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Abstract
We develop and test a model of the relationships between: (1) norms of information sharing and communication flows of frequency, bidirectionality, and formality, (2) these communication flows and dealers' assessments of the quality of communication and satisfaction with communication; and (3) formality of communication flows and dealers' distortion and withholding of information. Based on data collected with a survey mailed to a national sample of computer dealers, our findings offer insight on channels communication to both researchers and practitioners. By examining the impact of communication flows on summary judgments of communication, managers can focus their efforts on vital communication flows which stimulate positive assessments of communication, and which stymie less beneficial/detrimental communication behaviors (such as distortion and withholding of information).

RECENT RESEARCH on the management of channel relationships has increasingly focused on channel communication. Channel communication is central to effective channel functioning (Mohr and Nevin, 1990; Stem and El-Ansary, 1992). Communication behaviors between channel members have been linked to trust (Anderson and Weitz, 1989; Anderson and Narus, 1990; Bialaszewski and Giallourakis, 1985); power and influence strategies (Boyle, Dwyer, Robicheaux and Simpson, 1992; Frazier and Summers, 1984); channel structure (Brown, 1981; Etgar, 1976); coordination (Guiltinan, Rejab and Rodgers, 1980); channel member commitment (Anderson and Weitz, 1992; Morgan and Hunt, 1994); cooperation (Anderson and Narus, 1990); and resource allocation decisions (Anderson, Lodish and Weitz, 1987). Clearly, communication behaviors are an important factor in the development of channel relationships and assessments of relationship quality.

Researchers tend to take one of two approaches in conceptualizing and defining channel communication: either they focus on the flows of communication between channel members or they focus on evaluative/summary judgments regarding the communication exchange.[1] Researchers who have focused on the *nature of communication flows* typically examine aspects such as the frequency of interaction, the extent to which communication flows are bidirectional in nature, or the level of formality of communication flows. For example, Brown (1981) examined the number of communication interactions between channel members over a specified time period. Anderson et al. (1987) examined the extent to which both channel members were involved in the give-and-take of communication interactions (i.e., two-way feedback and participation). Anderson and Weitz (1989) measured the extent to which expectations were communicated in detail. Researchers who have focused on *summary, evaluative judgments of communication* examine the helpfulness (Guiltinan, Rejab, and Rodgers, 1980), adequacy (Bialaszewski and Giallourakis, 1985), or efficacy (Anderson and Narus, 1990) of communication. Rather than capturing the specific nature of communication flows, such summary judgments capture a more holistic assessment of the quality of communication interactions over time.

This prior research has examined only one aspect of communication, without acknowledging the potential for multi-dimensional aspects of communication flows. If communication is the "glue that holds together the channel of distribution" (Mohr and Nevin, 1990, p. 36), it would seem important to include more than one measure of communication flows in channels research. Further, prior research does not acknowledge that the nature of communication flows may form the basis for a channel member's evaluative/summary judgments of communication. For example, the formality with which communication procedures are specified might impact the quality of information shared as well as a channel member's satisfaction with communication. Research which examines the impact of communication flows on evaluative/summary judgments of communication would be useful in better managing communication flows.

Enhanced understanding of channel communication can help focus managerial efforts on vital communication flows which stimulate positive assessments of communication behaviors, and which stymie less beneficial/detrimental communication behaviors, such as distortion or withholding of information. Furthermore, researchers may better understand which dimensions of communication are more appropriate than others for potential inclusion in their theories and research. Therefore, the purpose of this paper is to develop and test a model of communication flows between manufacturers and dealers. More specifically, we examine four issues: (1) how norms of information sharing influence the frequency, bidirectionality, and formality of communication flows; (2) how these communication flows affect dealers' assessments of the quality of communication; (3) the relationship between communication quality and dealers' satisfaction with communication; and (4) the relationship between formality of communication flows and the dealers' distortion and withholding of information. In the sections which follow, we first review the literature on communications in distribution channels. Prior to developing our hypotheses, we establish the theoretical underpinnings of our model. Next we test our model with EQS (Bentler, 1992), utilizing data collected from 125 computer dealers. Finally, we discuss our results and their implications.

Theory and Research on Channel Communication

Organizations are oftentimes viewed in terms of their information flows and information processing capabilities (March and Simon, 1958; Tushman and Nadler, 1978). This view of organizations sees communication as a central phenomenon in organizations, and has contributed greatly to the understanding of how information flows and communication behaviors affect-and are affected by-the development and quality of inter-organizational relationships. According to Guetzkow (1965), communication is used to coordinate outputs; organizational hierarchies involve communication networks; and, communication serves to embed an organization in its environment. Guetzkow (1965) and others identify several important characteristics of communication in organizations, including formal vs. informal flows; vertical and lateral flows; omissions and distortions; communication quality and quantity (Wiio, 1988); and satisfaction with communication (Roberts and O'Reilly, 1974).

The communication flows in our model include the following. *Frequency,* or the amount of contact between channel members (Brown, 1981; Mohr and Nevin, 1990), reflects how often channel members have contact with each other. *Bidirectionality* refers to the extent to which each party gives feedback and input to the other (two-way flows) (Anderson et al., 1987). *Formality* is the extent to which communication flows are structured, planned, and routinized (vs. ad hoc or unstructured); such formality may be specified by the nature of the contractual relationship between the parties (Anderson et al., 1987; Mohr and Nevin, 1990).

Since frequency, formality, and bidirectionality are important aspects of communication flows (Mohr and Nevin, 1990), a key question becomes: what can channel members do to facilitate such communication flows? Based on organizational communications theory and relational contracting theory, a possible answer can be found by examining the norms of information sharing within the channel relationship. *Norms* are shared expectations for behavior; these shared expectations specify and guide appropriate conduct of the parties in a relationship (Heide and John, 1992). Relational contracting theory[2] addresses expectations regarding information sharing behavior. Interestingly, prior research has not examined the relationship between norms of information sharing (Heide and John, 1992; Noordewier, John and Nevin, 1990) and specific communication flows. If norms for information sharing specify and guide appropriate communication behaviors, it would seem important to assess their influence on communication flows.

We note three other points about prior research on channel communication. The majority of prior research on channel communication tends to focus on the positive or beneficial aspects of communication behaviors. However, the potential for more detrimental or negative communication flows exists. For instance, Stem and El-Ansary (1992) discuss the fact that channel members may withhold valuable information from each other or alter messages in such a way to protect themselves. Such "information control" (via selective disclosure, and so forth) is recognized as a source of power in organizations (Piercy, 1989). And, transactions costs analysis, in its treatment of efficient modes of governing exchange, addresses conditions of information impactedness[3] and opportunistic behavior. Opportunism, when one party acts with deceit or guile in its dealings with another, includes selective or distorted information disclosures (Williamson, 1975). Studies of opportunistic behavior (John, 1984) included measures of distortion and withholding of information. Hence, withholding and distortion of information (whether

intentional or unintentional) are potentially important aspects of communication to assess (see also Guetzkow, 1965; Mohr, 1991). Based on Fulk and Mani (1986) and Stohl and Redding (1987), *distortion and withholding of information* is defined as occurring when the meaning of a message is transformed or modified (either intentionally or unintentionally) by the sender, or when one party does not transmit a message to the other.

Furthermore, studies of summary assessments of communication have been rather sparse, and their measures have been rather narrow (for example, perceived helpfulness, such as, Guiltinan et al., 1980). However, O'Reilly (1982) and Stohl and Redding (1987) suggest that assessments of the overall quality of communication are a function of the completeness, credibility, accuracy, timeliness, and adequacy of communication flows. We believe that holistic, summary assessments of communication could usefully incorporate these various aspects; we refer to this as *communication quality.* Finally, no research (of which we are aware) has addressed a channel member's satisfaction with communication. Given that satisfaction has been shown to be an important outcome in channels research (Dwyer, 1980; Wilkinson, 1979), we focus our assessment of satisfaction on the channel member's satisfaction with communication. *Satisfaction with communication* refers to the channel member's overall affect regarding communication with a focal manufacturer (compared to communication with other manufacturers).

Model Development

The theoretical underpinnings of our model come from theories of organizational communication (Porter and Roberts, 1976; Roberts, O'Reilly, Bretton and Porter, 1973), transaction cost analysis (Williamson, 1975, 1979), and relational contracting theory (MacNeil, 1981). By combining these theories, a more complete picture of communication and information flows in organizations is available for channels researchers. Figure 1 provides an overview of the constructs in our hypothesized model.

Norms of information sharing affect the nature of communication flows between channel members. In turn, the nature of these communication flow forms the basis for summary judgments about communication quality. We examine the extent to which frequency, bidirectionality, and formality are associated with perceptions of quality of communication Because of the need to understand what factors predict opportunistic behavior (John, 1984), we focus on the formality of communication flows as one such factor which can inhibit the distortion and withholding of information. Finally, in our model, the impact of communication flows on a dealer's satisfaction with communication is mediated by communication quality.

Norms of Information Sharing

Information sharing in more extended, relational exchanges IS based on open, honest, and frequent exchanges of information (Dwyer, Schurr and Oh, 1987) Norms for information sharing define a bilateral expectation that parties in a relationship will proactively provide information

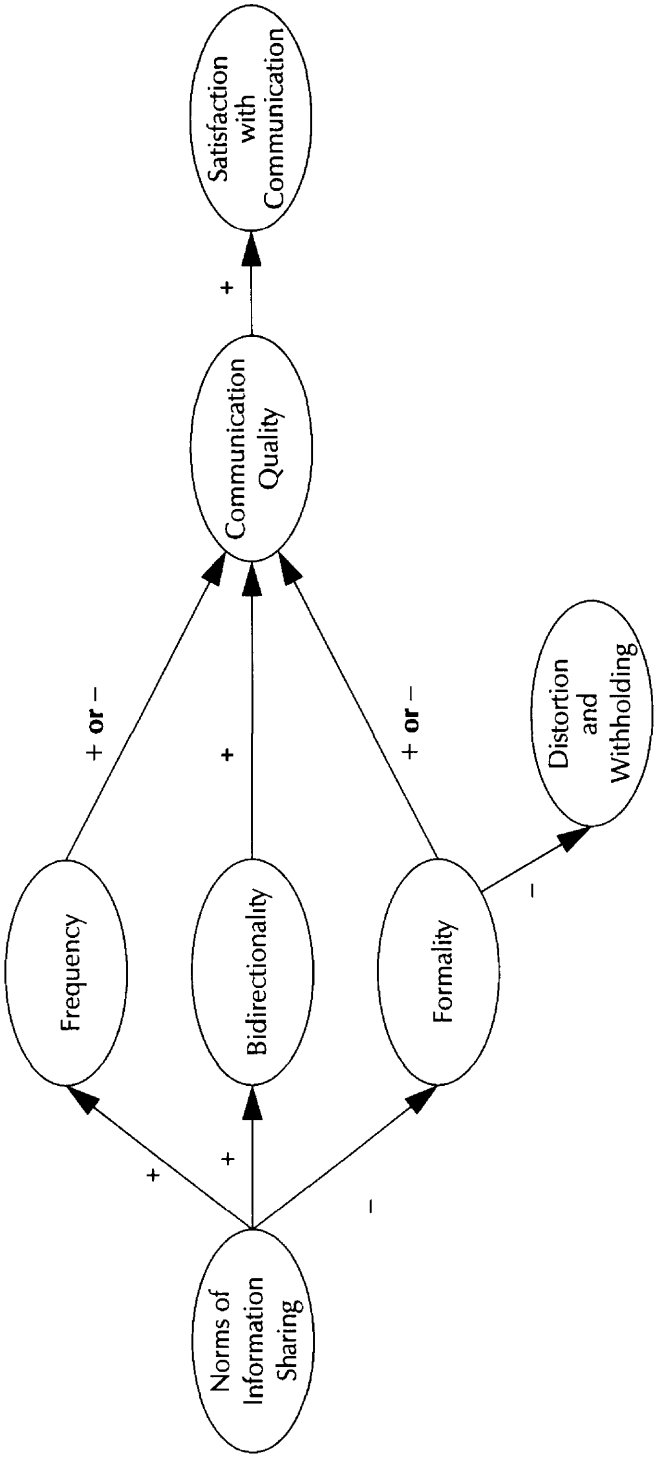

Figure 1. Hypothesized Model

useful to the partner (Heide and John, 1992; Noordewier et al., 1990). The presence of such norms implies that the manufacturer and dealer share the belief that information sharing is important and expected. In addition to MacNeil (1981), both Eisenberg, Farace, Monge, Bettinghaus, Kurchner-Hawkins, Miller and Rothman (1985) and Reilly and DiAngelo (1990) suggest that communication flows are affected by normative expectations which encourage an open flow of information.

Hence, where such norms exist, dealers and manufacturers have the incentive for more frequent contact with each other, and both parties are likely to participate in the exchange of information on an active basis. In such a situation, it is unlikely that one party will issue unilateral directives to the other, without receiving some sort of feedback. On the other hand, an absence of information sharing norms can limit the extent to which a manufacturer and a dealer feel the need to share information. Where such norms are lacking, parties have little incentive or reason to be forthcoming with information. As a result, communication frequency and bidirectionality may be lower.

The theoretical underpinnings of our model suggest that information sharing norms are likely to be associated with lower formality of communication flows. For example, Williamson (1979) says that familiarity between trading partners permits a specialized language to develop, and nuances are signaled and received in a sensitive way. Nuances and sensitivity in communication seem to go beyond institutionalized, structured, formal communication; hence, where norms of information sharing exist, communication is less formal. In addition, Eisenberg et al. (1985) suggest that an informal approach may be more successful than a formal approach in closer organizational relationships. Hence, having an understanding that information sharing is expected could mitigate the need to establish formalized routines and procedures to facilitate such information sharing. On the other hand, absence of information sharing norms may require the establishment of institutionalized routines to facilitate the sharing of pre-specified information.

H1: Norms of information sharing are positively related to frequency of communication flows.

H2: Norms of information sharing are positively related to bidirectionality of communication flows.

H3: Norms of information sharing are negatively related to formality of communication flows.

Communication Quality

Although not explored in prior research, we examine the relationship between the nature of communication flows and summary judgments about communication quality. The nature of the relationship between frequency of communication flows and assessments of communication quality IS not intuitively obvious. On the one hand, past research on organizational

communication has found that decision makers tend to operate under the belief that more information is better (Feldman and March, 1981; O'Reilly, 1980; Mohr, 1992). Poor decisions are frequently attributed to a lack of information-they are rarely attributed to too much information. When one has access to large amounts of information (arising from higher frequency of communication flows), it can be seen as an affirmation of competence and virtue; it is a tool that can be used to establish legitimacy in the organization. Feldman and March (1981) refer to this as "information posturing and conspicuous consumption of information." Hence, decision makers appear to believe that a greater amount of information (more frequent communication) is of higher quality than less frequent communication flows.

On the other hand, it is also possible that a high frequency of contact between channel members could result in information overload (Farace, Monge and Russell, 1977; O'Reilly, 1980) or an annoyance/nuisance factor, lowering perceptions of communication quality. Receiving information when it is not needed nor desired can lead to feelings of frustration, and in some instances may even be a source of confusion (Daft and Lengel, 1986). Because of the possibilities for a positive, negative, or even a nonlinear relationship between frequency and communication quality, we offer a nondirectional hypothesis.

Bidirectional communication allows both manufacturer and dealer to provide feedback to the other on a give-and-take basis. They can ask questions, seek clarification or verification of assumptions, and in the process, have the perception that communication is accurate, credible, and complete. If the dealer receives one-way communication, without the opportunity to contribute to the information exchange, he/she may be left with questions regarding the information that was shared, lowering perceptions of communication quality.

The relationship between formality of communication flows and communication quality is also unclear. On the one hand, when communication flows are planned, structured, and routinized, dealers and manufacturers know what to expect in terms of communication behaviors. Hence, they may feel that more structured communication is more timely, accurate, and complete than less structured communication. Moreover, more formal communication, by structuring and routinizing communication flows, can contribute to a dealer's sense that information is complete. With less formal communication flows, channel members probably wonder whether they are getting adequate, timely information. On the other hand, formal communication procedures may inhibit the ability of manufacturers and dealers to communicate in a timely fashion. Daft and Lengel (1986) suggest that communication flows vary in "richness" (or the ability to convey multiple cues at once). To the extent that formal communication is perceived as sterile or institutionalized, channel members may perceive it to be less adequate, less complete, or less credible than informal communication. Again, because of the competing rationales for this relationship, we offer a nondirectional hypothesis.

H4: Communication frequency is associated with perceptions of communication quality.

H5: Communication bidirectionality is positively associated with perceptions of communication quality.

H6: Communication formality is associated with perceptions of communication quality.

Distortion and Withholding of Information

No prior research has examined the link between formality and distortion. We propose that formality of communication reduces the distortion and withholding of information. When planned, structured procedures are in place to guide communication flows, the opportunities to alter or omit information are lessened. On the other hand, without formalized procedures to guide communication, channel members may use their own discretion in deciding what and how to communicate. In such a case, distortion and withholding of information may be more likely to occur.

H7: Communication formality is negatively related to distortion and withholding of information.

Satisfaction with Communication

In our model, we address the relationship between communication quality and the dealer's satisfaction with communication. Prior research in organizational communication has found a link between perceived accuracy of communication and satisfaction with communication (Roberts and O'Reilly, 1974). Dealers' perceptions of the quality of communication should positively influence their satisfaction with that communication. Because it can enhance the dealers' ability to be effective in marketing and merchandising manufacturers' products, more timely, accurate, and credible communication may be preferable to less timely, accurate, credible communication. Conversely, perceptions of low quality communication could leave dealers feeling frustrated and stymied in their ability to effectively represent manufacturers' products. Hence, when dealers perceive that communication is of lower quality, they are likely to be less satisfied with communication.

H8: Dealers' perceptions of the quality of communication is positively related to their satisfaction with communication.

Method

Context and Sample

We tested the hypotheses with data collected from a national sample of computer dealers, using a list of computer dealers who were members of the industry trade association, the Association of Better Computer Dealers. In order to include non-member dealers, we augmented the list with a random sample of outlets from a major computer franchisor.

We contacted owners/managers of each dealer location by telephone prior to mailing a questionnaire. The phone contact was used to solicit cooperation/participation in the research project, to verify the key informant's name and address, and to randomly assign a focal manufacturer on whom the dealer would respond.

Key informants were deemed appropriate for this study. Since the owner/manager of computer dealers is typically the top decision maker within the firm, he/she is the person who has key contact with the manufacturer and is the focal point for these small business (the median number of employees ranged from, 11–25).

We asked each dealer to respond to the questionnaire with respect to a randomly- assigned focal manufacturer. This precluded dealer respondents from selecting either their most or least favored supplier, and thus, assisted in increasing variance on the types of communication behaviors exhibited in the relationship. In the pre-screening phone call, dealers were asked to list the manufacturers whose lines they carried and the caller wrote these manufacturers down. The phone caller then consulted a random number table (generated independently for each individual phone call) to assign a focal manufacturer based on the number of manufacturers that the dealer named. For example, if the dealer named five manufacturers in the pre-screening phone call and if the random number generator for this specific phone call (five possible options) selected the number "2," then the caller instructed the dealer to answer the questionnaire with respect to the second manufacturer named. The caller then wrote that manufacturer on the questionnaire prior to mailing it to the dealer. This procedure is similar to the use of a Kish selection grid (Kish, 1965) in conducting research on households, when one needs to select a member of the household to respond. Through this procedure, the probability of a manufacturer being addressed by the dealer sample was approximately equivalent to that manufacturer's market share.

We mailed a total of 557 surveys. A reminder letter was sent approximately four weeks after the questionnaire. Twenty-five percent of the surveys were returned ($n = 140$). After, 15 surveys were eliminated due to incomplete responses, the total number of usable responses was $n = 125$. Table, 1 provides a summary of the respondents' characteristics.

In order to assess potential nonresponse bias, a comparison of early to late respondents was conducted (Armstrong and Overton, 1977). This analysis showed no significant differences on characteristics such as length of the relationship with the focal manufacturer, number of other products carried, or sales volume for the focal manufacturer. Late respondents were, however, slightly larger in terms of the number of employees ($t = 2.3$, $p < .02$) and total dollar volume of the dealership ($t = 1.72$, $p < .09$).

Measures

We operationalized the constructs in our model with a combination of reflective and formative indicators, most of which were adapted from prior research. The scales were pretested in a series of iterative personal interviews with twelve computer dealers. Each dealer in the pretest answered the questions, and verbalized any thoughts that came to mind, including ambiguities and suggestions. The items were revised following each personal interview until no further changes were suggested.

Table 1. Characteristics of the Sample

Characteristics	Percent of Sample (n = 125)
Referent Manufacturer	
Apple	19.0
IBM	18.0
Compaq	12.0
Epson	7.0
Hewlett Packard	6.0
NEC	5.0
All Others	33.0
Type of Dealer Structure	
Independent, through distributor	13.0
Independent, direct with manufacturer	44.7
Franchise	23.6
Company Owned	14.6
Manufacturer Owned	4.1
Number of Employees	
5 or less	9.6
6-10	24.0
11-25	34.4
26-35	10.4
36-50	3.2
Over 50	18.4
Total Monthly Sales of Dealership	
less than $100,000	16.0
$100,001 - $250,000	24.0
$250,001 - $500,000	25.6
$500,001 - $1,000,000	9.6
$1,000,001 - $5,000,000	15.2
Over $5,000,000	5.6
Information not provided	4.0

After collecting the data, we purified the scales and tested them for reliability, validity and unidimensionality, using the procedures described in the next section. The scale items are shown in the Appendix. The descriptive statistics are provided in Table 2.

Norm of Information Sharing: was initially operationalized by an eight-item Likert scale adapted from Noordewier et al. (1990), and Heide and John (1992). The items in this scale tapped the extent to which the parties kept each other fully informed about important issues, changes, and events. Two items were dropped in the initial reliability analysis because of low item-to-total correlations. Two more items were dropped during the exploratory factor analysis since they did not exhibit clean loadings. The final scale had four items with a coefficient alpha of 0.68.[4]

Frequency: of communication has consistently been operationalized as a formative scale in which respondents assess frequency of contact over variety of communication modes. "More" of the construct is defined as higher frequency across possible modes of communication

(Frazier, Gill and Kale, 1989). For our scale, we used eight modes of communication (see Appendix); the dealers indicated how frequently they provided information to the focal manufacturer for each of these eight modes. Similarly, they indicated how frequently the focal manufacturer provided information to them using these same eight modes. The scores on the eight modes of dealer communication were averaged to form an index of the dealer's frequency of communication, and a similar index was formed for the manufacturer's frequency of communication. These two indices were used as indicants of the "frequency of communication" construct in our model. Since the indices were formative, rather than reflective, we did not compute their coefficient alpha (Howell, 1987).

Bidirectionality: was operationalized with a three item scale (adapted from Anderson et al., 1987), which measured the extent to which feedback was given: (a) by the dealer to the manufacturer (1 item), and (b) by the manufacturer to the dealer (2 items). The two items measuring the manufacturer's feedback to the dealer were averaged to form one indicator of bidirectionality. The single item measuring the dealer's feedback formed the second indicant of bidirectionality. Once again, we did not compute coefficient alpha due to the formative nature of this scale.

Formality: of communication was operationalized by a four-item Likert scale, also adapted from Anderson et al. (1987). These four items captured the extent to which formal mechanisms for communication existed within the manufacturer-dealer relationship. Specifically, they tapped the extent to which communication flows were structured and regularized (see Anderson et al., 1987). The coefficient alpha for this scale was 0.86.

Distortion and Withholding: tapped the dealer's distortion and withholding of information and was operationalized with a four-item Likert scale (based on Roberts and O'Reilly, 1974; O'Reilly and Roberts, 1974). It is important to note the peculiarities associated with measuring distortion and withholding of information. Because respondents may be reluctant to acknowledge their distortion and withholding of information, it was important to allow them to admit so without negative value judgments attached to such behaviors. Based on prior research on distortion and withholding of information (O'Reilly and Roberts, 1974), the lead-in to these items read:

> You may often find it necessary to either change the nature of information (for example, by using different words, shifting emphasis, simplifying, and so forth) or to not pass on information to your manufacturer or sales rep (district manager).

The question then went on to ask four different items regarding the frequency of such behaviors. The coefficient alpha for this four item scale was 0.87.

Communication Quality: assessed the dealer's perceptions of the quality of communication, and was operationalized with a five-item semantic differential scale developed for this study. Recall that communication quality was defined as the extent to which the channel members perceive communication flows to be adequate, timely, accurate, complete, and credible (O'Reilly, 1982; Stohl and Redding, 1987). Accordingly, the scale items tapped into these five aspects of communication quality. The coefficient alpha for this scale was 0.92.

Satisfaction with Communication: was operationalized with a two-item Likert scale that reflected how good or bad the dealer felt about the communication with the referent manufacturer, both in an absolute sense and compared to other manufacturers. The correlation between these two items was 0.82.

Reliability, Validity and Unidimensionality of Measures

To purify the initial measures we followed the procedure suggested by Gerbing and Anderson (1988). We first tested for the internal consistency of scales, using a combination of exploratory factor analysis, and item-to-total correlations. Based on these, we dropped those items that had low item-total-correlations, as well as the items that loaded on multiple factors.

Next, we did a test of scale unidimensionality through confirmatory factor analysis. With the covariance matrix as the input, we analyzed a confirmatory factor model using EQS (Bentler, 1992), in which every item was restricted to load on its pre specified factor. The factors were allowed to correlate. We estimated the model using the elliptical reweighted least squares (ERLS) estimation procedure. The ERLS method assumes a multivariate elliptical distribution which is a more generalized form of the multivariate normal distribution assumed by the Maximum Likelihood (ML) method (Browne, 1984). According to Sharma, Durvasula, and Dillon (1989, p. 220), "... the performance of ERLS is equivalent to that of ML for normal data and superior to that of other estimation techniques for non-normal data."

Table 3 shows the results of the measurement model confirmatory factor analysis. The overall chi-square statistic of the model is significant (Chi-Square (209 d.f.) = 412.73, $p < 0.001$) which is expected given the number of parameters being estimated. But, the Comparative Fit Index (CFI = 0.93) indicates that the model fits the data adequately. Furthermore, an examination of the standardized residuals reveals that they are distributed normally. The Average Off-Diagonal Standardized Residual (AOSR) is 0.05. No standardized residual exceeds 2.58, with the largest standardized residual equal to 0.60. These statistics indicate that our confirmatory factor model is acceptable. All the cogeneric items in the model load significantly on their specified factors, and none of the measurement errors are correlated. This provides satisfactory evidence for the unidimensionality of measures (Anderson and Gerbing, 1988).

Having established unidimensionality, we computed the coefficient alphas for the constructs operationalized by reflective scales. With the exception of one, all the reflective scales exceeded reliability guidelines of 0.70 or above. The one exception, Norms of Information Sharing had a coefficient alpha of 0.68, which was considered acceptable for further analysis.

To test for discriminant validity, we used the nested model confirmatory factor analysis procedure. Taking one pair of constructs at a time, we first estimated a confirmatory factor model in which the covariance between the two construct factors was constrained to unity (implying that there was no discrimination between the two constructs). We then re-estimated the model after freeing the covariance between the factors. A significant difference in the Chi-Square

Table 2. Summary Statistics and Properties of Final Scale Measures

	Pearson Correlations *						
Constructs	NIS	FREQ	FORM	BD	DW	CQ	SAT
Norms of Information Sharing (NIS)	1.00						
Frequency (FREQ)	0.32	1.00					
Formality (FORM)	0.29	0.47	1.00				
Bidirectionality (BD)	0.26	0.40	0.21	1.00			
Distortion and Withholding (DW)	–0.37	–0.10	–0.25	–0.11	1.00		
Communication Quality (CQ)	0.15	0.39	0.32	0.08	–0.12	1.00	
Satisfaction with Communication (SAT)	0.28	0.51	0.41	0.29	–0.16	0.68	1.00
Number of Items	4	8+8	4	1+2	4	5	2
Mean	2.49	3.74	2.83	3.02	3.55	2.52	2.50
Standard Deviation	0.72	0.68	0.97	0.85	0.99	0.99	1.20
Theoretical Range	1–5	1–5	1–5	1–5	1–5	1–5	1–5
Actual Range	1–4.25	1.50–5	1–5	1.25–5	1–5	1–5	1–5
Coefficient Alpha	0.68	f	0.68	f	0.87	0.92	0.82[a]

* Correlations greater than 0.20 are significant at $p < 0.05$

** 5-point scales, lower numbers indicate more of the construct

a. Pearson Correlation

f. Formative indicators in which the measured variables are causes of the underlying theoretical construct

Table 3. Measurement Model-Confirmatory Factor Analysis

Construct	Indicators	Standardized Loading	*t*-Value
Norms of Information Sharing	N1	0.66*	—
	N2	0.79	5.98
	N3	0.58	5.18
	N4	0.27	2.56
Frequency of Communication	Manufacturer's Freq	0.94*	—
	Dealer's Freq	0.70	7.25
Formality	F1	0.84*	—
	F2	0.81	9.91
	F3	0.75	9.02
	F4	0.72	8.56
Bidirectionality	Manufacturer's Feedback	0.50*	—
	Dealer's Feedback	0.60	3.30
Distortion and Withholding	DW1	0.52	—
	DW2	0.56	4.91
	DW3	0.95	6.48
	DW4	0.95	6.48
Communication Quality	CQ1	0.76	—
	CQ2	0.78	9.04
	CQ3	0.90	10.77
	CQ4	0.88	10.39
	CQ5	0.84	9.88
Satisfaction with Communication	S1	0.94*	—
	S2	0.87	13.48

* Value fixed to 1.0 (unstandardized) to set the scale

Goodness of Fit Indices

Chi-square (209 d.f.) =	412.73	$p < 0001$
Comparative Fit Index (CFI) =	0.93	
Average Off-Diagonal Std Residual (AOSR) =	0.05	
Largest Standardized Residual =	0.60	

values between the constrained and unconstrained models, based on the 1 degree of freedom difference, provided evidence of discriminant validity between the two constructs (Anderson and Gerbing, 1988). We estimated a series of models, repeating this procedure for all the construct pairs. All the Chi-Square differences between the constrained and unconstrained models were significant,[5] providing evidence of discriminant validity between the constructs in the model. For example, in the case of the constructs representing communication flows (frequency, formality, and bidirectionality), a test of discrimination between frequency and formality resulted in a Chi-Square difference (1 d.f.) = 20.85 ($p < 0.001$); frequency and bidirectionality had a Chi-Square difference (1 d.f.) = 55.74 ($p < 0.001$); and formality and bidirectionality had a Chi-Square difference (1 d.f.) = 41.56 ($p < 0.001$).

To check for convergent validity, we examined the measurement model. According to Anderson and Gerbing (1988, p. 216), "Convergent validity can be assessed from the measurement model by determining whether each indicator's estimated pattern coefficient on its posited underlying construct factor is significant (greater than twice its standard error)." As Table 3 shows, all items load significantly on their specified constructs and have *t*-values greater than 2.0, providing evidence of convergent validity.

Analysis and Results

After the estimation of a satisfactory measurement model, we estimated our hypothesized structural model with EQS, using the variance-covariance matrix as input. The model was estimated by the ERLS method, because of its advantage discussed earlier. The Chi-Square value for the overall model was significant (Chi-Square (222 d.f.) = 459.54, $p < 0.001$), indicating differences in the data and the proposed model. But the other indices (CFI = 0.91, AOSR = 0.11, largest standardized residual = 0.60), provided evidence of model fit.

To check for the presence of better fitting models, we looked at the Wald test and the Lagrange Multiplier test, computed by EQS. The Wald test shows parameters that can be dropped in the estimated model, with the corresponding increases in the Chi-Square value. Similarly, the Lagrange Multiplier test shows the parameters that can be added to the estimated model, and the corresponding decreases in the Chi-Square value Within a single computer run, these tests provide information that would have to been obtained by comparing a series of alternate models using sequential Chi-Square difference tests (Anderson and Gerbing, 1988, p. 419). Based on the Wald test, we dropped the two nonsignificant paths between bidirectionality and communication quality, and between formalization and communication quality. The Lagrange Multiplier test suggested the addition of two paths: (1) from bidirectionality to satisfaction with communication, and (2) from frequency to satisfaction with communication. Re-estimating the model with these changes resulted in a slight improvement in model fit.

The revised model has a Chi-Square (222 d.f.) = 442.78 ($p < 0.001$). The Comparative Fit Index is 0.92. All the standardized residuals are normally distributed. The largest standardized residual is 0.60, and the Average Off-Diagonal Standardized Residual is 0.09. The Normed Chi-Square Index for model parsimony (Joreskog, 1969) is 1.99, which is within the recommended

Table 4. Standardized Path Coefficients and t-Values for Hypothesized and Revised Structural Models

	Hypothesized Model		Revised Model	
Structural Path	Std Coeff	t-Value	Std. Coeff	t-Value
Norms of Information Sharing → Frequency	0.46	4.12	0.46	4.16
Norms of Information Sharing → Bidirectionality	0.48	2.55	0.59	2.86
Norms of Information Sharing → Formality	0.44	3.77	0.46	3.87
Frequency → Communication Quality	0.50	4.13	0.49	5.41
Bidirectionality → Communication Quality	0.13	n.s.	—	—
Formality → Communication Quality	0.14	n.s.	—	—
Formality → Distortion	–0.29	–2.68	–0.29	–2.70
Communication Quality → Satisfaction	0.76	8.32	0.62	7.07
Additional Paths in Revised Model				
Bidirectionality → Satisfaction	—	—	0.27	2.44
Frequency → Satisfaction	—	—	0.22	2.98
Goodness of Fit Indices				
Degree of Freedom	222	222		
Chi Square	459.54	$p < 0.001$	442.78	$p < 0.001$
Comparative Fit Index (CFI)	0.91		0.92	
Average Off-Diagonal Std. Residual (AOSR)	0.11		0.09	
Largest Standardized Residual	0.60		0.60	

n.s. = Hypothesized path was not significant at $p = 0.05$

range of 1 to 3 (Carmines and McIver, 1981). These statistics indicate that our model is parsimonious and has an acceptable level of fit. Table 4 shows the structural model estimates for the hypothesized and revised models. We have omitted the measurement model estimates, since they are almost identical to the ones shown in Table 3.

H1 and **H2** predicted that information sharing norms would be positively associated with frequency and bidirectionality of communication. These hypotheses were supported (frequency: Std. Coeff = 0.46, *t*-value = 4.16; bidirectionality: Std. Coeff = 0.59, *t*-value = 2.86). When dealers and manufacturers hold bilateral expectations regarding more extensive information sharing, communication is more frequent and more bidirectional.

H3 predicted that norms of information sharing would be negatively associated with formality of communication flows. This hypothesis was not supported-in fact, the finding was exactly the opposite of that predicted (Std. Coeff = 0.46, *t*-value = 3.87). Norms of information sharing, rather than minimizing the formality of communication flows, appear to enhance them. Some of the reasons for this finding are explored in the discussion section.

H4 offered a nondirectional hypothesis for the relationship between communication frequency and quality. The findings show a significant positive relationship between communication frequency and perceived quality (Std. Coeff = 0.49, *t*-value = 5.41).[6] More frequent communication flows enhance a dealer's perception that such communication is timely, adequate, complete-in essence, of higher quality.

H5, regarding the relationship between bidirectionality and communication quality, is not supported in the hypothesized model (Std. Coeff = .13, $p > .05$). It appears that the extent to

which two-way feedback is given/received by manufacturers and dealers does not significantly impact the perceptions of the quality of communication.

H6 offered a nondirectional hypothesis regarding the relationship between formality of communication and perceptions of communication quality. The relationship between these two constructs is not significant in the hypothesized model (Std. Coeff = 0.14, $p > .05$).

H7, which addressed the relationship between formality of communication flows and distortion and withholding was supported (Std. Coeff = -0.29, *t*-value = -2.70). Formality of communication flows appears to have an inhibiting effect on distortion/withholding of information.

H8 predicted that perceived quality of communication is positively associated with a dealer's satisfaction with communication. This hypothesis was also supported (Std. Coeff = 0.62, *t*-value = 7.07).

Recall that two additional paths were added to the model based on the Lagrange Multiplier test. The path from frequency to satisfaction was significant (Std. Coeff = 0.22, *t*-value = 2.98), indicating that higher frequency improves satisfaction with communication. Similarly, the path from bidirectionality to satisfaction was also significant (Std. Coeff = 0.27, *t*-value = 2.44), indicating that bidirectionality also improves satisfaction. No other paths in the model are significant.

Discussion

The findings from this study provide general support for the notion that norms for information sharing within a channel relationship are significantly related to the communication flows within that relationship. In turn, the flows of communication between channel members are significantly related to the dealer's perceived quality of communication and satisfaction with communication. Formality of communication is negatively related to a dealer's withholding and distortion of information.

When manufacturers and dealers expect that information will be shared on a proactive basis, it appears that each channel member in the relationship puts a premium on communication- and their actual communication behaviors exhibit such a premium. Specifically, when norms of information sharing exist, the frequency of contact between the manufacturer and dealer is higher. In addition, norms for information sharing are associated with greater bidirectionality of communication. It seems that the bilateral expectations of information exchange created by the presence of information sharing norms help foster an atmosphere conducive to more open communication. This encourages manufacturers and dealers to communicate more often with each other. It also facilitates greater levels of feedback, both from the manufacturer to the dealer, as well as from the dealer to the manufacturer.

Furthermore, norms for information sharing are associated with greater levels of formality of communication in the relationship. This latter finding was counter to that hypothesized- prior literature suggested that when norms of information sharing exist in a relationship, they would preclude the need for formalizing communication flows. However, it appears that formality of communication serves as a mechanism to implement information exchange, and norms of information sharing encourage members' willingness to initiate and establish

routines and procedures for communication. Hence, the prevalence of information sharing norms enhances the commitment to planned, cooperative efforts, as reflected in more formal communication flows.

In turn, our model suggested that these flows of communication (frequency, bidirectionality, and formality) would be significantly related to the dealers' summary judgments regarding the quality of that communication. Our findings supported only the linkage between communication frequency and perceived quality of communication; greater communication frequency is associated with higher perceived levels of communication quality. It appears that in the computer industry, characterized by a high degree of technological change, greater frequency of communication facilitates a more complete, accurate, and timely flow of information between the manufacturer and the dealer. Hence, rather than being a nuisance or annoyance factor, causing information overload problems or confusion, higher communication frequency enhances dealers' perceptions of communication quality.

Increased bidirectionality of communication (in terms of feedback shared between dealers and manufacturers) does not appear to impact the perceived quality of communication. It could be that such perceptions are more a function of active participation in communication exchanges, rather than merely the amount of feedback given or received.

However, bidirectionality is directly related to dealers' satisfaction with communication, as is more frequent communication. We did not hypothesize these two direct relationships between the flows of communication (frequency and bidirectionality) and a dealer's satisfaction with communication—we expected that the impact of the flows of communication on satisfaction would be mediated by the perceived quality of that communication. But, our results show direct, positive relationships between frequency and satisfaction with communication, and between bidirectionality and satisfaction with communication. A possible reason for these findings may be that increased frequency and bidirectionality (in terms of the dealer's ability to give feedback to and receive feedback from a manufacturer) enhance the dealer's perception of openness and participation in the dealings with the manufacturer, contributing to greater satisfaction with communication.

Note that of the three communication flow variables (frequency, bidirectionality, and formality), only formality is *not* significantly related to either perceptions of quality or satisfaction with communication. While more routinized, structured procedures to guide communication may be important, they appear not to contribute to dealers' perceptions of communication quality nor their satisfaction with such communication. The lack of a significant relationship between formality and communication quality might be due to environmental factors in the channel relationship. For example, if some relationships required more adaptiveness (and hence, less formality), while others needed stability (and hence, more formality), their opposing effects on the linkage between formality and communication quality might have been a source of the nonsignificant findings. Our findings indicate that formality of communication has a significantly negative impact on the dealer's distortion and withholding of information. This provides support for our reasoning that when planned and structured procedures are in place to guide communication, the chances for altering or omitting information are reduced. To the extent that distortion and withholding of information are detrimental to the effective functioning of the relationship, more formal procedures for communication can mitigate these behaviors.

Limitations

Our findings must be interpreted in light of the limitations of our model. Additional scale development of communication flows and assessments would be helpful. For example, while prior research has focused on the extent to which feedback is given (Anderson et al., 1987), other conceptualizations of bidirectionality of communication flows are possible, and in fact, might offer additional insights. Similar issues could be addressed with our other communications measures.

In addition, we assessed only the dealers' perspective about the nature of communication in the relationship. While measures were included for the level of frequency and feedback from the manufacturer, manufacturers' perceptions are still unknown. The fact that data were collected from only the dealers' perspective also affected the paths in our model. For example, our measure of distortion and withholding pertained to the *dealer's* distortion and withholding, while quality and satisfaction were measured in terms of the dealer's perceptions of communication from the manufacturer. Hence, it did not make sense to posit a path between dealer's distortion and withholding to quality and satisfaction of communication from the manufacturer. With different perspectives on this issues, it might seem plausible that dealer's perceptions of manufacturer's distortion and withholding could be negatively related to the dealer's perceptions of quality and satisfaction of communication from the manufacturer.

We have tested our model in only the computer reseller industry, which may restrict the applicability of our results to other industries. While our scales and model could usefully be validated in other industries, we believe that our findings are generalizable and that similar results would likely be obtained in other retailing contexts.

Since the purpose of our study was to focus on the different aspects of communication behaviors, our model included only those variables that were relevant to the objective of our study. We did not include in our model constructs such as commitment, trust, overall satisfaction, and performance (Anderson and Weitz, 1992; Morgan and Hunt, 1994). These variables have been shown to be important outcomes of communication flows, and it would be useful to explore them in future research.

Finally, our study is limited by the cross-sectional nature of the design. Even though we have used the structural equations methodology, interpretation of causality between constructs should be treated with caution. The causality issue may be particularly important in assessing the relationship between norms of information sharing and actual communication flows. It is possible that, over time, where communication is more frequent, bidirectional, and formal, the communication flows themselves facilitate the emergence of information sharing norms.

Contributions and Implications

Notwithstanding its limitations, our study makes a number of theoretical contributions. The first one is with respect to the role of information sharing norms in the communication process. While norms of information sharing have been studied in the channels literature (Heide and John, 1992; Noordewier et al., 1990), they have not been linked to communication flows.

Our study shows the importance of these norms in facilitating the frequency, bidirectionality, and formality of communication.

The bulk of prior literature in channels has focused on the positive aspects of communication behaviors. While others have acknowledged that this type of behavior is likely to exist within the channel (Stern and El-Ansary, 1992), to our knowledge no researchers have included it in empirical research. Our findings show that while the overall level of distortion and withholding of information is moderate (mean = 3.55; standard deviation = 0.99), it does occur. We encourage channels researchers to include in their studies communication behaviors that tap the less salutary nature of communication flows, such as distortion and withholding of information. To the extent that distortion and withholding lead to information asymmetries in the relationship, it would be important to measure.

In terms of outcome variables, our study offers a more thorough operationalization of communication quality-a summary assessment of the nature of communication in channels of distribution, based on organizational communications research. Further, our study makes a contribution by showing the significance of satisfaction with communication as an outcome variable.

Our study also offers insight into the choice of communication variables that researchers may want to include in their studies. Which variable(s) to use depends on the objectives or purpose of the study. If the researcher's interest is in the diagnosis of the nature of communication flows in the relationship, or if communication problems exist, the researcher would probably find it most useful to focus on frequency, formality, and bidirectionality. If the researcher is interested in an overall assessment of communication, then quality of communication or satisfaction with communication may be preferred.

In addition to the theoretical contributions, our study has implications for managers. Certainly managers can increase the frequency, bidirectionality, and formality of communication with channel partners. By increasing the frequency of communication alone, they can enhance the quality of communication, leading to increases in the channel partner's satisfaction with communication. Infrequent communication may leave channel members feeling left out of the loop; downstream channel members may lack the necessary information to effectively merchandise and market a manufacturer's product. Hence, infrequent communication is associated with perceptions of lower communication quality. Moreover, by controlling the level of formality in the communication process, channel managers can reduce the distortion and withholding of information by channel partners.

Quite often, manufacturers tend to place great importance on margins and outcomes for developing effective channel relationships, but neglect procedural factors such as communication (Kumar, Scheer and Steenkamp, 1995). To the extent that relationships depend on effective communication, the role of communication flows becomes extremely important. Our study provides insight into the nature of those flows, an important antecedent-norms of information sharing, and summary assessments of communication flows.

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Appendix-Scale Items[a]

1. Norms of Information Sharing (Strongly Agree/Strongly Disagree)
(Adapted from Noordewier, John, and Nevin, 1990; Heide and John, 1992)

- We inform the manufacturer in advance of changing needs.
- We share proprietary information with this manufacturer.
- In this relationship, it is expected that any information which might help the other party will be provided.
- The parties are expected to keep each other informed about events or changes that may affect the other party.

A. The following items were dropped during the scale purification process:

- It is expected that the parties will only provide information according to prespecified agreements. (R)
- We do not volunteer much information regarding our business to the manufacturer. (R)
- This manufacturer keeps us fully informed about issues that affect our business.
- This manufacturer shares proprietary information with us (e.g., about products in development, etc.)

2. Frequency (Very Frequent/Very Infrequent) — formative scale (Brown, 1981)
These scales asked the respondents to estimate the frequency of communication over a typical four-week period for each of the communication modes provided.

A. *Dealer Frequency*
Face-to-face interaction with salespeople
Telephone interaction with salespeople
Technical support
Written letters, correspondence
Computer link
Trade shows
Dealer Councils
Seminars
(Summed and divided by 8)

B. *Manufacturer frequency*
Face-to-face interaction with salespeople
Telephone interaction with salespeople
Technical support
Written letters, correspondence
Computer link
Trade shows
Dealer councils
Seminars
(Summed and divided by 8)

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a. All items are measured on a five point scale with lower scores indicating more of the construct. If an origin for a scale is not listed, it was originated during this research. (R) denotes reverse coded Item

3. Bidirectionality (A Lot/None) — formative scale
(Anderson, Lodish, and Weitz, 1987)
A. *Dealer's Feedback*
How much feedback:
—do you provide to this manufacturer about the product, market conditions, etc.?
B. *Manufacturer's Feedback*
How much feedback:
—does this manufacturer provide to you?
(negative feedback)
(positive feedback)
(summed and divided by 2)

4. Formality (Strongly Agree/Strongly Disagree)
(Anderson, Lodish, and Weitz, 1987)
- In coordinating our activities with this manufacturer, formal communication channels are followed (i.e., channels that are regularized, structured modes versus casual, informal, word-of-mouth modes).
- The terms of our relationship have been written down in detail.
- The manufacturer's expectations of us are communicated in detail.
- The terms of our relationship have been explicitly verbalized and discussed.

5. Communication Quality (Semantic Differential)
To what extent do you feel that your communication with this manufacturer is:
- Timely/untimely?
- Accurate/inaccurate?
- Adequate/inadequate?
- Complete/incomplete?
- Credible/not credible?

6. Distortion and Withholding (Very frequently/Very infrequently)
(Roberts and O'Reilly, 1974; O'Reilly and Roberts, 1974)
You may often find it necessary to either change the nature of information (for example, by using different words, shifting emphasis, simplifying, and so forth) or to not pass on information to your manufacturer or sales rep (district manager). How frequently do you:
- Change the nature of information before passing it on to the manufacturer?
- Change the nature of information before passing it on to the sales rep?
- Not pass information on to the manufacturer?
- Not pass information on to the sales rep?

7. Satisfaction with Communication (Very Good/Very Bad)
- In general, how do you feel about the communication with this manufacturer?
- Compared to other manufacturers, how good is communication with this manufacturer?

Notes

1. Some researchers have also examined the content of influence attempts used to exercise power (Boyle et al., 1992; Frazier and Summers, 1984). We do not examine this aspect of communication in our model.
2. Relational contracting theory identifies the dimensions of exchange which move exchange relationships from discrete transactions to more extended, on-going, and open exchanges (MacNeil, 1981).
3. Information impactedness, which arises from uncertainty and opportunism, exists when the true underlying circumstances relevant to a transaction are known to one party but cannot be costlessly discerned by the other (Williamson, 1975, p. 31). Such asymmetric information conditions subject parties to exchange hazards, such as adverse selection and moral hazard
4. In the four-item scale which we used, items 1 and 2 are more behavioral in nature, while items 3 and 4 are focused on expectations One reviewer suggested that our scale would be more appropriate with only Items 3 and 4, since norms are based on expectations; and using Items 1 and 2 to predict communication behaviors could be tautological. When the data analysis is conducted With only items 3 and 4, the results remain the same as those reported here.
5. In the test for discrimination between Communication Quality and Satisfaction, the Chi-Square difference (1 d.f.) was 2.81, which is significant at $p < .10$. For all other construct pairs, Chi-Square differences were significant at $p < .01$ or better.
6. We also tested for nonlinearities in the relationship between communication frequency and quality and found none.

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