

Remote Leadership, Communication Effectiveness and Leader Performance

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Abstract As remote work arrangements have gained in popularity, workforce dispersion has become increasingly widespread. Little research to date has examined how physical distance influences leader–follower communication effectiveness or leader performance. Building on top of transformational leadership theory, this paper explores how perceived leader performance is influenced by leadership style, physical distance, and communication effectiveness between leaders and followers. A survey of 138 followers, reporting to a total of 41 leaders, was conducted and data were analyzed at the individual follower-level using the Partial Least Squares (PLS) technique. Our model explained 45% of the variance in communication effectiveness and 67% of the variance in perceived leader performance. Consistent with past empirical findings, transformational leadership was associated more strongly with perceived leader performance than transactional contingent reward leadership. Communication effectiveness was also a strong predictor of leader performance, and furthermore acted as a mediator of leadership behavior on performance. Surprisingly, distance had no influence on either communication effectiveness or perceived leader performance. Implications for theory and practice are discussed.

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1 Introduction

Since the invention of the first electronic digital computer, continuous adoption of new information and communication technologies (ICT) has dramatically influenced the nature of organizational relationships both inside and outside the firm. One manifestation of this is the ICT-enabled virtual organization that spans geographical and temporal boundaries (Davidow and Malone 1992) and operates as a dispersed, collaborative network of people who are independent of location or affiliation (Hedberg 1997). In the United States over 12 million employees, or 9% of the employee population, work virtually at least 8 h per week (U.S. Bureau of Labor Statistics 2002; Jones 2005). Similar numbers have been reported for Canada (10%, Statistics Canada 2001) and the United Kingdom (8%, Ruiz and Walling 2005). Fortune Magazine (2006) indicated that 79 of the 100 best companies to work for allow employees to work remotely at least 20% of the time. Virtual work appears to be especially proliferating in global corporations. At Intel Corporation, for instance, some 70% of employees regularly collaborate with colleagues located in different time zones without ever meeting face-to-face (Intel Corporation 2004). A study by IDC Corporation predicts that there will be one billion technology-enabled mobile workers globally by the year 2011 (Sudan et al. 2007).

One effect of this shift toward virtual work arrangements is that leaders must assume more responsibility for working with followers who are at a distance (Antonakis and Atwater 2002; Avolio et al. 2000). According to Bass (1990a, p. 658), effective leadership “depends on physical proximity, social and organizational propinquity, and networks of open channels of communications.” In this vein, Howell and Hall-Merenda (1999) investigated how the joint impact of leader–member exchange relationships and leadership style was moderated by physical distance in predicting individual-level follower performance. Howell et al. (2005) extended that work and reported that physical distance moderated the relationship between leadership and business unit financial performance (negatively for transformational leaders, positively for transactional leaders).

Meanwhile, virtual work research examining communication at a distance has shown changes in frequency, quality, and satisfaction with communication (Gainey et al. 1999; Duxbury and Neufeld 1999; Bélanger et al. 2001; Watson-Fritz et al. 1998). It has also raised questions about the performance implications of virtual work arrangements (Neufeld and Fang 2005; Staples et al. 1999). As organizations and employees become increasingly dispersed, communication becomes the principal means by which individuals exercise leadership (Penley and Hawkins 1985)—in essence, “leadership is enacted through communication” (Barge 1994, p. 21). We do not yet have a very clear understanding of how these variables are related, and leadership researchers have called for developing an improved understanding of the links between leadership and communication (Conger and Kanungo 1988; House and Shamir 1993; Mumford et al. 2000).

Thus, the objective of this paper is to improve our theoretical and practical understanding by engaging in a concurrent study of leadership, communication, and physical distance. We are guided by the following research question: *how is leader performance influenced by leadership style, physical distance, and communication effectiveness between leaders and followers?* Drawing on transformational leadership theory, as well as intra-organizational communication and virtual work literatures, a conceptual model is presented that captures the relevant aspects from this literature. A PLS model is constructed and tested using survey data collected from 138 direct reports of 41 senior business managers located in different organizations.

Three major findings are reported. First, transformational leadership positively influenced perceived leader performance, in ways consistent with transformational leadership theory and previously published empirical studies. Second, communication effectiveness significantly influenced perceived leader performance, and acted as a mediator of leadership style on performance—an important extension to the leadership literature. Third, building on the virtual work research cited above, and despite substantial variance in physical distance reported by subjects, distance had no significant influence on either perceived leader performance or communication effectiveness.

2 Distance, Communication Effectiveness and Leadership

This work is rooted in transformational leadership theory. Transformational leadership provides an alternative perspective to transactional leadership, which emphasizes authority-based exchange relationships and contingency-based rewards and punishments (Bass 1990b). Transformational leadership theory posits that leaders can transform followers in three essential ways: by increasing their awareness of task importance; by focusing them first on team or organizational goals; and by activating their higher order needs (Bass 1985). The required components of authentic transformational leadership behavior are characterized by the “four I” behaviors—idealized influence (e.g., exemplary role modeling), inspirational motivation (e.g., creating a compelling vision of the future), intellectual stimulation (e.g., fostering critical or innovative problem solving), and individualized consideration (e.g., coaching and mentoring) (Avolio et al. 1991). The first two dimensions, idealized influence and inspirational motivation, were originally conceived by Bass (1985) as a single dimension (“Charisma”), and this treatment has subsequently been validated empirically (Howell and Frost 1989; Bycio et al. 1995; Awamleh and Gardner 1999). Leaders who successfully engage in transformational leadership behaviors can elicit output from their followers that exceeds expectations.

Much of the published leadership literature has been situated in collocated research contexts in which leaders and followers are proximally located to one another. However, results may differ for close versus distant leader–follower relationships (Yammarino 1994; Shamir 1995). Some prior research has dealt with leadership at a distance in terms of leadership impression management (Conger and Kanungo 1998; Gardner and Martinko 1988; Rao et al. 1995), leadership communication (Shepherd and Weschler 1955; Streufert 1965), leadership substitutes (Kerr and Jermier 1978), and leadership performance appraisal (Ferris et al. 1994; Judge and Ferris 1993;

McFillen and New 1979; Sundstrom 1986). According to Conger and Kanungo (1998, p. 62), “proximity to the leader may influence the importance of certain behavioral components in attributions of charisma.” Similarly, Shamir (1995) showed that rhetorical skills were more frequently attributed as an important characteristic of physically distant charismatic leaders, while being considerate of others and exhibiting unconventional behavior were more important attributions for close charismatic leaders.

Communication effectiveness has also been broadly linked with leadership effectiveness (Klauss and Bass 1982), and this is reflected in some conceptual overlap across measures of leadership behavior and communication style in the leadership literature. Effective personal communication skills allow leaders to create and disseminate a compelling vision for followers, a central component of charisma (Bennis and Nanus 1985; Conger and Kanungo 1987; Locke et al. 1991). Effective leaders may tend to communicate using more metaphors, symbols, imagery and persuasive argumentation to sway others to accept their position (Bass 1985). Conger and Kanungo (1998, p. 54) stated that, “to be charismatic, leaders not only need to have visions and plans for achieving them but also must be able to articulate their visions and strategies for action in effective ways as to influence their followers”. A leader can help followers understand why and how the activities they are engaging in are meaningful, and this is largely accomplished through language and interpersonal communication (Pondy 1978). Apart from a broad acknowledgement that leadership and communication seem to be conceptually related, there has been little empirical research explicitly examining leader communication effectiveness (Den Hartog and Verbarg 1997; Shamir et al. 1994; Westley and Mintzberg 1991).

2.1 Leadership and Perceived Performance

A model for understanding the interplay of leadership style, physical distance, communication effectiveness and performance is proposed in Fig. 1 and described below.

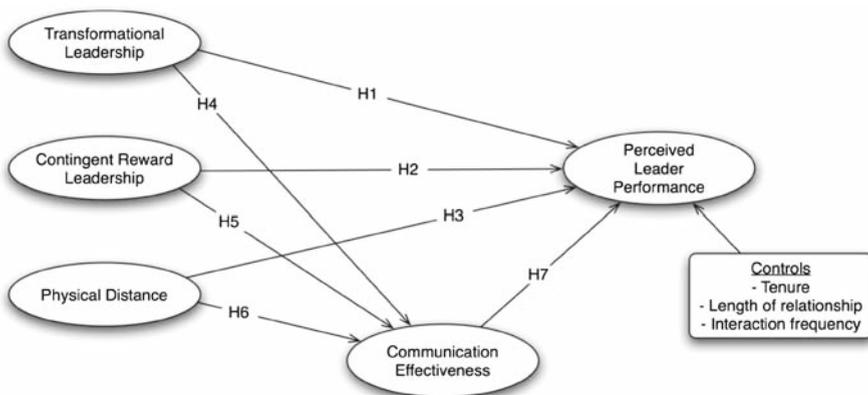


Fig. 1 Remote leadership research model

A large body of empirical research has consistently demonstrated that leadership behaviors influence organizational performance, that strong leaders outperform weak leaders, and that transformational leadership generates higher performance than transactional leadership (Burns 1978; Bass 1990a; Conger and Kanungo 1987; Hater and Bass 1988; Howell and Avolio 1993). Kirkpatrick and Locke (1996) identified over 35 studies reporting positive relationships between leadership and performance. Transformational leadership or its components have been associated with increases in individual, unit, and/or organizational performance in a variety of meta-analyses (Lowe et al. 1996), historical archival studies (House et al. 1991), laboratory experiments (Howell and Frost 1989; Kirkpatrick and Locke 1996), field experiments (Barling et al. 1996), and field studies (Baum et al. 1998; Curphy 1992; Hater and Bass 1988; Howell and Avolio 1993; Keller 1992). Recent leadership studies have continued to affirm the positive relationship between transformational leadership and performance at various levels (e.g., Dum Dum et al. 2002; Dvir et al. 2002; Howell et al. 2005). Transactional contingent reward leadership behaviors have also been positively associated with performance, although to a lesser degree than transformational leadership (Klimoski and Hayes 1980; Podsakoff et al. 1982, 1984; Boerner et al. 2007). Although they are sometimes treated as a dichotomy, we believe it is entirely possible for a given leader to exhibit neither, one, or both transformational and/or transactional leadership behaviors to varying degrees, in different situations. From the foregoing we propose two baseline hypotheses:

H1: Transformational leadership positively influences perceived leader performance.

H2: Transactional contingent reward leadership positively influences perceived leader performance, but to a lesser extent than transformational leadership.

2.2 Distance and Perceived Leadership Performance

Being at a distance may make it more difficult for transformational leaders to establish relationships and thus to influence the outcomes of their followers' performance (Avolio 1999; Kerr and Jermier 1978). In his research on military commanders, Bass (1998, p. 160) observed that, "Physical distances may be too great for much personal interaction and serve to neutralize much of the commander's transformational influence." Podsakoff and his colleagues (1984) concluded that physical distance negatively affected the transactional leader's ability to negotiate contracts concerning expectations and rewards, observe follower performance, and provide timely feedback and rewards. While contrary empirical findings have also been reported (e.g., Howell and Hall-Merenda 1999; Howell et al. 2005), distance on the whole appears to exert a negative impact on leadership effectiveness. Thus:

H3: Physical distance negatively influences perceived leader performance.

2.3 Leadership and Communication Effectiveness

Information richness theory defines communication effectiveness in terms of its efficacy in reducing equivocality (ambiguity) and uncertainty (Daft and Lengel 1986).

Communication is most effective when it leads to shared understanding (Chidambaram and Jones 1993; Qureshi et al. 2006). Personal communication skills are critical in determining whether a leader's message will be recalled and embraced (Conger and Kanungo 1988, 1998; Locke et al. 1991). The most effective leaders interact and communicate with their followers frequently (Bass 1990a), fostering mutual trust, respect, and healthy obligation between leader and followers (Uhl-Bien and Graen 1998). Effective transformational leaders tend to craft their messages carefully, are open to followers' input, communicate candidly, and appeal to followers' aspirations in order to gain followers' trust and commitment (Bass 1998; Bennis and Nanus 1985; Conger and Kanungo 1987). Leaders can also exercise their influence to motivate and inspire followers so as to draw them toward a shared understanding (Avolio 1999; Bass 1990a). From the foregoing arguments we hypothesize the following:

H4: Transformational leadership positively influences communication effectiveness.

Similarly, effective transactional leaders communicate for the purpose of establishing performance evaluation criteria, resolving differences in understanding, and negotiating and evaluating implicit and explicit contracts (Flauto 1999), thus reducing equivocality and uncertainty and increasing communication effectiveness (Daft and Lengel 1986). Regardless of leadership style, the most effective leaders provide regular, detailed, and prompt communication with their followers (Kayworth and Leidner 2001). Therefore:

H5: Transactional contingent reward leadership positively influences communication effectiveness.

2.4 Distance and Communication Effectiveness

Distant leaders may have greater difficulty in achieving high levels of communication effectiveness. Distant leaders must rely more heavily on explicit communication, whereas proximal leaders may have at their disposal additional informal influence behaviors (such as "standing on furniture" or "hanging ideas on clotheslines", Jaussi and Dionne 2003, p. 475). Leaders and followers communicate and work synchronously and asynchronously through all kinds of information and communication technologies (e.g., e-mail, voice mail, video conferencing, and collaborative software systems), but technology mediated communication may be less effective in conveying social presence (Daft and Lengel 1986; Rice 1993). This may be related to reduced opportunities for interaction, reduced access to popular communication channels, time delays, and lack of shared language among diversified members (Powell et al. 2004; Kayworth and Leidner 2001). Therefore, distant leaders have to spend extra effort in converting and explicating what otherwise could be shared with ease through social presence in a physically approximate situation (Avolio and Kahai 2003; Kelloway et al. 2003). This leads to the next hypothesis:

H6: Physical distance negatively influences communication effectiveness.

2.5 Communication Effectiveness and Leader Performance

Individual and group productivity have been positively correlated with ease and freedom of communication between superiors and followers (Indik et al. 1961; Jain 1973; Hoegl and Gemuenden 2001). Effective communication between leader and followers can leave employees with a positive impression of the leader and improve perceptions of leader performance (Conger and Kanungo 1998; Gardner and Martinko 1988; Rao et al. 1995). This results in the final hypothesis:

H7: Communication effectiveness positively influences perceived leader performance.

3 Research Method

3.1 Sample

A survey invitation letter describing the study was sent to 784 executive MBA alumni who graduated from a Canadian business school between 2002 and 2004. Forty-four leader respondents met the study criteria (i.e., they had leadership responsibility for a minimum of three direct reports, and were willing to complete a survey and promote it to their direct reports). In accordance with Dillman's (2000) "Total Design Method" a personalized e-mail invitation to complete a web-based survey was sent to these 44 leaders and their 181 followers. To validate their survey and insure data access integrity, respondents were required to enter a unique authentication code that was provided in the invitation letter. The online survey cover page assured respondents that the information they provided would be kept strictly confidential. Three rounds of follow-up reminder e-mails were distributed. Questionnaire responses were returned electronically to the authors. One hundred seventy nine of the 225 surveys were returned, including 138 out of 181 follower surveys (76.2%), and 41 out of 44 leader surveys (93.2%). A demographic summary of leaders and followers is shown in Table 1. This paper focuses exclusively on the follower data.

3.2 Measures

3.2.1 Transformational leadership

Transformational leadership is defined as behavior that goes "beyond exchanging inducements for desired performance by developing, intellectually stimulating, and inspiring followers to transcend their own self-interests for a higher collective purpose, mission, or vision" (Howell and Avolio 1993, p. 891). This was assessed using the Multifactor Leadership Questionnaire Form 5X (MLQ-5X) (Bass and Avolio 1990). Survey length restrictions prevented us from using the full 21-item measure, and so we selected six items to represent the three core dimensions: charisma (two items, e.g., "My direct manager talks optimistically about the future"); intellectual stimulation

Table 1 Sample characteristics

	Leaders	Followers
N surveys distributed	44	181
N surveys returned	41 (93.2%)	138 (76.2%)
Gender (% male)	85.4%	54.9%
Age (years)	35.9	35.8
Organizational tenure (months)	89.8	86.8
Time working with leader (months)	–	23.6
Job type		
Managerial	60.5%	47.5%
Professional/technical	23.7%	36.1%
Administrative/clerical	0.0%	9.0%
Other	15.6%	7.4%
Interaction frequency per week (Mean, S.D.)		
Face-to-face	–	0.9 (0.9)
Telephone		2.9 (24.4)
Video		0.0 (0.2)
Voicemail		0.5 (0.8)
Email		2.9 (4.4)
Written		0.1 (0.2)
Total		7.2 (5.1)

(two items, e.g., “*My direct manager seeks differing perspectives when solving problems*”); and individualized consideration (two items, e.g., “*My direct manager spends time teaching and coaching*”). These measures were captured on 7-point response scales (“Strongly Disagree” to “Strongly Agree”).

3.2.2 Transactional contingent reward leadership

Transactional contingent reward leadership refers to “an active and positive exchange between leaders and followers whereby followers are rewarded or recognized for accomplishing agreed-upon objectives” (Howell and Avolio 1993, p. 891). This was measured using three items drawn from the MLQ-5X, captured on 7-point response scales (e.g., “*My direct manager makes clear what one can expect to receive when performance goals are achieved*”).

3.2.3 Leader performance

Leader performance was assessed by followers using the four effectiveness items provided in the MLQ-5X (Bass and Avolio 1990) (e.g., “*My direct manager is effective in meeting organizational requirements*”).

3.2.4 Communication effectiveness

Communication effectiveness refers to the quality of leader–follower interactions as perceived by the followers. Again due to survey length restrictions, this construct was measured using a subset of six items drawn from a 20-item scale developed by [Chidambaram and Jones \(1993\)](#). The chosen items were selected due to their simple and straightforward wording (i.e., we removed items that contained potentially confusing terms such as “Constricted–Spacious” and “Hot–Cold”), and in terms of their concrete applicability to job-related communication tasks (i.e., we removed items that contained terms of a more general nature such as “Dehumanizing–Humanizing” and “Expressive–Inexpressive”). The final items used were: *Good–Bad*; *Inaccessible–Accessible*; *True–False*; *Difficult–Easy*; *Meaningless–Meaningful*; and *Successful–Unsuccessful* (subjects responded using a 7-point Likert-type scale).

3.2.5 Physical distance

Physical distance between leaders and followers was measured using three items adapted from [Kerr and Jermier \(1978\)](#) (e.g., “*The nature of my job is such that my manager is around me when I’m working*”).

3.2.6 Control Variables

Several control variables were included in the analysis. Because prior experience with a leader has been shown to affect performance (e.g., [Waldman et al. 2001](#)), we included both length of leader–follower relationship (in months), and followers’ job tenure (in months), as control variables leading to leader performance. Also, we anticipated a potential correlation between interaction frequency and leader performance ([Antonakis and Atwater 2002](#)), and so we included leader–follower interaction frequency as a third control variable.

3.3 Data Analysis

The conceptual model was tested using Partial Least Squares (PLS), a second-generation multivariate analytic technique that enables path analytic modeling using latent variables ([Wold 1982](#); [Chin 1998](#)). The loadings of items on constructs in a PLS model are the same as factor loadings, path coefficients are standardized regression coefficients, and R^2 values describe variance explained in dependent variables. PLS is regarded as an appropriate statistical tool for early stage research models where the emphasis is on theory exploration, extension, and prediction ([Jöreskog and Wold 1982](#)). Unlike standard linear regression, PLS does not require multivariate normality when estimating parameters, and is suitable for use with smaller samples ([Barclay et al. 1995](#)) (for a more detailed discussion of shortcomings of regression analysis, see [Wilcox 1998](#)). Tests of reliability and validity were conducted, including those for item reliability, internal consistency, convergent validity, and discriminant validity ([Hulland 1999](#)). Path significance was assessed using bootstrap statistics and a

blindfold resampling procedure, with a total of 500 resamples and an omission distance of one case per sample (Lohmöller 1984). Mediation was assessed using Sobel tests (Sobel 1982).

4 Results

4.1 Measurement Model

Results demonstrated satisfactory item reliability, internal consistency, convergent validity and discriminant validity (see Table 2). First, with one exception all measurement items loaded at 0.7 or above on their respective constructs, indicating acceptable item reliability (Chin 1998; Carmines and Zeller 1979). (Consistent with the exploratory nature of this study, one communication effectiveness item with a loading of .67 was judged to be close enough to the cutoff and retained.) Second, internal consistency was well above the commonly used 0.7 cut off for all five multi-item constructs (Nunnally 1978). Third, average variance extracted (AVE), a measure of the average amount of variance that a construct captures from its indicators relative to the amount due to measurement error, was well above the 0.5 threshold for all constructs suggesting satisfactory convergent validity (Fornell and Larcker 1981; Chin 1998). Fourth, items correlated most strongly with their intended construct (as shown by loadings and cross loadings in Table 2), and differences were greater than 0.10 for 171 out of 175 cross loadings, indicating acceptable discriminant validity (Barclay et al. 1995; Wixom and Todd 2005). Also, the average correlation among the measures of each construct (shown on the diagonal of the correlation matrix of Table 3) was greater than each construct's relationship with any other construct, providing further evidence of discriminant validity. Although a high correlation was observed between the transformational and contingent reward leadership constructs, this finding is consistent with prior empirical leadership studies (Avolio 1999).

4.2 Structural Model

Table 4 presents the results of hypothesis testing. The model explained a high proportion of the variance in communication effectiveness ($R^2 = .45$) and perceived leadership performance ($R^2 = .67$).

Hypothesis 1 was supported: transformational leadership positively predicted leader effectiveness ($\beta = .46, t = 4.45, p < .001$). Hypothesis 2, which stated that contingent reward leadership would positively predict leader effectiveness, was not supported ($\beta = .19, t = 1.86, n.s.$). Hypothesis 3 was not supported: distance had no effect on perceived leader performance ($\beta = -.04, t = 0.61, n.s.$). Hypothesis 4 stated that transformational leadership positively predicted communication effectiveness, and it was supported ($\beta = .37, t = 3.67, p < .001$). Likewise, hypothesis 5 stated that contingent reward leadership positively predicted communication effectiveness, and it was supported ($\beta = .35, t = 3.58, p < .001$). Hypothesis 6 was not supported: physical distance did not influence communication effectiveness ($\beta = .03, t = .40, n.s.$). Finally, hypothesis 7, which stated that communication

Table 2 Loadings, internal consistency reliabilities, and average variance extracted from measures ($N = 138$)

Items	Loadings							Controls			
	TF leadership (0.91, 0.62) ^a	CR leadership (0.79, 0.56)	Comm. effect. (0.89, 0.58)	Physical distance (0.86, 0.67)	Leadership perf. (0.89, 0.67)	Job tenure	Time with leader	Interaction frequency			
TF1	0.73^b	0.47	0.40	-0.01	0.55	0.01	-0.01	0.13			
TF2	0.81	0.62	0.50	0.11	0.58	-0.05	-0.10	0.08			
TF3	0.77	0.52	0.45	0.04	0.55	-0.12	-0.17	0.01			
TF4	0.85	0.70	0.58	-0.01	0.69	-0.05	0.01	0.01			
TF5	0.84	0.60	0.52	0.10	0.62	-0.10	-0.18	0.07			
TF6	0.74	0.56	0.50	0.00	0.61	-0.15	-0.06	0.07			
CR1	0.44	0.71	0.42	0.08	0.42	0.13	0.01	0.12			
CR2	0.47	0.71	0.39	-0.06	0.40	0.15	0.08	0.01			
CR3	0.69	0.81	0.55	-0.06	0.68	-0.08	-0.08	0.08			
CE1	0.48	0.45	0.80	-0.01	0.54	0.10	0.00	0.04			
CE2	0.41	0.47	0.67	0.09	0.46	-0.12	-0.10	0.07			
CE3	0.49	0.48	0.78	0.02	0.53	0.06	-0.06	0.03			
CE4	0.47	0.46	0.72	0.09	0.50	0.04	-0.05	0.05			
CE5	0.52	0.48	0.83	0.04	0.57	0.11	0.01	0.09			
CE6	0.51	0.52	0.77	-0.02	0.50	0.08	0.05	0.07			
PD1	0.03	-0.02	0.02	0.85	-0.01	-0.06	-0.11	-0.08			
PD2	0.07	0.05	0.01	0.71	-0.04	-0.07	-0.19	-0.10			
PD3	0.03	-0.06	0.06	0.89	-0.01	-0.10	-0.16	-0.13			
LP1	0.73	0.66	0.66	0.01	0.85	0.01	-0.04	0.11			
LP2	0.56	0.54	0.52	-0.10	0.78	-0.02	0.10	0.07			
LP3	0.58	0.53	0.51	0.04	0.83	-0.02	-0.02	0.08			

Table 2 continued

Items	Loadings				Controls			
	TF leadership (0.91, 0.62) ^a	CR leadership (0.79, 0.56)	Comm. effect. (0.89, 0.58)	Physical distance (0.86, 0.67)	Leadership perf. (0.89, 0.67)	Job tenure	Time with leader	Interaction frequency
LP4	0.63	0.55	0.51	-0.03	0.82	0.02	0.03	0.06
JT	-0.10	0.06	0.06	-0.10	0.00	1.00	0.27	0.06
TWL	-0.11	-0.01	-0.03	-0.19	0.02	0.27	1.00	0.29
IF	0.08	0.10	0.08	-0.13	0.10	0.06	0.29	1.00

^a Values in parentheses represent internal consistency reliability, and average variance extracted, respectively, for each factor

^b Values in bold represent highest scale loading for each item

Table 3 Means, standard deviations, and intercorrelations of constructs ($N = 138$)

	# Items	Mean	S.D.	TF	CR	CE	Dist.	Perf.	JobT	MWL	Inter'n Freq.
TF leadership	6	5.4	1.4	0.79^a							
CR leadership	3	6.0	1.4	0.74	0.75						
Comm. effect.	6	5.6	1.3	0.63	0.62	0.76					
Physical distance	3	3.7	1.9	0.05	-0.02	0.04	0.82				
Leader perf.	4	5.6	1.2	0.76	0.70	0.68	-0.02	0.82			
Job tenure	1	87.4	85.3	-0.10	0.06	0.06	-0.10	0.00	1.00		
Time with leader	1	24.3	28.1	-0.11	-0.01	-0.03	-0.19	0.02	0.27	1.00	
Interaction freq.	1	519.4	525.6	0.08	0.10	0.08	-0.13	0.10	0.06	0.29	1.00

^a Bold-faced elements on the diagonal represent the square root of the average variance extracted. Off-diagonal elements are correlations between measures. For adequate discriminant validity, the elements in each row and column should be smaller than the bold-faced element in that row or column. Correlations greater than .27 were significant at the $p < .01$ level

Table 4 Results from PLS analysis ($N = 138$)

	Path coefficient β	Path significance t
H1: Transformational → Leader performance	0.46	4.45***
H2: Contingent reward → Leader performance	0.19	1.86
H3: Physical distance → Leader performance	-0.04	0.61
H4: Transformational → Communication effectiveness	0.37	3.67***
H5: Contingent reward → Communication effectiveness	0.35	3.58***
H6: Physical distance → Communication effectiveness	0.03	0.40
H7: Communication effectiveness → Leader performance	0.27	2.94**
R^2 , Communication effectiveness	.45	
R^2 , Perceived leader performance	.67	

Controls: Job tenure ($\lambda = -0.01, t = 0.24, ns$); Time with leader ($\lambda = 0.08, t = 1.36, ns$); Interaction frequency ($\lambda = 0.00, t = 0.10, ns$) * $p < .05$ ** $p < .01$ *** $p < .001$

effectiveness was positively associated with perceived leader performance, was supported ($\beta = .27, t = 2.94, p < .01$).

These results indicate that communication effectiveness mediated the influence of leadership style on perceived leadership performance—or in the words of Barge (1994), that “leadership is enacted through communication”. To examine mediation

Table 5 Mediation results

Model A		Model B		Sobel test	<i>p</i>
Path	<i>t</i>	Path	<i>t</i>		
TF leadership → Communication effectiveness	3.69	Communication effectiveness → Leader performance	3.19	2.41	0.015*
CR leadership → Communication effectiveness	3.72			2.42	0.016*

* $p < .05$

effects we conducted a post-hoc Sobel test (Sobel 1982), which required running two PLS models. The first model included paths from the independent variables (transformational and contingent reward leadership) to the mediator variable (communication effectiveness), and yielded the *t*-test values shown in the “Model A” column of Table 5. The second model included the path from the mediator variable to performance, and provided the *t*-test value shown in the “Model B” column of Table 5. Test results, shown in the final column of the table, demonstrated that communication effectiveness significantly mediated the relationship between transformational leadership and perceived performance (Sobel=2.41, $p = .015$), as well as the relationship between contingent reward leadership and performance (Sobel=2.42, $p = .016$).

5 Discussion

Results confirmed a significant positive link between transformational leadership behavior and perceived leadership performance (H1). The relationship between transactional contingent reward leadership and performance (H2) was not supported using the standard two-tailed test, although we note that the (+.19) path loading would have been significant had we applied a less rigid one-tailed causal test. Similar “close” results have been reported in the leadership literature (e.g., Geyer and Steyrer 1998). Thus, we propose these H1 and H2 results are highly consistent with prior leadership research findings and provide a strong baseline context for an extended evaluation of physical distance and communication effectiveness.

Surprisingly, physical distance had no influence on either leader performance (H3) or communication effectiveness (H6). Despite substantial variance revealed by the physical distance measure (Table 3), follower attributions of performance and communication effectiveness were apparently unaffected by distance. We speculate that these insignificant results might be related to deep relational familiarity shared by these leaders and followers, as suggested by summary data in Table 1 (e.g., organizational tenure in excess of 12 years; experience with leader of almost 2 years; interaction frequency over seven times per week via synchronous or asynchronous means). As individuals absorb the details and nuances of an organization’s culture and managerial norms over time, they learn how to adjust their behaviors and expectations to achieve desired outcomes (Senge 1990). We suspect such learning over time may

negate the impact of physical distance, so that perceptions about performance and communication effectiveness were not influenced by distance. These results indicate that organizational leaders should not presume that distance automatically results in negative communication effectiveness or perceived leadership effectiveness outcomes. In other words, distance doesn't have to be a barrier to effective communication, or effective leadership.

Leadership was positively linked with communication effectiveness for both transformational leadership behaviors (H4) and transactional contingent reward leadership behaviors (H5). The implication of this finding is that managers who are perceived to demonstrate strong leadership behaviors, whether transformational or transactional, will also be seen as engaging in effective communication behaviors. This is an important finding because it empirically establishes a link that is often assumed in the leadership literature, as discussed earlier in this paper. Indeed, the high correlations between leadership behavior and communication effectiveness constructs suggest substantial conceptual overlap, such that the act of leadership appears to be tied intrinsically to the act of communication. Yet, these remain distinct constructs, as established by tests of discriminant validity.

Communication effectiveness was also positively associated with perceived leader performance (H7). The implication here is that managers who are perceived to engage in effective communication behaviors are also seen as exhibiting strong performance. Results from post hoc testing further established communication effectiveness as a significant mediator of both transformational and transactional contingent reward leadership style on leader performance. Transactional contingent reward leaders, who focus primarily on setting goals and rewards so as to “exchange inducements for desired performance” (Howell and Avolio 1993, p. 891), must explicitly articulate their goals and expectations and actively track employee performance through the process of communication. Likewise, to be perceived as effective transformational leaders must demonstrate charisma, intellectual stimulation and individualized consideration to followers (Avolio 1999). This demands effective verbal communication on the part of transformational leaders, and perhaps also non-verbal abilities such as execution and modeling (Bass 1985; Conger 1991; Flauto 1999). It is not enough for managers to have strong leadership convictions, they must also act on those convictions through effective communication. Without effective communication, leadership is essentially irrelevant.

The prior literature has acknowledged a close association between leadership and communication (Penley and Hawkins 1985; Hartog and Verburg 1997), but has failed to provide sufficient in-depth examination of the role that communication plays. This paper opens the “black box” of leadership behaviors, as called for by Jung and Avolio (2000), and begins to establish the link between leadership and communication effectiveness.

6 Limitations and Future Research

Future research should address a few important limitations of the current study. First, leader performance was reported by followers in the same survey as the leadership behavior measures, leading to potential common method bias (Podsakoff et al. 2003;

Bagozzi and Yi 1990). To address this issue, we assessed common method bias using the statistical approach described by Podsakoff et al. (2003) and Liang et al. (2007). That is, “we included in the PLS model a common method factor whose indicators included all the principal constructs’ indicators and calculated each indicator’s variances substantively explained by the principal construct and by the method” (Liang et al. 2007, p. 13). Results showed that the average variance explained by the principal constructs was .79, while the average variance explained by the method constructs was .13. This compared reasonably well to Liang et al.’s values of .67 and .02, respectively. Given the low and in most cases insignificant method variance values, we concluded that common method bias was not a serious threat.

Data were captured using a cross-sectional survey, and so causal relationships described in the research model could not be tested. Future research should ideally use longitudinal methods to capture leader performance over time (Judge and Piccolo 2004). Also, additional data collection would allow the researcher to conduct a leader-level aggregate analysis, which was not possible in the current study. Similarly, all measures employed in the survey were perceptual in nature. Objective measures would be preferable and should be considered for future research.

Drawing on the leadership and communication literatures, this paper develops and tests a theoretical model in the context of close and distant work arrangements. The theoretical model bridges two popular literatures by specifying the central role of communication effectiveness on leadership and performance. Analyses based on a survey of 138 followers supports four out of seven hypotheses. Follow-up mediating tests show that communication effectiveness mediated the effects of both transformational leadership, and transactional contingent reward leadership, on leader performance. This study contributes to the leadership literature by highlighting the instrumentality of communication effectiveness on leadership behavior and outcomes.

References

- Antonakis J, Atwater L (2002) Leader distance: a review and proposed theory. *Leadersh Q* 13:673–704. doi:[10.1016/S1048-9843\(02\)00155-8](https://doi.org/10.1016/S1048-9843(02)00155-8)
- Avolio BJ (1999) Full leadership development: building the vital forces in organizations. Sage, Thousand Oaks, CA
- Avolio BJ, Kahai SS (2003) Adding the “e” to leadership: how it may impact your leadership. *Organ Dyn* 31(4):325. doi:[10.1016/S0090-2616\(02\)00133-X](https://doi.org/10.1016/S0090-2616(02)00133-X)
- Avolio BJ, Waldman DA, Yammarino FJ (1991) Leading in the 1990s: the Four I’s of transformational leadership. *J Eur Ind Train* 15(4):9–16. doi:[10.1108/03090599110143366](https://doi.org/10.1108/03090599110143366)
- Avolio BJ, Kahai SS, Dodge G (2000) E-leadership and its implications for theory, research and practice. *Leadersh Q* 11(4):615–670. doi:[10.1016/S1048-9843\(00\)00062-X](https://doi.org/10.1016/S1048-9843(00)00062-X)
- Awamleh R, Gardner WL (1999) Perceptions of leader charisma and effectiveness: the effects of vision content, delivery, and organizational performance. *Leadersh Q* 10(3):345–373. doi:[10.1016/S1048-9843\(99\)00022-3](https://doi.org/10.1016/S1048-9843(99)00022-3)
- Bagozzi RP, Yi Y (1990) Assessing method variance in multitrait-multimethod matrices: the case of self-reported affect and perceptions at work. *J Appl Psychol* 75:547–560. doi:[10.1037/0021-9010.75.5.547](https://doi.org/10.1037/0021-9010.75.5.547)
- Barclay D, Higgins C, Thompson R (1995) The Partial Least Squares (PLS) approach to causal modeling, personal computer adoption and use as an illustration. *Technol Stud* 2(2):285–309
- Barge JK (1994) Leadership: communication skills for organizations and groups. St. Martin’s Press, New York

- Barling J, Weber T, Kelloway EK (1996) Effects of transformational leadership training on attitudinal and financial outcomes: a field experiment. *J Appl Psychol* 81(6):827–832. doi:[10.1037/0021-9010.81.6.827](https://doi.org/10.1037/0021-9010.81.6.827)
- Bass BM (1985) *Leadership and performance beyond expectations*. Free Press, New York
- Bass BM (1990a) *Bass & Stogdill's handbook of leadership: theory, research, and managerial applications*. Free Press, New York
- Bass BM (1990b) From transactional to transformational leadership: learning to share the vision. *Organ Dyn* 18(3):19–31. doi:[10.1016/0090-2616\(90\)90061-S](https://doi.org/10.1016/0090-2616(90)90061-S)
- Bass B (1998) *Transformational leadership: industrial, military, and educational impact*. Lawrence Erlbaum Associates, Mahwah, NJ
- Bass BM, Avolio BJ (1990) *Manual for the multifactor leadership questionnaire*. Consulting Psychologist Press, Palo Alto, CA
- Baum JR, Locke EA, Kirkpatrick SA (1998) A longitudinal study of the relation of vision and vision communication to venture growth in entrepreneurial firms. *J Appl Psychol* 83(1):43–54. doi:[10.1037/0021-9010.83.1.43](https://doi.org/10.1037/0021-9010.83.1.43)
- Bennis W, Nanus B (1985) *Leaders: the strategies for taking charge*. Harper & Row, New York
- Boerner S, Eisenbeiss SA, Griesser D (2007) Follower behavior and organizational performance: the impact of transformational leaders. *J Leadersh Organ Stud* 13(3):15–27. doi:[10.1177/10717919070130030201](https://doi.org/10.1177/10717919070130030201)
- Burns JM (1978) *Leadership*. Free Press, New York
- Bycio P, Hackett RD, Allen JS (1995) Further assessments of Bass's (1985) conceptualization of transactional and transformational leadership. *J Appl Psychol* 80(4):468–478. doi:[10.1037/0021-9010.80.4.468](https://doi.org/10.1037/0021-9010.80.4.468)
- Bélanger F, Collins RW, Cheney PH (2001) Technology requirements and work group communications for telecommuters. *Inf Syst Res* 12(2):155–176. doi:[10.1287/isre.12.2.155.9695](https://doi.org/10.1287/isre.12.2.155.9695)
- Carmine EG, Zeller RA (eds) (1979) *Reliability and validity assessment*. Sage, Beverly Hills, CA
- Chidambaram L, Jones B (1993) Impact of communication medium and computer support on group perceptions and performance: a comparison of face-to-face and dispersed meetings. *MIS Q* 17(4):465. doi:[10.2307/249588](https://doi.org/10.2307/249588)
- Chin WW (1998) The partial least squares approach for structural equation modelling. In: Marcoulides GA (Ed) *Modern methods for business research*. Lawrence Erlbaum Associates, Mahwah, NJ
- Conger JA (1991) Inspiring others: the language of leadership. *The Executive* 5(1):31
- Conger JA, Kanungo RN (1987) Toward a behavioral theory of charismatic leadership in organizational settings. *Acad Manag Rev* 12(4):637–647. doi:[10.2307/258069](https://doi.org/10.2307/258069)
- Conger JA, Kanungo RN (1988) *Charismatic leadership: the elusive factor in organizational effectiveness*. Jossey Bass Publishers, San Francisco
- Conger JA, Kanungo RN (1998) *Charismatic leadership in organizations*. Sage, Thousand Oaks, CA
- Curphy GJ (1992) An empirical investigation of the effects of transformational and transactional leadership on organizational climate, attrition, and performance. In: Clark KE, Clark MB, Campbell DR (eds) *Impact of leadership*. Center for Creative Leadership, Greensboro, NC, pp 177–188
- Daft RL, Lengel RH (1986) Organizational information requirements, media richness and structural design. *Manag Sci* 32(5):554–571
- Davidow WH, Malone MS (1992) *The virtual corporation: structuring and revitalizing the corporation for the 21st century*. HarperBusiness, New York
- Den Hartog DN, Verburg RM (1997) Charisma and rhetoric: communicative techniques of international business leaders. *Leadersh Q* 8:355–391. doi:[10.1016/S1048-9843\(97\)90020-5](https://doi.org/10.1016/S1048-9843(97)90020-5)
- Dillman DA (2000) *Mail and internet surveys: the tailored design method*. Wiley, New York
- Dumdum UR, Lowe KB, Avolio BJ (2002) A meta-analysis of transformational and transactional leadership correlates of effectiveness and satisfaction: an update and extension. In: Avolio BJ, Yammarino FJ (eds) *Transformational and charismatic leadership: the road ahead*. JAI Press, Amsterdam, pp 35–66
- Duxbury LE, Neufeld DJ (1999) An empirical evaluation of the impacts of telecommuting on intra-organizational communication. *J Eng Technol Manag* 16(1):1–28. doi:[10.1016/S0923-4748\(98\)00026-5](https://doi.org/10.1016/S0923-4748(98)00026-5)
- Dvir T, Eden D, Avolio BJ, Shamir B (2002) Impact of transformational leadership on follower development and performance: a field experiment. *Acad Manag J* 45:735–744. doi:[10.2307/3069307](https://doi.org/10.2307/3069307)
- Ferris GR, Judge TA, Rowland KM, Fitzgibbons DE (1994) Subordinate influence and the performance evaluation process: test of a model. *Organ Behav Hum Decis Process* 58:101–135. doi:[10.1006/obhd.1994.1030](https://doi.org/10.1006/obhd.1994.1030)

- Flauto FJ (1999) Walking the talk: the relationship between leadership and communication competence. *J Leadersh Stud* 6(1/2):86–96. doi:[10.1177/107179199900600106](https://doi.org/10.1177/107179199900600106)
- Fornell C, Larcker D (1981) Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res* 18:39–50. doi:[10.2307/3151312](https://doi.org/10.2307/3151312)
- Fortune Magazine (2006) 100 best companies to work for
- Gainey TW, Kelley DE, Hill JA (1999) Telecommuting's impact on corporate culture and individual workers: examining the effect of employee isolation. *S.A.M. Adv Manag J* 64(4):4–10
- Geyer ALJ, Steyrer JM (1998) Transformational leadership and objective performance in banks. *Appl Psychol* 47(3):397–420
- Gardner MJ, Martinko MJ (1988) Impression management: an observational study linking audience characteristics with verbal self-presentations. *Acad Manag J* 31:42–65. doi:[10.2307/256497](https://doi.org/10.2307/256497)
- Hartog DND, Verburg RM (1997) Charisma and rhetoric: communicative techniques of international business leaders. *Leadersh Q* 8(4):355–391. doi:[10.1016/S1048-9843\(97\)90020-5](https://doi.org/10.1016/S1048-9843(97)90020-5)
- Hater JJ, Bass BM (1988) Superiors' evaluations and subordinates' perceptions of transformational and transactional leadership. *J Appl Psychol* 73(4):695–702. doi:[10.1037/0021-9010.73.4.695](https://doi.org/10.1037/0021-9010.73.4.695)
- Hedberg B (1997) *Virtual organizations and beyond*. Wiley, New York
- Hoegl M, Gemuenden H (2001) Teamwork quality and the success of innovative projects: a theoretical concept and empirical evidence. *Organ Sci* 12(4):433–449. doi:[10.1287/orsc.12.4.435.10635](https://doi.org/10.1287/orsc.12.4.435.10635)
- House RJ, Shamir B (1993) Toward the integration of transformational, charismatic, and visionary theories. In: Chemers MM, Ayman R (eds) *Leadership theory and research: perspectives and directions*. Academic Press, Inc, San Diego, pp 81–107
- House RJ, Spangler WD, Woyke J (1991) Personality and charisma in the U.S. Presidency: a psychological theory of leader effectiveness. *Adm Sci Q* 36:364–397. doi:[10.2307/2393201](https://doi.org/10.2307/2393201)
- Howell JM, Avolio BJ (1993) Transformational leadership, transactional leadership, locus of control, and support for innovation: key predictors of consolidated-business-unit performance. *J Appl Psychol* 78(6):891–902. doi:[10.1037/0021-9010.78.6.891](https://doi.org/10.1037/0021-9010.78.6.891)
- Howell JM, Frost PJ (1989) A laboratory study of charismatic leadership. *Organ Behav Hum Decis Process* 43(2):243–269. doi:[10.1016/0749-5978\(89\)90052-6](https://doi.org/10.1016/0749-5978(89)90052-6)
- Howell JM, Neufeld D, Avolio BJ (2005) Examining the relationship of leadership and physical distance with business unit performance. *Leadersh Q* 16(2):273. doi:[10.1016/j.leafqua.2005.01.004](https://doi.org/10.1016/j.leafqua.2005.01.004)
- Howell HM, Hall-Merenda KE (1999) The ties that bind: the impacts of leader-member exchange, transformational and transactional leadership, and distance on predicting performance. *J Appl Psychol* 84(5):680–694. doi:[10.1037/0021-9010.84.5.680](https://doi.org/10.1037/0021-9010.84.5.680)
- Hulland JS (1999) Use of partial least squares (PLS) in strategic management research: a review of four studies. *J Strateg Manag* 20:194–204
- Indik BP, Georgopoulos BS, Seashore SE (1961) Superior-subordinate relationships and performance. *Person Psychol* 14:357–374. doi:[10.1111/j.1744-6570.1961.tb01242.x](https://doi.org/10.1111/j.1744-6570.1961.tb01242.x)
- Intel Corporation (2004) *eWorkforce: enabling the global vision*
- Jain HC (1973) Supervisory communication and performance in urban hospitals. *J Commun* 23:103–117. doi:[10.1111/j.1460-2466.1973.tb00935.x](https://doi.org/10.1111/j.1460-2466.1973.tb00935.x)
- Jaussi KS, Dionne SD (2003) Leading for creativity: the role of unconventional leader behavior. *Leadersh Q* 14(4):475. doi:[10.1016/S1048-9843\(03\)00048-1](https://doi.org/10.1016/S1048-9843(03)00048-1)
- Jones C (2005) *Teleworking: the quiet revolution (2005 update)*. Gartner Group, Stamford, CT
- Jöreskog KG, Wold H (1982) The ML and PLS techniques for modeling with latent variables: historical and comparative aspects. In: Jöreskog KG, Wold H (eds) *Systems under indirect observation: causality, structure, prediction*. North Holland, Amsterdam, pp 263–270
- Judge TA, Ferris GR (1993) Social context of performance evaluation decisions. *Acad Manag J* 36:80–105. doi:[10.2307/256513](https://doi.org/10.2307/256513)
- Judge TA, Piccolo RF (2004) Transformational and transactional leadership: a meta-analytic test of their relative validity. *J Appl Psychol* 89:755–768. doi:[10.1037/0021-9010.89.5.755](https://doi.org/10.1037/0021-9010.89.5.755)
- Jung D, Avolio BJ (2000) Opening the black box: an experimental investigation of the mediating effects of trust and value congruence on transformational and transactional leadership. *J Organ Behav* 21:949–964. doi:[10.1002/1099-1379\(200012\)21:8<949::AID-JOB64>3.0.CO;2-F](https://doi.org/10.1002/1099-1379(200012)21:8<949::AID-JOB64>3.0.CO;2-F)
- Kayworth TR, Leidner DE (2001) Leadership effectiveness in global virtual teams. *J Manag Inf Syst* 18(3):7
- Keller RT (1992) Transformational leadership and the performance of research and development project groups. *J Manag* 18(3):489–501. doi:[10.1177/014920639201800304](https://doi.org/10.1177/014920639201800304)

- Kelloway EK, Barling J, Kelley E, Comtois J, Gatién B (2003) Remote transformational leadership. *Leadersh Organ Dev J* 24(3):163. doi:[10.1108/01437730310469589](https://doi.org/10.1108/01437730310469589)
- Kerr S, Jermier JM (1978) Substitutes for leadership: their meaning and measurement. *Organ Behav Hum Perform* 22:375–403. doi:[10.1016/0030-5073\(78\)90023-5](https://doi.org/10.1016/0030-5073(78)90023-5)
- Kirkpatrick SA, Locke EA (1996) Direct and indirect effects of three core charismatic leadership components on performance and attitudes. *J Appl Psychol* 81(1):36–51. doi:[10.1037/0021-9010.81.1.36](https://doi.org/10.1037/0021-9010.81.1.36)
- Klauss R, Bass BM (1982) *Interpersonal communication in organizations*. Academic Press, New York
- Klimoski RJ, Hayes NJ (1980) Leader behavior and subordinate motivation. *Pers Psychol* 65:454–466
- Liang H, Saraf N, Hu Q, Xue Y (2007) Assimilation of enterprise systems: the effect of institutional pressures and the mediating role of top management. *MIS Q* 31(1)
- Locke EA, Kirkpatrick SA, Wheeler JK, Schneider J, Niles K, Goldstein H, Welsh K, Chah DO (1991) *The essence of leadership*. Lexington Books, New York
- Lohmöller J (1984) *LVPLS Program Manual: latent variables path analysis with partial least-squares estimation*. Zentralarchiv für empirische Sozialforschung, Köln
- Lowe KB, Kroeck KG, Sivasubramaniam N (1996) Effectiveness correlates of transformation and transactional leadership: a meta-analytic review of the MLQ literature. *Leadersh Q* 7(3):385–425. doi:[10.1016/S1048-9843\(96\)90027-2](https://doi.org/10.1016/S1048-9843(96)90027-2)
- McFillen JM, New JR (1979) Situational determinants of supervisor attributions and behavior. *Acad Manag J* 22:793–809. doi:[10.2307/255815](https://doi.org/10.2307/255815)
- Mumford MD, Zaccaro SJ, Harding FD, Jacobs TO, Fleishman EA (2000) Leadership skills for a changing world: solving complex social problems. *Leadersh Q* 11:11–35. doi:[10.1016/S1048-9843\(99\)00041-7](https://doi.org/10.1016/S1048-9843(99)00041-7)
- Neufeld D, Fang Y (2005) Individual, social and situational determinants of telecommuter productivity. *Inf Manag* 42(7):1037. doi:[10.1016/j.im.2004.12.001](https://doi.org/10.1016/j.im.2004.12.001)
- Nunnally J (1978) *Psychometric theory*. McGraw-Hill, New York
- Penley LE, Hawkins B (1985) Studying interpersonal communication in organizations: a leadership application. *Acad Manag J* 28(2):309–328. doi:[10.2307/256203](https://doi.org/10.2307/256203)
- Podsakoff PM, Todor WD, Skov R (1982) Effect of leader contingent and non-contingent reward and punishment behaviors on subordinate performance and satisfaction. *Acad Manag J* 25:810–821. doi:[10.2307/256100](https://doi.org/10.2307/256100)
- Podsakoff PM, Todor WD, Groner RA, Huber VL (1984) Situational moderators of leader reward and punishment behaviors: fact or fiction. *Organ Behav Hum Perform* 34:21–63. doi:[10.1016/0030-5073\(84\)90036-9](https://doi.org/10.1016/0030-5073(84)90036-9)
- Podsakoff PM, Mackenzie SB, Lee JY, Podsakoff NP (2003) Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol* 88:879–903. doi:[10.1037/0021-9010.88.5.879](https://doi.org/10.1037/0021-9010.88.5.879)
- Pondy L (1978) Leadership as a language game. In: Mccall MWJ, Lombardo MM (eds) *Leadership: where else can we go?*. Duke University Press, Durham, NC pp 87–99
- Powell A, Piccoli G, Ives B (2004) Virtual teams: a review of the current literature and directions for future research. *Database Adv Inf Sys* 35(1):6–33
- Qureshi S, Liu M, Vogel D (2006) The effects of electronic collaboration in distributed project management. *Group Decis Negot* 15:55–75
- Rao A, Schmidt SM, Murray LH (1995) Upward impression management: goals, influence strategies, and consequences. *Hum Relat* 48:147–167. doi:[10.1177/001872679504800203](https://doi.org/10.1177/001872679504800203)
- Rice R (1993) Media appropriateness: using social presence theory to compare traditional and new organizational media. *Hum Commun Res* 19(4):451–484. doi:[10.1111/j.1468-2958.1993.tb00309.x](https://doi.org/10.1111/j.1468-2958.1993.tb00309.x)
- Ruiz Y, Walling A (2005) Home-based working using communication technologies. *Labour Market Rev* 113(10):417–426
- Senge PM (1990) *The fifth discipline: the art and practice of the learning organization*. Doubleday, New York
- Shamir B (1995) Social distance and charisma: theoretical notes and an exploratory study. *Leadersh Q* 6(1):19–47. doi:[10.1016/1048-9843\(95\)90003-9](https://doi.org/10.1016/1048-9843(95)90003-9)
- Shamir B, Arthur MB, House RJ (1994) The rhetoric of charismatic leadership: a theoretical extension, a case study, and implications for research. *Leadersh Q* 5(1):25–42. doi:[10.1016/1048-9843\(94\)90004-3](https://doi.org/10.1016/1048-9843(94)90004-3)
- Shepherd C, Weschler IR (1955) The relation between three interpersonal variables and communication effectiveness: a pilot study. *Sociometry* 18:103–110. doi:[10.2307/2785995](https://doi.org/10.2307/2785995)
- Sobel ME (1982) Asymptotic intervals for indirect effects in structural equations models. In: Leinhardt S (ed) *Sociological methodology*. Jossey-Bass, San Francisco pp 290–312

- Staples SD, Hulland JS, Higgins CA (1999) A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Organ Sci* 10(6):758–776
- Statistics Canada (2001) Workplace and employment survey compendium. Ministry of Industry
- Streifert S (1965) Communicator importance and interpersonal attitudes toward conforming and deviant group members. *J Pers Soc Psychol* 2:242–246. doi:[10.1037/h0022389](https://doi.org/10.1037/h0022389)
- Sudan SK, Ryan S, Drake SD, Sandler M, Boggs R, Giusto R (2007) Worldwide mobile worker population 2007–2011, Forecast. 37
- Sundstrom E (1986) Work places: the psychology of the physical environment in offices and factories. Cambridge University Press, New York
- Uhl-Bien M, Graen GB (1998) Individual self-management: analysis of professionals' self-managing activities in functional and cross-functional work teams. *Acad Manag J* 41(3):340–350. doi:[10.2307/256912](https://doi.org/10.2307/256912)
- U.S. Bureau of Labor Statistics (2002) Work at home in 2001. Division of Labor Force Statistics
- Waldman DA, Ramirez GG, House RJ, Puranam P (2001) Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Acad Manag J* 44(1):134–143. doi:[10.2307/3069341](https://doi.org/10.2307/3069341)
- Watson-Fritz MB, Sridhar N, Hyeun-Suk R (1998) Communication and coordination in the virtual office. *J Manag Inf Syst* 14(4):7–28
- Westley F, Mintzberg H (1991) Visionary leadership and strategic management. In: Henry J, Walker D (eds) *Managing innovation*. Sage, London
- Wilcox R (1998) How many discoveries have been lost by ignoring modern statistical methods? *Am Psychol* 53:300–314. doi:[10.1037/0003-066X.53.3.300](https://doi.org/10.1037/0003-066X.53.3.300)
- Wixom BH, Todd P (2005) A theoretical integration of user satisfaction and technology acceptance. *Inf Syst Res* 16(1):85–102. doi:[10.1287/isre.1050.0042](https://doi.org/10.1287/isre.1050.0042)
- Wold H (1982) Systems under indirect observation using PLS. In: Fornell C (ed) *A second generation of multivariate analysis*. Praeger, New York pp 325–347
- Yammarino FJ (1994) Indirect leadership: transformational leadership at a distance. In: Bass BM, Avolio BJ (eds) *Improving organizational effectiveness through transformational leadership*. Sage, Thousand Oaks pp 26–47