

Beyond the Unidimensional Collective Leadership Model: Study of Leadership Patterns in Committees

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Abstract

A careful review of the competing models of *collective leadership* (e.g., shared, distributed, democratic, peer leadership, co-leadership) reveals interesting conceptual differences that suggest that there may be multiple forms of collective leadership. In this paper, we propose a multi-dimensional model of collective leadership using a social networks methodology that identifies the extent to which all members of the committee participate in different leader behaviors – sharedness of charismatic, participative, and directive leader behaviors – and the extent to which these behaviors are roles distributed among committee members – leadership distribution. Further, we explore the relationship between several characteristics of collective leadership for different leader behaviors and two outcomes of committee effectiveness: team performance and team-level team commitment.

Introduction

Attention to *collective leadership* has increased significantly in the last few decades within business and the academic field and is lately attracting the attention of the general public with the emergence of collectively led social movements like the *Facebook generation* in Tunisia and Egypt, the 15-M protests in Spain, and the cleanup brigades in London. Collective leadership challenges the assumption that leadership processes are necessarily guided by a single individual (what Gibb termed *focused leadership*; 1954) and is a dynamic process in which multiple individuals collaborate in leadership towards the attainment of their common goals. Despite the extensive research this phenomenon is producing, we are still far from fully understanding the internal dynamics of collective leadership in its multiple forms.

The study of collective leadership in committees is particularly interesting for their unique characteristics and dynamics. On the one hand, they are groups of a participative nature where decisions are often made by consensus and therefore would seem to be a setting in which collective leadership would naturally thrive. On the other hand, the majority of the empirical studies of collective leadership have been performed in teams that meet with greater frequency than committees and that are more likely to develop a team identity and high levels of cohesion. In fact, prior research on committee leadership suggests that effective committees would have highly centralized leadership, where the committee chair is a strong leader and there is little participation from committee members in this role (Filley, 1970). These studies, however, assume that committees lacking a strong leader display a “laissez faire” leadership style that is inherently ineffective, such as in the case described next.

“Often there is no regular agenda at the meetings of this committee – when and if it meets... they proceed with an atmosphere of apathy, with junior members, especially, feeling frustrated and left out, like first graders at a seventh grade party.”

The *purpose* of this paper is to develop a multi-dimensional measure that allows the analysis of multiple aspects of a collective leadership pattern, particularly the extent to which all members of the committee participate in different leader behaviors – sharedness of charismatic, participative, and directive leader behaviors – and the extent to which these behaviors are roles distributed among committee members – leadership distribution. For that, we explore committee patterns of four different leader behaviors (charismatic, directive, participative, and supportive), and explore the relationship between these aspects of the leadership pattern and two outcomes of committee effectiveness: team performance and team-level team commitment.

Collective Leadership

Collective leadership is a dynamic process in which multiple individuals collaborate in leadership towards the attainment of their common goals, and therefore assumes that leadership does not necessarily have to be assigned to a single person in a group (Pearce, 2004; Yukl, 2011). This unorthodox understanding of leadership has been the object of interest and research throughout the twentieth century (e.g., Benne & Sheets, 1948; Gibb, 1954; Bales, 1954) but the attention of mainstream scholars to it has increased in the last two decades, with the proliferation of empirical studies and increased dialogue among its proponents (e.g.: Pearce & Conger, 2003; Carson, Tesluk, & Marrone, 2007; Day, Gronn, & Salas, 2004; Ensley, Hmieleski, & Pearce, 2006). This dialogue is helping the field advance significantly, since it’s allowing the establishment of standard definitions and common vocabulary (Salancik, Staw, & Pondy, 1980).

However, further advances in the understanding and operationalization of collective leadership are likely to result from the study of the differences among these models and not from the similarities. Some of these different understandings are conceptually subtle, but important enough to imply qualitative dissimilarities in the dynamics of leadership transfer in a team. Particularly, these differences may affect the training needed by the committee, the selection of members with the right skills to adapt to these dynamics, and maybe even the committee results at the individual and group levels.

Collective Leadership and its Different Patterns

The careful review of the literature on collective leadership evidences the existence of two main groups of models attending to the characteristics of the leadership pattern. The first pattern has been described as a set of roles or behaviors that can be “split apart” and enacted by different individuals, key element of its definition being the *division of labor* (Benne & Sheets, 1948; Gibb, 1954; Gronn, 2002). It involves the fragmentation of the leadership roles their coordination (Barry, 1991; Burke, 1967; Gronn, 2002). Barry (1991) performed a grounded theory study that described leadership pattern evolutions in self-managed teams. Barry observed that the leadership roles assumed by different members in the team were complementary and contingent on their leadership strengths. Conversely, a more recent group of authors assume that collective leadership evolves fluidly, without a set distribution of roles, in which various team members often co-enact or share the same leadership role (Avolio, Jung, Murry, & Sivasubramaniam, 1996; Ensley, Hmieleski, & Pearce, 2006; Pearce, 2004; Pearce & Sims, 2002). The assumption that leadership roles are shared instead of distributed can be observed in the construct’s

operationalization. For instance, Pearce & Sims (2002) assessed team members' reports regarding the extent to which their teammates used a particular leader behavior to influence each other, this behavior being transactional leadership, transformational leadership, empowering leadership, etc. Hence, in this operationalization, teams in which the aforementioned behaviors are shared would exhibit collective leadership, but not so in teams that assign each of these leader behaviors to a different team member.

These two different views regarding the patterns of collective leadership was also identified in the literature. For instance, House and Aditya (1997) used peer leadership and co-leadership, respectively, to categorize these two groups of collective leadership patterns. Similarly, Yukl (2010; p.449) proposed that "some leadership functions (e.g., making important decisions) may be shared by all members of a group, and some leadership functions may be allocated to individual members (e.g., whoever is most qualified)." Prior literature has not explored the extent to which a group engages in role distribution more than on role sharing (or vice-versa) and the influence of one or the other on group outcomes.

A Social Networks Multi-dimensional Model of Collective Leadership

In this paper, we propose a social networks multi-dimensional model of collective leadership that indicates the extent to which multiple behaviors are shared within the group, and the extent to which they are not shared but distributed. Social networks depict leadership patterns using graphs – one for each leader behavior – where the nodes represent the members in the committee and the ties indicate the amount of leadership influence exerted by one person upon other members in the committee. The networks used for this paper are valued – we assess the level to which a particular leader behavior is demonstrated, and not only whether it is demonstrated – and directional – the link between two members in a group carries a different value depending on who of the two is being evaluated and who is the evaluator.

The two dimensions of collective leadership, leadership sharedness and leadership distribution, can be assessed by exploring a fundamental property of social networks: *degree-based centrality* proposed by Freeman (1979). In the context of leadership, degree-based centrality is a network property at the individual level that indicates the extent to which an individual is perceived as influential by the rest of the committee. Degree-based centrality of a committee member is calculated as the sum of the values of all ties that link this person with all of the other members of the committee (Wasserman & Faust, 1994). Centrality scores are specific to a particular leader behavior, so that each committee member has four values of leadership centrality that correspond to the four leader behaviors studied: charismatic, directive, participative, and supportive.

$$C_D(p_{ij}) = \sum_{i'=1}^n x_{i'i'j}$$

Where $C_D(p_{ij})$ is the degree-centrality of member i for a given leadership behavior j , and where $x_{i'i'j}$ reflects the leadership influence of member i on any other member i' , with $i'=1, \dots, n$, n being the committee's size.

Leadership Sharedness. Two different network properties at the group level help determine the extent to which committees share a certain leadership behavior: centralization and density. The two properties are complementary and necessary to explore the leadership pattern. The first, *centralization*, is a measure that indicates the extent to which leadership is concentrated

in one vs. all or a few committee members (Sparrowe, Liden, Wayne, & Kraimer, 2001). The centralization of the network for a given leadership role or behavior is determined as the sum of differences between the centrality of the most central member in the committee and the centralities of the rest of the members, divided by the maximum sum of differences (Freeman, 1979).

$$C_{Dj} = \frac{\sum_{i=1}^n [C_D(p^*) - C_D(p_{ij})]}{\max \sum_{i=1}^n [C_D(p^*) - C_D(p_{ij})]}$$

where C_{Dj} is the centralization of the committee for a specific leadership behavior j , $C_{Dj}(p_{ij})$ is the centrality of member i for leadership behavior j , and $C_{Dj}(p^*)$ is the highest of all members' centralities for that same behavior. The denominator of the formula indicates the maximum possible sum of differences in a hypothetical network of size n . A centralization of 0 would correspond to a pattern where all members in the committee have the same level of centrality (high level of sharedness). A centralization of 1 corresponds to a pattern where one member has the maximum centrality while all other members have minimum centrality (low level of sharedness).

The second property needed to determine sharedness, *density*, is a measure of the influence in the network that indicates the average level of leadership influence that is being exerted among members of the committee. It is calculated as the average value of the ties between actors in the network (Wasserman & Faust, 1994). A committee where density is high will tend to have more levels of influence among peers, and therefore, higher sharedness. Therefore, its calculation does not depend on the variance among committee members' influences on their peers. The formula for density proposed for valued networks by Wasserman & Faust (1994) is the following:

$$\Delta_j = \frac{\sum_{i=1}^n C_D(p_{ij})}{(n-1)n}$$

where Δ_j is the density of the leadership network for a specific leadership role j and $C_{Dj}(p_{ij})$ is the centrality of member i for leadership behavior j . Given a leadership behavior, this form of network density can be interpreted as the average perceived leadership influence between two committee members, that is, the average weight of a tie between two nodes in the network. Density ranges from 1 to 7, with a density of 1 indicating a situation where nobody within the committee influences their peers via a given leader behavior (low level of sharedness). Conversely, a density of 7 indicates a situation where all members exhibit an important influence on the rest of the committee via that leader behavior (high level of sharedness).

Centralization and Density: Complementary Measures. Prior literature has erroneously assumed that the two dimensions of sharedness (density and centralization) are interchangeable and highly correlated, and that the measurement of one of them would make it unnecessary to measure the other (Carson, Tesluk, and Marrone, 2007). However, the two properties capture essentially different characteristics of the network, where centralization is a measure of dispersion of leadership influence in the committee and density is an aggregated measure. The use of any one of these two network characteristics on its own is insufficient to completely

describe the leadership pattern and is likely to yield ambiguous results (Friedkin, 1981). In these lines, Wasseman & Faust (1994) recommend the complementation of a measure of the average centrality in the network with a measure of dispersion of the centrality values.

Compare, for instance, the networks depicted in Figure 1. The assessment of sharedness using only centralization would lead us to conclude that patterns A, D, and G are all equivalent and high in leadership sharedness because all of them have the same low level of centralization. When comparing the three graphs, however, they differ significantly in the amount of leadership that is actually being exerted among committee members. In particular, the lack of influence between committee members in case G should not be considered a case of high sharedness, but a case of total lack of leadership. Similarly, if we assess sharedness by looking only at density, we fail to see the existing differences between patterns A and B because both examples have the same high level of density.

Insert Figure 1 about here

The two patterns are clearly distinct, however. The pattern corresponding to B has one committee member that is clearly more influential than all other committee members, while all members have exactly the same influence on their peers in pattern A. It should be noticed in this figure that, by definition, a pattern with high density and high centralization is impossible (the pattern that would correspond to C). This is because high centralization implies by definition the elimination of a large number of ties between nodes in the network, that is, many committee members are not being perceived as influential by their peers). Hence, high centralization is only compatible with a medium to low density.

Leadership Distribution. The two measures of collective leadership that evaluate sharedness (centralization and density) describe the pattern of leadership for a specific leader behavior. The second dimension of the model of collective leadership proposed here is a comparison of the leadership patterns across behaviors. Distribution captures the degree to which different leadership behaviors – charismatic, directive, participative, and supportive – are divided among the committee members, so that *a different person enacts each behavior*. A high level of distribution indicates that team members' leadership in the team is highly specialized, each using a different leader behavior to influence their team. Necessarily, this strong specialization of members' leadership implies that the leader behaviors have low sharedness. In this case, it is not each behavior what is shared by the team but leadership in broader terms. The operationalization of leadership distribution proposed in this paper builds on prior conceptual studies which discussed the need to study collective leadership patterns characterized by a division of labor (House & Aditya, 1997; Gronn, 2002; Mayo, Meindl, & Pastor, 2003). Distribution is, by definition, a structural property of the team's leadership pattern across networks, that is, across leadership behaviors.

Leadership distribution measures the extent to which the team's dependence on each of its members varies with the leader behavior considered. It builds on the concept of *leadership dependence*, which is measured by the expression $DE_{ij} = (C_{ij} - \bar{C}_j)$. DE_{ij} is the team's dependence on member i for a leader behavior j . C_{ij} is member i 's centrality for leader behavior j , and \bar{C}_j is the team's centrality average for that same behavior. The difference between the two values is an indicator of the dependence of a team on a single individual for a particular leadership behavior. For instance, in a team where a particular team member's charismatic

leadership centrality exceeds the team's average for that same behavior, this person would be perceived by his or her peers as more influential than most other team members in terms of charismatic leadership. Hence, the greater the difference between that members' charismatic centrality and the team's average, the higher will be the team's dependence on this member for charismatic leadership. The difference between both values will be close to zero when the team perceives that the member considered is not more influential than the team average. Finally, the difference between these two values will be the lowest – and negative – when the team member is perceived to influence the team less than most of the members in the team. Notice that dependence, in those cases, takes negative values given that the members' centrality is lower than the team's average.

The comparison of the dependence of a team on a particular individual across behaviors may indicate that the team's dependence on a certain individual is higher for some behaviors than for others. A comparison between the maximum and minimum team's dependence on an individual across leader behaviors is specially revealing and is an assessment of the individual's level of leadership specialization. Building on these differences, leadership distribution measures the extent to which team members are specialized into different leadership behaviors. In particular, leadership distribution is calculated as the average of team members' maximum dependence differences across behaviors.

$$D = \frac{1}{n} \sum_{i=1}^n \frac{|DE_i^M - DE_i^m|}{\max |DE_i^M - DE_i^m|} = \frac{1}{n} \sum_{i=1}^n \frac{|(C_{ij}^M - \bar{C}^M_j) - (C_{ij}^m - \bar{C}^m_j)|}{\max |(C_{ij}^M - \bar{C}^M_j) - (C_{ij}^m - \bar{C}^m_j)|}$$

D is the team's leadership distribution. DE_i^M corresponds to the highest dependence of the team on a member i across all leadership behaviors and DE_i^m the team's lowest dependence on that same person. C_{ij}^M and C_{ij}^m correspond to that member's highest and lowest centrality values across behaviors, respectively. \bar{C}^M_j is the team's average centrality for the behavior j that corresponds to member i 's maximum centrality, and \bar{C}^m_j , the team's average centrality for the behavior that corresponds to i 's minimum centrality. Distribution ranges from 0 to 1, with values closer to 1 corresponding to situations where the team depends on different members for different leadership behaviors, that is, where a strong division of labor characterizes the leadership pattern. This pattern is represented in Figure 2; in the pattern described in the first row of this figure, each of the four members in the team specializes in a different leadership behavior.

Leadership distribution values close to zero correspond to situations where that the team's dependence on each of its members is very similar across behaviors. This low value of distribution is observed in different cases. For instance, a team with a single leader will show a high dependence on him or her for all leadership roles or behaviors and low dependence on the other members across behaviors. This pattern is characterized by a low level of distribution and low sharedness across behaviors (see leadership pattern depicted in the second row of Figure 2). On the other hand, a team where members participate actively in all leadership behaviors exhibits low dependence on any of its members across behaviors (see pattern depicted in the last row of Figure 2). This pattern, which is clearly different from the one represented in the second row also corresponds to a low level of leadership distribution. These are just two examples of the large number of alternative patterns that can be associated to a low level of distribution. As it can be observed in the examples above, distribution is not sufficient to fully describe the leadership

pattern, but needs to be complemented by the levels of density and centralization that describe sharedness in each particular behavior. Distribution adds another dimension to the description of collective leadership by comparing the team's leadership pattern for all leader behaviors.

Patterns of Collective Leadership and Committee Outcomes

Previous literature has explored the relationship between different leadership patterns and outcomes in different types of groups. In this paper, we are exploring different committee outcomes as team performance and committee-level team commitment.

Leadership Pattern and Team Performance. Leadership scholars have expressed doubts regarding the actual effectiveness of collective leadership (Pearce, Conger, & Locke, 2007). This view stems from the assumption that groups can more easily achieve a sense of purpose and clear direction with these are established by one single leader, and not by a group of people. However, empirical research has provided support to the relationship between different patterns of collective leadership and team performance. Decision-making quality has been found to be higher in teams with high sharedness of participative leadership (Pearce, Yoo, and Alavi, 2004), and general team performance (Avolio, Jung, Murry, and Suvasubramaniam, 1996; Carson, Tesluk, & Marrone, 2007; Pearce & Sims, 2002). However, Barry (1991) found in his grounded theory study that performance was higher for teams with high levels of leadership.

From the discussion above, it seems reasonable to expect that teams with high sharedness in participative leadership, charismatic leadership, and directive leadership will have greater effectiveness than teams with a more focused or distributed pattern of those forms of leadership

Hypothesis 1a: Charismatic sharedness is positively associated to team performance.

Hypothesis 1b: Directive sharedness is positively associated to team performance.

Hypothesis 1c: Participative sharedness is positively associated to team performance.

Beyond the influence of members' participation on team performance, sharing leader behaviors may influence members' attitudes towards the team and its decisions. The identification with the team's decisions and actions and active engagement in the team is known as team commitment, and may be higher when the leader efforts exhibited by this member are valued and respected by others in the team. While prior research has studied the relationship between collective leadership and individual attitudes towards the team (Bowers & Seashore, 1966; Pearce, Yoo, and Alavi, 2004; Sivasubramaniam, Murry, Avolio, & Jung, 2002), no prior research has explored the influence of this form of leadership on team commitment.

Members' active engagement in the team's direction is likely to help them better understand the challenges and opportunities that their team is facing and align with the decisions made by it (Bales, 1954; Katz & Kahn, 1978). Therefore, we expected that members' commitment to their team will be higher when they share the charismatic and directive leadership roles of their team.

Hypothesis 2a: Charismatic sharedness is positively associated to team commitment.

Hypothesis 2b: Directive sharedness is positively associated to team commitment.

Considering the importance that team commitment is likely to have on team performance (Bishop, Scott, & Burroughs, 2000), the study of commitment as a mediating effect for team performance gains relevance. Particularly, it seems reasonable to assume that motivated team members will exert greater effort and collaborate closely towards the attainment of their common

goals, therefore helping their team achieve greater performance. Based on the discussion above, we predict that sharedness in charismatic and directive leadership will indirectly affect team performance by increasing members' commitment to their team.

Hypothesis 3a: Charismatic sharedness is positively associated to team performance, and this relation is mediated by team commitment.

Hypothesis 3b: Directive sharedness is positively associated to team performance, and this relation is mediated by team commitment.

Methods

Sample and Data Collection

The sample included 28 committees with a median number of 10 members, varying from 3 to 16 members. A majority of the respondents were females (64%), educated (75.5% had at least a college degree), and with ages ranging from 20 to 78 years old, with an average age of 51 years old. The surveys asked committee members to respond to questions regarding their commitment to the team, and then to rate the leadership influence that each of their peers had on them, considering multiple leader behaviors. The committee chair rated the committee's performance in a separate questionnaire. Missing data was replaced by the mean in the computation of leadership centrality values for the four leader behaviors. For other variables, listwise deletion was selected to treat missing data considering that this is the method that yields least biased results, and that the missing data is MCAR (missing completely at random). Centralization, sharedness, and distribution scatterplots were generated that helped identify two outlier committees in the sample. After a careful study of the dynamics observed during the meetings, both committees were eliminated from the sample. The elimination of these two committees resulted in a final sample size of 26 committees.

Measures

All the constructs in this paper were measured on 7-point Likert scales with possible responses ranging from 1 (strongly disagree) to 7 (strongly agree). The scales are included in Appendix A.

Pattern of Leadership. Members' perceptions of their peers' leadership were analyzed using social networks. For this paper we relied on path-goal theory as a widely recognized theory that groups leader behaviors into four categories: directive, goal oriented (or charismatic), supportive and participative (Bowers & Seashore, 1966; Seers; 1996). These ratings were used to compute the three properties assessed in the multi-dimensional model of leadership: centralization and density for each leader behavior and distribution across leader behaviors.

Team Commitment. The measure of commitment to the team included six items from Kirkman and Rosen (1999; adapted from Mowday, Steers, & Porter, 1979), eliminating one of the items in the scale to adapt it to the characteristics of the present research study. Averages were calculated to obtain a team-level measure of team commitment. The coefficient alpha for this measure was $\alpha = 0.84$.

Team Performance. Performance was evaluated using a 5 item scale that built on the scale proposed by Zellmer-Bruhn and Gibson (2006). Evaluations of performance were gathered for each committee from a superior that was in a position to evaluate the output of the committee. The coefficient alpha for this measure was $\alpha = 0.90$.

Team Tenure. In this paper, team tenure is defined as the number of years that individual members reported membership to the team and is calculated as the average of these individual values (Wiersema & Bantel, 1992).

Control Variables. We controlled for various team characteristics that have been associated to team performance in past research: team size, team tenure, and tenure diversity.

Results

The average values of team performance and team commitment are comparable to those of prior research (Bishop, Scott, & Borroughs, 2000; Kirkman & Rosen, 1999). There were high and significant correlations among the densities of the four leader behaviors, all greater than 0.60. Values over 0.80 were found for the correlations between charismatic leadership and directive leadership densities and between charismatic and participative leadership densities. This result suggests that the level of influence that a team member receives from his peers is very similar for all leader behaviors. The values of density for all leader behaviors were slightly higher but comparable to those obtained by prior empirical research (Carson, Tesluk, and Marrone, 2007). Significant correlations were observed between the team outcome variables and the eight values that represent sharedness in the team (centralizations and densities for all four leader behaviors) but no correlation was significant between these two outcome variables and team distribution.

Preliminary Analyses

The validity of the scales used for leader behaviors was assessed using a confirmatory factor analysis for the ratings of peers' leader behaviors in the team using maximum likelihood estimation. A first CFA on the four leader behavior scales compared the goodness-of-fit of the proposed four-factor model (charismatic, directive, participative, and supportive leadership; $\chi^2 = 1268.8$, d.f. = 98, $p < 0.01$, CFI = 0.91, TLI = 0.90, RMSEA = 0.11, SRMR = 0.06) to a theoretically-sound two-factor model: consideration and initiating structure ($\chi^2 = 1841.6$, d.f. = 103, $p < 0.01$, CFI = 0.88, TLI = 0.86, RMSEA = 0.13, SRMR = 0.09). The four-factor model explained more variance in the data than the two-factor model, and the combination of goodness-of-fit indices suggested that the fit was reasonably good (Hu & Bentler, 1999). The internal consistency reliabilities of all the instrument's scales were confirmed through the calculation of Cronbach α for each scale (all over the cutoff 0.8 for moderate to high reliability (Murphy & Davidshofer, 1988).

Finally, interrater agreement and interrater reliability were calculated. Interrater reliability r_{wg} was over the cutoff of 0.7 for team commitment and lower but close to this value for the four leader behaviors (ranging from 0.59 to 0.63 respectively; Klein et al, 2000). The values of interrater agreement index ICC[2] for team outcomes and leader behaviors, however, do not reach the recommended levels of 0.7 (Klein & Kozlowski, 2000); these low levels of interrater agreement could affect the power of the current study to identify meaningful relationships between the variables in it. These results indicate, however, that a significant portion of the variance resides between teams in the variables studied, and are comparable to aggregate constructs reported in the literature (Edmonson, A., 1999; Hirst, Knippenberg, & Zoust, 2009).

Test of Hypotheses

Insert table 1 about here

We used a stepwise regression to explore the direct relationship between charismatic sharedness and directive sharedness with team performance ($R^2 = 0.57$, $F = 31.56$, $p < 0.01$; see Model 2, Table 1). The control variables were included in the first step and charismatic density and centralization and Directive density and centralization, in a second step. In a third step, we added team commitment at the team level. *Hypothesis 1a* predicted a direct relationship between charismatic sharedness and team performance. Charismatic density was found to be positively related to team performance as predicted ($\beta = 1.47$, $p < 0.01$), but centralization was not significantly related to team performance ($\beta = 0.08$, $p > 0.05$). Therefore, this hypothesis was only partially supported. *Hypothesis 1b* predicted a direct relationship between directive sharedness and team performance. Directive density was found to be negatively associated to team performance ($\beta = -0.86$, $p < 0.01$) and directive centralization was positively associated to team performance ($\beta = 0.33$, $p < 0.01$), both results against our predictions, so hypothesis 1b was not supported. We tested *hypothesis 1c* in a separate model to prevent problems of collinearity among leadership variables ($R^2 = 0.49$; $F = 37.85$; $p < 0.001$; see model 1 in Table 1). The hypothesis was supported for participative density ($\beta = 0.89$, $p < 0.01$) but not for participative centralization ($\beta = 0.43$, $p < 0.01$), that was a strong but positive predictor of performance against our predictions. A subsequent stepwise regression was performed including control variables in a first step, in which participative density - the stronger predictor - was included in the second step and participative centralization was included in a third step; the results further supported the significance of participative centralization as a predictor of team performance beyond participative density ($\Delta R^2 = 0.09$, $p < 0.0001$). This result suggests that teams' performance is higher when team members participate actively in the participative leadership of their team, but that this effect is even higher when some team members have a greater participative influence over their team.

Hypotheses 2a and 2b predicted a positive relationship between team commitment and charismatic sharedness and directive sharedness respectively (see Table 1). They were tested using a stepwise regression analysis in which three control variables were included in the first step – team size, team tenure, and team tenure diversity – and charismatic density and centralization and Directive density and centralization were included in a second step. *Hypothesis 2a* was not supported, as charismatic centralization was not significantly related to team commitment ($\beta = -0.09$, $p > 0.05$) and charismatic density was significantly but negatively related to team commitment against our prediction ($\beta = -0.51$, $p < 0.01$). *Hypothesis 2b* was partially supported; directive density was positively related to team commitment ($\beta = 0.95$, $p < 0.01$) but directive centralization was also positively related to team commitment against our predictions ($\beta = 3.82$, $p < 0.01$).

Regression coefficients for the indirect paths were calculated as the product between the coefficient of team commitment regressed on team performance and the coefficient of each of the sharedness measures regressed on team commitment (Schwab, 1999). *Hypothesis 3a* predicted a fully mediated relationship between charismatic sharedness and team performance via team commitment. This hypothesis was not supported as observed in the significant but negative correlation coefficient calculated for charismatic density via team commitment ($\beta = -0.17$, $p < 0.001$) and the nonsignificant correlation coefficient calculated for charismatic centralization via team commitment ($\beta = 0.03$, $p > 0.05$). *Hypothesis 3b* predicted a fully mediated relationship between directive sharedness and team performance via team commitment.

This hypothesis was partially supported, where the indirect relationship between directive density and performance mediated by team commitment was positive as predicted ($\beta = 0.31$, $p < 0.001$), but also positive for directive centralization against the predicted direction ($\beta = 1.26$, $p < 0.001$).

Discussion

Several interesting findings attracted our attention resulting from the testing of our hypotheses. First, while our results were complex and our hypotheses not always supported, the non-redundancy of the results for the various network properties justifies the need to assess several properties of the collective leadership pattern. The two measures of participative sharedness – density of participative leadership and participative centralization – were strongly related to team performance, suggesting that teams may benefit from an environment where all members actively foster participation but that having a visible figure that enforces participation may be essential to maintain this culture in the team (Benne & Sheats, 1948).

The direct relationship between charismatic sharedness and team performance also elicited intriguing results. Charismatic density was positively related to performance, but was negatively related to committee commitment, suggesting a negative indirect effect of charismatic density on committee performance. While intriguing, the findings may be easier to interpret in the context of committees, often assigned with tasks that are peripheral to the main job activities and with less professional recognition. It seems reasonable to presume that such committees in which there is frequent questioning of the task and routines may lead to better results but also greater waste of time, to the dissatisfaction of the committee members. Sharedness in directive leadership had a significant but negative direct relationship with performance, where density was negatively related to committee performance and centralization positively related to committee performance, suggesting that there may be such a thing as “too much direction” for the committee to be effective. On the other hand, both directive density and centralization had a positive indirect effect on committee performance via committee commitment. The committee may benefit when one of its members has higher levels of directive leadership than the average committee member, bringing unity to these directions.

The distribution of leader behaviors among team members did not seem to affect team performance. This result contradicts the initial hypothesis that predicted that teams with permanent leadership roles are likely to benefit from the most effective leadership possible in the team, so long as they have sufficient team tenure to build knowledge about each other's strengths. This result suggests that the team may assign leadership roles considering personal characteristics other than actual ability, such as age, tenure, gender, personal appearance, or talkative behavior (Hollander, 1993; Won, 2006), and not necessarily their personal capacity to exert each leader behavior effectively.

References

[References are available on demand]

Table 1
Results of Regression Analysis for Mediating Effects of Sharedness on Team Performance

Variables	Model 1: Participative		Model 2: Charismatic & Directive	
	Team Performance ^a		Team Commitment ^a	Team Performance ^a
Step 1: Controls				
Committee size		-.10	.08	-.10
Committee tenure average		-.13	.13	-.13
Committee tenure diversity		.34**	-.18	.34**
ΔR^2		.06	.02	.02
Step 2: Direct Effects				
Charismatic Sharedness	<i>Centralization</i>		-.09	.05
	<i>Density</i>		-.51**	1.30**
Directive Sharedness	<i>Centralization</i>		3.82**	.44**
	<i>Density</i>		.95**	-.55**
Participative Sharedness	<i>Centralization</i>	.43**		
	<i>Density</i>	.89**		
ΔR^2		.43	.31	
Step 3: Mediating Effect				
Charismatic Sharedness	<i>Centralization</i>			.08
	<i>Density</i>			1.47**
Directive Sharedness	<i>Centralization</i>			.31**
	<i>Density</i>			-.86**
Team Commitment				.33**
ΔR^2				.07
<i>Overall R²</i>		.49	.33	.57
<i>Overall model F</i>		37.85**	13.56**	31.56**

* $p \leq 0.05$; ** $p \leq 0.01$; ^a N = 200; ^b N = 172.

Figure 1
Examples of Leadership Patterns attending to Centralization and Density

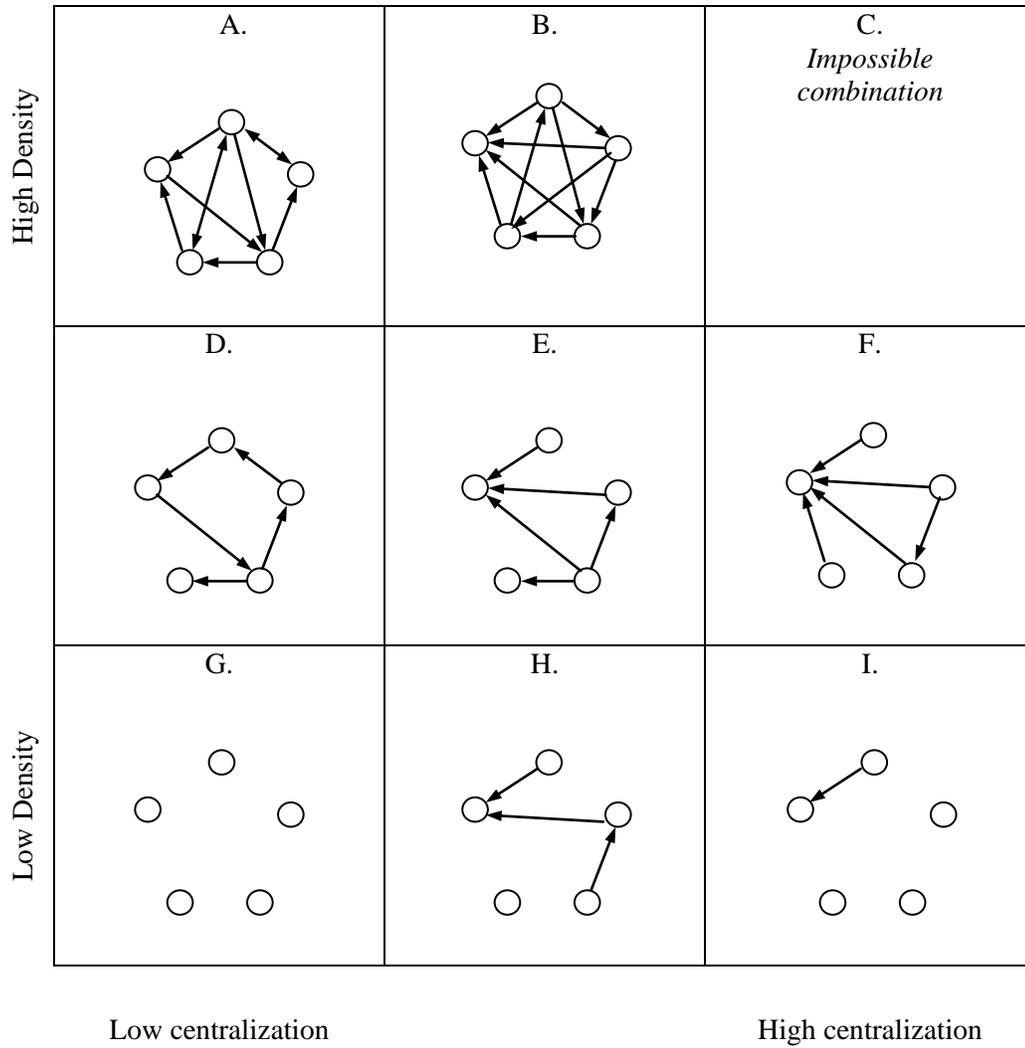


Figure 2
Leadership Patterns with different levels of Distribution and Sharedness

	Directive Leadership	Charismatic leadership	Participative Leadership	Supportive Leadership
<p>High Distribution and Low Sharedness <i>Each member in the committee leads, but using a different behavior</i></p>				
<p>Low Distribution and Low Sharedness <i>There is only one leader in the committee</i></p>				
<p>Low Distribution and High Sharedness <i>All members participate in all leader behaviors</i></p>				