Beyond the boss: how distributed leadership elevates team effectiveness in startup organizations? – a multi-level analysis

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Abstract

Purpose – Though there is an increasing corpus of work on contemporary styles of leadership, studies on distributed leadership (DL) are still in the nascent stage. Therefore, the purpose of this paper is to investigate how DL affects team effectiveness from the neglected perspectives of team cognition, team motivation and team coordination in startup companies using multi-level analysis.

Design/methodology/approach – The authors investigated the study variables through the lens of 42 teams in 18 startup organizations operating in India, representing an equitable distribution of the manufacturing and service sectors. M-plus was used to do statistical analysis on the multi-level model.

Findings – Drawing upon social exchange theory (SET), results indicated that DL had a favorable impact on team effectiveness and team cognitive processes, team motivation and team coordination mediates the association between DL and individual perceptions of team effectiveness.

Originality/value – Various studies have been carried out relating to leadership and how it impacts effectiveness. However, as far as the authors know, previous studies have failed to empirically address how DL drives team effectiveness by uncovering the mediating impact of team cognitive processes, team motivation and team coordination in the Indian startup context.

Keywords Distributed leadership, Team startup, Team coordination, Team motivation, Team cognitive processes, Team effectiveness, India

Paper type Research paper

1. Introduction

India, now is the third-largest startup ecosystem, with 38 companies valued at more than one billion dollars, popularly known as the unicorns (Patwardhan, 2022). As per the Economic Survey report of 2020–2021, 41,061 startups were recognized in India. For this trend to persist and not be a passing fad, startups must continue to expand and remain competitive in order to thrive. The foundation and growth of startups are inextricably tied to leadership and a crucial aspect in the formation of effective startups (Cogliser and Brigham, 2004). In startups, it is predicted that leadership behavior will be connected with both staff performance and organizational outcomes (Chammas and da Costa Hernandez, 2019) such as team effectiveness. Although leadership study has a long history, it is still at the infancy stage in the startups context (Zaech and Baldegger, 2017). All members of a startup team need to be nimble thinkers who can switch gears swiftly and confidently in the face of uncertainty (Thirasak, 2019). Startups function in a very uncertain environment with few established
conventions and procedures to govern their operations. Therefore, effective information exchange is imperative (Spender et al., 2017). As important as a brilliant and visionary leader is for a startups success, so is a strong and capable group of employees who can help bring the business to fruition. Furthermore, in a quick and dynamic workplace such as a startups, one leader cannot be able to carry out all the activities. Therefore, the leadership that is relevant in creative, complex and interdependent contexts (Pearce and Ensley, 2004) such as a startup is distributed leadership (DL). “Distributed leadership” is distinct from traditional leadership and involves enabling the leadership in others and actively supporting them (Harris, 2013). Leadership and accountability are disseminated throughout an organization as a result of DL and the decision-making process is shared by many people (Carroll, 2021). This is contrary to the traditional form of leadership authority and decision-making are vested in one person. In traditional leadership, the administration of dozens of direct reports becomes cumbersome and inefficient (Jain et al., 2019). Consequently, typical hierarchical management structures can fail and fall apart (Dwivedi et al., 2020). DL has been considered as a naturally arising property of a group or network of individuals who are interacting whereby expertise of the group members is pooled (Gronn, 2002). “Decisions about who leads and who follows are dictated by the task or problem situation, not necessarily by where one sits in the hierarchy” (Copland, 2003, p. 378). Adapting Gronn’s definition of DL which states that DL is a sort of concerted action that focuses on the added dynamism that emerges when individuals work together or as a result of combined agency (Harris, 2008), we have conceptualized DL as concerted action. The interpretation of DL as concerted action proposes a more comprehensive perspective in which leadership is manifested through synergies achieved through cooperative action. DL is generally defined as influencing members of a team by way of dynamic, interactive means to lead everyone in the direction of a team goal or organizational goals or both (Spillane et al., 2004; Thien, 2019). It indicates how evenly distributed authority is throughout the team. According to the recent work by Jönsson et al., (2016), DL was defined as sharing of generic leadership tasks to influence resource availability, decision-making and goal setting within an organizational perspective. The team with DL enables every member to contribute to the effective and efficient performance of the team (Canterino et al., 2020; Printy and Liu, 2021). A well-balanced distribution of leadership roles in a team can enhance team coordination, motivation and information sharing, thereby contributing to effectiveness (Zaccaro et al., 2001).

DL has been studied in various contexts like schools, universities and organizations (such as Bush and Ng, 2019; Canterino et al., 2020; García Torres, 2019; Hickey et al., 2022; Printy and Liu, 2021) and has been connected with numerous variables including job satisfaction (García Torres, 2019), organization change (Harris, 2008), team performance (Mehra et al., 2006). Though the concept of DL rose to prominence since 2000, the studies about this field remain largely restricted to the domain of education only (see review Bolden, 2011). This instills the importance of conducting studies in other contexts such as manufacturing and services and even more in the context of emerging businesses such as startups. Further, the literature is well established between leadership and effectiveness (e.g. Wallace, 2002; such as Mehra et al., 2006). However, the impact of DL on team effectiveness among startups is still an unexplored area. Through this study, we aim to make a bridge this research gap and contribute to the present body of knowledge.

This study intents to comprehend the connection between DL and team effectiveness of Indian startups using a multi-level model. Besides, by demonstrating multi-level model, our research aims to contribute to the literature by offering new insight into the underlying mechanism of team cognition, team motivation and team coordination linking DL and team effectiveness. In the current study, we draw on the prepositions by Zaccaro et al (2001) which states that the four types of team processes – cognitive, motivational, affective and coordination – are all influenced by leadership processes. Combining individual and
organizational level variables, this study explores the connection between DL and team effectiveness using multi-level analysis. We posit that team members will feel encouraged by the mutual backing provided by this arrangement leading to motivation, coordination and team cognition and thus enhancement in team effectiveness. Further, Klotz et al., (2014) advocated for further research on the mediating processes of the team to advance research on startup team dynamics. However, the meditational mechanisms through which leadership affects team outcomes have only been studied indirectly in a small number of studies (Morgeson et al., 2010). A comprehensive understanding of the interplay between DL and team effectiveness through these variables are missing in the previous studies. Therefore, we postulate that through DL, the cognition (Gutwin and Greenberg, 2001), motivation (Printy and Liu, 2021) and coordination (Feng et al., 2017) increases leading to enhanced team effectiveness. In addition to this, the study aims to understand DL based on the theoretical viewpoint of social exchange theory (SET) (Blau, 1964), focusing on the influence of DL on team effectiveness through the mediating consequence of team cognition, team motivation and team coordination. According to Homans (1961), the purpose of SET is to explain behavior rather than merely describe it. The direct influence of DL on team effectiveness can be explained by Due to its emphasis on interactions between multiple actors, SET is often contended to as the transactional theory of social existence (Mitchell et al., 2012). It is based on the premise that one party typically returns the good (or occasionally bad) deeds of another through a process of reciprocity involving the exchange of resources (Gouldner, 1960). Employees frequently evaluate whether their organization has provided what it promised or agreed to provide. When a contract is substantially fulfilled, employees are likely to increase their team contributions (Gervasi et al., 2022). Therefore, it is argued that when teams' supportive and supervisory functions are evenly distributed among its members through DL, team motivation, cognition and coordination will be developed and as a consequence of which employee will reciprocate with enhanced team effectiveness. In light of the aforementioned justifications, this study seeks to find answers to the following overarching questions:

RQ1. Does DL foster team effectiveness among startup teams?

RQ2. Do team cognition, team motivation and team coordination mediate the relationship between DL and team effectiveness?

2. Theoretical background and hypotheses development

2.1 Distributed leadership and team effectiveness

DL is typically described as the process of influencing team members through dynamic and interactive methods, guiding everyone toward the achievement of team and organizational goals, or both (Hickey et al., 2022; Spillane et al., 2004; Thien, 2019). It refers to the extent to which supportive and supervisory functions are equitably distributed among the subgroups within the leadership team. This fosters the cultivation of shared values among team members, encompassing a collective set of opinions, ideas and principles regarding how and where team members collaborate (Liu et al., 2021). It facilitates inclusion, dynamism, community discourse, participation, motivation and coordination; these factors are essential for promoting systemic, sustained organizational excellence (Harris, 2004; Woods and Gronn, 2009). Whereas, team effectiveness refers to “the extent to which group members are motivated and committed to their joint work” (Chen and Tjosvold, 2002, p. 558). Here we argue that DL will have a positive impact on team effectiveness. The relationship between DL and team effectiveness can be understood through the lens of the SET. SET posits that individuals engage in relationships and interactions based on a principle of reciprocity, where
they seek to maximize rewards and minimize costs (Macias et al., 2023). This theory suggests that people are more likely to invest effort and resources when they perceive that their contributions will be recognized, appreciated and rewarded in return. DL involves spreading leadership responsibilities across multiple team members rather than relying solely on a single leader (Bush and Ng, 2019). In this arrangement, team members have the opportunity to contribute their skills, knowledge and insights to the team’s goals (Rasoolimanesh et al., 2015). As per the notions of SET, when team members perceive that their contributions are valued and recognized, they are more likely to invest their effort and collaborate effectively which can lead to team effectiveness. This assumption is also supported by the extant empirical evidence that has found a favorable impact of DL on team effectiveness. For example, Ensley et al. (2006) found that shared leadership (used synonymously with DL in the literature) enhances top management teams’ performance in startup companies. Similarly, the positive effect of DL on self-rated and others-rated team effectiveness has been demonstrated in school effectiveness (Liu, 2020). Additionally, DL has also been associated with an array of positive outcomes such as service delivery (Jakobsen et al., 2023), professional learning, work motivation (Bektas et al., 2022), optimism (Thien and Chan, 2022) etc. Therefore in concordance with the theory and previous research (such as Ensley et al., 2006; Pearce and Sims, 2002), we propose the following:

H1. DL (Level 2) is positively related to team effectiveness (Level 1).

2.1.1 Mediating role of team cognitive processes (information sharing and processing). Team cognition is a characteristic of the team that describes the mental organization, representation and/or distribution of knowledge among team members (Aggarwal and Woolley, 2019; Grand et al., 2016; Salas and Fiore, 2004). It is distinct from individual cognition because each team member acts as an independent information processor. It is the ability of members of a team to anticipate one another’s requirements and coordinate their actions based on shared patterns of knowledge structures (Kozlowski and Ilgen, 2006). Therefore, team cognition consists of stimulating and predicting the thoughts, behaviors and attitudes of others without having to be specifically inquired or told about (Gorman et al., 2020).

We propose that DL enhances team effectiveness by cultivating team cognition, which encompasses information sharing and processing within teams. In cases, where leadership functions are dispersed among team members, the exchange of information and interpersonal influence becomes multi-lateral, in contrast to the traditional vertical leadership model where it occurs primarily between a single leader and other team (Bush and Ng, 2019). Consequently, we anticipate that DL will bolster team effectiveness by facilitating information sharing and processing among team members. This can also be explained drawing on the theoretical lens of SET. As explained previously, SET posits that individuals engage in social interactions with the expectation of mutual benefits. DL is a type of leadership encourages more participation, collaboration and shared responsibility among team members (Hulpia and Devo, 2010). It aligns closely with SET as it promotes a collaborative environment where team members are more likely to invest their cognitive and emotional resources due to the expectation of a positive exchange of benefits. Team cognitive processes, such as information sharing, play a critical role in facilitating this exchange of benefits. This cycle of exchange leads to improved team effectiveness. Furthermore, a meta-analysis conducted by DeChurch and Mesmer-Magnus (2010) tracked the influence of team cognition on both team processes and performance, revealing substantial and significant effects. The advantages of enhancing cognitive processes within teams lie in their capacity to autonomously adapt and promptly respond to evolving team dynamics (Martins and Wonbin, 2022). Moreover, it’s been historically assumed that team cognition forms a linear connection linking inputs (such as DL), processes (like information sharing) and outcomes (such as team effectiveness) (Gorman
et al., 2020). Prior empirical studies have also delved into the relationship between team cognition and performance (Bierhals et al., 2007; Salas and Fiore, 2004; Ward and Eccles, 2006). Therefore, we propose.

H2a. Team cognition (level 2) mediates the positive relationship between DL (level 2) and team effectiveness (level 1).

2.1.2 Mediating role of team motivation. Individual motivation is characterized by the intrinsic desire to complete a task or solve a problem, driven by its inherent intrigue and challenge (Wang et al., 2016). It pertains to how an individual perceives and engages with a task (Deci and Ryan, 1985). Other team members might impact and reinforce an individual’s perception and ideas regarding job tasks. Team motivation is defined by Chen and Kanfer (2006) as a set of common beliefs among team members about the nature of their work and the extent to which they are capable of accomplishing it. Such shared beliefs originate from individual motivation and are formed through constant interaction and communication among team members (Morgeson and Hofmann, 1999). Recent research indicates that team motivation can be comprehended by generalizing individual motivation components and theories to the team level (Park et al., 2013; Wang et al., 2016).

We assume that DL improves team effectiveness by enhancing team motivation. The beliefs, values, goals and expectations of team members are distinct. While a leader must find a way to motivate each team member based on their motivational element, it is tough with traditional leadership. In DL, the leadership tasks are allocated among team members (Hulpia and Devos, 2010). When leadership functions are distributed among team members, especially if the distribution is based on each person’s expertise and competence, team members are likely to believe that all tasks that a team needs to perform are dealt within the best possible way (García Torres, 2019). This belief further strengthens a team’s motivation in accomplishing its goals (i.e. team effectiveness) and helps the team to achieve high performance. Team motivation plays an imperative role when it comes to inspiring, encouraging and stimulating individuals or teams to achieve tremendous success (Luu et al., 2019). This can also be explained using SET. DL fosters a sense of trust, respect and mutual support among team members (Thien and Chan, 2022). The team members, feeling valued and respected, are motivated to engage more fully in the team’s activities. We argue that the improved motivation facilitated by DL enhance the team’s ability to make well-informed decisions and effectively address challenges. This, in turn, leads to improved outcome such as team effectiveness. Previous studies in the education sector (such as Bektas et al., 2022; Ucar and Dañgl, 2017) have noted that a positive relationship exists between DL and the motivation of teachers. Further, researchers have contended that of the key drivers of effective team outcomes is the motivation of team members (Hackman and Walton, 1986; Kozlowski and Bell, 2003). A rich body of research has endorsed the value of team members’ task-related motivational states in building effective teams (see meta-analytic reviews by Seibert et al. (2011) and Stajkovic et al. (2009). Past studies has also shown considerable empirical evidence of the positive influence of team motivation on team performance (Ma et al., 2017).

Therefore, we hypothesize:

H2b. Team motivation (level 2) mediates the positive relationship between distributed (level 2) leadership and team effectiveness (level 1).

2.1.3 Mediating role of team coordination. Coordination, which involves dynamically arranging various components to accomplish larger tasks or functions, remains a perpetual necessity in human activities (Gorman, 2014). Team coordination refers to a unified action of two or more people working interdependently to achieve a mutual goal (Berntzen and Wong, 2021). It is a special case that occurs when two or more people work interdependently for a time period to perform a common and valued function, Team coordination safeguards that a
particular team will function as a whole (Pasarakonda et al., 2021). Individuals achieve more as a group than they could by themselves.

Elucidating on the theoretical grounding of SET, we assume that DL improves team effectiveness by facilitating team coordination. In DL, team members collectively share leadership responsibilities and decision-making authority (Gronn, 2009). This dynamic creates a sense of mutual dependence among team members (Day et al., 2004). We argue that this dynamic sense of interdependence enhances the team coordination (Nordbäck and Espinosa, 2019) which in turn leads to team effectiveness (Mathieu et al., 2019). It has been contended by Zaccaro et al. (2001) that fundamentally, the effectiveness of a team depends on how well its members can coordinate their actions. As discussed earlier, DL is such a leadership practice that enables every individual to share the work and be coordinated which is identified as a crucial process to understanding and leading to work team effectiveness. DL is a more open, democratic leadership paradigm, which incorporates the unique competencies of different individuals, prioritizes organizational performance and uses this to maximize performance (Fusarelli et al., 2011). Greater coordination amongst employees is generally considered as a strategy of achieving joint corporate goals and developing a competitive edge (Day et al., 2004). Therefore, it is expected that DL will harness team coordination. Furthermore, as highlighted by Pearce and Manz (2005 p. 132), through shared leadership (used synonymously with DL) organizations will be in a better position to harness the skills and talents of employees. This is because only leaders from the top don’t have all the requisite information, skills and abilities essential to lead all parts of knowledge work. Based upon the ideas, we assume that DL results in the coordination of the team efforts which will ultimately improve the effectiveness. Therefore, we hypothesize:

\[ H2c: \text{ Team coordination (Level 2) mediates the positive relationship between DL (level 2) and team effectiveness (level 1) (see Figure 1).} \]

3. Methods

3.1 Participants and procedure

We collected data between March–June 2021 from 42 teams in 18 startup organizations operating in India, including manufacturing, telecommunications and IT sectors domains, with an equitable distribution of teams in manufacturing and service sectors. Teams were selected only if they were found to meet the following criteria:

1. Each team comprised a minimum of four and all members were long-term employees of their organizations.
2. While collecting the data, the team should have been operational for at least six months.

Responding to the survey was entirely voluntary and confidential. The team members and their respective leaders filled the survey during their work hours.

We collected data by using both pen-paper and online versions. The online version was administered via a Google link sent to identify personnel on LinkedIn. It was possible to calculate response rates because we kept a track of the respondents with whom questionnaire was shared on LinkedIn. All participants were informed that their participation was voluntary and responses to the surveys would remain confidential. We collected data by using both pen-paper and online versions. The online version was administered via a Google link sent to identify respondents on LinkedIn. It was possible to calculate response rates because we kept a track of the respondents with whom questionnaire was shared on LinkedIn. All participants were informed that their participation was voluntary and responses to the surveys would
Distributed Leadership

Team Coordination

Team Effectiveness

Team Cognition

Team Motivation

Distributed Leadership

b3 = 0.178**
b2 = 0.178***
b1 = 0.112***
a3 = 0.530***
a2 = 0.481***
a1 = 0.432***
c = 835***
c’ = 645***

Note(s): **p < 0.05, ***, p < 0.01
Source(s): Authors’ analysis

Figure 1. The statistical diagram of the parallel multiple mediator model of leadership elevating team effectiveness.
remain confidential. Each participant was assigned a code number and all the respective team members were assigned a similar code number to match the data. This helped the researchers to identify the data with ease. Additionally, no reward was given to the respondents (see Table 1).

3.2 Data collection instruments
3.2.1 Distributed leadership. Eight questions from a scale developed by Canterino et al. (2020), based on Gronn’s (2002, 2009) description of DL, were used to assess DL. Team level data was calculated by aggregating individual perception of DL at the group level, that is, by the means of individual perception of DL among employees pertaining to the same working group. The responses ranged from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree”. The sample items included statements such as “Both me and my peers could clearly describe the vision”. The Cronbach’s alpha of the scale was 0.98.

3.2.2 Team cognition. To measure team cognition, a 3-item scale developed by Tsai and Ghoshal (1998) was adopted. The responses ranged from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree”. A sample item is as follows: “Team members share a common understanding and are willing to share their problems when communicating with each other”. The Cronbach’s alpha of the scale was 0.97.

3.2.3 Team motivation. Team motivation was assessed by adopting Tierney et al. (1999) 5-item measure of individual motivation. Minute changes were made in the scale such as the focal referent was changed from individual (i.e. “I”) to the team level (i.e. “our team”) (Chan, 1998). Sample Item includes: “Team enjoys creating new procedures for work tasks.” The Cronbach’s alpha of the scale was 0.97.

3.2.4 Team coordination. To measure team coordination, we adopted (Tierney et al., 1999) 5-item measures of team coordination. The responses ranged from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree”. Sample items include: “Our team has very few misunderstandings about what to do.” The Cronbach’s alpha of the scale was 0.97.

3.2.5 Team effectiveness. For measuring the individual perception of team effectiveness, we have adopted a scale by Hur et al. (2011). Slight modifications were made to the adaptations and wordings of the scale items to suit the requirement particular Indian startup

<table>
<thead>
<tr>
<th>Characteristics of the respondents</th>
<th>Number</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
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<tbody>
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<tr>
<td>Age</td>
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<td>Total</td>
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<tr>
<td>Total</td>
<td>452</td>
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</tbody>
</table>

Table 1. Description of sampling characteristics and distribution in the survey

Source(s): Authors’ analysis
context. The scoring ranged from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree”. Sample items include: “The employees of our team are good at coming up with ways to complete their tasks” and “The employees of our team get their work done very effectively.” The Cronbach’s alpha of the scale was 0.98.

4. Results
4.1 Construct validity
In order to assess the construct validity and distinctiveness of our study variables, we utilized multi-level confirmatory factor analysis (CFA) to evaluate the measurement models at both the individual and team level.

We modeled DL, cognition, motivation and coordination at the between level. At the within level we modeled individual perception of team effectiveness. The measurement model exhibited a good fit to the data ($\chi^2 = 683.82$, df = 354, $p < 0.001$, comparative fit index [CFI] = 0.96, root mean square error approximation [RMSEA] = 0.04, standardized root mean square residual [SRMR]$_{within} = 0.04$ and [SRMR]$_{between} = 0.11$. The indicators of all the variables loaded significantly on their respective latent factors. In light of these findings, the CFA reveals the distinctness of the study variables and, consequently, the construct validity of the survey measures was indicated.

4.2 Analytic strategy
Multi-level structural equation modeling (MSEM) with observed variables and robust maximum likelihood (RML) estimates was used to test the multi-level hypotheses.

Using Mplus software, MSEM was conducted (Muthén and Muthén, 1998). By separating (differentiating) the variance of the variables, MSEM provides an accurate estimation (Muthén and Asparouhov, 2011) within level (level 1; owing to individual differences) and between level (level 2; similarity among employees in the same team). A 2-1 model for Hypotheses 1 and a 2-2-1 model for hypothesis 2 were examined following (Preacher et al., 2010). The team level of DL, cognition, motivation and coordination corresponded to variables at level 2, whereas individual perception of team effectiveness corresponded to the variables at Level 1. Furthermore, the variables which were controlled included the effect of group size (Level 2) and the gender, age and length of service (tenure) of the employees (Level 1). In addition to the $\chi^2$ statistic, comparative fit index (CFI), the Tucker–Lewis Index (TLI) and the root mean square error of approximation (RMSEA) was also assessed. In general, models with CFI and TLI values over 0.90 and RMSEA values below 0.05 suggest an acceptable fit (Schermelleh-Engel et al., 2003). Web utility (Selig and Preacher, 2008) employed Monte Carlo (MC) confidence intervals was used to estimate the relevance of indirect effects on multi-level modeling.

4.3 Aggregation analysis and descriptive statistics
DL, team cognition, team motivation and team coordination were the four variables which were tracked on an individual basis and added up at the group level (Edmondson, 1999). To investigate the justification of the aggregation, we calculated within-group agreement ($r_{wg}$), intra class correlations (ICC1), the reliability of the team means (ICC2) and F-tests to determine whether average scores varied significantly across teams. As per (Bliese, 2000) where the $r_{wg}$ is more than 0.70, the ICC1 is more than 0.12 and the ICC2 is more than 0.60, an aggregation can produce more reliable assessments of the construct of interest than a single rating. The $r_{wg}$ were 0.762 for DL, 0.730 for Team cognition, 0.734 for Team Motivation and 0.726 for Team Coordination in this study indicating that all these values were greater than the critical value of 0.70 indicating that team agreement on the construct was acceptable (James et al., 1993).
For DL the ICC1 value was 0.662, ICC2 value was 0.955 (p < 0.001) and F (41,410) = 20.86, p < 0.001. The ICC1 value is equal to the ICC term referred to the mixed-effects model literature (Bryk and Raudenbush, 1992) and value of 0.662 indicates that 66.2% of the variance in individual perception of DL can be explained by team membership. The measure of group mean reliability is ICC2 and the value of 0.954 implies that the team can be reliably distinguished in terms of average DL (see Bliese, 2000). For team cognition the ICC1 value was 0.204, ICC2 value was 0.733 (p < 0.001) and F (41,410) = 3.729, p < 0.001, for team motivation the ICC1 value was 0.176, ICC2 value was 0.698 (p < 0.001) and F (41,410) = 7.691, p < 0.001 and for team coordination the ICC1 value was 0.301, ICC2 value was 0.822 (p < 0.001) and F (41,410) = 5.635, p < 0.001. All evidence indicated that the group effect was statistically significant (p 0.001). The results suggested it was statistically acceptable to conceptualize and analyze the aggregation of individual-level data to team-level data. Table 2 presents the mean and bivariate correlation for each of the study variables.

Overall, the MSEM model where DL at the team level was a predictor at Level 2 and had a cross-Level effect on individuals’ perceptions of the team effectiveness, showing a good fit: $\chi^2/df = 3.689, p = 0.162, CFI = 0.984, TLI = 0.932, RMSEA = 0.069$. Table 3 presents the results of the MSEM analysis. The cross-level effect hypothesized (H1) was supported by finding a positive correlation between DL at team level and perception of team effectiveness at an individual level (employee level) (B = 0.945, p < 0.001). A good model fit was also shown by the 2-2-1 MSEM: $\chi^2/df = 4.060, p = 0.162, CFI = 0.920, TLI = 0.941, RMSEA = 0.064$. Table 4 shown the results of MSEM analysis which presents between and within effects for the examined 2-2- model (H2). Concerning H2a, there is a significant favorable link between DL at team level (level 2) and cognition (level 2) (B = 0.830, p = 0.000), as well as a significant positive association between cognition and individual perception of team effectiveness (level 1) (B = 0.424, p = 0.007). Additionally, through team cognition, the team level of DL had a favorable and statistically significant indirect effect on individual perception of team effectiveness (non-standardized estimate of the product of coefficients = 0.05, 95% MC CI = 0.165, 0.542). Therefore, H2a’s proposed mediation is supported.

For H2b, there is a substantial and positive association between team-level DL (level 2) and team motivation (level 2) (B = 0.934, p = 0.000), as well as a significantly favorable association between motivation and individual perception of team effectiveness (level 1) (B = 0.47, p = 0.007). In addition, DL at the team level had a positive and statistically significant indirect effect on individual perception of team effectiveness via team motivation (non-standardized estimate of the product of coefficients = 0.05, 95% MC CI = 0.227, 0.653), thereby supporting the mediation hypothesis H2b.

With regard to H2c, a favorably significant association between team-level DL (level 2) and team coordination (level 2) (B = 0.772, p = 0.007) and significant positive relationship between team coordination and individual perception of team effectiveness (level 1) (B = 0.486, p = 0.00) was found. Furthermore, team level DL had a statistically significant positive indirect effect on individual perception of team effectiveness, via team coordination (non-standardized estimate of the product of coefficients = 0.05, 95% MC CI = 0.197, 0.655), thereby therefore lending credence to H2c’s mediation hypothesis.

5. Discussion

Drawing on SET, the article provides a more comprehensive understanding of the underlying factors through which DL among startup teams contributes to individual perception of team effectiveness through a multi-level investigation. In the pursuit to further explain the factors contributing to TE, we surmise that the direct relationship between DL and individual perception of TE may be mediated through team cognition, team motivation and team coordination. Therefore, a multi-level model was built and tested (Hayes, 2017) based on the
<table>
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<th></th>
<th>Mean</th>
<th>Variance within</th>
<th>Variance between</th>
<th>Distributed leadership</th>
<th>Team cognition</th>
<th>Team motivation</th>
<th>Team coordination</th>
<th>Team effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed leadership</td>
<td>2.59</td>
<td>0.59</td>
<td>1.15</td>
<td>–</td>
<td>0.92</td>
<td>0.99</td>
<td>0.8</td>
<td>0.96</td>
</tr>
<tr>
<td>Team cognition</td>
<td>3.22</td>
<td>1.21</td>
<td>0.31</td>
<td>0.24</td>
<td>–</td>
<td>0.98</td>
<td>0.99</td>
<td>0.93</td>
</tr>
<tr>
<td>Team motivation</td>
<td>3.4</td>
<td>1.27</td>
<td>0.27</td>
<td>0.27</td>
<td>0.21</td>
<td>–</td>
<td>0.9</td>
<td>0.96</td>
</tr>
<tr>
<td>Team coordination</td>
<td>3.26</td>
<td>1.16</td>
<td>0.50</td>
<td>0.37</td>
<td>0.42</td>
<td>0.36</td>
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<td>0.82</td>
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<td>Team effectiveness</td>
<td>2.72</td>
<td>1.09</td>
<td>0.96</td>
<td>0.51</td>
<td>0.32</td>
<td>0.37</td>
<td>0.4</td>
<td>–</td>
</tr>
</tbody>
</table>

**Note(s):** \( n(\text{within}) = 452, n(\text{between}) = 42 \) lower triangular: within-group, upper triangular: between-Group

**Source(s):** Authors' analysis
key insights of Zaccaro et al. (2001) to account for ways in which DL may indirectly lead to team effectiveness. Taking guidance from the broader literature on TE, we found that the results of our investigation show the imperativeness of considering indirect association of DL. Our findings showed that DL and team effectiveness are positively associated. Further, as predicted, all the three mediators (team cognition, team motivation and team coordination) mediated the directed relationship between DL and individual perception of team effectiveness.

5.1 Theoretical implications
The findings of this study add significantly to the literature on DL and TE. First, drawing upon the SET, it is expected that teams with a well-balanced role system attained through DL, will outperform teams that lack DL as employees will try to reciprocate positively to the organization. We thus, attempt to contribute to SET in the light of DL and therefore our study enriches the literature of these variables which is vital for startups.

Second, the paper provides empirical evidence of what influence DL has on startup teams’ effectiveness and, more importantly, how. Little work has been undertaken to study these variables in the context of startups. Startup teams are a particular type of team for which DL practice is most suitable and beneficial (Pearce et al., 2004). In addition to this, previous studies related to these variables have been conducted largely in either education (such as Garcia Torres, 2019; Bush and Ng, 2019) or healthcare (Canterino et al., 2020). Therefore, it remains an open question that whether these findings can be generalized to other sectors like

<table>
<thead>
<tr>
<th>Team effectiveness</th>
<th>Parameter</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.019</td>
<td>0.001</td>
</tr>
<tr>
<td>Age</td>
<td>21.206</td>
<td>1.444</td>
</tr>
<tr>
<td>Tenure</td>
<td>1.172</td>
<td>0.081</td>
</tr>
<tr>
<td>Between</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed leadership</td>
<td>0.946</td>
<td>0.064</td>
</tr>
</tbody>
</table>

Table 3.
Multi-level analysis for 2-1 model
Note(s): **p < 0.01. Coefficients are unstandardized
Source(s): Authors’ analysis

<table>
<thead>
<tr>
<th>Team effectiveness</th>
<th>Parameter</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within</td>
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<td>1.172</td>
<td>0.081</td>
</tr>
<tr>
<td>Between</td>
<td></td>
<td></td>
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<tr>
<td>Distributed leadership</td>
<td>0.945</td>
<td>0.086</td>
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<tr>
<td>Team cognition</td>
<td>0.424</td>
<td>0.113</td>
</tr>
<tr>
<td>Team motivation</td>
<td>0.47</td>
<td>0.117</td>
</tr>
<tr>
<td>Team coordination</td>
<td>0.486</td>
<td>0.113</td>
</tr>
</tbody>
</table>

Table 4.
Within and between effects for the tested 2-2-1 model (H2)
Note(s): **p < 0.01. Coefficients are unstandardized
Source(s): Authors’ analysis
startup teams. Therefore, through our study, we attempt to show the relevance of DL in startups and thus making an essential contribution to the literature. Moreover, literature is well established exploring the importance of DL in organizations of high performance such as the army (Fusarelli et al., 2011) which allows leadership to be pervasive throughout the organization (Collins, 2001). Despite the startup being a high-performance organization, DL has not received significant scholarly attention.

Lastly, we explain this by considering a more complex framework by unfolding conditions of mediating mechanism of three underlying processes (team cognition, motivation and coordination), certainty supporting the idea that the relationship between DL to TE is contingent upon team cognition, motivation and coordination. Therefore, it supplements prior research of Zaccaro et al., (2001) by empirically extending their study in the DL context, and therefore, our study establishes the importance of DL in achieving TE via team cognitive processes, team motivation and team coordination.

5.2 Practical implications
The relationships presented by our study play a substantial role in comprehending what drives DL towards team effectiveness. Apart from contributing theoretically, our study bears some imperative implications for managerial practice as well. First, our study highlights the role of DL in contributing to team effectiveness. We aim to expand the current scientific knowledge of DL in the startup teams that may largely benefit from the practice of DL. The findings of this study demonstrate that DL does account for team effectiveness. As a consequence, organization leaders must consider implementing DL to develop a better tailored and more effective team among startups. The efficiency of teams as a whole will improve greatly as a result of these efforts. Employees who perceive that their opinions are valued are more likely to perform effectively in a team contrary to teams where leadership is centralized. To facilitate leaders, enhance the DL, training programs may be offered to teams for nurturing leadership behaviors. In addition, the findings of this study can provide guidance (such as to compose optimal teams in terms of leadership functions) and help to develop training programs (e.g. to train teams in specific leadership and followership behaviors) for startup teams. Through our study, we attempt to highlight the significance of DL as it helps in breaking down complex/dense tasks into sections and steps, strategize and manage time, refine the comprehension through dialog and explanation within, provide and obtain feedback/response on the performance.

Consequently, developing DL among teams can also facilitate members of the team to build/develop skills specific to collective efforts, permitting them to deal with more complicated problems than they could have done on their own such as pooling everyone’s knowledge, expertise and skills and delegation of roles, duties and responsibilities by sharing diverse viewpoints. Therefore, we recommend the startup team leaders hold one another and be held accountable and enable transparency of decisions, receive collective support and reassurance to take up consequences and risks. Moreover, we further recommend developing innovative tactics to resolve the discrepancies and differences and establishing a shared identity with the team members by finding efficient and valuable partners to follow.

Second, the results of the mediation indicate that with team cognition, team motivation and team coordination, the team effectiveness of startups will tend to increase. Thus, organizations can enhance team effectiveness by establishing team cognition, team motivation and team coordination which emphasizes the need for clear goal-setting set achievable goals and encouraging employees. For example, managers may foster a climate of team cognition by information sharing, inhibiting knowledge hiding behavior by organizing training programs and workshops. Additionally, managers may create institutionalized
communication and knowledge exchange platforms and flatter organizational structures. Managers should incorporate measures that will enhance the motivation of team members. It is a way to achieve effectiveness as explored by our study which can be enhanced through the DL. Managers should encourage employees to perform to the best of their capabilities. Positive reinforcement can enhance teams’ motivation which will, in turn, be a precursor for team effectiveness. In addition, organizations should develop team coordination by organizing team-building exercises.

Finally, the findings of the paper will contribute to leadership, team and entrepreneurial research and management practices, especially those specific to entrepreneurial startup teams. DL can guide to establish a well-balanced role system in startup teams that may help them to survive fierce competition against incumbent enterprises.

5.3 Limitations and future study recommendations

Though an attempt has been made to significantly contribute to the theory and practice of DL, this study also has some shortcomings. The first limitation pertains to research survey methods incorporated by our study. The responses were self-reported which has a potential disadvantage of socially desirable bias (Chung and Gary, 2003) and leniency bias (Barron and Sackett, 2008). Though we tried to decrease its impact of common method bias by conducting a dyadic survey but the impact cannot be completely wiped out (Jordan and Troth, 2020). Moreover, to test the theoretical assumptions about the association between the DL and team effectiveness, future research may aim to conduct longitudinal by sampling startup companies in different geographical locations across the globe. It may be fruitful if future researches undertake experimental design to further strengthen the causal inferences.

Second, we attempted to determine the relationship between DL and TE through the mediating effects of team cognition, motivation and coordination. However, other potential mechanisms are guiding DL toward team effectiveness such as knowledge sharing and trust which have been ignored by our study. Future researches can undertake other consequences of DL. Moreover, there are some other plausible moderators which may play a role between DL and team effectiveness such as lack of coordination among team members, the self-interest of team members. Future studies can uncover these variables in the light of DL as well as consider adding more control variables at organizational and team level to develop more robust model.

Third, through this paper, we have also begun to develop a holistic overview of DL in startup teams in India. However, recognizing the generalizability limits of any study is important. The respondents of this study were limited to Indian startups. We, therefore, recommend more studies to be conducted in other western and non-western countries.

References


Edmondson, A.C. (1999), The View through a Different Lens: Investigating Organizational Learning at the Group Level of Analysis, Division of Research, Harvard Business School, Boston.


Kozlowski, S.W.J. and Bell, B.S. (2003), *Work Groups and Teams in Organizations*, John Wiley & Sons, NJ.


Leadership elevating team effectiveness


Supplementary analysis

To further verify our results, We used process model 4 to examine the direct and indirect effect of our model. In this model, exogenous variable X (Distributed Leadership – DL) is modeled as influencing endogenous variable TeamEffectiveness-EF), directly as well as indirectly via three parallel mediators (Team cognition – EC, Team motivation -EM, Team coordination – ECOR). For this analysis the most relevant information considered was the indirect and direct effects of Distributed leadership on Team effectiveness.

Firstly, we analyzed whether distributed leadership has an impact on team effectiveness. The results of the mediation effect were tested via bootstrapping, which considers 65% confidence intervals. Results from SPSS Process macro (Table 3) illustrated that the direct effect of distributed leadership on team effectiveness was significant ($\beta = 0.645$, 95% CI (confidence Interval) [0.567, 0.722]), providing support for hypothesis H1. Similarly, the impact of distributed leadership on team cognition ($\beta = 0.432$, 95% CI [0.353, 0.511]), team motivation ($\beta = 0.481$, 95% CI [0.404, 0.559]) and team coordination ($\beta = 0.530$, 95% CI [0.451, 0.608]) were positive and significant. Considerably, hypothesis H2a suggested that team cognition mediates the relationship between distributed leadership and team effectiveness. Results indicate that the indirect effect of distributed leadership on team effectiveness via team cognition was positive and significant ($\beta = 0.053$, 95% CI [0.015, 0.089]), providing support for hypothesis H2a. In similar vein, indirect effect of distributed leadership on team effectiveness via team motivation was positive and significant ($\beta = 0.085$, 95% CI [0.050, 0.126]) and also the indirect effect of distributed leadership on team effectiveness via team coordination was positive and significant ($\beta = 0.051$, 95% CI [0.003, 0.100]) providing support for the hypothesis H2b and H2c.
<table>
<thead>
<tr>
<th></th>
<th>Team cognition</th>
<th>Team motivation</th>
<th>Team coordination</th>
<th>Team effectiveness</th>
</tr>
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<tr>
<td>Coef.</td>
<td>SE</td>
<td>t</td>
<td>p</td>
<td>Coef.</td>
</tr>
<tr>
<td>Distributed</td>
<td>b 0.432</td>
<td>0.04</td>
<td>10.77</td>
<td>b 0.481</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b 0.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b 0.645</td>
</tr>
<tr>
<td>Team cognition</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Team motivation</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
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<tr>
<td>Team coordination</td>
<td></td>
<td></td>
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<td>0.097</td>
</tr>
<tr>
<td>Constant</td>
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<td>iY 2.15</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>iY 1.898</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>iY 0.259</td>
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<tr>
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<td>452</td>
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<tr>
<td>adjusted R²</td>
<td>0.452</td>
<td>0.499</td>
<td>0.531</td>
<td>0.799</td>
</tr>
<tr>
<td>F-statistics</td>
<td>F (1,450) = 116.14, p &lt; 0.01</td>
<td>F (1,450) = 149.38, p &lt; 0.01</td>
<td>F (1,450) = 177.24, p &lt; 0.01</td>
<td>F (4,447) = 197.95, p &lt; 0.01</td>
</tr>
</tbody>
</table>

Source(s): Authors' analysis
Constructs | ICD | FL | Alpha
---|---|---|---
**Distributed leadership**
1. I discussed with and helped my peers in solving problems | DL1 | 0.873 | 0.984
2. Both me and my peers could clearly describe the vision | DL2 | 0.856 | 0.984
3. The organization provided me and my peers with a set of shared values that guided the change | DL3 | 0.852 |
4. All units were expected to achieve high levels | DL4 | 0.843 |
5. Me and my peers met regularly to discuss performance | DL5 | 0.839 |
6. Me and my peers regularly met to discuss standards and objectives | DL6 | 0.821 |
7. I provided structure that encouraged all my peers to participate in improving the process | DL7 | 0.798 |
8. Informal leaders played an important role in improving the change implementation effectiveness | DL8 | 0.792 |

**Team cognition**
1. Team members share a common understanding and are willing to share their problems when communicating with each other | TC1 | 0.887 | 0.971
2. Team members share the same ambitions and vision with each other | TC2 | 0.878 |
3. Entrepreneurial team members are enthusiastic about pursuing the collective goals and missions of the whole organization | TC3 | 0.876 |

**Team motivation**
1. Team enjoy finding solutions to complex problems | TM1 | 0.897 | 0.971
2. Team enjoy coming up with new ideas for products | TM2 | 0.885 |
3. Team enjoy engaging in analytical thinking | TM3 | 0.878 |
4. Team enjoy creating new procedures for work tasks | TM4 | 0.876 |
5. Team enjoy improving existing processes or products | TM5 | 0.860 |

**Team coordination**
1. Our team worked together in a well-coordinated fashion | TCOR1 | 0.901 | 0.979
2. Our team had very few misunderstandings about what to do | TCOR2 | 0.869 |
3. Our team needed to backtrack and start over a lot. (reversed) | TCOR3 | 0.866 |
4. We accomplished the task smoothly and efficiently | TCOR4 | 0.863 |
5. There was much confusion about how we would accomplish the task. (reversed) | TCOR5 | 0.840 |

**Team effectiveness**
The employees of our team are good at coming up with ways to complete their tasks | TEF1 | 0.860 | 0.98
The employees of our team effectively deals with uncertainty and unexpected events | TEF2 | 0.860 |
At times, this team fails to approach its task adequately (reversed) | TEF3 | 0.838 |
The employees of our team are very competent | TEF4 | 0.816 |
The employees of our team get their work done very effectively | TEF5 | 0.809 |
The employees of our team has performed their job well | TEF6 | 0.793 |
I can rely on those I work with in this team | TEF7 | 0.681 |
There is team spirit among members of the team | TEF8 | 0.665 |

**Note(s):** ICD, items code; FL, factor loadings; α, Cronbach alpha

**Table A2.** Constructs, items, factor loads, Cronbach’s ALPHA

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