not directly affect performance, it is likely to create an environment in which partners are willing to consult, communicate, etc., so as to make their exchange cost effective and meaningful. In addition, firms may feel indebted when their partners display collaborative and adaptive behavior. As such, they may reciprocate with additional business or emphasize a win-win approach in the exchange.

Finally, this study underscores the argument that power is an antecedent to collaboration and relationship-specific adaptations (Ganesan, 1994; Kumar, Scheer & Steenkamp, 1995; Maloni & Benton, 2000; Jonsson & Zineldin, 2003; Benton & Maloni, 2005; Palmatier, Dant, & Grewal, 2007). However, unlike other studies that conclude power use is more important than the structure of power relations (Frazier & Summers, 1986; Crook & Combs, 2007), results in this study suggests that both are important. Power use affects partner behavior and operational performance, but the nature of the relationship dictates which power uses are most appropriate. Managers need to be able to anticipate changes in the nature of the relationship and associated shifts in power balance in the exchange in order to align their firms accordingly.

This study also makes important theoretical contributions. First, the study corroborates the argument that formal incentive systems complement relational exchange mechanisms (Poppo & Zenger, 2002; Kaufmann & Carter, 2006). That reward power affects collaborative and adaptive behavior demonstrates the central role that relational norms play in supply chain exchanges. As stipulated in SET, incentives enhance reciprocity. Partners may reciprocate by acting in ways that generate greater value in the exchange. Indeed, by reducing conflict, improving performance, and promoting cooperation as a way to continue receiving rewards, incentives may have additional effects in supply chain exchanges beyond an individual partner. There is need for further research that explores reward power in the context of gain sharing or win-win relationship arrangements that are increasingly being considered in many high value relationships.

Secondly, this study challenges the argument that relational governance and formal governance mechanisms are substitutes (Larson, 1992; Dyer & Singh, 1998). As demonstrated by the effects of power asymmetry, relationship quality, and adaptive behavior, both relational and transactional factors can play an important role in supply chain exchanges. This study underscores the complementary roles of SET and TCE as argued by Lambe, Wittmann and Spekman (2001). As many firms engage in supply chain exchanges, the role of relational factors will continue to grow even as such relationships require increased transactional governance. For example, in many supply chain relationships, it is not possible to rely on relational norms with every partner. Some transactions are short-term and do not merit substantial investments in time and resources as required to build good relationships. Moreover, in highly fragmented industries such as the U.S. health care sector, the presence of many actors with varying power advantages, and transactional embeddedness suggests that firms may have to simultaneously employ formal governance and relational governance.

Finally, it appears that relationship quality reduces the effect of power asymmetry in supply chain exchanges. That is, having quality relationships lowers the level of uncertainty and vulnerability associated with being in a position of weakness. As such, relationship quality could be a counterforce to power imbalance. It is likely that relational embeddedness reduces the powerful party's need to leverage its power advantage. This is especially important because power imbalance is inevitable in supply chain relationships. However, power asymmetry may balance out since partners will often possess complementary power advantages. For example, a firm with expertise power may not have reward power. When its partner that has reward power uses it to gain advantage, the firm may counter with expertise power such that the net is neutral power.

Limitations and Suggestions for Future Research

This study has focused on the relationship between a large multinational organization and its top suppliers by spend. Hence the findings should be seen as reflective of high value relationships. One strand of future research would be to extend the sample to include a wider buyer and supplier portfolio. In particular, a better understanding of the impact of relationship quality and actions on the performance of less critical relationships would be valuable.

The research highlighted the importance of power use in buyer-supplier relationships. Although we examine the exercise of power in a dyadic setting, our survey does not capture changing power perceptions with age of relationship. Given that previous research has suggested power use and power perceptions change over time, a longitudinal study could be useful in examining important changes in relationship structure and power balance, and how these affect adaptation, collaboration and performance.

Another limitation is that we focused on relationships in one industry and involving a single brand name buyer and its top suppliers. Although the buyer has many strategic business units, which also have their own buying cultures and relationships, there is a limitation to the extent to which the results can be generalized. Future research could examine the exercise of power across multiple industries. For example, in the retail sector, one retailer may control an extensive network of retail outlets and represent a substantial revenue source for suppliers (manufacturers). Power imbalances in such a situation may exhibit different characteristics from power imbalances between manufacturers and suppliers given that the seller (manufacturer) stands to gain more by adapting processes and systems to facilitate efficient order fulfillment, forecasting, and customer relationship with a large retailer. Moreover, the retailer may not be as dependent upon the manufacturer. As such, the model used in this research may vary based on the industry, importance of the supplier and supply chain position of the buyers and suppliers.

Fourth, power asymmetry may be manifested at different levels (i.e., low or high) but this study does not assess such variations. Moreover, the way such asymmetry was tested (using perceptual measures) may be inadequate. Future research could develop more in depth assessment of power asymmetry measures and examine how perceptions of power use and their implications differ at different levels of asymmetry. Finally, future research could examine the moderating effect of the level of interdependence between supply chain partners not only on power use but also on partner's willingness to adapt and/or collaborate.

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Factor Loadings and Construct Reliability for Buyer and Supplier Samples

Survey Item (Cronbach's α – Buyer, Supplier)	Buyer	Supplier
Expert Power (α = 0.780; 0.815) (Maloni and Benton 2000)		
1. This buyer/supplier is an expert in the industry.	0.763	0.839
2. We respect the judgment of buyer's/supplier's representatives.	0.887	0.866
3. This buyer/supplier has business expertise that makes them likely to suggest the proper thing to do.	0.850	0.858
Referent Power (α = 0.797; 0.778) (Maloni and Benton 2000)		
1. We really admire the way this buyer/supplier runs its business so we try to follow its lead.	0.841	0.812
2. We often do what this buyer/supplier asks because we are proud to be affiliated with them.	0.869	0.819
3. We talk up this buyer/supplier to our colleagues as a great business with which to be associated.	0.834	0.864
Legal Power (α = 0.862; 0.925) (Maloni and Benton 2000)		
1. This buyer/supplier often refers to a portion of an agreement to gain our compliance on a particular request.	0.865	0.898
2. This buyer/supplier makes a point to refer to any legal agreement when attempting to influence us.	0.904	0.945
3. This buyer/supplier uses sections of our sales agreement as a "tool" to get us to agree to their demands.	0.890	0.954
Coercive Power (α = 0.898; 0.810) (Maloni and Benton 2000)		
1. If we do not do as asked, we will not receive very good treatment from this buyer/supplier.	0.871	0.932
2. If we do not agree to their suggestions, this buyer/supplier could make things difficult for us.	0.882	0.906
3. This buyer/supplier makes it clear that failing to comply with its requests will result in penalties.	0.800	0.896
Reward Power (α = 0.809; 0.732) (Maloni and Benton 2000)		
1. This buyer/supplier offers incentives when we are initially reluctant to cooperate with a new program.	0.874	0.752
2. We feel that by going along with this buyer/supplier, we will be favored on other occasions.	0.814	0.780
3. This buyer/supplier offers rewards so that we will go along with their wishes.	0.866	0.888
Communication quality (α = 0.928; 0.940) (Mohr and Spekman 1994)		
Our communication with this buyer/supplier is always….		
1. …timely	0.832	0.882
2. …accurate	0.915	0.937
3. …complete	0.906	0.925
4. …adequate	0.868	0.889
5. …credible	0.882	0.870
Trust (α = 0.878; 0.913) (Ganesan 1994)		
1. This buyer's/supplier's representative has been frank in dealing with us.	0.829	0.915
2. Promises made by this buyer's/supplier's representative are reliable.	0.903	0.907
3. This buyer's/supplier's representative is knowledgeable regarding firm's products/services.	0.861	0.888

4. This buyer's/supplier's representative does not make false claims.	0.837	0.856

Uncertainty (α = 0.874; 0.862) (Gao, Sirgy and Bird 2005)

1. It was very hard to evaluate the future performance of buyer's/suppliers' team.	0.881	0.890
2. It was very hard for us to make accurate judgments about the outcomes of transacting with buyer/supplier.	0.935	0.910
3. At the time of the decision, we felt that this purchase decision was hampered by a lot of uncertainty.	0.868	0.856

Adaptive Behavior (α = 0.889; 0.910) (Jonsson and Zineldin 2003)
This buyer/supplier is willing to….

1. …customize requirements/specifications for us.	0.797	0.849
2. …adjust production processes to meet our needs.	0.911	0.895
3. …change inventory procedures for us.	0.855	0.903
4. …adjust distribution/delivery procedures to suit us.	0.901	0.914

Collaborative Behavior (α = 0.824; 0.784) (Ellinger, Daugherty and Keller 2000)

1. This buyer/supplier seeks our advice and counsel.	0.859	0.854
2. We participate in goal setting and forecasting with this buyer/supplier.	0.869	0.823
3. Our suggestions are encouraged by this buyer/supplier.	0.856	0.861

Operational Performance (α = 0.881; 0.845) (Jonsson and Zineldin 2003)

1. We meet order accuracy expectations	0.927	0.904
2. We meet order condition expectations	0.914	0.890
3. We meet on-time delivery standards	0.862	0.836