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Characteristics of Effective Leadership in Multiteam Systems

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ABSTRACT

Work is more and more structured in teams and so-called Multiteam Systems (MTS). We address the question what constitutes effective leadership in MTS by conducting a qualitative and a quantitative study. The results highlight MTS-specific leadership behaviors above and beyond common leadership concepts.

PRESS PARAGRAPH

Work is more and more structured in teams and so-called Multiteam Systems (MTS), in order to meet the challenges of today's work environment. We address the question what constitutes effective leadership in MTS by conducting a qualitative and a quantitative study in applied settings. The results contribute by specifying MTS-specific leadership behaviors that relate to the effectiveness of MTS above and beyond common leadership concepts.

Characteristics of Effective Leadership in Multiteam Systems

In order to master the complexity and dynamism of today's work environment, organizations increasingly structure work in teams and in networks of teams. A network of teams is required when collaboration across traditional team and organizational boundaries is necessary to perform complex tasks, effectively adapt to changes and to meet diverse challenges. These networked entities can be described as teams that interdependently work for an overall goal and are called Multiteam Systems (MTS; Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005; Mathieu, Marks, & Zaccaro, 2001; Zaccaro, Marks, & DeChurch, 2012). In more detail MTS describe "two or more teams that interface directly and interdependently in response to environmental contingencies toward the accomplishment of collective goals. MTS boundaries are described by the virtue of the fact that all teams within the systems, while pursuing different proximal goals, share at least one common distal goal; and in doing so exhibit input, process and outcome interdependence with at least one other team in the system" (Mathieu et al., 2001, p. 290). In the recent years MTS have received more and more attention from theory and research (for an overview see Zaccaro et al., 2012). An example of an MTS is an interdependent network of teams working on the innovation of a new product consisting of teams in research and development, production and sales within an organization as well as teams from component suppliers from outside the organization. Whereas such an MTS has a specific overall goal (e.g., producing the new product), different teams within the network might have different proximal goals.

Many different aspects are crucial for MTS to function well, one of which is the leadership within the MTS. Leading MTS is a challenge for management over and above leading single teams or divisions within the organizational structures. For example competing

interests need to be managed when multiple leaders of different teams within an MTS collaborate with one another in reaching the overall common goal, while efficiently organizing the work within teams. In our research we focus on the question: What in particular constitutes effective leadership in MTS?

Even though leadership in MTS has been addressed by theory and research, many questions still remain unanswered. For example, regarding the structure of leadership in MTS Zaccaro and DeChurch (2012) suggest different forms: vertical and fully centralized leadership, vertical multilevel leadership, shared rotated leadership, shared distributed leadership, and shared simultaneous leadership. There is evidence that shared leadership is indeed beneficial for certain types of MTS (Bienefeld & Grote, 2014). Furthermore, empirically investigating different structures of MTS Lanaj, Hollenbeck, Ilgen, Barnes, and Harmon (2013) found that decentralization has positive (e.g., proactivity of team members) as well as negative effects (e.g., overly risky behaviors). Other studies have focused on specific leadership behaviors like strategizing and coordinating (De Church & Marks, 2006), strategic communication (Murase, Carter, DeChurch, & Marks, 2014) or boundary spanning (Davison & Hollenbeck, (2012), which are crucial and beneficial in leading MTS. A comprehensive analysis of different aspects important to leading MTS has been offered by De Church et al. (2011), who focused on MTS in extreme contexts like MTS responding to the aftermath of natural disasters or orchestrating post-war stability. Just like this last example all of the studies and papers mentioned before focus on MTS in somewhat special and extreme contexts: emergencies, military, aircraft teams, or ad hoc teams in the laboratory. However, so far research on leadership in MTS in “ordinary” organizational work settings, like product and service innovations, organizational change projects, horizontal linkage enterprises, restructuring initiatives and the like, is still missing.

Therefore, this paper explores characteristics of effective leadership in MTS in diverse and general organizational settings. We specifically do not include extreme context as listed above. Because little is known about leadership in MTS in non-extreme contexts, we began with exploratory qualitative interviews with leaders of various MTS. Building on these interviews we inductively identified what constitutes effective leadership in MTS. In a subsequent quantitative study, we tested the qualitatively induced assumptions about leadership in MTS. The two studies contribute in different ways to the literature: For theory building on leadership in MTS, we identify and further develop characteristics which comprise different facets of effective leadership in MTS. Furthermore, a questionnaire based measure was designed that can be used for exploring leadership and its effectiveness in MTS. Organizations in practice can benefit from the research by learning how to identify and train leaders for effective leadership in MTS beyond leading individuals and teams.

Study 1

Method

Participants. We conducted standardized interviews with 15 managers from low to medium levels within one organization. All managers worked in the area of research and development, where MTS are very common, of a large automotive company in Germany. They were part of different MTS within the organization or MTS beyond the boundaries of the organization. Based on the fact that the research question was specific and the interview partners were relatively homogenous (e.g., in professional background, occupancy, position), 15 participants are considered sufficient in order to learn about the major factors that constitute effective leadership in MTS of the kind studied (Robinson, 2014).

Design and Procedure. The study was a qualitative study, in which standardized interviews were conducted by one interviewer, who was a member of the university. After a general introduction the interviewer defined the term MTS: “*A MTS consists of at least two teams, which are together working on one overall goal besides specific team-goals. The teams within a MTS are dependent from one another due to the common use of resources, processes and outcomes.*” The interviewees were asked to think of the MTS, in which they were mainly working. In order to bring the MTS lively to interviewees’ minds, the interviewer prompted the interviewees to draw the MTS with its different agents on a sheet of paper. For example, one interviewee thought of an MTS, which worked on the development of drive systems, consisting of teams devoted to energy management, to thermal management and other areas. Then the interviewer first asked questions regarding the factors determining whether (or not) a MTS is functioning well. This first set of questions is not considered in this manuscript. Second, interviewees were asked: “*What does a leader needs to do in order for the MTS to function well?*” and “*Which behaviors of a leader hinder or impede a good collaboration in an MTS?*”. These two questions were the basis of the analysis presented here.

Data Analyses. The interviews were first entirely transcribed. The analysis was conducted following Huberman and Miles (2002). First we proceeded inductively: For answering the question what constitutes effective leadership in MTS, 203 chunks of information were extracted from the 15 interviews. For example a chunk of information was: “... one cannot only do one’s own thing, but one needs to consider other areas, subordinate areas and communicate that to teams to do that as well; that is important.” The information was then reduced by summarizing the content of the chunks of information and by identifying subordinate themes (68 themes were identified). These themes were then summarized in 32 categories. For

example the category for the chunk of information mentioned above was “focusing on the big picture of the MTS “. Two categories were only mentioned once and were not further considered. Thus the final number of categories was 30. Then we continued deductively: We were able to assigning the categories to factors addressing the leaders’ behaviors and emergent states in the MTS. In this paper we further focus on the first, not the latter. The leaders’ behaviors were assigned to existing leadership theories, if appropriate, or summarized in new behavioral clusters.

Results and Discussion

The results for the question what constitutes good leadership in MTS revealed existing leadership behaviors and new MTS-specific leadership behaviors. In more detail we found that transformational leadership as well as transactional leadership is necessary for efficiently leading MTS. However, in addition, the leaders need to show MTS-specific leadership behaviors. Examples for the leadership behaviors mentioned most often are: communicating with the different partners in the MTS, focusing on the big picture of the MTS, creating space for the collaboration within the MTS, understanding the multiple perspectives within MTS.

We conclude that effective leadership in MTS incorporates different leadership aspects: transformational and transactional leadership on the one hand as well as MTS-specific leadership behaviors on the other hand. However, this first exploratory approach asks for further specification and investigation. A first step towards this goal constitutes Study 2.

Study 2

Building on the results of Study 1 we aimed to quantitatively test the 3 characteristics identified as crucial for leading MTS: transformational leadership, transactional leadership and MTS-specific leadership behaviors. Thus we conducted a questionnaire study with individuals

working in different MTS in multiple organizations and diverse areas. Given that the three named characteristics were identified as constituting effective leadership in MTS, they were thought to positively relate to perceptions of efficient leadership in MTS as well as perceptions of the overall performance of the MTS. Thus we hypothesize:

Hypothesis 1a: Transformational leadership is positively related to effective leadership in MTS and the general performance of the MTS.

Hypothesis 1b: Transactional leadership is positively related to effective leadership in MTS and the general performance of the MTS.

Hypothesis 1c: MTS-specific leadership behaviors are positively related to effective leadership in MTS and the general performance of the MTS.

Furthermore, the distinctiveness and uniqueness of the three characteristics are specified in a second hypothesis:

Hypothesis 2: Transformational leadership, transactional leadership, and MTS-specific leadership behaviors each explain unique parts of the variance of effective leadership in MTS and the general performance of the MTS.

Method

Participants. We recruited 147 employees (67% female; average age = 33.03 years, SD=11.44) from diverse organizations in Germany, who answered an online questionnaire. In the introduction to the questionnaire we highlighted that it was a necessary condition for participation to work in a MTS. The companies and MTS, in which participants worked, were diverse: 26% worked in small companies (≤ 50 employees), 16% worked in medium-sized companies (≤ 500 employees) and 58 % in larger companies (< 500 employees); 69% of the participants worked in small MTS (≤ 5 teams), 28% worked in medium MTS (≤ 20 teams), 3%

worked in large MTS (> 50 teams); the majority of the MTS was within one organization (73%), the other 27% involved multiple organizations. Because our research focus is leadership in MTS we were also interested in the leadership structures of the MTS: 64% of the MTS were led by multiple leaders and 35% only by one leader (1% of the participants indicated to have other forms of leadership structure in the MTS).

Design and procedure. Participants received an online questionnaire prompting them to think of the MTS, in which they were working regularly. In the questionnaire we first defined the term “MTS” (using the same definition that was also used in Study 1) and then asked questions about the specific MTS (size, leadership structure), in which participants were working. Second, we urged participants to think of the leader or the leaders, leading the MTS. Third we included measures for transformational leadership, transactional leadership and MTS-specific leadership behaviors as well as questions about the effectiveness of the leadership and the general performance of the MTS. Please note that the study included other items assessing for example emergent states and other performance-related items that will not be further considered in this paper.

Measures. *Transformational leadership* and *transactional leadership* was assessed with a short version of the Multifactor Leadership Questionnaire (MLQ; Avolio, Sivasubramaniam, Murry, Jung, & Garger, 2003) published in Germany by Felfe (2006). The 12 items for transformational leadership formed a reliable scale. The transactional leadership scale includes 6 items; however, the 2 items for “management by exception - passive” had to be excluded because they lacked consistency with the scale. For measuring the *MTS-specific leadership behaviors* we formed items directly building on the statements of the qualitative interviews. Thus we draw from the expertise of the interviewees of Study 1 and deductively developed our

items (Hinkin, 1998). As a detailed description of the item generation process as well as its internal structure would exceed the scope of this paper, we provide all details upon request. *Effective leadership in MTS* was measured with 4 items designed for this study (“I am satisfied with the leader(s)”, “I would describe the leader(s) as (a) good leader(s)”, “the leader(s) make a contribution to the effective functioning of the MTS”, “the leader(s) do a good job”). The *general performance of MTS* was assessed with the 5-item scale by Hoegl, Weinkauff, & Gemuenden, (2004), which was created for teams, and adapted for MTS (one sample items is: “Going by the current status, this MTS can be regarded as successful”).

All items were assessed using a 5-point Likert scale. The descriptive data as well as the reliabilities are displayed in Table 1.

Results and Discussion

Table 1 shows that indeed transformational leadership, transactional leadership, and MTS-specific leadership behaviors were positively and significantly related to perceptions of effective leadership in MTS and the overall performance of MTS. These results support our Hypothesis 1a through 1c. In order to explore Hypothesis 2 we performed multiple regression analyses, which are shown in Table 2. Entering transformational, transactional and MTS-specific leadership behaviors simultaneously in the regression, we found that MTS-specific leadership behaviors explain a distinct part of the variance of both effective leadership and general performance of the MTS (see Table 2, Model 2). However, transformational leadership was only independently related to perceptions of effective leadership. Transactional leadership did not relate to any of the two dependent variables above and beyond transformational leadership and MTS-specific leadership behaviors. Thus Hypothesis 2 was confirmed for MTS-specific leadership behaviors, but only partly for transactional and transformational leadership.

Because we were especially interested in MTS-specific leadership behaviors we conducted an additional analysis: We explored the percentage of variance that was explained by MTS-specific leadership behaviors above and beyond transformational and transactional leadership (see Table 2, comparison of Model 1 and Model 2). MTS-specific leadership behaviors indeed explained a significant and substantial additional part of the variance of leadership effectiveness (18%) and of general performance of the MTS (9%).

The results highlight that MTS-specific leadership behaviors are especially crucial for leading MTS above and beyond the common leadership behaviors, which appear to be less determining MTS performance. Future research is asked to further validate the scale.

General Discussion and Conclusion

The purpose of the two studies presented in this manuscript was to induce (qualitative Study 1) and preliminarily test (quantitative Study 2) MTS specific characteristics of leadership and their relationships with perceived leadership effectiveness in MTS and MTS performance indicators. Preliminary construct validation indicates conceptual distinctness of the newly developed measure for MTS-specific leadership behaviors from known leadership constructs, which are presumed relevant to MTS leadership effectiveness and MTS performance (namely transformational and transactional leadership). These two leadership themes were non-reactively induced in Study 1 and empirically shown to be distinct from MTS-specific leadership behaviors by Study 2. Furthermore, Study 2 provided evidence for the hypothesis, that MTS-specific leadership behaviors predict leadership effectiveness and MTS performance over and above transactional and transformational leadership. The incremental variance explained is substantial in magnitude (18% for leadership effectiveness in MTS and 9% for general performance of the MTS).

The limitation of our manuscript clearly is that the validation of the measure for MTS-specific leadership behaviors so far is based on a cross-sectional study with common source and common method bias. Future research is asked to test the concept and measure in further studies using longitudinal and multi-source studies as well as diverse MTS performance criteria. As a strength of our paper, however, we want to emphasize the non-reactive induction of leadership characteristics via interviews in Study 1, resulting in known leadership concepts plus MTS-specific leadership characteristics, which relate strongly to perceptions of leadership effectiveness and MTS performance. Thus we are confident that future research exploring leadership in MTS in diverse organizational settings can benefit from our measure and first exploration of its statistical properties in relation to known leadership measures.

As MTS differ from classic organizational structures, organizations can learn from research like ours how to prepare and train their workforce to efficiently collaborate within such structures. MTS is more of a heterarchy, a cloud of teams, within which forms of shared and partial leadership are practiced. The themes and categories found in Study 1 and tested in Study 2 are a valuable source to address specific leadership skills and behaviors for managing MTS effectively.

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Table 1

Correlations, Means, Standard Deviations, and Coefficient Alphas for the Variables used in Study 2

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Transformational Leadership	3.48	0.80	(.92)				
2. Transactional Leadership	3.26	0.74	.51**	(.66)			
3. MTS-Specific Leadership Behaviors	3.49	0.75	.80**	.55**	(.96)		
4. Effective Leadership in MTS	3.70	1.12	.73**	.49**	.85**	(.96)	
5. General Performance of MTS	3.70	0.87	.51**	.34**	.60**	.60**	(.92)

Note. N = 147. * $p < .05$. ** $p < .01$. Coefficient alphas are presented in parentheses along the diagonal. MTS=Multiteam System. The items were assessed on a 5-point Likert scale (1= low levels of the respective construct, 5= high levels of the respective construct).

Table 2

Multiple Regression Analysis Summary for Study 2

Independent Variables	Dependent Variables			
	Effective Leadership in MTS		General Performance of MTS	
	Model 1	Model 2	Model 1	Model 2
Transformational Leadership	.65**	.15*	.45**	.09
Transactional Leadership	.16*	.02	.11	.01
MTS-specific Leadership Behaviors		.72**		.52**
R ²	.56	.73	.26	.34
F	89.91**	130.41**	25.81**	26.43**
ΔR^2		.18**		.09**

Note. MTS=Multiteam System. N = 147. * $p < .05$. ** $p < .01$. Standardized coefficients are shown