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ABSTRACT

Using data from retail pharmacies, we study the mediating role of trust in the fairness-loyalty relationship under different types of interdependence structure between buyers (wholesalers) and suppliers (retailers). It is only under symmetric conditions that fairness leads to trust, which in turn leads to loyalty, thus establishing a complete mediation effect of trust under such conditions. Under conditions of both perceived independence (i.e., lack of interdependence) and asymmetric buyer dependence, however, trust does not mediate but fairness directly influences loyalty. The implications for research and practice are discussed in the paper.

Key words: Fairness, Loyalty, Trust, Interdependence, Supply chain management, Channels, Pharmaceutical industry

In the supply chain management and marketing channels literatures, fairness, trust, interdependence, and loyalty have been identified as key constructs to build, manage, and maintain supplier-buyer relationships (cf., Kumar et al. 1995a, 1995b; Kumar 1996; Geyskens et al. 1996, 1998; Brown et al. 2006; Brown et al. 2000; Ryu et al. 2007). Despite the theoretically and empirically well-established importance of these constructs, however, researchers have not incorporated all these constructs in a single study. For example, as shown in Appendix A, a few researchers studied the following relationships between these constructs in the inter-organizational context: (a) fairness and trust (Kumar et al. 1995a)¹; (b) trust and loyalty (Schurr and Ozanne 1985); and (c) interdependence and trust (Kumar et al. 1995b, Izquierdo and Cilian 2004). The extant literature suggests that trust generates outcomes similar to loyalty such as, perceived continuity of relationship (Anderson and Weitz 1989), propensity to not leave a relationship (Morgan and Hunt 1994), long-term orientation (Ganesan 1994), commitment (Morgan and Hunt 1994, Andaleeb 1996, Geyskens, Steenkamp, Scheer and Kumar 1996, 1999), anticipated future interactions (Doney and Cannon 1997), sharing internal strategic information (Frazier et. al. 2009), buyer satisfaction (Johnston et al. 2004), and relational behaviors (Yilmaz, Sezen and Ozdemir 2005). Further, there is evidence, as stated earlier, that fairness creates trust. So a key research question is does trust, being a central concept in the channels literature, mediate the relationship between fairness and loyalty under different conditions of interdependence structure?

An interesting finding from Kumar, Scheer and Steenkamp (1995b, p. 353) in the context of automobile dealers and manufacturers relationship was that “high, symmetric interdependence

¹ Kumar et al. (1995) created an inclusive relationship quality measure as a dependent variable. Relationship quality was measured as a complex second-order construct with several dimensions: affective conflict, manifest conflict, trust in partner's honesty, trust in partner's benevolence, commitment, expectation to continuity, and willingness to invest.

is no guarantee that trusting relationship will develop,” and “trust and commitment do not naturally flourish in asymmetric relationships; if they have to develop, they must be carefully cultivated.” They further suggest that in asymmetric relationships trust can be cultivated using mechanisms such as fairness. Thus, fairness has a role in creating trust under asymmetric conditions, but the findings from Kumar et al. (1995a) suggest that trust is not guaranteed under symmetric or asymmetric conditions. What is the role of fairness in creating loyalty when trust is moderated by interdependence structure? Does fairness operate through trust or does it have direct effects under different conditions of interdependence? We set to explore these intriguing research questions in this study.

The purpose of this study is three-fold. First, literature suggests that successful supplier-buyer relationships are determined by the nature of interdependence in the relationship (Heide 1994), which is indispensable for achieving long-term fruitful strategic partnerships (Mentzer, Min and Zacharia 2000). We seek to understand how the mediating role of trust in the fairness-loyalty relationship is influenced by the moderating role of interdependence between suppliers and buyers.

Second, the relationship between trust and loyalty has been relatively underexplored. Firms are increasingly placing greater strategic importance on customer retention and loyalty management. While marketing to new customers influences continued growth, several benefits also emerge from creating loyalty. First, it is less expensive to retain existing customers than it is to attract new customers. Second, repeat customers may be less price sensitive, providing the potential for greater profit margins and decreasing the risk of defections due to competitive price undercutting. Finally, repeat customers are more likely to purchase a greater volume and variety of products. Many studies have explored the relationship between trust and commitment

(Morgan and Hunt 1994, Ganesan 1994, Geyskens et. al. 1996), but very few studies have examined the relationship between trust and loyalty in the buyer-supplier context (Schurr and Ozanne 1985).

Finally, most of the studies in this research stream have been conducted in a single context, such as automobile dealers–manufacturer relationship (See Appendix A). In fact, some of the findings might be specific to the context as automotive dealers are highly dependent on the manufacturer and customarily find it very difficult to switch to another supplier. This raises the question whether those findings are relevant only in the context of powerful suppliers and vulnerable buyers or also in other channel contexts. Several authors have criticized the empirical research in channels for being fragmented and involving single-context studies (cf. Malhotra, Peterson and Kleiser 1999; Reid and Plank 2000). Our goal is to address this issue by testing the concept of fairness in a multiple-context setting, the pharmaceutical wholesaler-pharmacy retailer channel, where the buyers can source from multiple suppliers. In such a setting, different types of interdependence may exist between suppliers and buyers, leading to multiple contexts of interdependence—symmetric, asymmetric, and no perceived interdependence.

We study the aforesaid relationships in the pharmaceutical supply chain, involving pharmacies and wholesalers which assure an uninterrupted flow of drugs to patients at optimal price, with minimal delays, few shortages, and with little room for error. Wholesalers play a critical role in this supply chain as over 80 percent of the prescription drugs flow through the wholesalers (HDMA 2009). The wholesaling business has, however, been facing competitive pressure owing to some recent trends in the industry, such as mail-order business, third party logistics, and consolidation. As a result, the pharmaceutical wholesalers place increased importance on the pharmacy customer retention and loyalty, and hence this study.

We begin by defining the key concepts and developing our hypotheses. A discussion of research methodology is followed by a test of our hypotheses. Finally, we conclude with a discussion of our findings and implications for practice and future research.

THEORY AND HYPOTHESES

Relationship management is considered ‘the most fragile and tenuous’ component of a supply chain management strategy, which may be due to the high importance placed on trusting relationships within a supply chain (Handfield and Nichols 1999). As each party in the chain needs to have mutual confidence in the actions and capabilities of the other members, developing trust is an important factor in buyer-supplier relationships (Johnston et al. 2004). The moderated-mediation model of trust shown in Figure 1 is composed of four constructs described below.

Place Figure 1 about here

Fairness

Research on organizational and social justice has identified two distinct categories of fairness: distributive fairness, the fairness of outcomes received, and procedural fairness, the fairness of process (Tyler and Lind 1992). *Distributive fairness* refers to the buyer's perception of the fairness of earnings and other outcomes that it receives from its relationship with the supplier. Kumar et al. (1995a) defined distributive fairness as a firm's comparison of its actual outcomes to those outcomes the firm deems it deserves. *Procedural fairness* refers to the buyer's perception of the fairness of the supplier's procedures and processes in relation to its buyers (Kumar et al. 1995a). Value can be gained from assessing both distributive and procedural

fairness, because they are conceptually distinct, created through different practices, and affected by different parties.

Trust

Interorganizational trust operates as a governance mechanism (Bradach and Eccles 1989, Heide 1994) that mitigates opportunism in exchange contexts characterized by uncertainty and dependence (Pfeffer and Salancik 1978). For this study, the definition of trust has two distinct dimensions: (1) *credibility*, which is based on the extent to which the buyer believes that the supplier has the required expertise to perform the job effectively and reliably, the cognitive dimension of trust and (2) *benevolence*, which is based on the extent to which the buyer believes that the supplier has intentions and motivation beneficial to the buyer when new conditions arise for which a commitment is not made (Ganesan 1994, Ganesan and Hess 1997), the emotional dimension.

Loyalty

Several different conceptualizations of the loyalty construct containing varying levels of complexity have been proposed (Oliver 1999; Dick and Basu 1994; Jacoby and Chestnut 1978). Oliver's (1999) comprehensive framework suggested that loyalty, in a relational context, goes through four distinct phases: cognitive loyalty, affective loyalty, conative loyalty, and action loyalty. Cognitive loyalty is the phase in which the buyer indicates a preference for one supplier over its alternatives based on belief in the supplier. Affective loyalty is the phase during which a buyer develops a liking toward the supplier based on cumulative satisfying usage occasions. The conative loyalty is defined as repeat episodes of intent to rebuy from the supplier and is similar to motivation. Action loyalty is when motivated intention in the conative loyalty phase is transformed into readiness to act to overcome obstacles that could reduce loyalty to the existing

supplier, such as switching incentives provided by alternative suppliers, buyer's variety-seeking behavior, multi-supplier loyalty, etc.

A buyer's loyalty with its supplier can move from one type of loyalty to the other in a seamless way. Action loyalty, which is the extreme case in the loyalty spectrum, might be very difficult to achieve under conditions where the buyer has the ability and opportunity to work with multiple suppliers. In addition, it is impossible to identify conditions under which "insurmountable unavailability" makes a channel member switch to other suppliers. Given the problems with the operationalization of the "action loyalty" construct, we focus on conative loyalty, the third phase in the loyalty framework proposed by Oliver (1999).

Interdependence

Dependence is arguably the most important construct in understanding distribution channel relationships, because channel members, to a varying degree, are dependent on one another (Stern et al. 2001). The concept of dependence has been elevated to the dyadic level of interdependence with recognition that a firm's dependence on another is relative to the other firm's dependence on it (Buchanan 1992; Kumar et al. 1995b). In an exchange relationship, interdependence describes the sociopolitical structure (Cook and Emerson 1978, Lawler 1992, Stern and Reve 1980, Gundlach and Cadotte 1994) and can be classified into four groups: (1) no perceived interdependence between the parties, spot markets, (2) the buyer is more dependent on the supplier, (3) the supplier is more dependent on the buyer, and (4) both parties are equally dependent on each other. Groups 2 and 3 create asymmetric interdependence, and group 4 represents symmetric interdependence. In this study, the focus is on the symmetry (asymmetry) of dependence and not on the magnitude of interdependence.

Fairness-Trust-Loyalty Relationship and Interdependence

In the consumer research, fairness (distributive and procedural) positively influences long-term customer loyalty (Seiders and Berry 1998, Blodgett, Hill and Tax 1997), indicating a direct effect of fairness on loyalty. In the inter-organizational research, Kumar et al. (1995a) found that fairness influences relationship quality, including commitment and expectations to continue. That is, if a supplier treats his/her buyers fairly, this will in the long run lead to a positive effect on the buyers' loyalty to the supplier (Folger 1986).

In the inter-organizational literature, fairness (distributive and procedural) was also found to increase trust as part of the relationship quality construct (Kumar et al. 1995a). There is literature support establishing the theoretical relationship between trust and loyalty (Schurr and Ozanne 1985), and outcomes similar to loyalty such as perceived continuity of relationship, commitment, long-term orientation, propensity to not leave a relationship and anticipated future intentions (See Appendix A). One study has shown the mediating role of trust between fairness and loyalty (Jambulingam et al. 2009). Kumar et al. (1995b) noted that mutual interdependence between the buyer and the supplier increases trust and commitment, and asymmetric interdependence structure decreases them. Further, under conditions of asymmetric interdependence, trust seems to increase commitment (Geyskens, Steenkamp, Scheer and Kumar 1996). Thus, the levels of trust and commitment seem to be determined by the nature of the interdependence structure. Hence, we contend that the mediating role of trust in the fairness-loyalty relationship is influenced by a situational contingency—the type of interdependence structure between the supplier and the buyer (Figure 1). We first present a global hypothesis and then develop specific hypotheses for different types of interdependence.

H1: The mediating role of trust between fairness and loyalty is influenced by the type of interdependence structure between the supplier and the buyer.

Next, we specifically examine how four different states of interdependence may affect the fairness-trust-loyalty relationship.

Symmetric Interdependence. Symmetric interdependence is a condition where both parties are equally dependent on each other. The balance in the relationship provides a stable long-term relationship with high levels of trust and cooperation (Dwyer et al. 1987; Anderson and Weitz 1989). Kumar et al. (1995b) proposed a “bilateral convergence theory,” which suggests that, in symmetric interdependence, the interests of the channel participants are convergent or they have common goals. Kumar (1996) shows this symmetric dependence produces effective relationships. Symmetric interdependence makes it increasingly undesirable for the suppliers and buyers to engage in opportunistic behavior, negative tactics, or coercion, because they have much to lose (Kumar et al. 1995b). Such lack of opportunistic behavior fosters higher levels of positive effects of procedural and distributive fairness on the trust and commitment in the exchange relationship. In a balanced interdependent relationship, both parties must be fair to each other which underscores the need for procedural and distributive fairness. In the absence of any lingering fear of being exploited, perceived fairness in an exchange relationship promotes benevolence- and credibility-based trust between the two parties, which, in turn, leads to loyalty. Thus, the two dimensions of trust pave the way for the apparent fairness-loyalty relationships under conditions of symmetric interdependence.

H2: Under conditions of symmetric interdependence, both benevolence-based and credibility-based trust will mediate the effect of:

a. Procedural fairness on buyer’s loyalty keeping the level of distributive fairness unchanged.

- b. *Distributive fairness on buyer's loyalty keeping the level of procedural fairness unchanged.*

Asymmetric Interdependence. Asymmetric interdependence is a condition where one party is more dependent on the other party. Williamson (1985) suggests that asymmetric exchanges resemble hierarchical relations containing centralized decision structures and unilateral governance. Under these conditions, being the vulnerable party is traditionally considered a liability. For example, if the buyer is more dependent on the supplier (asymmetric buyer dependence) because the supplier controls resources important to the buyer, the supplier can bargain aggressively, influencing the buyer's strategic decisions (El-Ansary and Stern 1972; Pfeffer and Salancik 1978). The supplier under this condition has been assumed to use its influence to achieve internal goals at the buyer's expense; the relationship often has been characterized as involving a high degree of dissatisfaction (Gaski 1984; Reve and Stern 1979; Buchanan 1992). A buyer under this condition often must rely on the powerful supplier's sense of fairness and restraint to avoid mistreatment (Anderson and Weitz 1992; Heide and John 1988). Kumar (1996) defines these asymmetric interdependence situations as either "hostages" meaning that they are more dependent on the other party or "drunk with power" if the other party is more dependent on them.

Under such conditions of a lop-sided asymmetric buyer dependence relationship, the weaker party fears opportunistic behavior by the more powerful party or a greater probability of being taken advantage. The resultant fear is so strong and irrational that it dampens the effects of any procedural or distributive fairness in provoking or cultivating trust in the relationship. Kumar et al. (1995b) have shown that increasing interdependence asymmetry decreases the trust in the relationship. Geyskens et al. (1998), conducting a meta-analysis of studies in marketing channel

relationships, have shown that interdependence asymmetry appears to have a small negative effect on trust. Anderson and Weitz (1989) offered evidence that channel relationships, characterized by power asymmetry, generate lower trust than those characterized by symmetry. The buyer, however, might continue to do business with the supplier (i.e., show loyalty) simply because they become more sensitive to fairness when trust is low and s/he perceives procedural and distributive fairness in the supplier's dealings, but there it is less likely that fairness would pave the way for either benevolence- or credibility-based trust in this relationship. Hence, it is hypothesized that distributive and procedural fairness will have direct impact on loyalty and will not be mediated by trust.

H3: Under conditions of asymmetric interdependence, where the buyer is more dependent on the supplier, neither benevolence-based trust nor credibility-based trust will mediate the effect of

- a. Procedural fairness on buyer's loyalty keeping the level of distributive fairness unchanged.*
- b. Distributive fairness on buyer's loyalty keeping the level of procedural fairness unchanged.*

Similarly, when the buyer perceives the supplier to be more dependent on him/her (asymmetric supplier dependence), the buyer can exercise influence to get better delivery terms. As explained above, such a relationship would also be marked by high fear of opportunistic behavior, which, in turn, would deter the development of trust between the two parties. Since the buyer commands more influence in the relationship, s/he might not feel the necessity to develop a trusting relationship with the supplier. Further, since the supplier is more dependent on the buyer, the former would demonstrate procedural fairness and equitable distribution of benefits in order to have continued business from the buyer. In the absence of a trusting relationship, any repeat business would largely be due procedural and/or distributive fairness on part of the

supplier, and hence there is no question of either dimension of trust mediating the fairness-loyalty relationships.

H4: Under conditions of asymmetric interdependence, where the supplier is more dependent on the buyer, neither benevolence-based trust nor credibility-based trust will mediate the effect of

- a. Procedural fairness on buyer's loyalty keeping the level of distributive fairness unchanged.*
- b. Distributive fairness on buyer's loyalty keeping the level of procedural fairness unchanged.*

No Perceived Interdependence. Lack of interdependence, or independence, in an exchange relationship is when both parties perceive that they do not depend on each other. This can happen when the relationship resembles a spot market or when it is relatively new. When the two parties generally do not feel dependent on each other, the relationship might be more competitive than cooperative in nature (Molm et al. 2006). Evidently, given the lack of cooperative behavior, the buyer may perceive a lower probability of supplier engaging in actions that are beneficial to the buyer; that is lack of perceived trust in the relationship.

Trust is most widely recognized as the social norm for managing and coordinating interorganizational exchange (Morgan and Hunt 1994; Jap 2001). Sheppard and Sherman (1998) contend that trust is the acceptance of risks associated with interdependence inherent in each relationship. In the case of no perceived interdependence, the resultant lack of cooperative behavior between the buyer and supplier may hamper any possibility of fairness leading to trust. No matter how fair the procedures (procedural fairness), or how equitable the supplier sharing of the benefits with the buyer (distributive fairness), the non-cooperative behavior between supply chain partners would inhibit a trusting relationship that might have otherwise spawned based on the perceived fairness. It is also possible that due to non-cooperative behavior, arising out of no perceived interdependence, the supply chain partners may not feel that the other party respects

and values their efforts, and is thus likely to treat them inequitably (Kickul et al. 2005). Under such perceived fears of inequity, any amount of fairness is unlikely to lead to trust. The buyer, however, might be willing to continue to transact business with the supplier (i.e., show loyalty) based on perceived procedural and/or distributive fairness in supplier's dealings. Thus, neither dimension of trust would be expected to mediate the fairness-loyalty relationships under conditions of no perceived interdependence. Hence,

H5: Under conditions of no perceived interdependence between the buyer and the supplier, neither benevolence-based nor credibility-based trust will mediate the effect of:

- a. Procedural fairness on buyer's loyalty keeping the level of distributive fairness unchanged.*
- b. Distributive fairness on buyer's loyalty keeping the level of procedural fairness unchanged.*

METHOD

Sample and Data Collection

The literature review indicated that most of the studies done in this area were in the automobile industry whereby the automotive dealers evaluated their suppliers. Lusch and Brown (1996) study, however, was in the context of the wholesaler/distributor and supplier. The present study is focused on the pharmaceutical supply chain in the health care industry. The sample in this study was drawn from the retail pharmaceutical industry that deals with pharmaceutical wholesalers, who play a critical role in the distribution of prescription products. About 80 percent of the pharmaceutical products flow through the wholesalers. The sample frame for the study was a list of retail pharmacies obtained from state departments of licensing and regulation. Because it is mandatory that all pharmacies in each state register and obtain a license to operate, this list was the most comprehensive and accurate and included all types of pharmacies (e.g., independent, chain, food and drug combination stores, etc.).

Telephone prescreening was conducted to: (a) identify the owner/manager, (b) seek prior commitment to participate in the mail survey, (c) identify the supplier that served as the referent for that pharmacy's response, and (d) determine how knowledgeable and involved the prospective respondent was with respect to the supplier. Most of the pharmacies had multiple suppliers of pharmaceutical products. The identification of the referent supplier on which the pharmacy answered the questionnaire was done randomly following a procedure similar to the Kish selection grid (Kish 1965). This procedure was used to avoid pharmacies consistently selecting either their best or their worst supplier and to ensure variance on the type of supplier evaluated. Each line (row) of the grid was generated by a computerized random number generator (number between 1 and 5) as each pharmacy tended to name between 2 and 5 suppliers. Each line was used for only one pharmacy contact; after a pharmacy was contacted, the line of the grid was used to assign a referent supplier and that line was never used again for any other pharmacies. If a pharmacy had only one supplier, then that supplier was used as the referent supplier.

Following prescreening, pretested surveys with personalized cover letters were mailed to 400 pharmacies. Follow-up letters were not sent. Questionnaires were received back from 156 pharmacies. After elimination of nine questionnaires, because of incomplete data, the final sample consisted of 147 pharmacies or a completed response rate of 37 percent. Using the Armstrong and Overton (1977) procedure, the "non-response" bias was evaluated by comparing the early respondents with late respondents for all constructs considered in this study. Since no significant differences were found at the 0.05 level of significance, the potential of "non-response" bias is mitigated. In addition, questions measuring the respondent's degree of personal involvement (pharmacy's dealings with this wholesaler) and knowledgeability (in general about

the pharmacy's dealings with this wholesaler) were included in the survey. The average levels of involvement and knowledgeability measured on a seven-point scale were 6.35 and 6.56 respectively, indicating that the respondents were very involved and knowledgeable about the suppliers.

In addition, we also compared the levels of involvement and knowledgeability between early and late respondents, which did not reflect any significant statistical differences using the *t*-tests. The early and late respondents were also compared on variables such as number of suppliers used, purchase volume, length of the relationship, and average annual inventory turnover, all of which showed non-significant differences (*t* values ranged from 0.686 to 1.572, which are non-significant at the .05 level).

Measure Development

Whenever possible, we attempted to use multi-item measures that had been utilized in previous studies. Where a new scale had to be developed, we were guided initially by the construct definitions and the scales utilized in organizational research. The resulting measures and scales were then modified after face-to-face and telephone interviews with pharmacy managers (see Appendix B).

Distributive fairness was assessed using five items developed by Kumar et al. (1995a) and Yilmaz et al. (2004) but was modified based on interviews with retail pharmacies. The items require the pharmacy managers to assess, relative to several factors, the fairness of outcomes and earnings from carrying the wholesaler's line. Procedural fairness items were adapted for this study from measures previously utilized by Kumar et al. (1995a). One item measuring each of the six principles of bilateral communication, impartiality, refutability, explanation, knowledgeability, and courtesy created the procedural fairness scale.

Trust was defined as the perceived credibility and benevolence of a target (supplier) of trust (Ganesan 1994; Kumar et al. 1995a; Geyskens et. al. 1998). Credibility and benevolence are considered two dimensions of trust. Past studies have indicated that the two dimensions are correlated. Thus, a two-dimensional construct of trust was developed, and the items were rendered from past studies, such as Ganesan (1994) and Doney and Cannon (1997). The buyer's loyalty scale was developed based on the definition of conative loyalty, which is characterized by repeat episodes of intent to rebuy from the supplier and is similar to motivation (Oliver 1999).

Researchers in the past have used two approaches to measure interdependence (Kim and Hsieh 2003). One approach categorizes supplier-distributor dependence as either low or high and creates a 2 x 2 matrix (Buchanan 1992, Kumar et al. 1995b). The other approach identifies and measures two aspects of interdependence: magnitude and asymmetry (Gundlach and Cadotte 1994; Jap and Ganesan 2000; Kumar et al. 1995b; Lusch and Brown 1996). Apparently, there are potential trade-offs with both approaches of measurement. In a comparative review of the two main approaches generally used to measure interdependence—categorical approach and dimensional approach—Kim and Hsieh (2003) conclude that both approaches have advantages and limitations, and as such none is superior to the other. The categorical approach, as used in this study, “is more parsimonious and less burdensome than is the dimensional approach, [and] it can be an efficient way of collecting data” (p.102). Among its limitations, they point out that it reduces a multipoint scale to a two-point scale and cannot handle the degree of asymmetry. The dimensional approach, however, “cannot determine which party contributes more to the magnitude of the interdependence and, consequently, to an outcome variable” (Buchanan 1992 in Kim and Hsieh 2003, p. 103).

For the aforesaid reasons and the added complexity due to two mediator variables and two antecedents, we chose to focus on the four *types* of interdependence: (i) mutual (equal) interdependence, (ii) buyer-dominated interdependence, (iii) supplier-dominated interdependence, and (iv) lack of perceived interdependence. Our measure was similar to, but not the same as, Buchanan (1992). Buchanan measured dependence as the ability to replace the other supplier. We measured the extent of interdependence directly by asking the buyers to choose from among four descriptions of their relationship with the supplier: (1) the buyer is more dependent on the supplier, (2) the supplier is more dependent on the buyer, (3) they are equally dependent on each other, and (4) they are not dependent on each other (see Appendix B for details on this measure and others). The overall sample was split into four groups, based on the buyer's response to this above mentioned question, for testing the study hypotheses. In our assessment, the sub-group approach adopted in the study helps parcel out the intricate mediating effects of the two dimensions of trust in the procedural fairness-loyalty and distributive fairness-loyalty relationships under four different conditions of interdependence.

Measurement Analysis

We evaluated the validity and reliability of the study constructs as follows. First, a confirmatory factor analysis was performed using AMOS 6.0 on three alternative measurement models: a) The baseline Independence model whereby the latent variables are assumed to be uncorrelated, b) The three latent variable (correlated) model with one dimension each of the Fairness and Trust constructs, and Loyalty as the third variable, and c) The five-variable (correlated) model with two dimensions each of the Fairness and Trust constructs. Each latent variable had multiple indicators or observed variables. The improvement in fit (i.e., ratio of chi-square to degrees of freedom or CMIN/DF) was used to compare the three models. The fit

indices (CMIN/DF) were 14.22, 5.22 and 4.61 respectively, which show that the third model is the most efficient in accounting for the data. Further, the third model also indicates a reasonable fit as its ratio is below 5 (Hair et al. 2006). The Normed Fit Index (NFI) was also the highest for the third model. These results support our conceptualization that both trust and fairness have two dimensions each.

The standardized regression weights (a.k.a. factor loadings or path coefficients) ranged between 0.59 and 0.91 with one exception. The third item for procedural fairness had a weight of 0.38 which was marginally below the 0.4 threshold commonly considered meaningful in factor-analytic investigations (Ford et al. 1986 in Geyskens et al. 1996). The model fit for the original model was reasonable, but it improved (CFI= 0.89, TLI=0.85, NFI=0.86) as the items with lower weights were dropped. The RMSEA, however, continued to be on the higher side (= 0.13). We verified the internal consistency of the scales using Cronbach's Alpha. The internal consistency was 0.88 for procedural fairness, 0.86 for distributive fairness, 0.94 for trust (credibility), and 0.87 for trust (benevolence). The composite reliability was also very high for all of the above scales and ranged between 0.90-0.96, with the exception of loyalty (=0.82) which too is above the threshold of 0.8. Such high reliability estimates suggest that the indicators measure the same latent constructs, and hence are reliable indicators. The convergent validity of the constructs was tested using the average variance extracted (AVE), which ranged between 0.67-0.78 and much exceeds the minimum threshold of 0.50. Hence, the amount of variance captured by each latent construct is much higher compared to the variance due to random measurement error.

To assess the discriminant validity, we used the *Fornell-Larcker* test which ensures that a latent variable explains more variance of its own indicators than the variance of other latent variables. The test is conducted by comparing the square root of the AVE to the correlations

between the latent variable and all other latent variable constructs. As seen in Table 1, the square root of the AVE for each latent variable (number in **bold** along the diagonal of the matrix) is greater than all the other correlations in the same rows and columns for that AVE.

Place Table 1 about here

Purchase volume (percentage of total annual dollar purchase from this particular wholesaler) was used as a control variable. The summary statistics for the measures are reported in Table 1. All of the independent and dependent variables are significantly intercorrelated at $p < 0.01$. The control variable, purchase volume, is significantly correlated at $p < 0.05$ with the ultimate outcome variable, buyer loyalty. Purchase volume is also significantly correlated at $p < 0.05$ with trust (benevolence), which serves as a mediating variable, as a penultimate outcome variable.

RESULTS

The traditional Sobel test is generally used to decipher the effect of one mediator at a time between an independent variable and the dependent variable, but it does not allow for any covariates in the model. The Sobel Z statistic based on the Multiple Mediation procedure of Preacher and Hayes (2008), however, can be obtained using bootstrapping but again the model allows for only one independent variable at a time and no covariates. Using the Baron and Kenny procedure and Structural Equation Modeling, we were able to test for the mediation effects of the two dimensions of trust (credibility_trust and benevolence_trust) between two independent variables (procedural and distributive fairness) and the dependent variable (loyalty) simultaneously, in the presence of a covariate (purchase volume).

The overall hypothesis (H1) regarding the moderating influence of interdependence that the mediating role of trust would vary under four conditions of interdependence was first tested

using the “Multiple-Group Analysis” in AMOS 6.0. The results (Overall Chi-square = 20.457, $df = 15$, $p = 0.155$) supported our overall contention that the mediating role of trust differs in the four groups, and that interdependence moderates the nature of fairness-trust-loyalty relationships. A nonsignificant p value suggests that we fail to reject the hypothesis that the unconstrained model of differences across groups fits the data. Hence, interdependence does influence the nature of fairness-trust-loyalty relationship in that the four groups pertaining to as many conditions of interdependence are indeed different.

To further test the varying mediating role of trust under different conditions of interdependence represented by four subgroups, Hypotheses H2-H5 were tested using regression models as the limited subgroup size prohibited further use of SEM. We followed the Baron and Kenny (1986) procedure to test for the mediation effects of trust under different conditions of interdependence as follows. First, we ran a regression with loyalty as the dependent variable and purchase volume as the independent (control) variable. Second, we estimated a direct model without any mediation variables (trust—credibility and trust—benevolence) and estimated direct effects of the two dimensions of fairness on loyalty after controlling for the purchase volume. We then compared the direct effects with the corresponding coefficients from a mediating model that included the two types of trust, credibility and benevolence, as the mediating variables. A full mediation was indicated if the following conditions were met: (1) the direct effects model produced a significant effect on a given outcome (procedural fairness and distributive fairness on loyalty), (2) the corresponding direct effect was reduced to non-significance after inclusion of the mediating variables, and (3) the mediators had a significant effect on the focal outcome (i.e., trust credibility and trust benevolence on loyalty). Mediation was not indicated when the direct

effects remain virtually unchanged with the introduction of the mediating variables as in condition 2. Finally, partial mediation was indicated if the direct effects were reduced but did not become non-significant.

To test Hypotheses H2-H5, we first divided the overall sample into subgroups based on the four interdependence categories as described earlier under the Measure Development section. We were able to use only three of the four subgroups: symmetric interdependence (our firm and the wholesaler are equally dependent on each other, $N = 63$); asymmetric buyer dependence (our firm is more dependent on this wholesaler, $N = 45$); and no perceived interdependence (our firm is not dependent on this wholesaler, and this wholesaler is not dependent on our firm, $N = 27$) to test the hypotheses. Given the nature of the industry under study, the asymmetric supplier dependence group (this wholesaler is more dependent on our firm) turned out to be less prevalent with $N = 12$, and was dropped from further analysis due to insufficient sample size.

Under conditions of symmetric interdependence, when the buyer and supplier are equally dependent on each other, both procedural and distributive fairness have a direct significant effect ($beta = 0.346$ at $p < 0.01$, and $beta = 0.236$ at $p < 0.05$, respectively) on loyalty, as shown in Table 2. Further, the relationship is completely mediated by both dimensions of trust—credibility and benevolence—as the two fairness coefficients become non-significant ($beta = 0.017$ and 0.066 , respectively). Thus, Hypotheses H2a and H2b are supported.

Place Table 2 about here

Under conditions of asymmetric interdependence, when the buyer is more dependent on the supplier, only procedural fairness has a significant direct effect ($beta = 0.719$, $p < 0.001$) on loyalty. When trust is introduced in the equation, the results shown in Table 3 indicate that the

procedural fairness coefficient becomes less significant ($\beta = 0.435$, $p < 0.05$), but both trust coefficients are non-significant. Thus, trust does not seem to mediate the fairness-loyalty relationship when the buyer is more dependent on the supplier, and hence H3a and H3b are supported. As mentioned above, H4a and H4b couldn't be tested owing a small number of observations in that subgroup.

Place Table 3 about here

The results shown in Table 4 suggest that in an exchange relationship with no perceived interdependence, trust does not mediate the fairness-loyalty relationship, as expected. Thus, the proposed H5a and H5b are supported. It is important to note that both procedural and distributive fairness have a significant direct effect ($\beta = 0.403$ and 0.380 , respectively; both are significant at $p < 0.05$) on buyer loyalty when there is no perceived interdependence between buyer and supplier.

Place Table 4 about here

DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

Theoretical Implications

Interdependence was found to be a very important construct in supplier-buyer relationships. We found that varying types of interdependence (i.e., symmetric interdependence, asymmetric buyer dependence, and no perceived interdependence) have differential impacts on the nature of fairness-trust-loyalty relationships. Under conditions of symmetric dependence, trust completely mediates the relationship between fairness and loyalty. We established that, in symmetric (balanced) relationships, both distributive and procedural fairness facilitate the development of benevolence-based and credibility-based trust which, in turn, engenders loyalty.

Under symmetric interdependence structure when the power is balanced, trust would have developed well. A balanced relationship helps alleviate the fear that one's supply chain partner will engage in any irrational, opportunistic behavior, and, thus, fosters a trusting relationship based on perceived fairness. Under such conditions, trust can lead even highly developed firms to desire to maintain the relationship (Geyskens et al. 1996). So signaling fairness under conditions of symmetric interdependence generates trust, which, in turn, creates loyalty. It may be noted that this finding is contrary to that of Kumar et al. (1995b), who observed that even in high symmetric interdependence conditions there was no guarantee that a trusting, committed relationship would develop.

In the case of asymmetric buyer dependence when the buyer perceives itself to be more dependent on the wholesaler, the supplier can bargain aggressively given its lack of offsetting dependence. Such a relationship could be marked by a high degree of opportunistic behavior, which would deter the development of trust between the two parties. Since the supplier enjoys more influence in the relationship, s/he might not feel the necessity to develop a trusting relationship with the buyer. The asymmetric nature of the relationship dampens the development of adequate trust, thus leading to reliance on other mechanisms for developing loyalty.

The vulnerable retailers, unable to protect themselves from the wholesaler's opportunism, would not develop trust in the relationship (Heide and John 1988). Under asymmetric conditions trust may be low (Anderson and Weitz 1989, Dwyer, Schurr and Oh 1987, Frazier, Gill and Kale 1989, Stern and Reve 1980). Geyskens et. al 1996 observed that when "trust is absent, developing affective commitment is highly unlikely" (p. 314). Kumar et al. (1995b) noted that "trust and commitment do not naturally flourish in asymmetric relationships; if they are to develop, they must be carefully cultivated" (p. 353). Our study concurs with these earlier

findings suggesting that under asymmetric interdependence structure, trust cannot create loyalty (similar to affective commitment) but fairness can directly impact loyalty. So in asymmetric relationships, signaling fairness by the powerful wholesaler could generate loyalty even when the trust is low or absent in the relationship. Since the buyer is more dependent on the supplier, the latter could at least demonstrate procedural fairness in order to have continued business from the buyer. In the absence of a trusting relationship, the likelihood of repeat business could be improved by improving the perception of procedural fairness on part of the supplier, and hence either dimension of trust may not mediate the fairness-loyalty relationships.

Under conditions of no perceived interdependence, trust (credibility and benevolence) does not mediate the relationship between fairness and loyalty. This is a condition that could happen either early in a relationship or in a spot market situation. When supply chain partners do not perceive interdependence, a trusting relationship based on credibility and benevolence does not seem to develop because of the possible fear of opportunistic behavior or because the relationship is premature. The buyer, however, might be willing to continue to transact business with the supplier (i.e., show loyalty) if s/he perceives procedural and/or distributive fairness in supplier's dealings. Thus, if firms try to develop loyalty with their partners while remaining independent, fairness seems indispensable in the relationship.

Managerial Implications

Given the increasing pressures on the cost of the health care system, pharmaceutical companies are increasingly finding ways to becoming more efficient. They are also experimenting direct distribution strategies to pharmacies using third party logistics companies, such as UPS. If such practices become a common place, then the role of wholesalers will diminish or eventually disappear. This challenge poses more a reason for the wholesaler to build

trusting relationships and loyalty with the pharmacies, which has strategic advantage for the pharmaceutical wholesalers. First, the more loyal pharmacy customers the wholesalers have, the more clout they would have as the pharmaceutical manufacturers would hesitate to bypass the wholesalers thus providing power balance to the wholesalers. Second, it is less costly to retain a customer than to acquire a new one. Appropriate deployment of procedural fairness and distributive fairness is necessary to build trust and eventually loyalty with the pharmacies. The wholesaler that does a superior job in creating a competitive advantage leveraging fairness to engender trust might get to benefit in recruiting more pharmacies to their loyalty programs.

Under conditions of symmetric interdependence, we noted that as managers at the supplier's end demonstrate fairness—procedural and distributive—they are able to cultivate a trusting relationship with the buyers, which in turn leads to buyer loyalty. A straight forward implication of this finding in the pharmaceutical supply chain is that pharmaceutical wholesalers should clearly communicate and set expectations to the pharmacy on how they can help on various business processes that will contribute to the pharmacy's success (Doucette and Jambulingam 1998). Specifically, the wholesaler could offer to train and educate pharmacy managers on how to a) improve clinical services and monitor drug interactions, b) manage third party prescription benefit contracts, c) deploy patient compliance and reminder solutions. In addition, the wholesaler should examine the local market conditions of the pharmacy and help them identify appropriate service offerings, such as long-term care, home health care, etc. Since the pharmacy managers can easily observe, monitor, and track the above mentioned business processes, it would help develop trust in the relationship leading to their loyalty to the wholesaler. Additionally, the wholesalers should display intentions beneficial to the pharmacy. For example, how they could make better margins on generic drugs. Such actions signal to the

pharmacies that the wholesalers care about the pharmacy's business and are willing to put the pharmacy needs above their own.

Under conditions of perceived independence or asymmetric buyer-dependence, a trusting relationship between supply chain partners may not develop. In asymmetric buyer-dependence condition, the buyer shows repeat behavior based on the supplier's fair procedures. Thus, managers at the supplier's end should effectively develop procedural fairness and signal their counterparts at the buyer's end. Procedural fairness on part of the wholesalers could be demonstrated by instituting business processes that can be easily observed, monitored and tracked by the pharmacies. In the case of early relationships, where there is no perceived interdependence yet, suppliers should also demonstrate equitable division of benefits with their buyers to espouse loyalty in their buyers.

The above findings, when viewed from the opposite angle, could be used to train the wholesalers to signal to the pharmacies that they are equally dependent on them for their own success. Such signaling on part of the wholesalers would help the pharmacy managers to perceive a mutually dependent relationship. Managing the perception is germane to generating trust, which in turn engenders loyalty.

The results have significant applications to other channel contexts wherever buyers can exercise choice in selecting suppliers. It is important to note that trust plays a critical role in highly interdependent relationships. Building trust becomes imperative in symmetric relationships. In asymmetric buyer-dependent relationships, supplier's procedural fairness plays an important role in garnering buyer loyalty. It may be that when the buyers are more dependent on their suppliers, the suppliers may not see the need to engage in fair distribution of benefits

since the buyers would continue to buy out of necessity. In early relationships, however, both forms of fairness—procedural and distributive—help engender loyalty.

Limitations and Directions for Future Research

This study is not free from limitations, which could serve as a fertile ground for future research. First, due to a relatively powerful position of the wholesalers in this pharmaceutical wholesaler-buyer relationship, the asymmetric seller dependence condition could not be investigated. Other channel or supply chain relationships consisting of more powerful buyers should be investigated to see how fairness and trust operate under an asymmetric supplier dependency situation. Second, the interdependence measure used in the study is a categorical one, which we thought to be appropriate for the study as it allowed us to parcel out the mediating effects under different conditions of interdependence. It, however, suffers from the limitation of not being able to assess the degree of symmetry or asymmetry under each condition. The dimensional approach used in some earlier studies has limitations too. Thus, future research should consider developing some alternatives, such as the response surface approach of Kim and Hsieh (2003).

Given the important role that fairness plays in generating buyer loyalty in the cases of perceived independence between buyers and suppliers and asymmetric buyer dependence, future research opportunities exist for exploring the antecedents to distributive and procedural fairness. Future research may also benefit from studying the moderating influence of variables, such as conflict and dissatisfaction, in the fairness-trust-loyalty relationship under different conditions of interdependence. Future research in this area should further investigate the role of fairness in other channel contexts.

Conclusions

The varying conditions of interdependence examined in the study help us better understand the mediating role of trust in the fairness-loyalty relationship. It is only under symmetric conditions that fairness leads to trust, which in turn leads to a loyal, longer lasting buyer-supplier relationship. Under conditions of perceived independence or asymmetric buyer dependence, the lack of cooperative behavior and related fear of irrational, opportunistic behavior hinder the growth of a trusting relationship. In such cases, the buyer's repeat buying behavior is simply founded on the procedural and distributive fairness of the supplier.

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APPENDIX A

Study	Independent Variable	Dependent variable	Context	Findings
Schurr and Ozanne 1985	Trust (+)	Attitude toward loyalty	MBA students in a simulated buyer-seller context	Supported
Anderson and Weitz 1989	Trust (+)	Perceived continuity of relationship	Independent sales agents and their manufacturers	Relationship Supported
Ganesan 1994	Trust –credibility (+) Trust – benevolence (+)	Long-Term Orientation (LTO)	Retail buyers and their vendors of six regional department stores	Only trust –credibility and LTO relationship supported
Morgan and Hunt 1994	Trust(-) Trust (+)	Propensity to leave Commitment	Automobile tire retailers that are members of national tire dealers and retreaders association (NTDRA)	Both Relationships Supported
Kumar, Scheer and Steenkamp 1995a	Distributive Fairness (+) Procedural Fairness (+)	Relationship quality (complex measure including trust)	Automotive dealers evaluating manufacturers	Both relationships supported
Kumar, Scheer and Steenkamp 1995b	Total Interdependence (+) Interdependence asymmetry (-)	Trust	Automobile dealers	Both relationships supported
Geyskens, Steenkamp, Scheer and Kumar 1996	Total Interdependence (+)	Affective commitment Calculative commitment	Automobile dealers in US and Netherlands	All relationships except relationship between interdependence asymmetry and attitudinal commitment were supported
	Interdependence asymmetry (-)	Attitudinal commitment		
	Interdependence asymmetry (+)	Calculative commitment		
	Trust(+)	Attitudinal commitment		
	Trust(-)	Calculative commitment		
	Interdependence asymmetry x Trust (+)	Attitudinal commitment		

Andaleeb 1996	Trust (+)	Commitment	Simulated buyer, supplier relationship with MBA students	Supported
Lusch and Brown 1996	Bilateral dependence (+) Wholesaler/distributor dominated dependence (+) Supplier dominated dependence (-)	Long Term Orientation of the wholesaler/distributor	Wholesaler -distributors evaluating their suppliers	Only the relationship between wholesaler/distributor dominated dependence and LTO was supported
Doney and Cannon 1997	Trust (+)	Anticipated future interactions	Industrial manufacturing firms in SIC 30 – 37 evaluating their suppliers	Supported
Geyskens, Steenkamp, and Kumar 1998	Trust (+)	Long Term Orientation	Meta-analysis	Supported
Geyskens, Steenkamp, and Kumar 1999	Trust (+)	Commitment	Meta-analysis	Supported
Kim and Hsieh 2003	Interdependence type (Categorical) Interdependence – magnitude and asymmetry	Distributor Commitment	Industrial Distributors – SIC 5084 – industrial machinery/equipment and SIC 5085 industrial supplies	Distributor commitment was high for high mutual dependence category compared to other three categories of asymmetric and low dependence.
Izquierdo and Cilian 2004	Magnitude of Interdependence (+)	Trust	Supplier-manufacturer in the automotive industry	Supported
Yilmaz, Sezen and Ozdemir 2005	Trust	Relational behaviors	Manufacturer -Automobile dealership in Turkey	Supported

APPENDIX B

Measures

Distributive Fairness: $\alpha = 0.86$

(7-point Likert scale, "Strongly Disagree to Strongly Agree")

1. This wholesaler provides us fair gross margins on the purchases made from them.
2. This wholesaler provides us a fair share of the earnings for the effort we have made to support their product lines.
3. This wholesaler provides us fair prices compared to other pharmacies in our industry.
4. This wholesaler provides us fair service levels for the investment we have made to support their product lines.

Procedural Fairness: $\alpha = 0.88$

(7-point Likert scale, "Strongly Disagree to Strongly Agree")

1. This wholesaler promotes bilateral communication with the pharmacies.
2. This wholesaler does not differentiate but rather treats all pharmacies similarly.
3. This wholesaler sometimes alters its policies in response to a pharmacy's objections.
4. This wholesaler provides valid reasons for any changes in their policies affecting the pharmacies.
5. This wholesaler makes great effort to learn local market conditions under which our pharmacies operate.
6. This wholesaler treats the pharmacies with respect.

Trust (Credibility): $\alpha = 0.94$

(7-point Likert scale, "Strongly Disagree to Strongly Agree")

1. The wholesaler keeps promises it makes to our pharmacy.
2. This wholesaler is reliable.
3. If problems arise, this wholesaler is honest about the problems.
4. This wholesaler has been consistent in terms of their policies.
5. We are confident in the information that this wholesaler provides us.
6. Whenever this wholesaler gives our pharmacy advice on our business operations, we know that they are sharing their best judgment.

Trust (Benevolence): $\alpha = 0.87$

(7-point Likert scale, "Strongly Disagree to Strongly Agree")

1. This wholesaler is genuinely concerned that our pharmacy achieves its goals.
2. When making important decisions, this wholesaler considers our welfare before its own.
3. This wholesaler considers our interests when problems arise.
4. This wholesaler has gone out of its way to help us.
5. This wholesaler has made sacrifices for us in the past.

Buyer Loyalty: $\alpha =$ not applicable

(7-point Likert scale, "Strongly Disagree to Strongly Agree")

1. We will not switch from this wholesaler at any cost.
2. We will shift more business to this wholesaler.

Interdependence

Please check the one statement below that best describes your relationship with your wholesaler.

1. Our firm is more dependent on the wholesaler.
2. This wholesaler is more dependent on our firm.
3. Our firm and the wholesaler are equally dependent on each other.
4. Our firm is not dependent on this wholesaler, and this wholesaler is not dependent on our firm.

Purchase Volume

What percentage of your total annual dollar purchase of prescription drugs do you obtain from this particular wholesaler? _____%

TABLE 1
Means, Standard Deviations, and Intercorrelations

Variables	Mean	SD	Correlations					
			1	2	3	4	5	6
1. Buyer Loyalty	4.45	1.19	0.83	0.370	0.549	0.556	0.534	0.186
2. Distributive Fairness	5.17	1.07		0.83	0.714	0.584	0.612	0.072
3. Procedural Fairness	4.42	1.12			0.83	0.780	0.694	0.025
4. Trust (Credibility)	4.85	1.47				0.89	0.742	0.024
5. Trust (Benevolence)	4.21	1.29					0.82	0.133
6. Purchase Volume	84.47	25.34						*

Note: All correlation coefficients > 0.36 are significant at $p < 0.01$, whereas correlation coefficients > 0.13 are significant at $p < 0.05$.

Numbers along the diagonal in **bold** are the square root values of the AVE for that latent variable.

*Purchase volume is an objective measure

Table 2
Mediating Role of Trust under the Symmetric Interdependence Condition
 Dependent variable: Loyalty

Variables	Model 1	Model 2	Model 3
Purchase Volume	.364***	.393****	.352***
Procedural Fairness		.346***	.017
Distributive Fairness		.236**	.066
Trust (Credibility) ¹			.472***
Trust (Benevolence) ¹			.311**
Adjusted R-Square	.119	.295	.365
F Statistic	9.49***	9.79****	8.25****

 **** $p < .001$, *** $p < .01$, ** $p < .05$

Note: N = 63. Directional hypotheses were tested using a one-tailed t-test.

¹Mediating variable.

Table 3
Mediating Role of Trust under the Asymmetric Buyer Dependence Condition
 Dependent variable: Loyalty

Variables	Model 1	Model 2	Model 3
Purchase Volume	.137	.044	.001
Procedural Fairness		.719****	.435**
Distributive Fairness		.140	.042
Trust (Credibility) ¹			.238
Trust (Benevolence) ¹			.212
Adjusted R-Square	.004	.464	.465
F test value	.84	14.04****	8.79****

 **** $p < .001$, ** $p < .05$

Note: N = 45. Directional hypotheses were tested using a one-tailed t-test.

¹ Mediating variable.

Table 4
Mediating Role of Trust under the No Perceived Interdependence Condition
 Dependent variable: Loyalty

Variables	Model 1	Model 2	Model 3
Purchase Volume	.401**	.153	.074
Procedural Fairness		.403**	.703***
Distributive Fairness		.380**	.452**
Trust (Credibility) ¹			.437**
Trust (Benevolence) ¹			.061
Adjusted R-Square	.129	.367	.435
F Statistic	4.99**	6.22***	5.16***

*** $p < .01$, ** $p < .05$

Note: N = 27. Directional hypotheses were tested using a one-tailed t-test.

¹ Mediating variable.

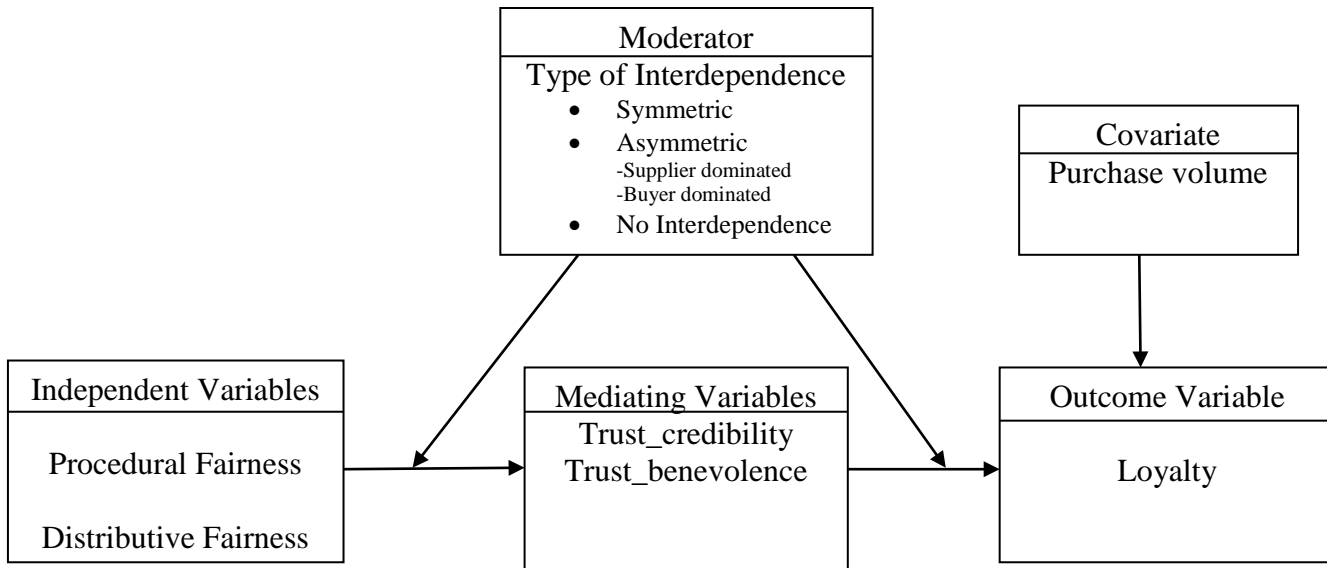


Figure 1: The Moderated-Mediation Model of Hypothesized Relationships