



Contents lists available at ScienceDirect

International Journal of Project Management

journal homepage: www.elsevier.com/locate/ijproman

Single versus multiple project teams and individual performance: Do they ask for different leadership behaviors?

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ARTICLE INFO

Keywords:

Multiple project team membership
Individual performance
Leadership
Charisma
Boundary-spanning

ABSTRACT

Multiple project team membership is a prevalent phenomenon in modern organizational life. However, is any leadership behavior in such a setting beneficial to individual team members' performance? Our study suggests that working in a multiple project team setting requires particular types of leadership. In an experimental design, we manipulated charismatic and boundary-spanning leadership behaviors in single and multiple team project settings and we studied their effects on project members' performance. When workers are part of a single team, charismatic leadership enhances their performance to a greater extent than a boundary spanning leader. When members are part of two project teams concurrently, boundary-spanning leadership behavior becomes more beneficial for individual performance compared to charismatic leadership. The main theoretical contribution lies in the insight that different organizational project forms ask for different leadership behaviors to nurture individual performance. Practically, (future) project leaders must be prepared for operating in different project settings.

1. Introduction

With economic and technological development and a higher need for more flexibility and adaptability, the nature of how work is organized has changed. Examples are the shift to less hierarchical organizational structures such as projects and multiple projects at the same time, where teamwork has become the new norm (Einola & Alvesson, 2019). Data shows that in knowledge-intensive industries over 90 % of employees work on multiple projects at the same time (Mortensen & Gardner, 2017; Payne, 1995). While scholars widely addressed the field of single team membership (STM) (e.g., Mathieu et al., 2008), the concept of multiple team membership (MTM) or "multi-teaming" (Gupta & Woolley, 2018; van de Brake et al., 2018), where individuals are simultaneously members of more than one (project) team at the same time, received increased scholarly attention only recently. Aritua et al. (2009) are among the first to acknowledge that in the past the project management field was designed to support single project settings while in reality the majority of projects are organized simultaneously.

Although multiple project management – "a management practice where a project manager is assigned to simultaneously lead multiple projects" also referred to as the management of a group of multiple

projects (Patanakul, 2011, p. 14) – is not a new phenomenon in the project management field, it is predominantly addressed as portfolio management (Patanakul, 2011, 2013; Patanakul & Milosevic, 2008). To improve the project and consequently organizational performance (Apaolaza & Lizarralde, 2020), project management scholars investigated multiple project management through the development and/or application of different methods, frameworks, and tools, like Critical Chain Project Management (Apaolaza & Lizarralde, 2020), Buffer Burn Index (Agarwal & Borchers, 2009), progressive elaboration approach, and the Critical Chain method (Apaolaza & Lizarralde, 2020).

Albeit Patanakul and Milosevic (2009, p. 217) stated that more attention should be devoted to answering the question "what is an effective way to lead multiple projects [at a project manager level]?", until now, little academic effort was invested to address this question from a leadership perspective. While some studies approached this void by showing that project managers managing multiple projects should possess specific competencies (Patanakul & Milosevic, 2008) or separating the managing and leading roles in the Overall-Project-Leader-Role framework (Kaulio, 2008), leadership behaviors have been less investigated. Indeed, numerous studies address the topic of leadership types and behaviors in project management (e.g.,

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<https://doi.org/10.1016/j.ijproman.2024.102563>

Received 10 October 2022; Received in revised form 22 January 2024; Accepted 23 January 2024

Available online 24 January 2024

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Aga et al., 2016; Barber & Warn, 2005; Müller et al., 2018; Novo et al., 2017; Sergeeva & Kortantamer, 2021; Turner & Müller, 2005), showing the crucial role of transformational leadership for team project success (Aga et al., 2016; Ali et al., 2021; Gundersen et al., 2012; Shafique & Mollaoglu, 2022; Zhu et al., 2019a). However, they predominantly focus on the management of a single project and not on multiple project contexts. Consequently, this study bridges the multiple project management with the MTM and leadership field.

Multiple project team membership as a structural organizational work arrangement has the potential to increase project team member performance in different ways (e.g., via cross-team and individual learning, Mo & Wellman, 2016; Mortensen et al., 2007; van de Brake et al., 2020b). However, to avoid the negative effects (such as high job demand, project overload, stress, role ambiguity, Pluut et al., 2014; van de Brake et al., 2020b; Zika-Viktorsson et al., 2006) and strengthen the positive ones, the projects and their members need to be adequately managed. This raises an important question: What are the specific managerial challenges and problems of MTM as compared to STM structures? For STM structures, plenty of research explored which leadership behaviors are beneficial for individual and project team performance. Transformational, charismatic, horizontal, and transactional leadership behaviors are the most widely explored (Aga et al., 2016; Dinh et al., 2014; Pilkienė et al., 2018; Zhu et al., 2019b). Person-oriented leadership, the category under which charismatic and transformational leadership behaviors also fall, has been found to have multiple benefits for teams and their members (Ceri-Booms et al., 2017). Essentially, these leadership behaviors are directed at leading single projects toward their overall goals, often with dedicated (human) resources. The transformational project leader has been found to create and maintain positive interaction processes within teams (such as communication, coordination, cohesion, trust) which further contributes to enhanced project team performance (Aga et al., 2016; Ali et al., 2021; Gundersen et al., 2012).

However, it remains still unknown whether for organizational work structures such as MTM the same person-oriented leadership behaviors are beneficial. The MTM form is a fundamentally different arrangement, which might require different leadership competences and behaviors. Previous studies show that a one-size-fits-all leadership style is not effective, suggesting that specific project settings require specific leadership behaviors (Lee-Kelley, 2002; Müller & Turner, 2007).

Besides structural differences, multiple project teams differentiate from single project teams regarding interdependence, referring to the extent to which a task and consequently the overall goal requires collective action (Benishkek & Lazzara, 2019; Wageman, 1995). Studies show that multiple teams are not only interdependent on their own goals and problems, but also on other project teams they are connected to in the same organization (O'Leary et al., 2011; Wageman et al., 2012) or across organizations (DeFillippi & Sydow, 2016), resulting in an interdependent network of teams. Interdependence pertains to situations in which the actions or outcomes of one entity have an impact on others, and vice versa. This requires additional project managerial efforts in terms of, for example, integration, coordination, and conflict resolution between interconnected project teams.

Accordingly, we maintain that interdependent MTM settings require a specific leadership behavior that mitigates the boundaries between individual and interdependent project teams, by promoting inter-team knowledge and information sharing. Consequently, we draw from the network literature on boundary-spanning (Tushman & Scanlan, 1981a), to identify a specific leadership behavior, labeled boundary spanning leadership that is relevant in this setting. Boundary spanning leadership behavior is defined as a leadership behavior facilitating and creating crucial connections between teams to move information, ideas, and resources where needed most (Ernst & Yip, 2009; Fleming & Waguespack, 2007; Hogg et al., 2012). Besides general leadership competences needed to manage projects (e.g., planning, scheduling resources and conflict management), boundary spanning leadership asks for

competences and activities focused on the management of interdependencies and interaction (Porck & Van Knippenberg, 2022). Patanakul and Milosevic (2008) suggest that given the high complexity of the management of multiple teams and their members, boundary spanning leadership asks for competences pertaining to for example, building and maintaining relationships, multi-tasking, and the management of interproject processes.

It is argued that this leadership behavior would be a good fit for organizational arrangements such as MTM and it is contrasted with the traditional one like charismatic leadership, which represents a major stream of leadership research to date (Dinh et al., 2014; Zhu et al., 2019b). It is relevant to point out that conceptualizations and measures of charismatic leadership overlap to some degree with the ones of transformational leadership, oftentimes being collapsed into a charismatic-transformational leadership approach (van Knippenberg & Sitkin, 2013). Here, we take a signaling approach to charismatic leadership defined as "values-based, symbolic, and emotion-laden leader signaling" (Antonakis et al., 2016, p. 304). This implies that the leader uses specific techniques (e.g., the use of rhetorical questions, contrasts, expressing moral conviction) to make his/her message more salient and to arouse follower's emotions (Antonakis et al., 2022). Given the behavioral nature of these techniques, it is a suitable approach for our study.

When project members and managers are simultaneously immersed in multiple project teams, they are confronted with issues such as where to spend time, when to switch from one team to the other, how to transfer knowledge and essentially manage the boundaries of the teams they are part of. However, empirical studies looking at the leadership role in this setting are scant. Such a perspective is nevertheless highly relevant given the need for knowledge and information exchange, resource allocation, coordination and integration across interdependent projects. Thus, in this paper, we develop and test the argument that leaders' boundary-spanning behaviors – such as bridging boundaries between teams by redirecting crucial information within and outside teams (Fleming & Waguespack, 2007) and providing strategic links between a team and the source of resources (Urch Druskat & Wheeler, 2003) – are particularly relevant in a MTM context as compared to a STM context.

We contribute to the project management and MTM fields in four ways. First, compared to single teams, MTM has a completely different work dynamic. Members of multiple project teams are not only interdependent within a single, but within multiple different project teams (O'Leary et al., 2011; Wageman et al., 2012). To perform well, project teams in the MTM context require information and resources beyond their boundaries (Fleming & Waguespack, 2007). The more interdependent the setting is, the more crucial the flows of information and resources from one project team to the other are. Such exchanges also need to be stimulated and managed. Consequently, we identify whether the MTM context requires a specific leadership behavior – namely boundary spanning leadership behavior, which focuses beyond project team boundaries and is different from leadership of a single project team (Marrone, 2010). Hence, we add to the contingency theory discussion in the leadership field by combining insights from two different fields, namely leadership and network theory.

Second, we combine organizational structure and leadership behavior variations in one framework. Beyond focusing solely on the MTM setting we also include an STM project context. Moreover, apart from boundary spanning leadership behavior, we also include charismatic leadership behavior, as one of the most studied leadership styles in the field. Third, charismatic leadership looks predominantly at individual aspects and focuses on influencing individuals' emotions (Antonakis et al., 2011), increasing their self-esteem and self-worth which results in increased motivation (Shamir et al., 1993), consequently suggesting being a good fit for the STM project setting. While bridging the boundaries of different interdependent project teams, boundary spanning leadership behavior appears to be a favorable match for the

MTM project context. Subsequently, we determine whether in MTM settings, boundary spanning outperforms charismatic leadership. Lastly, we focus on the dynamic aspect of this phenomenon when individuals switch from single to multiple project teams. We identify to what extent the mentioned leadership behaviors affect individual performance in each of the two project contexts.

2. Theoretical background and hypotheses

In this study, we examine the effects of leadership behavior (boundary spanning and charismatic) as an independent variable on project team member's performance as the dependent variable under the condition of single and multiple project team membership. Below, we define the main concepts and the reasoning substantiating our hypotheses.

2.1. Multiple project team membership

O'Leary et al. (2011) together with other scholars in the field (e.g., Maynard et al., 2012) advanced calls for empirical research in the area of MTM, stating that there is insufficient evidence regarding the relation between MTM and performance. Following this call, Chan (2014) studied 85 engineering project teams in South Africa and found an inverted U-shaped relation between MTM and individual performance and a positive linear relation with team performance. Next, Bertolotti et al. (2015) investigated the relationship between MTM and performance in an R&D unit of an Italian company and replicated an inverted U-shaped relation between MTM and team performance. Additionally, they also found that receiving advice from external resources positively moderated this relationship.

However, Crawford et al. (2019) showed a negative relation between MTM and unit performance in primary care, suggesting that individuals perform best in a STM setting. Also the study of Van de Brake et al. (2018) found a negative relation between MTM and individual job performance. These opposing results motivate additional exploration of the link between MTM and performance investigating the conditions under which it functions.

Previous research has looked at both performance levels. Given that individual performance represents a prerequisite of team performance (Nikoleizig et al., 2019), and that the field is still evolving, we believe this phenomenon should be addressed from the most granular perspective of performance – individual performance. However, to date, only the studies of Berger (2018), Chan (2014) and Van de Brake et al. (2020a, 2018, 2020b) empirically addressed individual performance in an MTM project setting. Van de Brake et al.'s (2020a) study looked at possible mechanisms and conditions that could explain the relationship between MTM and performance. They found that MTM was indirectly associated with individual performance, through the size of individuals' information-sharing networks. This relationship was moderated by the average strength of an employee's network ties. Similarly, Chan (2014) considered several individual factors that may aid individual innovative performance – project experience, education, social skills, emotional skills, and cognitive skills. However, the relationship was statistically significant and positive only for the latter two. Van de Brake et al.'s (2018) longitudinal study specifically looking at an individual's overall job performance, showed that from a within-person perspective the changes in an individual's MTM and job performance are mutually linked in a deviation-counteracting feedback loop, from a between-person perspective, individual's MTM is positively related to individual's job performance. Authors concluded that the relationship between individual MTM and individual performance is complex, suggesting further researching its underlying mechanisms. This includes measuring individual performance in objective ways and focusing on performance in specific project teams rather than just addressing the individual's job performance in general.

An important factor for performance in organizational

(García-Morales et al., 2012) and team settings (Zaccaro et al., 2001) is leadership. This is grounded in the idea that an effective leader provides goals and guidance, is open to ideas and innovations, enables a safe working environment, and nurtures followers to grow (Giles, 2016). So far, only two studies focused specifically on leadership in an MTM environment. Chen et al. (2019) study looked at how empowering leadership spills over the boundary of a project team, relating to psychological empowerment and influencing employee proactivity beyond the border of a single project team. Moreover, Alfaro's (2009) study investigated the challenges in development of Leader-Member Exchange (LMX) relationship in a multiteam setting.

2.2. Charismatic & boundary spanning leadership behavior, STM/MTM settings, and project team member performance

Multiple leadership styles and theories have been addressed in the management field, like transformational, transactional (Bass, 1990), shared leadership (Wang et al., 2014), and LMX theory (Martin et al., 2016), to name a few. One of the most common leadership models used in the project management literature is the transformational leadership model. According to Bass's transformational leadership model, there are four leadership dimensions: idealized influence, inspirational motivation, intellectual stimulation and individualized consideration (Bass, 1985; Bass & Avolio, 1995; Bass & Riggio, 2006). The first two dimensions are the most commonly used as indicators of charismatic leadership and oftentimes equaled or even named charismatic-transformational leadership (van Knippenberg & Sitkin, 2013). In the past decade, most leadership studies have predominantly focused on neocharismatic leadership, which stems from charismatic leadership theory (Dinh et al., 2014; Zhu et al., 2019b). Charismatic leadership alters the needs, values, preferences, desires, and aspirations of followers in such a way that they transcend from self to more collective activities (House & Howell, 1992). In our paper, the focus is on the charismatic leadership style, and we draw on both charismatic and transformational leadership literature (given their similarities) in order to argue and posit our hypotheses. Below, we develop two hypotheses in which the project team setting (STM/MTM), leadership behaviors (charismatic/boundary spanning), and individual project member performance are systematically related.

Many empirical studies have investigated the relationship between transformational leadership style and project performance, showing its benefits in an STM setting while explaining the mechanisms at hand. The study of Aga et al. (2016) showed that the project manager's transformational leadership style is associated with project success through team-building practices (Klein et al., 2009). The transformational leader enables team processes such as goal setting (clear goals and specific objectives), role-clarification (clear role expectations, group norms), interpersonal relations (mutual trust, open communication), and problem-solving techniques (ability to identify major problem areas, exchange information, engage in problem-solving). Recent work of Ali et al. (2021) supports this finding, showing that both team building and teamwork quality (such as communication, coordination, and cohesion) mediate the relation between transformational leadership and project success in a professional information system development setting. Shafique and Mollaoglu (2022) show that transformational leadership is related to perceived project team performance, and this relationship is mediated by team integration. Zhu et al. (2019a) showed that a transformational project leader is associated with less defensive and prosocial silence within the team while Gundersen et al. (2012) found that team trust mediates the relationship between transformational leadership and project performance. Besides, in an STM setting, charismatic leadership with its focus on the values, preferences, and aspirations of the project team's internal followers (House & Howell, 1992) to enhance their effectiveness and task performance (Towler, 2003) is regarded advantageous. The above arguments are aligned with a vast body of evidence in project management literature showing that transformational

leadership creates a positive climate within the team that further contributes to project team performance (Aga et al., 2016; Ali et al., 2021; Gundersen et al., 2012; Shafique & Mollaoglu, 2022; Zhu et al., 2019a). In sum, these studies indicate that transformational/charismatic leadership contributes to a positive climate within project teams, positively impacting the performance of the project teams and their members.

The next step in the development of theoretical arguments leading to the first hypothesis is explaining why in the STM setting, boundary spanning leadership behavior is associated with comparatively lower individual performance. In this setting, where project teams are not externally interdependent, reliance on external sources, facilitation, and enhancement of connections outside of the team (Ernst & Yip, 2009; Hogg et al., 2012) do not play a crucial role in achieving the project team's goals. Consequently, it is argued that STM settings will not benefit from boundary spanning leadership behavior because it brings external information to team members, which is unrelated to their task in the project, causing information overload and confusion, which negatively impacts their performance. Meta research (Graf & Antoni, 2021) has shown that especially the characteristics of such, in this case also task unrelated, external information determine the information overload experienced by individuals. Information transferred by the boundary spanning leader to the team members is often of less relevance to the task at hand, ambiguous, novel, and not meeting the needs of users. Hence, in an STM setting, boundary-spanning leadership behavior and its related sharing of external knowledge and information, creates information overload among individual team members creating a negative performance effect.

Therefore hypothesis 1 reads:

In a single team organizational setting, project team members exposed to charismatic leadership behavior will perform higher as compared to the performance of project team members exposed to boundary spanning leadership behavior.

However, to date studies addressing (neo)charismatic leadership and transformational leadership in a project management setting focused predominantly on the effects of leadership behavior on the individual (e.g., Shea & Howell, 1999), the single project team (e.g., Wang et al., 2005), or organizational level (Conger & Kanungo, 1994), not taking in consideration the MTM setting.

For example, leaders in multiple project teams settings have less control over their team members' time and work (Mortensen et al., 2007), especially when they are involved in numerous other projects simultaneously, resulting in increased fragmentation of their time and attention (O'Leary et al., 2011). Consequently, the MTM work environment demands greater attention to inter-project resource coordination (O'Leary et al., 2012). Moreover, leaders should also consider MTM employees' well-being, since simultaneously taking part in multiple teams poses high risks for stress development and burnout (Chan, 2014; Mistry et al., 2023; Pluut et al., 2014). Additionally, members of multiple teams are oftentimes exposed to increased time pressure, due to diverse requirements and deadlines (O'Leary et al., 2011), especially in the project environment, because of its time bounded temporary work processes (Turner et al., 2008). Compared to a single team situation, the MTM setting presents another source of complexity (Aritua et al., 2009; O'Leary et al., 2012). As Margolis (2020) points out, MTM can result in organizational and leadership difficulties, since the often used leadership behaviors do not apply.

We maintain that the structural difference present in MTM as compared to the STM setting should also be reflected in leadership behavior. Therefore, we look beyond the commonly applied leadership styles and facets, considering the literature on boundary spanning behavior. Boundary spanning leadership behavior, commonly defined as a leader's ability to create alignment and commitment across organizational boundaries in order to achieve a higher vision or goal (Takanashi & Lee, 2019), plays an important role, especially in situations when team members work on tasks that are highly interdependent on

the resources, knowledge, and support beyond their internal team environment (Joshi et al., 2009). Since single project teams oftentimes operate as separate systems, within their boundaries, the leader should play a boundary spanning role to help bridge the project team with its external environment. This further facilitates the transfer of favorable task-related solutions, ideas, information, and knowledge across teams. A boundary spanning project manager plays a key role in linking a team to external resources (Tushman & Scanlan, 1981b). Disseminating information relevant to the teams' task through boundary spanning can only be performed by well-connected individuals or so-called internal and external communication stars (Tushman & Scanlan, 1981a) such as project team leaders. The boundary spanning leader should be well connected internally (within the project team), as well as externally (beyond the project team) to distribute new information or ideas to their subordinates (Tushman & Scanlan, 1981a). Furthermore, Ancona and Caldwell (1990) indicate a set of activities that a high-quality boundary spanning individual possesses: ambassador (boost support from influential outside parties), task coordinator (coordination beyond the borders of a team), scout (general examination), and guard (control of the information flow) (also see Gould & Fernandez, 1989).

Empirical studies show several positive aspects of boundary spanning leadership behavior. For example, Marrone et al.'s (2007) study on self-managed teams highly reliant on external sources, showed that on the team level (as opposed to the individual level) team members' boundary spanning behavior resulted in diminished role overload experience. Focusing specifically on team leaders, Kratzer et al. (2008) found that leaders who can bring together the required knowledge and information outside of the team and wisely share it within the team enhance team creativity. Furthermore, they conclude that managerial capabilities should prevail over technical expertise when selecting leaders in such settings, highlighting the importance of leadership skills. Miller (2008) adds that boundary spanning leaders also aid in promoting community advancement and evolving boundary spanning infrastructures within their workplace, while Mehra et al. (2006) show that group leaders with a high number of internal and external social network ties are positively related to objective measures of group performance. Moreover, peers and subordinates regard such leaders as highly reputable.

Although charismatic and transformational leadership are believed to be applied in various organizational settings, Shamir and Howell (1999) state, that based on a contingency theory of leadership, there exist situations where this leadership behavior can be more or less effective. Specific settings may therefore require particular leadership approaches which also might apply to MTM settings in which individuals are simultaneously part of multiple project teams. Moreover, in highly interdependent multiple project teams, connections between the teams, and the exchange of information, ideas, and resources are crucial for team and individual performance (Cummings & Cross, 2003). Boundary spanning project team leaders bridge so-called 'structural holes' (Brion et al., 2012), referring to a gap or absence of ties between two teams in an organizational network. These provide access to critical external parties that offer a variety of task-related information or knowledge. Furthermore, this study shows that this leadership behavior buffers against external pressures and facilitates cross-project coordination. The boundary spanning leadership role also brings influence which in turn could lead to higher motivation levels among project members and subsequent individual performance (Liu et al., 2018). When discussing the theoretical arguments for hypothesis 1, it was argued that charismatic leadership behavior is more strongly project internally oriented. In a MTM organizational setting in which there is inter-project interdependency, this leadership behavior is less inclined to cross-project boundaries, which will lower individual performance, and in a wider context, also the accomplishment of superordinate (e.g., organizational) goals (Carter et al., 2020). A boundary spanning leader could, therefore, enable a smoother operation of a team by focusing on resource coordination (O'Leary et al., 2012) and facilitating the

connection beyond the project team, thus enhancing individual performance. Consequently, we believe that a boundary spanning type of leadership behavior would best fit such a situation and propose the following hypothesis 2.

In an MTM organizational setting, project team members exposed to boundary spanning leadership behavior will perform higher as compared to the performance of project team members exposed to charismatic leadership behavior.

3. Methods

3.1. Introduction

The sections below present the methodological approaches used for this study. We use an experimental design (see Sections 3.2 and 3.3). Section 3.4 introduces the participants of this study. Given that the dependent variable is individual performance, these participants are the units of observation and analysis. We further describe the measurements (Section 3.5) and the statistical techniques used (Section 3.6).

3.2. Design of the experiment: single and multiple-team membership

We used a two-way mixed experimental design, with the within factor (organizational setting: STM vs. MTM) and the between factor (leadership behavior: charismatic vs. boundary spanning) (see Table 1). Experimental designs offer several advantages. The most important ones are (Kirk, 2013): because of the high control on variables, cause and effect relationships can be established more easily resulting in a high internal validity; participants are randomly assigned which as a consequence implies that individual differences among participants are more evenly distributed across experimental groups lowering the probability of bias; lastly, causal claims are strong in this design.

The experiment was divided into two sessions and started with a briefing that one of the local banks (Bank Euro) was attacked by hackers and the participants in the room were called in for help to decipher some codes. Participants were informed that they will be working in a virtual project team environment, where they were permitted to communicate via computer Skype chat only.

In the first session of the exercise (OS1), all participants were randomly allocated to individual project teams, where each team consisted of three team members and one leader. The leaders (also see Section 3.5.1) received instructions for their behavior outside the experiment room. Meanwhile, copies (placed face-down) of task and decoding schemes were distributed among team members. Each participant received a unique ID with log-in details and the leaders created team chat groups following a list displayed on the blackboard. The participants worked on the task for 30 min.

In the second session (OS2), participants were informed that another local bank (Bank Dollar) was also attacked by hackers so they were required to form a second project team that will help Bank Dollar. They continued to work in the same teams as in session 1 (Bank Euro), and at the same time each participant was part of a new project team (Bank Dollar). Every project member was simultaneously participating in two different (in terms of member composition) teams, resulting in an MTM environment (Fig. 1). Every leader was also in charge of an additional

Table 1
Two-way mixed experimental design.

Within-factor: organizational setting	Between-factor: leadership behavior	
	Charismatic	Boundary spanning
Single-team (STM)	Condition 1: STM × Charismatic	Condition 2: STM × Boundary spanning
Multiple-team (MTM)	Condition 3: MTM × Charismatic	Condition 4: MTM × Boundary spanning

team in OS2. In this session, the task had a time limit of 60 min.

3.3. Project task

At the start of OS1, each project team member received a unique task. The task included decrypting sentences divided into 7 chunks using three different decoding schemes. For example, using the correct decoding scheme the code “V nz fher lbh pnaabg pngpu zr” should be decrypted into “I am sure you cannot catch me”. This task has been adapted from Meslec et al. (2020). The interdependence of the task varied, while some chunks of codes could be decoded individually, others could only be solved when working as a team. For example, the solution of chunk 1 of one team member presented a key for a specific code for chunk 2 of another team member. The instructions attached to each task also included a link to an online folder, where different documents were stored. Among them, participants were able to find additional information concerning the use of keys. The role of collaboration and task interdependence was emphasized to the participants.

The nature of the task was the same in OS2, team members had to decrypt 7 different chunks of codes. However, this time they received a separate task for each of the two project teams they were part of. Moreover, an additional decoding scheme was added in the second session, so they could decode the chunks using four different decoding schemes. Similarly, as in the first session, team members were not able to solve the task individually. Minor parts of the task could be cleared up within the team, however, for the task to be solved successfully collaboration with team members from all the other project teams was crucial.

3.4. Participants

Participants of the study were 118 undergraduate students (age $_{MEAN} = 21.55$, with 91 females, 77 % of the sample) enrolled at a Dutch university, who were randomly assigned to project teams, as part of a course. In the simulation, participants experienced project work in a virtual MTM setting and were invited to write a reflection assignment based on it. The assignment was part of a project team research portfolio, worth 50 % of the final grade. Participants could decide if they wanted to participate in the study, by signing an informed consent form (89.4 % of all students enrolled in the course consented). These students were included in a draw lot for six 10 € vouchers.

We chose a student sample for two main reasons. First, the set-up of the task (see Section 3.3) and the project teams are highly aligned with project team characteristics, and hence suitable for our study. According to PMI, “a project is a temporary endeavor undertaken to create a unique product, service, or result” (Project Management Institute, 2021, p. 4). The project teams used in our study worked for a pre-defined period, had to come up with a unique solution for their task, and worked progressively to achieve their outcomes. Hence, they fit the main characteristics of a project team.

Second, this sample and setting enabled us to observe the change from organizational setting 1 (OS1: single project team), to organizational setting 2 (OS2: multiple project team setting). Such observations would have been difficult to obtain with employees working in organizational projects. At the same time, it enabled us to use an experimental design, where we manipulate leadership forms, which would also have been difficult to execute in real-life organizational settings.

3.5. Measurements

3.5.1. Independent variable: charismatic and boundary spanning leadership behavior

Two leadership conditions were manipulated – 49 team members were exposed to charismatic and 67 team members to boundary spanning leadership behavior. We aimed for an equal number of participants in both conditions, but due to different numbers of students in groups,

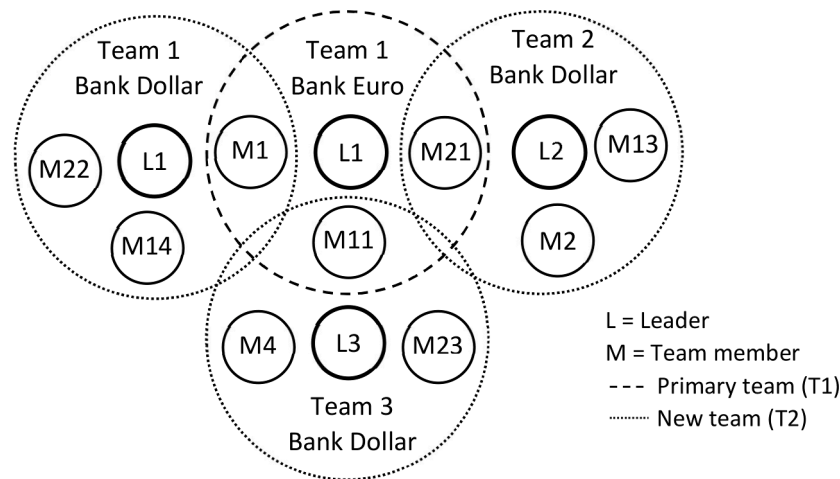


Fig. 1. An exemplary depiction of participants' allocation in the second organizational setting saving Bank Euro and Bank Dollar.

we ended up with fewer participants in the charismatic leadership condition. Those playing the charismatic leadership role were given a list of exemplary sentences to use in the group chat, which adhered to ten charismatic leadership tactics (Antonakis et al., 2022, 2011, 2012). An example of such a chat message is: "I want you to do three things to successfully complete this project - work hard, work smart and think of the most vulnerable families that are affected by this event. I know you can do it!" (see Appendix A). The manipulation of charismatic leadership behavior was the same in sessions OS1 and OS2.

The participants playing the boundary spanning leader roles were given a list of exemplary sentences that complied with the definition of this leadership behavior (Ernst & Yip, 2009; Hogg et al., 2012) and that were building on key behavioral leadership activities distinguished in the literature, for example internal and external activities (Benoliel & Somech, 2015; Takanashi & Lee, 2019). They aimed to guide the team with external factors, so they gathered the necessary information to complete the task. In OS1, the leader directed and encouraged team members to communicate with each other. An example of such a message included: "Connect with your teammates. They might have the knowledge, ideas, and resources that may be useful for you." In OS2, the leader directed and encouraged the team members to communicate with team members from the other teams with messages like: "Please collaborate with the other team as well" (see appendix B and C).

A manipulation check for charismatic leadership was measured with three items capturing the behavior of charismatic leaders during the project task. An example of an item is: "My team leader gave me advice to work hard, work smart and think about the affected families." The response was presented on a 7-point Likert scale and the Cronbach alpha was 0.633 in OS1, and in OS2 0.654 for Bank Euro and 0.667 for Bank Dollar. The manipulation check for boundary spanning leadership was measured with five (OS1) and four items (OS2), an example of an item is: "The leader of your team encouraged you to search for information outside of the team boundaries." The respondents could rate their answers on a 7-point Likert scale and the Cronbach alpha was 0.859 in OS1, while in OS2 0.938 for Bank Euro and 0.961 for Bank Dollar.

3.5.2. Dependent variable: individual task performance

Individual task performance scores were obtained by counting the number of correctly decrypted letters per task. Each team member received three performance ratings – one for the task in OS1 (saving Bank Euro), and two for tasks in OS2 (Saving Bank Euro and Bank Dollar). A high number of correctly decoded letters was indicative for high individual performance. It should be noted that the study makes use of various measurement methods. The independent variable (leadership behavior) is manipulated while the dependent variable (performance) is objectively coded. This design accounts for the common

method bias given that the predictor and the criterion variable are derived from different sources (Antonakis et al., 2010; Pesämaa et al., 2021; Podsakoff et al., 2003).

3.6. Statistical techniques applied

Some variables (e.g., manipulation checks for the leadership behaviors) were measured with multiple items. To test their reliability, we used Cronbach's alpha. Alpha values above 0.7 indicate internally consistent measurement scales (Nunnally & Bernstein, 1994). A manipulation check analysis was conducted to identify whether there are statistically significant mean differences between the two leadership behaviors. Participants' performance scores could have been influenced by their project team membership, which would imply there is a multilevel structure in the data. To check whether a multilevel analysis was appropriate, we looked at the intraclass correlation coefficient (ICC) (Bliese, 2000; Woltman et al., 2012). The ICC is a statistic that is used when quantitative measurements are made on units, in our case project members, that are organized into groups, in our case project teams. ICC indicates which percentage of the variance of a variable is attributable to group membership and which percentage is attributable to individual level. Low scores indicate that variability is less dependent on group membership and hence multilevel analysis is not justified while high scores indicate that scores depend on group membership and hence a multilevel analysis should be conducted.

The dependent variable (individual task performance) is a count variable, whereas the independent variable indicates whether a project member is exposed to one of two leadership behaviors. We measured these variables at two points in time (OS1 in a single team setting and OS2 in a MTM setting). Hence we used a repeated measure ANOVA, also known as GLM (see Park et al., 2009).

4. Results

4.1. Introduction

Before the hypotheses can be tested (Section 4.4), it is necessary to conduct a few checks. First, results of manipulation checks are described in Section 4.2. To find out whether multilevel analyses are needed, Section 4.3 reports on tests checking this. Correlations and descriptive statistics are to be found in Table 2.

4.2. Manipulation check

The results of the independent samples *t*-test indicate a statistically significant mean difference between the two leadership behaviors in all

Table 2
Correlations and descriptive statistics.

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 Charismatic leadership (Bank Euro) OS1 (M. Check) 3 items	2.94	1.55	(0.63)									
2 Boundary spanning leadership (Bank Euro) OS1 (M. Check) 5 items	4.81	1.61	-0.32**	(0.86)								
3 Charismatic leadership (Bank Euro) OS2 (M. Check) 3 items	3.07	1.64	.58**	-0.28**	(0.65)							
4 Charismatic leadership (Bank Dollar) OS2 (M. Check) 3 items	2.74	1.46	.46**	-0.12	.61**	(0.67)						
5 Boundary spanning leadership (Bank Euro) OS2 (M. Check) 4 items	4.16	1.71	-0.47**	.53**	-0.33**	-0.14	(0.94)					
6 Boundary spanning leadership (Bank Dollar) OS2 (M. Check) 4 items	4.16	1.70	-0.48**	.41**	-0.39**	-0.15	.76**	(0.96)				
7 Individual performance (Bank Euro) OS1	56.82	24.14	.12	-0.07	.07	-0.02	-0.12	-0.09				
8 Individual performance (Bank Euro) OS2	71.49	51.56	.04	.02	-0.10	-0.09	.03	-0.04	.38**			
9 Individual performance (Bank Dollar) OS2	80.25	49.50	-0.01	-0.06	-0.12	-0.03	-0.06	.10	.26**	.22*		
10 Gender	1.77	0.42	-0.05	.04	-0.01	.04	.06	.03	-0.08	-0.19*	-0.01	
11 Age	21.55	1.79	.03	-0.12	-0.00	-0.05	-0.22*	-0.09	.11	-0.01	-0.06	-0.32**

Note: ** $p < .01$; * $p < .05$; Cronbach alphas are displayed on the diagonal in the parentheses. Gender: 1 = male, 2 = female.

conditions. A significant mean difference was identified between charismatic leadership ($M = 4.12, SD = 1.54$) and boundary spanning leadership behavior ($M = 2.11, SD = 0.88$) in OS1 for the charismatic leadership condition $t(116) = -8.95, p < .001$. Similarly, charismatic leadership ($M = 3.80, SD = 1.50$) and boundary spanning leadership behavior ($M = 5.53, SD = 1.27$) were significantly different in OS1 for the boundary spanning condition $t(116) = 6.75, p < .001$.

In OS2, a statistically significant mean difference was identified between charismatic leadership ($M_{Bank Euro} = 4.28, SD_{Bank Euro} = 1.68; M_{Bank Dollar} = 3.46, SD_{Bank Dollar} = 1.66$) and boundary spanning leadership behavior ($M_{Bank Euro} = 2.20, SD_{Bank Euro} = 0.90; M_{Bank Dollar} = 2.20, SD_{Bank Dollar} = 1.00$) for charismatic leadership condition $t(115)_{Bank Euro} = -8.63, p < .001; t(112)_{Bank Dollar} = -5.03, p < .001$. Furthermore, significant mean difference was identified between charismatic leadership ($M_{Bank Euro} = 2.99, SD_{Bank Euro} = 1.43; M_{Bank Dollar} = 2.96, SD_{Bank Dollar} = 1.56$) and boundary spanning leadership ($M_{Bank Euro} = 5.00, SD_{Bank Euro} = 1.37; M_{Bank Dollar} = 5.03, SD_{Bank Dollar} = 1.20$) for boundary spanning condition $t(115)_{Bank Euro} = 7.65, p < .001; t(115)_{Bank Dollar} = 8.12, p < .001$.

4.3. Team dependencies checks

Each participant was nested in one project team at OS1 and two project teams at the same time at OS2. Given that participants' performance scores could have been influenced by their project team membership, we ran several tests to check whether a multilevel analysis was appropriate. We ran an unconstrained null model for individual performance Bank Euro OS1 and individual performance Bank Euro OS2. For OS2 we ran the model twice while considering the Bank Euro membership as well as the Bank Dollar membership.

Results indicate that the individual performance score at OS1 does not depend on the group membership given that $\chi^2 = 58.74, p > .05$, and $ICC = 0.12$. ICC was computed while using the following formula $ICC = \tau_{00} / (\tau_{00} + \sigma^2)$, where τ_{00} is the variance between groups and σ^2 is the variance within groups (Woltman et al., 2012). Individual performance scores at OS2 also did not depend on Bank Euro project membership with $\chi^2 = 54.79, p > .05$ and $ICC = 0.10$, or Bank Dollar project membership with $\chi^2 = 45.92, p > .05, ICC = 0.03$. These results indicate that participant's performance scores did not depend on group membership. Given the lack of group dependencies, a multi-level analysis is not justified. We proceeded thus further with a GLM analysis.

4.4. General linear model (GLM) analysis

The results show that the general change in individual performance from OS1 to OS2 is statistically significant $F(1) = 8.84, p = .004$, indicating that individual performance is higher in OS2. When looking at leadership differences in individual performance in general (combining results from OS1 and OS2), the results show a statistically non-significant effect $F(1) = 1.14, p = .287$. Finally, when looking at changes in individual performance between organizational settings when comparing the boundary spanning with charismatic leadership behavior, we found a statistically significant interaction $F(1) = 4.38, p = .039$. Thus, both hypotheses received support.¹ The boundary spanning leadership shows a significant increase in individual performance be-

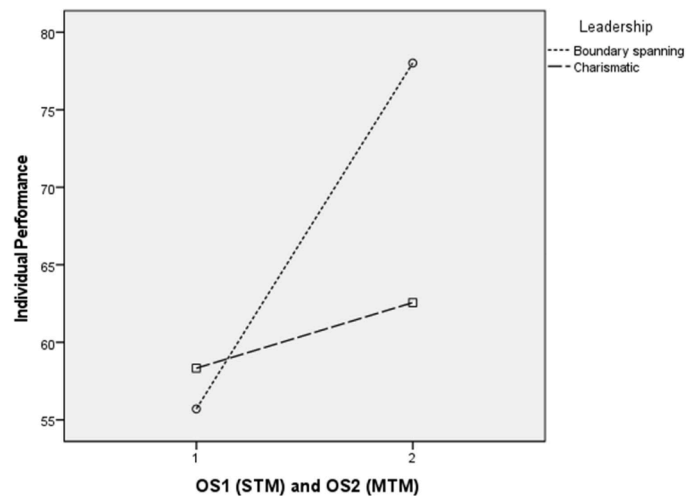


Fig. 2. Interaction plot.

¹ As a robustness check we estimated our model including age and gender as control variables (Ng & Feldman, 2008; Millmore et al., 2007); The results did not change, indicating robust results.

tween OS1 and OS2 at a significantly greater level of change than the increase of charismatic leadership shows between OS1 and OS2 (Fig. 2).

5. Discussion

Drawing from research on teams (Mathieu et al., 2008) and MTM (Mortensen et al., 2007), we investigated whether different organizational settings, STM and MTM, require distinct leadership approaches for project members to have high performance in project teams. We included two leadership behaviors, charismatic — one of the most widely studied leadership theory (Dinh et al., 2014; Zhu et al., 2019b), which to an extent conceptually also overlaps with transformational leadership (van Knippenberg & Sitkin, 2013); and boundary spanning leadership behavior — adopted from the network theory literature (Tushman & Scanlan, 1981a), which looks beyond the boundaries of a single project team and promotes the (management of) inter-project flows of information, ideas, and resources (Ernst & Yip, 2009).

The results of our experimental study revealed that in an STM project context (as opposed to MTM), individuals performed higher when they were exposed to a signaling perspective of charismatic leadership, while in an MTM project work setting (as opposed to an STM setting), individual team members excelled when they were exposed to a boundary spanning leader. Finally, when comparing the project team members' performance in the two contexts with the assigned leadership behavior (STM vs. MTM and charismatic vs. boundary spanning leadership), the analyses showed that individuals exposed to an MTM project working environment led by a boundary spanning leader performed significantly higher.

5.1. Theoretical and methodological contributions

This study contributes to the fields of project teams, especially MTM, and leadership in four different ways. First, existing research addresses the importance of MTM work settings since the number of employees concurrently active in more than one project team is growing. Although scholars to a certain degree answered the call of Maynard et al. (2012), linking MTM to performance (e.g., Chan, 2014; van de Brake et al., 2020b), no study to date looked at the role of leadership in this setting. The results of our study indicate that leaders should adapt their leadership behavior according to the organizational context and situation at hand (Lee-Kelley, 2002; Wright, 2017) to enhance individual performance in a project. This was specifically evident when observing how individual performance changed when switching from an STM to an MTM organizational setting. The results revealed significantly higher individual performance when team members were exposed to MTM and led by a boundary spanning leader in comparison to members led by a charismatic leader. This indicates that it is very important to match leadership styles with specific contexts, which adds to the discussion on the contingency theory in the leadership field.

Leadership scholars reported a mixed bag of inconsistent findings concerning contingency theory in the past, resulting in a steep decline in research in this field (Lord et al., 2017; Yukl, 2011). Our study indicates it is time to revisit them and adapt them to the current, more modern organizational settings, like MTM and project work. Such working environment is different and more complex than the regular single-team setting (e.g., switching between teams and tasks), hence leadership should take these situational factors in consideration. This is in line with the study of Zhang and Fjermestad (2006), who suggest combining traditional leadership theories, namely traits and contingency theories, in improving and understanding virtual team leadership, since applying the findings from face-to-face context may not be applicable.

Second, we did not focus solely on MTM, but we combined organizational setting variations (STM vs. MTM) and leadership behaviors (charismatic vs. boundary spanning), to capture the dynamics of project member performance when switching from single-team settings to multiple team settings. The results of our study, in line with hypothesis

1, show that in the STM setting individuals exposed to charismatic leadership performed higher than those exposed to boundary spanning leadership, which is in line with our theorizing. Several prior studies, that were predominantly performed in traditional organizational settings or STM environments, show a strong positive link between charismatic leadership and followers' performance (Banks et al., 2017; Towler, 2003). Being exposed to a single leader (as opposed to multiple leaders like in the MTM setting) provides more structure to the followers and consequently enables the positive characteristic of charismatic leadership like enhancing a sense of collective identity, and feelings of empowerment (Conger et al., 2000), which in the end promote individual performance.

Third, STM and MTM are structurally different and require a different work dynamic, therefore we looked beyond the traditional leadership styles and facets (e.g., charismatic, transactional, etc.), to find a leadership match for the context of MTM. We considered boundary spanning leadership, due to its characteristics of encouraging inter-project team collaboration, exchange, interaction, and coordination beyond the borders of a single team (Hogg et al., 2012) and therefore bridging relations and resources to increase individual performance. In line with hypothesis 2, the results show that in the settings where participants are simultaneously members of two project teams with somehow interdependent tasks, boundary spanning leadership (as opposed to charismatic leadership) is favorable for enhancing individual performance. According to the boundary spanning theory (Tushman & Scanlan, 1981a), this leadership enhances the connections and promotes ideas and information sharing beyond the borders of a single team, considering a larger goal (Ernst & Yip, 2009). Such behavior seems to be especially important when linking individual project teams working on similar tasks or goals and, where knowledge, information, and resources can be shared for mutual benefits.

Finally, next to our theoretical contribution we also bring a methodological contribution to the study of multiple project teams. We use an experimental approach where we manipulate different leadership behavior and assess their effects (as opposed to associations in cross-sectional designs) on project members' performance. Experimental designs are one of the few that allow us to make causal claims regarding our findings, being recognized as valuable in the establishment of many different fields (Eden, 2021; Podsakoff & Podsakoff, 2019). Finding causal effects also comes with practical contributions, given that we can define specific recommendations that are geared at improving multiple project members' performance (e.g., the value of using boundary spanning leadership).

With our study, we provide an example of how project teams can be studied and understood while using an experimental paradigm and hence other scholars can follow this approach while looking at other phenomena in the multiple project management field. In following this experimental approach, we also answer recent calls in the project management field asking for rigor and the need to carefully disentangle correlational from causal types of studies (Pesämaa et al., 2021).

5.2. Practical implications

This study offers practical implications for organizations that rely on projects and multiple team structures and provides insights on how leaders in highly interdependent multiple project teams should function to maximize followers' performance. Organizations should be aware that MTM is structurally different from traditional STM settings, consequently requiring a different leadership approach. Leaders should not merely cling to the traditional leadership styles when focusing on individual performance but look beyond it and, where appropriate, match adequate other leadership theories and approaches with solutions at hand (Lee-Kelley, 2002; Wright, 2017).

At the same time, leaders should think about situation assessment, considering the extent of MTM usage and project team interdependence. Based on that, organizations could provide appropriate leadership

training (Lacerenza et al., 2017), which would focus on pulling down the barriers between individual project teams by promoting communication and collaboration beyond the borders of a single project team, consequently aiding in sharing and coordinating ideas, resources, knowledge, and information not only for the individual goal achievements but for the common good of project team members (bigger knowledge pool and social capital; e.g. Mo & Wellman, 2016) as well as the overall project and organization.

5.3. Limitations and future directions

The use of experimental designs is associated with various advantages: high internal validity that allows researchers to make causal claims regarding the relation between the independent and the dependent variable, minimized effects of endogeneity biases, control over potential confounding variables that reduces error variance and increases the probability that an effect will be identified. At the same time, it is also associated with particular disadvantages: reduced ecological validity, given the brief exposure to the manipulation and the task, a risk that the findings may not generalize to non-laboratory settings and that participants' awareness of the experiment might act as confounding variables (Podsakoff & Podsakoff, 2019). Given the limitations listed above, our findings need to be cautiously interpreted. We propose a few directions for future research that could further establish the generalizability of our results (Podsakoff & Podsakoff, 2019).

First, researchers should explore whether results obtained in our experimental study replicate in organizational settings as well.

Second, for parsimony reasons we enabled participants in our experiment to be part of the minimum number of project teams (two projects) in the MTM setting at OS2 and also with a small team size. Although this is in line with the study design, to capture the phenomena more accurately right in the place when it begins – therefore moving from STM to MTM – it may not be in line with the real-life organizational settings, where team members can work in more than two projects at the same time and also in larger teams. Further research could focus on exploring the manifestation of leadership in settings with three, four, or even more projects in a multiple-team setting, comprising at the same time larger teams, as this is a more realistic organizational setting.

Third, our study focused solely on charismatic leadership as the most widely addressed leadership style (Zhu et al., 2019b) and how it manifests in relation to the boundary spanning type of leadership.

Appendix A. Charismatic leadership – Instructions to play the role

How should you play your role?

- You should motivate the team members by using the listed remarks in the table below.
- You should make sure the team members move to the next chunk only after they solved the present chunk successfully.
- You should follow the conversation between team members attentively and make sure you are able to help in real time – according to the role you are playing (e.g., inspire and motivate, give praise).
- You are **not allowed** to disclose the information that the key is needed for code 3 and how to get the key!
- You are **not allowed** to encourage team members to collaborate with each other – your main task is to inspire and motivate the team members.

In order to keep your team focused on the task use the following remarks:

1. Hi, my name is __"Leader X (use your Skype ID name)"__ and I volunteered to lead this emergency project.
2. Hackers took over the bank threatening to steal all the money. Several families are devastated, all their life savings were deposited in the bank and most of them risk losing their homes.
3. In order to prevent this and win against the hackers, you need to decode several chunks of information. However, you are not here only to decode letters, you have a noble mission – help the families whose homes and life savings are in danger and get their life back. Use Angel emoticon at the end of the sentence. Shortcut for emoticon: (angel)
4. Imagine that each letter you decode is a brick – a brick of a salvaged family's house. And each house represents a family's home. Use House/Computer emoticon at the end of the 1st sentence. Shortcut for emoticon: (wfh)

(continued on next page)

Considering the role of other leadership styles, for example, transactional leadership, which contrary to charismatic leadership focuses on compliance (Eagly et al., 2003), would be interesting to explore.

Finally, our experimental study looked at the phenomena of leadership and MTM on a limited time-span. Scholars could consider looking at the phenomena of MTM and leadership from a longitudinal perspective with a minimum of three points in time to observe a non-linear change (Ployhart & Vandenberg, 2010) and grasp any potential temporal changes, perhaps also paying greater attention to the dynamics of increasing the number of teams an individual is a member of. Since this study was performed on a rather short time frame task, a longitudinal design would help examine if leadership keeps the same effect through longer-lasting project tasks or project durations (Purvanova & Kenda, 2022).

6. Conclusion

Although nowadays MTM is being more and more used in the project environment, there is only a handful of studies considering this phenomenon from an academic perspective. We specifically aimed to shed light on the aspect of leadership and individual performance in MTM, which, to our knowledge, has not been empirically addressed before. Based on the performed experimental study, we found that specific organizational structures and settings, like MTM, require a distinct leadership approach, which may not necessarily stem from traditional leadership theories. Comparing a widely explored charismatic leadership and boundary spanning leadership – a leadership behavior specifically oriented toward the context of MTM – our results show a significant increase in individual performance when project team members in MTM settings are led by the latter. We believe the key lies in helping to bridge the boundaries of a single project team and consequently enhancing the exchange of knowledge, information, and resources with the outer environment.

We hope that these findings will stimulate scholars to research this field further, shed more light on the underexplored leadership-MTM field in the project work domain, and aid leaders in these complex work arrangements.

Declaration of Competing Interest

There was no conflict of interest.

(continued)

-
5. You may think that one letter is meaningless and if your effort will help...
This reminds me of story of a girl throwing starfish from the shore to the sea, to save them. An old man approached saying that her work will not make a difference, as there are too many starfish on the shore. She threw a starfish in the sea and said: "I made a difference to this one, did not I?"
Use Smile emoticon after this text. Shortcut emoticon::)
So, my answer is Yes, each letter is important and your effort will help!
 6. I volunteered to lead this project not because it would look good on my CV, but because I believe we can accomplish something good with the knowledge we have and save the money and homes of multiple families.
 7. I want you to do three things to successful complete this project - work hard, work smart and think of the most vulnerable families that are affected by this event. I know you can do it!
Use Fist bump emoticon at the end of the sentence. Shortcut emoticon: (*fistbump*)
 8. We will not let the hackers take the homes and life savings of multiple families.
 9. "Work hard, work smart and think of the families."
Use High five emoticon at the end of the sentence. Shortcut emoticon: (*highfive*)
(REPEAT THROUGHOUT)
-

Appendix B. Boundary spanning leadership – Instructions to play the role (OS1)

How should you play your role?

- You should bridge the team with external factors, so they gather the necessary information, by using the listed remarks in the table below.
- You should encourage team members to collaborate with each other.
- You should make sure the team members move to the next chunk only after they solved the present chunk successfully.
- You should follow the conversation between team members attentively and make sure you are able to help in real time – according to the role you are playing.
- You are **not allowed** to directly disclose the information that the key is needed for code 3 and how to get the key!
- You are **not allowed** to directly disclose the information that the missing words (_ _ _) can be found in the team members chunks (noted in *italic*), but you should encourage them to find the information in the environment (read the instructions) and collaborate.
- You are **not allowed** to direct the team members to Google drive directly – but you should encourage them to read the instruction (e.g. "Is anything mentioned anywhere about external environments that might be helpful?") and encourage them to find a way to the Google drive folder themselves.

In order to keep your team focused on the task use the following remarks:

-
1. Hi, my name is __ "use your Skype ID"__ and I am a leader of this emergency project.
 2. Hackers took over the bank threatening to steal all the money. The situation is serious since millions of customers risk losing all their bank deposits and many of them also risk losing their homes.
 3. In order to fight this cyberattack you need to decode several chunks of information.
To be able to reach this objective it is crucial you interact with your team members.
 4. Please collaborate with your team members.
 5. Connect with your team mates. They might have knowledge, ideas, resources that may be useful for you.
 6. If you want to be successful, I encourage you to step out of the boundaries of your team and see if you can enrich yourself in terms of the knowledge from the wider environment.
 7. You are part of a team. The information from your team mates can be useful for you and the other way around. I think it is important to have good relationship with your team mates. Information they have might be useful as well.
-

Appendix C. Boundary spanning leadership – Instructions to play the role (OS2)

How should you play your role?

- You should bridge the team with external factors, so they gather the necessary information, by using the listed remarks in the table below.
- You should encourage team members to collaborate with each other and with the other team.
- You should make sure the team members move to the next chunk only after they solved the present chunk successfully.
- You should follow the conversation between team members attentively and make sure you are able to help in real time – according to the role you are playing.
- You are **not allowed** to directly disclose the information that the key is needed for code 3 and how to get the key!
- You are **not allowed** to directly disclose the information that the missing words (_ _ _) can be found in the team members chunks (noted in *italic*), but you should encourage them to find the information in the environment (read the instructions) and collaborate.
- You are **not allowed** to direct the team members to Google drive directly – but you should encourage them to read the instruction (e.g. "Is anything mentioned anywhere about external environments that might be helpful?") and encourage them to find a way to the Google drive folder themselves.

In order to keep your team focused on the task use the following remarks:

1. Hi, my name is __"use your Skype ID"__ and I am a leader of this emergency project.
2. Besides Bank Euro hackers also took over Bank Dollar threatening to steal all the money. The situation is serious since millions of customers risk losing all their bank deposits and many of them also risk losing their homes.
3. In order to fight this cyberattack you need to decode several chunks of information. To be able to reach this objective it is crucial you interact with members of the other team.
4. Please collaborate with the other team as well.
5. Look at the other teams you are part of. They might have knowledge, ideas, resources that may be useful for you.
6. If you want to be successful I encourage you to step out of the boundaries of this team and see if you can enrich yourself in terms of the knowledge from the other team.
7. You are part of two teams at the same time but information from the other team can be useful for you and the other way around. I think it is important to have good relationship with the other team. Information they have might be useful as well.

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