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Abstract

Purpose – Shared leadership describes leadership as a collective and reciprocal activity distributed among the members of a team (Carson *et al.*, 2007). The purpose of this paper is to investigate variables assumed to be antecedents for this leadership approach. In particular, the authors examine the importance of external empowering leadership and task and goal interdependence for shared leadership as well as the relationship between shared leadership and team performance.

Design/methodology/approach – In order to test the hypotheses, the authors applied structural equation modeling using a field sample of 81 knowledge and manufacturing teams from a Danish company.

Findings – Results indicated that an external empowering team leader and interdependence in the team significantly predicted the extent of shared leadership, which, in turn, was positively related to team leader ratings of team performance.

Research limitations/implications – Overall, the study supports previous findings that the act of sharing leadership in a team may contribute to increased team performance. In addition, the study provides an initial understanding of antecedent conditions for the successful development of shared leadership. However, as the study was cross-sectional and conducted within a single organization, care must be taken in making causal claims or in generalizing the results without additional evidence.

Originality/value – Few studies focus on the antecedents of sharing leadership. The authors obtained evidence, which suggests that the development of shared leadership may depend on the presence of an empowering team leader as well as task and goal interdependence in the team.

Keywords Interdependence, Team performance, Empowering leadership, Shared leadership

Paper type Research paper

1. Introduction

Increasing globalization and competition, along with the ubiquitous pursuit of innovation, drive organizations to organize more effectively, in order to maintain a competitive advantage in an ever-changing market (Drucker, 1995; Goodwin *et al.*, 2009). Concomitantly, organizations face the challenges of meeting the needs and seizing the advantages of a more educated workforce with a wider range of knowledge to offer (Pearce and Manz, 2005). As a result, the prevalence and use of teams has increased along with a focus on factors that enable team performance (Burke *et al.*, 2011; Morgeson *et al.*, 2010). Leadership is one crucial contributor to team performance (Zaccaro *et al.*, 2001); however, in order to leverage the advantages of teamwork and to capture emergent leadership dynamics in the team (Barry, 1991), it is necessary to question traditional leadership models that place the formal hierarchical leader as the primary center of attention (Gronn, 2002; Morgeson *et al.*, 2010).

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Rather than focussing narrowly on downward influence and leadership by a single individual, attention has shifted toward the leadership processes that develop within the team and among the team members (Bligh *et al.*, 2006; Day *et al.*, 2004, 2006; Friedrich *et al.*, 2009; Pearce and Sims, 2000, 2002). Shared leadership represents a reconceptualization of leadership on a team level (Ensley *et al.*, 2006; Mehra *et al.*, 2006), and it describes influence and leadership as a collective and shared activity emerging among the members of a team (Conger and Pearce, 2003). In addition, a shared leadership approach implies that leadership responsibilities and tasks are actively distributed (Perry *et al.*, 1999), and influence processes are horizontal and mutual instead of vertical and unidirectional. In this way, the notion of shared leadership expands the traditional leadership model to include multiple leaders and to take advantage of dispersed knowledge and expertise among team members.

Within the last decade, shared leadership has received growing theoretical and empirical attention, and its significance in relation to team performance and team processes has been demonstrated across different contexts (e.g. Boies *et al.*, 2010; Carson *et al.*, 2007; Hoch *et al.*, 2010b; Pearce and Sims, 2002; Sivasubramaniam *et al.*, 2002; Small and Rentsch, 2010; Solansky, 2008). Nonetheless, what is lacking is an elaborate understanding of antecedent conditions necessary for the mutual sharing of leadership to emerge successfully.

Although numerous scholars identify antecedents of shared leadership as an area meriting further inquiry (e.g. Bligh *et al.*, 2006; Burke *et al.*, 2003; Cox *et al.*, 2003; Conger and Pearce, 2003; Perry *et al.*, 1999; Seers *et al.*, 2003), few studies investigate antecedent conditions for the development of shared leadership. In the current paper, we propose that an empowering team leader and interdependence are two critical antecedents to shared leadership. Even though scholars recognize and stress the importance of the vertical, formal team leader (e.g. Cox *et al.*, 2003; Houghton *et al.*, 2003; Pearce, 2004), existing studies largely neglect the significance of the team leader for the development of shared leadership. We propose that an empowering team leader is particularly important to encourage and empower team members to lead themselves and each other and, thereby, to facilitate rotation of leadership in the team. In a similar vein, Wassenaar and Pearce (2012, p. 367) stress "that empowerment is a critical and necessary component for the development of shared leadership in a group." Moreover, in order for shared leadership to emerge and to be functional, we also argue that team members must work toward the same goals and interact and depend on each other in solving their tasks and, thus, experience a certain degree of interdependence. The importance of interdependence for cooperative social processes has long been recognized (e.g. Deutsch, 1949; Tjosvold, 1998). More recently and in a shared leadership context, Pearce (2004) proposed that team members are more likely to share the leadership when they face situations with high levels of interdependence. Despite the theoretical emphasis on interdependence, it has to our knowledge not been investigated in relation to the development of shared leadership.

The primary purpose of the present study is, therefore, to investigate the predictive value of these two theoretically important antecedents in relation to shared leadership. The second purpose is to examine the relationship between shared leadership and team performance, in order to capture whether or not shared leadership is a successful team practice. Toward this end, we used a field sample of 81 knowledge and manufacturing teams from a Danish company. Since most shared leadership studies are conducted in a US context, the present study also contributes to expanding the cultural context for shared leadership studies by offering a new context for the exploration of shared leadership dynamics.

2. Shared leadership and team performance

Shared leadership is defined as a "simultaneous, ongoing, mutual influence process within a team that is characterized by 'serial emergence' of official as well as unofficial leaders" (Pearce, 2004, p. 48). Defined in this way, shared leadership emerges in the team processes and involves distribution and rotation of leadership to the team member with most relevant knowledge and skills in any given situation (Carson *et al.*, 2007; Conger and Pearce, 2003; Perry *et al.*, 1999). Accordingly, vertical influence from a single team leader is substituted for or complemented by continuous interactions of reciprocal and horizontal influence processes among the members of a team. Therefore, instead of mostly relying on the skills of one leader, shared leadership allows for the enactment and effective use of skills and knowledge across multiple team members (Carson *et al.*, 2007). Based on these theoretical advantages, shared leadership should predict higher levels of team performance, particularly in knowledge work areas that require complex decision making, creativity, and flexibility. This argument is supported by some initial research on shared leadership that demonstrates shared leadership's positive influences on attitudes, behavior, cognitions, and performance (see Wassenaar and Pearce, 2012, for a review). However, the relationship between shared leadership and team performance has primarily been studied in the USA (Pearce, 2008). Conversely, the present study of 81 teams is conducted in a Danish context. Hoch *et al.* (2010b) demonstrated a positive relationship between shared leadership and team performance in a German context, and Ishikawa (2012) found positive relationships between shared leadership and R&D performance in a Japanese context. Denmark is characterized by a much lower power distance than Germany, the USA, and Japan (index 18 compared to 35, 40, and 54, respectively; Hofstede, 1980), which according to Muethel and Hoegl (2010) predicts a higher level of shared leadership. Moreover, Denmark is known for its traditions of participation, which involve employee involvement and influence sharing. Since shared leadership is predicated on the notion of power sharing, Denmark makes for a relevant and interesting country to study the effects of shared leadership. Consequently, we propose the following hypothesis:

H1. Shared leadership and team performance are positively related.

3. Antecedents of shared leadership

Since shared leadership is defined as an emergent team process (e.g. Carson *et al.*, 2007; Pearce *et al.*, 2004), we maintain that certain conditions must be met, in order for it to develop. We aim to inquire into two dimensions in teams' conditions, pertaining to the significance of teams' relation to the external managerial system and to their internal task and goal organization. By including these two contextual dimensions, we argue that we tap into two different, yet important, conditions for team work. Following this, we investigate vertical empowering leadership – in terms of an external empowering team leader – and task and goal interdependence.

3.1 Vertical empowering leadership and shared leadership

Theoretically, the emergence of shared leadership does not eliminate the existence of nor continued need for a formally appointed team leader (either internal or external), also referred to as a vertical leader (Carson *et al.*, 2007; Cox *et al.*, 2003; Ensley *et al.*, 2006; Friedrich *et al.*, 2009; Houghton *et al.*, 2003; Pearce *et al.*, 2008; Pearce and Sims, 2002; Perry *et al.*, 1999; Seibert *et al.*, 2003). In particular, scholars agree that shared leadership supplements rather than replaces vertical leadership (Cox *et al.*, 2003; Houghton *et al.*, 2003). In support of this, in their study of 71 change management teams, Pearce and Sims

(2002) found that teams characterized by both shared and vertical leadership outperform other team leadership constellations. Vertical leadership usually implies top-down hierarchical leadership where the leader is positioned above the employees, who as a consequence experience low levels of discretion (Ensley *et al.*, 2006; Pearce and Manz, 2005). However, since shared leadership relies on leadership tasks and responsibilities being distributed among team members, the formally appointed team leader has to take on a new role that fosters team member leadership initiatives and active rotation of leadership in the team. Perry *et al.* (1999, p. 37) equally maintain that shared leadership is unlikely in teams "without power and authority to lead themselves" and, thus, in teams with highly hierarchical and controlling team leaders. Consequently, the absence of empowered team members may leave the leadership undistributed in the hands of the official team leader. In the following, we therefore argue that external, vertical empowering leadership is crucial in the development of shared leadership in teams.

Overall, empowering leadership is defined as a leader's encouragement of employees to initiate tasks, set goals, learn new thing, assume responsibilities, and coordinate and collaborate with each other (Pearce and Sims, 2002; Sims *et al.*, 2009). Therefore, instead of directing and controlling the team members, an empowering team leader transfers power, responsibility, and leadership to the team (Manz and Sims, 1987; Stewart, 2006) by empowering the team and the individual team members to be self-directing and to lead themselves and each other without direct supervision (Srivastava *et al.*, 2006). Consequently, if team members experience that their team leader displays empowering leadership behaviors – in terms of modeling and encouragement of self-leadership, collaboration, and shared leadership (Houghton *et al.*, 2003; Manz and Sims, 1991) – the team members may be more willing and motivated to offer and accept leadership from each other.

Theoretically, the importance of empowering leadership is emphasized by Houghton *et al.* (2003) who stress that the SuperLeader (equivalent to an empowering team leader) is essential in creating and developing shared leadership in teams. In particular, they maintain that since sharing leadership implies that different leadership roles are filled by the team members, the SuperLeader's primary function is to facilitate and support the shared leadership processes by empowering and developing team members. Pearce *et al.* (2008) and Clarke (2012) similarly argue that vertical empowering leadership is essential in developing shared leadership in teams.

Although no studies to our knowledge have examined the relationship between vertical empowering leadership and shared leadership, one of Hoch's (2013) findings in her study of 43 work teams was that the combined effect of transformational and empowering leadership fosters the development of shared leadership. Ishikawa (2012) similarly found that gatekeeping leadership facilitates shared leadership in 119 R&D teams in Japan, whereas Carson *et al.* (2007) showed that external coaching behaviors predict the emergence of shared leadership in their study of 59 MBA consulting teams. Using a field experiment, Martin *et al.* (2013) additionally demonstrated that empowering leadership stimulated proactive behaviors, which suggests that empowering leadership similarly may encourage the active sharing of leadership in a team. Building on the above studies and on the theoretical advantages of empowering leadership in relation to shared leadership emergence, we propose the following hypothesis:

H2. Vertical empowering leadership is positively related to shared leadership.

3.2 Interdependence and shared leadership

Interdependence is a defining characteristic of teams (Campion *et al.*, 1993; Guzzo and Dickson, 1996; Rasmussen and Jeppesen, 2006; Sundstrom *et al.*, 2000) that reflects

a mutual dependency among team members in their work. In particular, interdependence is defined as the degree to which team members must rely on the skills of others, interact, and depend on one another in order to complete and accomplish their tasks and, accordingly, reach their goals (Guzzo and Shea, 1992; Wageman and Baker, 1997). Interdependence can be placed on a continuum such that teams are highly interdependent when team members experience that they have to coordinate their efforts and rely on input, information, and materials from each other to solve their tasks and achieve their goals (Campion *et al.*, 1993; Guzzo and Shea, 1992). Conversely, interdependence is low, if employees can complete their work somewhat independently with minimum interaction with each other.

Following Pearce and Sims' (2000) theoretical framework of shared leadership, we argue that interdependence acts as an antecedent to shared leadership. Since shared leadership relies on leadership among team members, such that they cooperate, interact, and mutually guide and influence each other, we expect that interdependence is a necessary internal team condition for shared leadership to emerge and persist effectively. One of Wageman and Baker's (1997) findings – in their experimental study of 112 undergraduate students – was that task interdependence increased team member cooperative behaviors. Koster *et al.* (2006) similarly demonstrated that task interdependence was positively related to solidarity toward co-workers. Consequently, interdependence may facilitate cooperative relations and interactions and in this way enable and foster the rotation of leadership required in shared leadership.

Scholars within the shared leadership literature have similarly stressed the importance of interdependence, and Wassenaar and Pearce (2012, p. 382) maintain that "shared leadership is applicable only to tasks where there is interdependency between the individuals involved." Additionally, Pearce and Sims (2000) propose that the level of task interdependence predicts the display, form, and effectiveness of shared leadership. They further emphasize that the opportunity for shared leadership decreases, if tasks are completely independent. Perry *et al.* (1999) contend that a team incurs time and effort costs, if they share the leadership without having interdependent tasks and goals. Therefore, it is likely not worth the effort to engage in shared leadership processes, if employees are not interdependent. Following this, the emergence of shared leadership seems unlikely in teams with very small levels of interdependence among team members. On the other hand, the interaction and coordination inherent in interdependence provides a suitable context for the enactment of effective shared leadership behaviors.

Building on the above arguments, we therefore propose that:

H3. Interdependence is positively related to shared leadership.

Together the above proposed hypotheses are presented in an overall model (see Figure 1).

4. Methods

4.1 Sample and procedure

The present study was conducted among 81 teams in a green tech manufacturing company located in Denmark. In total, 37 of the teams were manufacturing teams and the remaining 44 were knowledge teams. Teams varied considerably in size from three to 24 members with a mean size of 9.13 (SD = 4.16). In total, 63 percent of the team members were male and age ranged from 19 to 66 years across teams with a mean

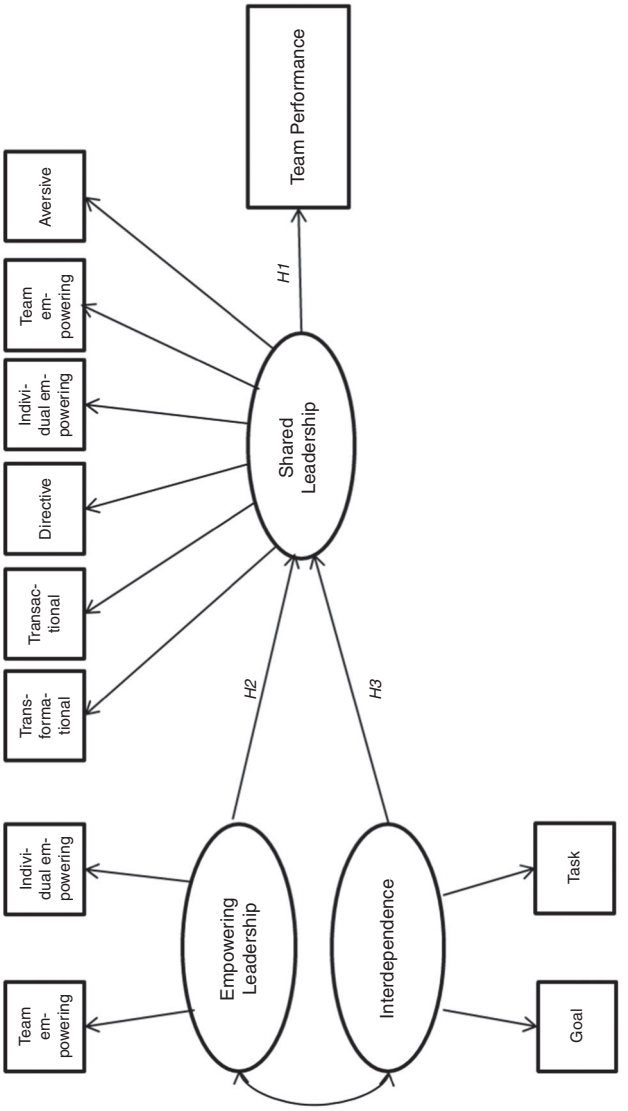


Figure 1.
Hypothesized model

of 41.51 years (SD = 9.16). The team members had an average organizational tenure of 5.45 years (SD = 4.79) at the current company and an average team tenure of 2.66 years (SD = 2.68) in their current team.

Questionnaires were administered in Danish. To ensure content validity (Brislin, 1986), the English questionnaire items were translated from English to Danish and then back translated into English to ensure validity of the first translation. This was done by several independent individuals. Survey data were gathered during paid working hours over the course of three weeks either through an online questionnaire (for employees with access to computers) or through paper-pencil questionnaires. Participants were assured that their answers would be strictly confidential and only available to the research group and not to the company. Of the 763 participants who received the questionnaire, 562 returned it, yielding a response rate of 74 percent. However, teams with fewer than three respondents were eliminated from the sample, resulting in a sample of 552 employees in 81 teams.

4.2 Measures

The present study is part of a larger study on teams, influence, and leadership. Measures of shared leadership, vertical empowering leadership, and interdependence reflect team level phenomena (cf. the Appendix). Team members, therefore, rated their perception of their team and team leader. Following this, team member scores were aggregated to the team level to reflect a team score, and subsequent analyses were performed at the team level. Following the advice of Chan (1998), we checked whether aggregation of scores to the team level was appropriate by computing within group similarity, r_{WG} (James *et al.*, 1993). As a supplement to r_{WG} (Biemann *et al.*, 2012) and to further support aggregation of scores, interclass correlations, *ICC(1)*, were calculated for each scale. Shared leadership, vertical empowering leadership, and interdependence were rated by team members on a five-point Likert scale (1 = strongly disagree) to 5 (strongly agree). The Cronbach's α measure was used to test the internal consistency of each scale and ranged from 0.73 to 0.95, establishing good reliability of the scales.

4.2.1 Shared leadership. Shared leadership was measured using Hoch *et al.*'s (2010a) *Short Version of the Shared and Vertical Leadership Questionnaire*, originally developed by Pearce and Sims (2002) and also applied by Hoch *et al.* (2010b) and Hoch (2013). The questionnaire includes measures of transformational, transactional, directive, individual empowering, team empowering, and aversive shared and vertical leadership, with four to six items per subscale. The items reflect team members' perceptions of different leadership behaviors displayed by members of the team (Pearce and Sims, 2002). A sample item for shared transformational leadership is: "My team colleagues provide a clear vision of whom and what our team is." Because the Danish language is less comprehensive than the English language, the scale for aversive leadership was slightly altered in order to ensure variability in the wording of the questions. However, the core theoretical components of aversive leadership were maintained in the scale. Since shared leadership is composed of six distinct leadership styles (subscales), we analyzed the construct as a latent variable. The Cronbach's αs for the shared leadership subscales ranged from 0.79 to 0.95.

In order to test the factor structure of shared leadership, we conducted an individual level hierarchical confirmatory factor analysis (CFA). Building on the results of the CFA, we excluded the subfactor shared aversive leadership, since it did not load substantially on the shared leadership factor ($\beta = -0.28$). In the resultant CFA,

subfactor loadings ranged from 0.52 to 0.88, and the subsequent measurement model demonstrated a satisfactory fit: $\chi^2(204) = 588.47$, $p < 0.001$, CFI = 0.929, TLI = 0.919, RMSEA = 0.059, 90 percent CI (0.054, 0.065), SRMR = 0.058. The Cronbach's α for the combined scale (without aversive leadership) was 0.85. We obtained support for aggregating to the team level. Even though the *ICC(1)* scores for the included shared leadership subscales ranged from 0.02 to 0.09 and 0.07 for the combined scale, which indicates a small to moderate group effect (Bliese, 2000), the r_{WG} scores ranged from 0.62 to 0.86 (transformational leadership = 0.86; transactional leadership = 0.75; directive leadership = 0.62; individual empowering leadership = 0.68; team empowering leadership = 0.78; combined scale = 0.84), suggesting moderate to strong inter-rater agreements, which supports aggregation of scores (Biemann *et al.*, 2012).

4.2.2 Vertical empowering leadership. Vertical empowering leadership reflects team member perceptions of their external team leader and was measured using two four-item scales of individual empowering vertical leadership and team empowering vertical leadership from the *Short Version of the Shared and Vertical Leadership Questionnaire* developed by Hoch *et al.* (2010a). Item examples for individual empowering and team empowering vertical leadership are: "My team leader urges me to assume responsibilities on my own" and "My team leader encourages me to work together with other individuals who are part of the team," respectively. The Cronbach's αs were 0.82 for individual empowering vertical leadership, 0.85 for team empowering vertical leadership, and 0.89 for the combined scale. We conducted an individual level two-factor CFA in order to test the factor structure of individual and team empowering vertical leadership. This resulted in factor loadings ranging from 0.55 to 0.87 and demonstrated a satisfactory model fit: $\chi^2(18) = 71.00$, $p < 0.001$, CFI = 0.975, TLI = 0.962, RMSEA = 0.075, 90 percent CI (0.057, 0.093), SRMR = 0.032.

Aggregation of scores to the team level was justified by high r_{WG} scores of 0.82 and 0.84 for individual empowering and team empowering vertical leadership, respectively, and 0.86 for the combined scale. In addition, *ICC(1)*s were 0.09 for both subscales and 0.10 for the combined scale, which suggests a moderate group effect (Bliese, 2000).

4.2.3 Interdependence. Interdependence was measured using a four-item scale adapted from Sprigg *et al.* (2000) and Campion *et al.* (1993). The scale includes items related to task and goal interdependence. Item examples for task and goal interdependence are: "I cannot complete my work assignments without information and materials from other members of the team" and "All the work I do is related to the goals of my team," respectively. The Cronbach's αs were 0.86 for task interdependence, 0.80 for goal interdependence, and 0.80 for the combined scale. In order to test the factor structure of task and goal interdependence, we conducted an individual level two-factor CFA. This resulted in factor loadings ranging from 0.68 to 0.97 and produced a satisfactory fit: $\chi^2(1) = 0.138$, $p =$ ns, CFI = 1.00, TLI = 1.00, RMSEA = 0.00, 90 percent CI (0.000, 0.081), SRMR = 0.002.

The r_{WG} scores for task and goal interdependence were 0.49 and 0.67, respectively, and 0.73 for the combined scale. *ICC(1)*s were 0.12 and 0.15, respectively, and 0.14 for the combined scale. These indices suggest moderate to strong agreement within teams as well as a moderate group effect (Biemann *et al.*, 2012).

4.2.4 Team performance. In an attempt to diminish common method bias (Podsakoff *et al.*, 2003), we used the company's annual performance rating system based on manager ratings as our performance measure. This performance rating is given once a year by the immediate manager, which in our case is the external team

leader, who is not an inherent part of the team, but who interacts with the team on a daily basis. The performance score is based on the team leaders' assessment of their employees' and teams' achievement (i.e. abilities to deliver the expected business results) and of how they achieved it (i.e. the behaviors displayed in delivering and reaching the expected results). The team performance score was measured on a scale from 80 to 135, and the scores ranged from 83 to 133, with a mean score of 105.09 (SD = 9.93).

4.2.5 Control variables. As team size varied considerably among the 81 teams (size range: three to 24 members), we included this variable as control in the analyses. Also, given that the sample consisted of both knowledge worker teams and manufacturing teams, who have varying degrees of task complexity, we included team work function as control variable in order to account for its potential influences on the relationship between shared leadership and team performance. Team size and team work function were based on company records.

4.3 Strategy of analysis

We applied structural equation modeling (SEM) with team level aggregated variables to analyze the hypotheses as integrated in a full model that also considers measurement error (Tomarken and Waller, 2005). For this purpose, we used the Mplus 7.0 software and its default normality robust maximum likelihood (MLR) model test. Moreover, we used full information maximum likelihood to deal with missing data (Muthén and Muthén, 2011). In order to deal with statistical power issues due to scales with a high number of items combined with a moderate number of teams, we chose to apply a parceling approach (cf. Tomarken and Waller, 2005). We parceled items together from the same subfactor of each of the variables. The parcels were then applied as manifest variables of the latent variables in the factor analysis part of the SEM model.

First, we analyzed the hypothesized model, and then we analyzed a subsequent model based on modification indices. In the modified model, we allowed errors of selected items to correlate, if they were either part of the same latent variable or crossed latent variables that were hypothesized to be independent variables (cf. Byrne, 2011).

5. Results

Means, standard deviations, and intercorrelations of key variables are presented in Table I. A missing data analysis showed covariance coverage of minimum 0.99. That is, missing data were less than or equal to 1 percent.

We performed a CFA of all the latent factors in the model by including parcels of the subfactors at the team level (i.e. the measurement model). The results of this test (without aversive shared leadership) demonstrated an unsatisfactory model fit: $\chi^2(24) = 101.26$, $p < 0.001$, CFI = 0.74, TLI = 0.61, RMSEA = 0.20, 90 percent CI (0.16, 0.24), SRMR = 0.09. However, in a Modification Index (MI)-based process (Byrne, 2011), the analyses showed that some of the errors of the indicator variables correlated. We chose to evaluate the conceptual meaningfulness of correlations with a MI beyond 3.84 because that is the 0.05 level significance cut off point for the χ^2 distribution. The resultant measurement model showed acceptable fit indices: $\chi^2(25) = 36.82$, $p = 0.06$, CFI = 0.97, TLI = 0.94, RMSEA = 0.08, 90 percent CI (0.00, 0.13), SRMR = 0.086, though the SRMR was somewhat above the often acceptable cut off at 0.08 (Hu and Bentler, 1998). However, sample size has a considerable impact on SRMR and due to this fact and in light of the other fit indices' acceptable levels, we chose to accept the model.

Table I. Means, standard deviations, and intercorrelations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Team size	9.13	4.16	–											
2. SL – transformational	3.54	0.26	−0.27*	*0.79*										
3. SL – transactional	3.36	0.31	−0.10	0.62***	*0.79*									
4. SL – directive	2.44	0.50	0.12	0.34**	0.53***	*0.95*								
5. SL – individual empowering	3.33	0.37	−0.10	0.67***	0.58***	0.51***	*0.88*							
6. SL – team empowering	3.58	0.37	−0.22*	0.68***	0.43***	0.29**	0.75***	*0.84*						
7. SL – aversive	1.57	0.33	0.20	−0.32**	−0.21	0.33**	−0.12	−0.25*	*0.89*					
8. VL – individual empowering	3.76	0.33	−0.09	0.39***	0.23*	−0.08	0.45***	0.47***	−0.42***	*0.82*				
9. VL – team empowering	3.95	0.32	−0.17	0.30**	0.10	−0.04	0.37***	0.61***	−0.29**	0.72***	*0.85*			
10. Task interdependence	3.09	0.56	0.12	0.26*	0.15	0.15	0.24*	0.30**	0.05	0.15	0.24*	*0.86*		
11. Goal interdependence	3.50	0.52	0.06	0.33**	0.43***	0.33**	0.18	0.35***	0.03	0.07	0.21	0.34**	*0.80*	
12. Team performance	105.09	9.93	0.03	0.18	0.02	−0.01	0.22*	0.10	−0.23*	0.26*	0.13	−0.09	−0.21	–

Notes: $n = 81$ teams. SL, shared leadership; VL, vertical leadership. α reliabilities are presented in italic on the diagonal. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Results of the full structural equation model confirmed our hypotheses. The model fitted satisfactory: $\chi^2(24) = 34.14$, $p = 0.08$, CFI = 0.97, TLI = 0.95, RMSEA = 0.07, 90 percent CI (0.00, 0.12), SRMR = 0.086. Specifically, the model showed that shared leadership and team performance were positively related ($\beta = 0.20$, $p < 0.05$, one-tailed) (*H1*). Moreover, vertical empowering leadership was positively related to shared leadership ($\beta = 0.45$, $p < 0.001$, one-tailed) (*H2*), and the same was the case for the hypothesized relationship between interdependence and shared leadership ($\beta = 0.43$, $p < 0.001$, one-tailed) (*H3*). Vertical empowering leadership together with interdependence explained 52 percent of the variance in shared leadership ($R^2 = 0.52$, $p < 0.001$), and shared leadership explained 4 percent of the variance in team performance ($R^2 = 0.04$, $p < 0.01$).

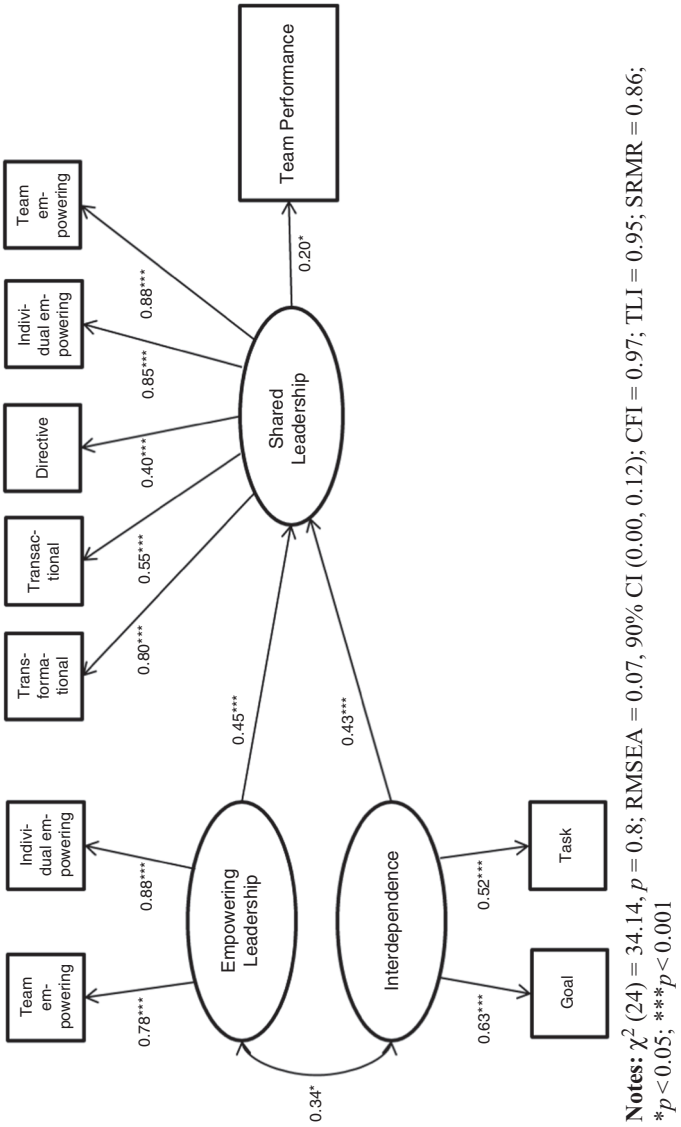
The two proposed independent variables, interdependence and vertical empowering leadership, were positively associated ($r = 0.34$, $p < 0.05$, one-tailed). Some correlations among the errors of the manifest indicator variables were identified: vertical team empowering leadership was associated with shared team empowering leadership ($r = 0.65$, $p < 0.001$, one-tailed). Vertical individual empowering leadership was associated with shared directive leadership ($r = -0.45$, $p < 0.01$, one-tailed). Shared transactional leadership was associated with shared transformational leadership ($r = 0.36$, $p < 0.001$, one-tailed), with shared individual empowering leadership ($r = 0.28$, $p < 0.01$, one-tailed), and with shared directive leadership ($r = 0.38$, $p < 0.001$, one-tailed). Goal interdependence was associated with shared transactional leadership ($r = 0.27$, $p < 0.01$, one-tailed) and with shared individual empowering leadership ($r = -0.40$, $p < 0.01$, one-tailed). Finally, shared individual empowering leadership was associated with shared directive leadership ($r = 0.40$, $p < 0.001$, one-tailed).

In order to control for team size and team work function, we regressed performance on these two variables. The resulting model showed a deteriorated fit: $\chi^2(42) = 110.71$, $p < 0.001$, CFI = 0.84, TLI = 0.74, RMSEA = 0.14, 90 percent CI (0.11, 0.17), SRMR = 0.12. In addition, neither team size ($\beta = 0.07$, $p = 0.53$) nor work function ($\beta = 0.05$, $p = 0.65$) were significantly related to team performance (Figure 2).

6. Discussion

The present study contributes to our understanding of factors associated with the development of shared leadership in teams. Moreover, it extends previous research findings by pointing toward a comprehensive model and understanding of antecedent conditions as well as performance effects of shared leadership. In sum, our results support our proposed model and demonstrate that vertical empowering leadership and interdependence are positively associated with the development of shared leadership in teams, which, in turn, is positively related to team performance.

To our knowledge, our study is the first to obtain evidence that vertical empowering leadership and interdependence may be two important predictors of the emergence of effective shared leadership. In particular, our results extend previous research on vertical leadership and confirm the theoretical predictions of the significance of an empowering team leader in facilitating shared leadership. Specifically, our results suggest the importance of an external empowering team leader who encourages and empowers the team members to provide and accept leadership in a team context in order to facilitate the sharing of leadership. In a study of 111 work teams in four organizations, Kirkman and Rosen (1999) similarly found that external leader behaviors increased team members' experience of team empowerment. Combined with our study, this suggests that team empowerment may be managed by the employees



Notes: χ^2 (24) = 34.14, p = 0.8; RMSEA = 0.07, 90% CI (0.00, 0.12); CFI = 0.97; TLI = 0.95; SRMR = 0.86; *$p < 0.05$; ***$p < 0.001$

Figure 2.
Structural model with standardized direct path coefficients

through shared leadership and in this way transformed into higher levels of team performance. In addition, one of Lorinkova *et al.*'s (2013) findings, in their longitudinal laboratory study of 60 teams, was that the effects of empowering leadership on team performance work through emergent team processes and states, which supports our findings that empowering leadership stimulates the emergence of shared leadership, that again, facilitates team performance. Correspondingly, Srivastava *et al.* (2006) assert that the relationship between empowering leadership and team performance is mediated by team processes. The present study identifies shared leadership as such a mediating team process.

Up to this research, the impact of interdependence on shared leadership emergence has not been empirically investigated. However, consistent with Kozlowski and Bell's (2003) recommendations for team research, we explicitly address and explore the significance of interdependence in relation to the team phenomena of shared leadership. In relation to this, we find that interdependence predicts shared leadership. Accordingly, we confirm the expected importance of having interdependent tasks and goals (Pearce and Sims, 2000; Perry *et al.*, 1999; Wassenaar and Pearce, 2012), in order to leverage the advantages of sharing leadership. Our results are similarly in line with research that shows that interdependence is related to cooperative behaviors and solidarity among co-workers (Wageman and Baker, 1997; Koster *et al.*, 2006).

In addition, consistent with previous studies of shared leadership effectiveness, we find a significant positive relationship between shared leadership behaviors and team performance. Since the present study is conducted in a Danish context among both knowledge and manufacturing teams, it contributes to prior literature by expanding the cultural and organizational contexts for shared leadership studies that otherwise predominantly have been conducted in the USA among student or knowledge teams. Thus, together with research on shared leadership conducted by Hoch *et al.* (2010b) in a German context and by Ishikawa (2012) in a Japanese context, the present study further supports and extends the positive effects of shared leadership cross-culturally. However, an initial CFA showed that the aversive leadership dimension of the shared leadership construct by Hoch *et al.* (2010a) did not load substantially onto the latent factor. Aversive leadership was therefore excluded from the analyses. Compared to the included leadership dimensions, aversive leadership represents a considerably more negatively loaded leadership style, characterized by threats, critique, focus on mistakes, and a harsh tone among the team members. This may account for the weak loading onto the latent shared leadership factor, which is otherwise dominated by benevolent leadership behaviors. Accordingly, aversive shared leadership may be a different phenomenon compared to other shared leadership behaviors.

In sum, our results suggest that the two team conditions – vertical empowering leadership and task and goal interdependence – may facilitate shared leadership that, again, may stimulate higher team performance.

6.1 Managerial implications

There are various managerial implications of the present study. Specifically, we encourage organizations and managers to carefully analyze specific team conditions, in order to ensure interdependence among tasks and goals in each team, if the organization aims to foster shared leadership behaviors. This may involve providing the team with overall goals and tasks that can only be reached through collaboration and enactment of diverse team member knowledge. Simultaneously,

our results suggest the importance of participative structures and empowering practices, in terms of providing teams with external empowering leadership, in order to facilitate and support the emergence of shared leadership among the team members. Moreover, an empowering team leader may facilitate team members' use of their collective resources in attaining their interdependent tasks and goals (Hackman and Wageman, 2005) by providing the team with opportunities and a context to enact their competences and to share the leadership. Accordingly, if team-based organizations want to promote shared leadership behaviors, they should delegate responsibility and leadership to the teams and train their team leaders to empower and model shared leadership in the teams.

6.2 Limitations and future research

The empirical study of shared leadership is still in its infancy and needs further exploration in relation to antecedents, moderators, mediators, and outcomes of shared leadership. The present study offers significant contributions, but it is not without limitations. Since our design is cross-sectional, no direct causation can be inferred. It may, for example, be that the nature of the relationships between the proposed antecedents and shared leadership is reciprocal such that the degree of interdependence also increases as a consequence of shared leadership. Moreover, in time, the role and tasks of the empowering team leader may change, as shared leadership becomes established in the team. For example, Lorinkova *et al.* (2013) found that over time, teams with empowering team leaders experienced greater performance improvements compared to teams with directive team leaders, although teams with directive leaders initially outperformed teams with empowering leaders. The performance improvements over time may be explained by the empowering team leader's early focus on encouragement of team development as opposed to a focus on instant task performance (Lorinkova *et al.*, 2013). These findings emphasize the importance of conducting longitudinal shared leadership research that addressees issues of direction and causality and that investigates the interaction and relative importance of shared leadership and different types of vertical leadership over time. Correspondingly, Carson *et al.* (2007) demonstrated that external coaching behaviors were more important for the emergence of shared leadership in teams who lacked a strong and supportive internal team environment compared to teams who had a strong internal team environment. The effects of an empowering team leader on shared leadership emergence may similarly be subject to certain contingencies such as team characteristics and team member attitudes. In particular, one of Li *et al.*'s (2013) findings, in their study conducted in two Chinese companies, was that the relationship between transformational leadership and followers' behavioral outcomes was contingent on various follower perceptions and characteristics such as team identification and individual differences. Therefore, an interesting direction of investigation may be to specify under which conditions empowering leadership is more likely to stimulate shared leadership as well as what processes may mediate the relationship between shared leadership and team performance. In relation to this, future research may benefit from investigating the interactions and joint influence of team member and team leader aspects and perceptions (Li *et al.*, 2013) in relation to the success of shared leadership. For example, it may be that certain team member and team leader constellations are more effective than others.

Furthermore, in order to clarify the role and significance of including or excluding the different leadership dimensions in the measurement of shared leadership, we encourage future research to investigate the underlying factor structure of shared leadership across multiple samples and contexts. Additionally, future research can benefit from further addressing how to measure shared leadership. A possible avenue would be to combine the present measurement approach that deals with the overall perception of leadership behaviors among the team members with a social network approach that captures to what extent each team member engages in the shared leadership processes (Carson *et al.*, 2007; Mayo *et al.*, 2003; Seibert *et al.*, 2003).

In addition, although the study is a field study, it was conducted in one organization in a Danish context. This limits the generalizability of the findings beyond countries with similar cultural and organizational features. In particular, Denmark is known for its traditions of participation and influence sharing, which may provide especially facilitating conditions for shared leadership to flourish. For example, it may be that the Danish context is responsible for the omission of aversive leadership from the shared leadership construct. This stresses the importance of investigating shared leadership more extensively across countries and cultures, in order to untangle the effects of sharing the lead in countries with various labor traditions and in order to further address and understand the advantages and possible pitfalls of sharing leadership in a team. This is particularly relevant in culturally diverse teams, where cultural values may differ, which provides different conditions for shared leadership to develop effectively (Ramthun and Matkin, 2012). In addition, the present sample was limited to knowledge and manufacturing teams in a private sector organization. Future research may benefit from exploring shared leadership across additional team and organizational contexts, including public sector settings.

Finally, the coefficients in the present study are somewhat low, particularly the coefficient between shared leadership and team performance, which was marginally significant. However, this may be due to the somewhat small sample size, and it suggests the importance of further investigating shared leadership across various samples and contexts.

7. Conclusions

The issue of team leadership and in particular of shared leadership has been addressed increasingly in recent years, and questions have been raised regarding how to develop shared leadership successfully. The present paper has empirically tested and found positive relationships among vertical empowering leadership, interdependence, shared leadership, and team performance. As expected, both an empowering team leader and interdependence were positively related to the development of shared leadership, which, in turn, was positively related to team performance. The present study provides a new context for shared leadership studies, and it confirms the theoretical notions of an external empowering team leader as well as organizational conditions that encourage interdependence in the team, in order to facilitate the emergence of effective shared leadership.

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Further reading

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Appendix

Shared leadership

a. Transformational leadership
- "My team colleagues provide a clear vision of whom and what our team is"
- "My team colleagues are driven by higher purposes or ideals"
- "My team colleagues show enthusiasm for my efforts"
- "My team colleagues encourage me to rethink ideas which had never been questioned before"
- "My team colleagues seek a broad range of perspectives when solving problems"
- "My team colleagues encourage me to go above and beyond what is normally expected of one (e.g. extra effort)"

b. Transactional leadership
- "My team colleagues and I have clear agreements and stick to those when we work together"
- "If I perform well, my team colleagues will recommend more compensation"
- "My team colleagues give me positive feedback when I perform well"
- "My team colleagues give me special recognition when my work performance is especially good"

c. Directive leadership
- "My team colleagues decide on my performance goals together with me"
- "My team colleagues and I work together to decide what my performance goals should be"
- "My team colleagues and I sit down together and reach agreement on my performance goals"
- "My team colleagues work with me to develop my performance goals"

d. Individual empowering leadership
- "My team colleagues encourage me to search for solutions to my problems without supervision"
- "My team colleagues urge me to assume responsibilities on my own"
- "My team colleagues encourage me to learn new things"
- "My team colleagues encourage me to give myself a pat on the back when I meet a new challenge"

e. Team empowering leadership
- "My team colleagues encourage me to work together with other individuals who are part of the team"
- "My team colleagues advise me to coordinate my efforts with other individuals who are part of the team"
- "My team colleagues urge me to work as a team with other individuals who are part of the team"
- "My team colleagues expect that the collaboration with the other members in the team works well"

f. Aversive leadership
- "My team colleagues use a harsh tone towards me"
- "My team colleagues try to influence me through threats"
- "My team colleagues focus on my mistakes"
- "My team colleagues are quick at leveling criticism against me"

Vertical leadership

a. Individual empowering leadership
   "My team leader encourages me to search for solutions to my problems without supervision"
   "My team leader urges me to assume responsibilities on my own"
   "My team leader encourages me to learn new things"
   "My team leader encourages me to give myself a pat on the back when I meet a new challenge"

b. Team empowering leadership
   "My team leader encourages me to work together with other individuals who are part of the team"
   "My team leader advises me to coordinate my efforts with other individuals who are part of the team"
   "My team leader urges me to work as a team with other individuals who are part of the team"
   "My team leader expects that the collaboration with the other members in the team works well"

Interdependence

a. Task interdependence
   "I cannot complete my work assignments without information and materials from other members of the team"
   "Other members of my team are depending on me for information and materials in order to do their jobs"

b. Goal interdependence
   "The work goals I have come directly from the work goals of my team"
   "All the work I do is related to the goals of my team"

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