

## Virtual teams and transformational leadership: An integrative literature review and avenues for further research



Nina S. Greimel<sup>a,\*</sup>, Dominik K. Kanbach<sup>a,b</sup>, Mihaela Chelaru<sup>c</sup>

<sup>a</sup> HHL Leipzig Graduate School of Management, Leipzig, Germany

<sup>b</sup> School of Business, Woxsen University, Hyderabad, India

<sup>c</sup> University of Modena and Reggio Emilia, Marco Biagi Foundation, Modena, Italy

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### ABSTRACT

Digitalisation reshapes both the workplace and the forms of communication used within a team. Due to the COVID-19 crisis, rethinking leadership has required transitioning from a physical to an entirely virtual work environment to respond to the COVID-19 crisis, accelerating and increasing the relevance of exclusively virtual communication. In a face-to-face professional work environment, transformational leaders can motivate their followers by example. In addition to publications addressing these face-to-face environments, there is an emerging and growing research interest in virtual teams guided by transformational leaders. Therefore, this study conducts a literature review integrating virtual teams and transformational leadership, identifying team, leadership, and motivation factors in the existing literature. As its main contribution, the paper challenges an established leadership model under exceptional economic circumstances and identifies research gaps within team, leadership, and motivation factors. Knowing that the virtual working environment will influence the future of work, this study paves the way for further research on transformational leaders and their influence on virtual teams.

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### Introduction

Within a hierarchically organised team, leaders influence, train, and guide followers through change (Bass, 1999). The transformational leadership theory introduced by Burns (1978) enables teams to help each other reach a higher level of motivation by changing external circumstances. Transformational leadership describes an approach whereby leaders motivate followers to align with the organisation's aims and interests to achieve performance that exceeds expectations (Grošelj et al., 2021). Transformational leadership can be defined based on its impact on followers through charisma, inspiration, intellectual stimulation, or individualised consideration (Bass, 1999). Likewise, these four factors are the main characteristics of transformational leaders, as described by Bass and Avolio (1994). Siangchokyo et al. (2020) argued that no matter the positive results associated with this leadership construct, a leader is not truly "transformational" unless the followers are transformed. Andriani et al. 2018 describe the transformational leadership style as effective in any situation and culture. In this vein, Mysirlaky and

Paraskeva (2020) pointed out that leaders who express transformational leadership behaviours can help a virtual team improve its performance.

The core of transformational leadership is creating and communicating a vision beyond one's self-interest, which naturally evolves through verbal and nonverbal communication in a face-to-face environment (Zigurs, 2003). The motivation dynamics of transformational leaders and their followers is a broad research field as far as the face-to-face working environment (DeChurch & Marks, 2006). However, the forms of interaction and communication within teams are changing as they are leveraged through digital transformation (Bresciani et al., 2021). Under working conditions that involve communicating through a technological medium, the virtual working environment provides a wide range of opportunities for interaction and forms of connection. A team under the leadership of a transformational leader will be amenable and adaptable in changing circumstances, and computer-mediated communication environments have become a growing field of interest (DeChurch et al., 2006).

As the pandemic triggered social distancing, remote working became a necessity (Prin & Bartels, 2020). The international health and economic crisis forced employees and corporations worldwide into a virtual working environment (Bouziri et al., 2020). In order of

\* Corresponding author.

E-mail address: [nina.greimel@hhl.de](mailto:nina.greimel@hhl.de) (N.S. Greimel).

magnitude, since March 2020, over 3.5 billion individuals worldwide have been forced to stay at home, and several million are working solely with virtual communication methods (Bouzir et al., 2020). The COVID-19 pandemic affected companies and business routines in many ways (Kraus et al., 2020) and drastically changed organisations, family dynamics, and teamwork (Feitosa & Salas, 2021).

The changes brought on by the pandemic have challenged the activities that virtual teamwork requires, such as relationship interactions (Whillans et al., 2021). Within a team, leaders can have formal and informal extended relationships (Malik et al., 2015). For instance, leaders may build solid and trusting relationships with only a portion of team members (Ansari et al., 2007; Bauer & Erdogan, 2015). A virtual team consists of people from different geographic locations and, potentially, different time zones (Garro-Abarca et al., 2021). Jarvenpaa and Leidner (1999) described virtual teams as teams working in virtual environments where members are temporarily and geographically dispersed and rely on information and communications technologies (ICT) to work and communicate. Virtuality is the main characteristic in the use of information and communication technologies.

Since research on virtual teams directed by transformational leadership is an evolving field (Hambley et al., 2007), unexpected economic circumstances indicate the importance of taking a closer look at a proven leadership theory and challenging it within an exceptional situation. The challenge of motivating a virtual team that solely communicates through a technological medium provides an opportunity to integrate existing literature (Zigurs, 2003). Working exclusively in virtual teams with the additional stress of a pandemic situation requires a precise inspection of the existing theory, underlying models, and potential research gaps. Faced with the aftermath of the COVID-19 pandemic and simultaneously hovering in a transitional state between face-to-face and computer-mediated communication working conditions, practitioners and researchers will be interested in a transformational leader who assists their followers in a virtual team in reaching a higher level of motivation (Burns, 1978). Leadership effectiveness plays a key role in the success of virtual teams.

In their recent study, Mysirlaki et al. (2020) showed that transformational leadership mediates the relationship between leaders' emotional intelligence and team effectiveness in a virtual team. In the same way, researchers agree that effective leadership is a key factor in the success of virtual teams (Bell & Kozlowski, 2002; Hoch & Kozlowski, 2014) and an important component in overcoming the challenges of virtual teams and realising their potential benefits (Liao, 2017).

It is commonly agreed that there is a need for a better understanding of transformational leaders and virtual teams and how transformational leaders motivate their followers in a virtual team setting (Zigurs, 2003; Pitts et al., 2012; Dulebohn & Hoch, 2017). This paper integrates the literature to date analysing the dimensions of virtual teams and transformational leadership. The discourse starts with the theoretical background and definition of leadership in a virtual environment and continues with a description narrowing down the target literature. Based on the identified literature, the paper analyses and synthesises the delimited research field in a structured approach, providing a new, holistic perspective on motivating virtual teams guided by transformational leadership. The identified gaps determined in the breakdown of the literature are stated as an outlet for further research.

## Theoretical background

The following section portrays both the theoretical background and a delimited definition of virtual teams, transformational leadership, and leadership in a virtual environment, building on the

outlined discussion and relevance of the topic and providing a basis for further analysis.

### Virtual teams

As part of the digital transformation, planned changes and the integration of advanced technologies in daily work routines (Bresciani et al., 2021) have enabled new forms of collaboration, communication configurations, and work arrangements (i.e., telework) (Gilson, Costa, O'Neill, & Maynard, 2021). Thus, the concept of a physical work environment has been transformed, and organisations are increasingly becoming more flexible in how, where, and when work is performed (Harris, 2016; Palvalin & Vuolle, 2016). For instance, in geographically dispersed teams, members can rely on technology to collaborate virtually within the team (Hill & Bartol, 2016).

In virtual teams, collaboration enabled by IT solutions is vital for communication and working methods within a team (Townsend et al., 1998; Lipnack & Stamps, 2000; Hollingshead, 2004; Lilian, 2014). Virtual team interaction gained new visibility and became perceived differently during and since the outbreak of COVID-19 when regulations led to physical distancing and related guidelines (e.g., wearing face masks) (Wendt et al., 2022). As a result of the pandemic, teams that were not geographically or organisationally dispersed across time zones found themselves unexpectedly unprepared to collaborate via computer-mediated communication (Lilian, 2014).

In general, team interaction is affected by the medium of communication, and virtual working entails more possibilities for interaction and connection, which are interrelated with and can be influenced by the geographical location of the team members (Balthazard et al., 2009; Kraus et al., 2022b). Team members' geographical location, therefore, impacts the forms of communication. For example, a team being geographically dispersed for various reasons limits face-to-face contact and encourages computer-mediated communication possibilities. Not being able to meet and communicate face-to-face with one's colleagues makes the team reliant on technology-based solutions for communication (Jarvenpaa & Tanriverdi, 2003).

Lilian (2014) defines the collaboration that occurs within a virtual team as "effective communication and information diffusion across time and space." In our analysis, we focus on virtual teams that communicate solely through a technological medium, excluding occasional face-to-face contact (Hambley et al., 2007), as informal meetings between colleagues took place primarily in a virtual setting during the beginning of the COVID-19 pandemic (Viererbl et al., 2022). For instance, Hill et al. (2016, cited in Liao 2017) highlight the importance of virtual collaboration in virtual teams, given that tasks are largely carried out through virtual channels. Collaboration in virtual teams refers to interactions and tasks to achieve common goals (Morrison-Smith & Ruiz, 2020).

Numerous computer-mediated communication forms exist, are constantly evolving, and can be classified and distinguished by the richness of the communication therein. For instance, videoconferencing or teleconferencing is a deeper form of communication than chat-based interaction (Cascio & Shurygailo, 2003; Hambley et al., 2007). Furthermore, collaboration tools are not limited to one form of communication, meaning one tool can simultaneously entail different forms and intensities of communication or be time-shifted.

Given the recent events of the pandemic and the prospect of unpredictable future developments, the rationale for and definition of virtual teams in the literature must be reconsidered and revised. The literature until now has provided a substantial foundation for the theoretical framework and scientific research in understanding the phenomenon of virtual teams (Bell et al., 2002). Lilian (2014) defined a virtual team as one dispersed over different time zones. A primary reason for computer-mediated communication when there is geographical team dispersion is to overcome separations while simultaneously reducing costs (Lilian, 2014). Although the role of virtual

teams within organisations has grown in the last two decades, the reasons for a team to interact via a technological medium are changing (Lipnack et al., 2000; Hertel et al., 2004).

### *Transformational leadership*

In his descriptive research, Burns (1978) introduced transformational and transactional leadership as mutually exclusive concepts. In its ideal form, transformational leadership enables leaders and their followers to help each other reach a higher level of morale and motivation (Burns, 1978). Unlike transactional leadership, which emphasises the self-interest of leaders and their followers operating in an existing culture, transformational leadership enables followers to become leaders and creates value by changing the culture within a social system's organisation (Burns, 1978). Transformational leadership can be defined based on its impact on followers and characterised by factors like idealised influence, intellectual stimulation, or individualised consideration (Bass et al., 1994; Bass, 1999). The interplay between leaders and employees defines how a team harmonises with each other and performs, which is crucial for initiating change. The way that entire organisations and team units operate depends on leadership as defined by the people who make decisions in their daily work.

The impact of transformational leadership has been well observed and discussed as far as face-to-face working environments. Leadership studies outline a positive connotation between a transformational leadership style, motivation, and meaningful work (Bailey et al., 2019). Transformational leaders outperform transactional leaders in empowerment, group cohesion, and perceived group effectiveness when operating in a face-to-face setting (Jung & Sosik, 2002).

Ruggieri (2009) analysed the effects of transformational and transactional leadership on virtual groups and evaluated the perception of the style adopted. The results showed a transformational leadership style as being more satisfying than a transactional one, and transformational leaders evaluated better than transactional ones (Ruggieri, 2009).

Al-Husseini et al. (2021) have explained that transformational leadership is an important and influential factor in innovation and knowledge management systems.

Bogoviz et al. (2018) found that a transformational leadership style is best suited for knowledge-intensive companies, mainly because of its orientation toward the continuous development of individual employees as well as the company. Similarly, Rafique et al. (2022) research revealed that transformational leadership positively impacts employee engagement, knowledge sharing, and the creation of an environment of trust.

Although the initial transformational leadership theory - which can be divided into measurable characteristics - has a broad field of existing research in a face-to-face environment, this study is not limiting itself to well-known and established concepts in order to keep an open mind when adapting transformational leadership to a virtual environment. In this paper, the focus rests upon a transformational leadership personality: leading by example, being open to innovative change within the organisation, and commitment to employee well-being, independent of constant comparison to transactional leadership characteristics.

### *Leadership in a virtual environment*

The existing literature analysis and implications for the practice of transformational leadership theory in virtual teams are scarcely comparable to those for a face-to-face environment (Zaccaro & Bader, 2002). Because virtual work is a relatively new phenomenon in leadership research, leadership characteristics and team motivation have primarily been studied in a face-to-face environment.

As nonverbal communication must be thought new when it comes to a virtual working environment, proven transformational leadership characteristics must also be challenged (Purvanova & Bono, 2009). A technological medium replaces physical interaction, so we cannot simply transfer the findings from face-to-face into a virtual environment (Zigurs, 2003). Moreover, typical transformational leadership interactions of "lead by example" tend to be more emotionally driven, often transmitted to followers through nonverbal communication (Kirkpatrick & Locke, 1996). Therefore, leadership in a virtual environment is an evolving human resource development topic in the literature that has gained new relevance due to the digital transformation and has been accelerated by the COVID-19 pandemic and its work-from-home consequences (Bertello et al., 2022).

Since a transformational leadership model can be a strong motivator in a face-to-face environment, we aim to integrate the existing literature to provide a basis for a solid leadership model within a virtual working environment that can adapt to changing circumstances.

### **Methodology**

The methodology of Torraco (2005) is used to integrate the existing literature and form a basis for further research while considering the external and evolving circumstances. An integrative literature review is ordered by topic and relationship rather than chronology (Torraco, 2005).

The research design of an integrative literature review is a suitable approach for a new perspective on a current topic that is still evolving in the literature (Snyder, 2019; Kraus et al., 2022a). For instance, integrative literature reviews have been published on evolving topics like contingent work and new employment relationships, new forms of organisations, and training concepts (Easterby-Smith, 1997; Kalleberg, 2000; Liker et al., 2003; Burke-Smalley & Hutchins, 2007; Scully-Russ & Torraco, 2020). Moreover, journal publications have indicated that integrative literature reviews are a valuable approach for human resource development-related topics that entail the investigation of team dynamics and leadership (Torraco, 2005, 2016; Scully-Russ et al., 2020).

For the content analysis of the literature, we applied an inductive qualitative approach to concept development, as described by Gioia et al. (2013). The grounded theory approach, which starts with data collection and not hypothesis building, is suitable for generating new concepts and ideas (Gioia et al., 2013).

We first identified target articles in the data selection process. Afterward, we systematically developed a concept from the literature, as outlined below.

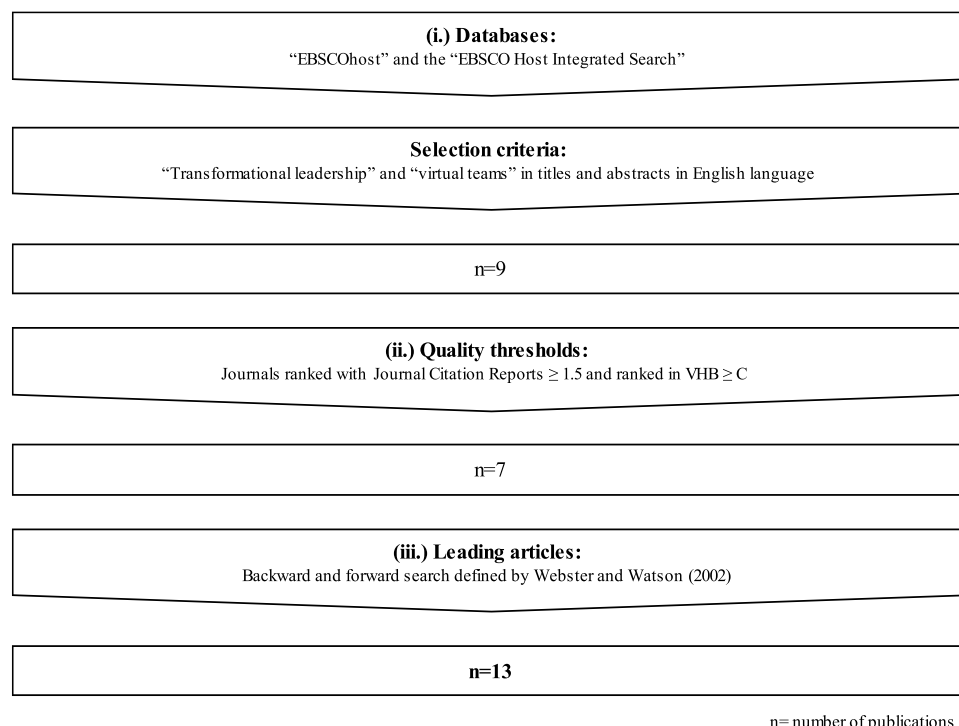
### *Data collection*

Using the data collection approach, 13 target articles were identified (see Table 1 below). To narrow down the literature sample size for subsequent analysis, the data collection and selection process for the target literature's inclusion in the study was conducted in three sequential steps: (i) searching the pre-selected databases with keyword combinations, (ii) executing a quality threshold, and (iii) screening the literature manually and analysing the content (see Fig. 1 below).

We reviewed the databases with a list of keyword combinations such as "virtual teams" and "transformational leadership" and then ensured that the detected articles either contained the keywords in the title or described the phenomenon in the abstract. Furthermore, we aimed to ensure that all target articles included keyword combination strings in their core analysis. In the first step, we used the electronic databases "EBSCOhost" and "EBSCOhost Integrated Search" to encompass various databases with access to external and internal sources. We received results in various research fields, including business, strategy, management topics, human resource

**Table 1**  
Target articles resulted from the literature search.

Author(s) and year	Title	Journal	Empirical study (primary research)	
Balthazard et al. (2009)	Predictors of the emergence of transformational leadership in virtual decision teams.	The Leadership Quarterly	Yes	Yes
Ben Sedrine et al. (2020)	Leadership style effect on virtual team efficiency: trust, operational cohesion and media richness roles.	Journal of Management Development	Yes	Yes
Eisenberg et al. (2019)	Team Dispersion and Performance: The Role of Team Communication and Transformational Leadership.	Small Group Research	Yes	Yes
Hambley et al. (2007)	Virtual team leadership: The effects of leadership style and communication medium on team interaction styles and outcomes.	Organisational Behaviour & Human Decision Processes	Yes	Yes
Hoyt and Blascovich (2003)	Transformational and transactional leadership in virtual and physical environments.	Small Group Research	Yes	Yes
Kahai et al. (2003)	Effects of leadership style, anonymity, and rewards on creativity-relevant processes and outcomes in an electronic meeting system context.	The Leadership Quarterly	Yes	Yes
Kahai et al. (2012)	Interaction Effect of Leadership and Communication Media on Feedback Positivity in Virtual Teams.	Group & Organisation Management	Yes	Yes
Kelloway et al. (2003)	Remote transformational leadership.	Leadership & Organisational Development Journal	Yes	Yes
Maduka et al. (2017)	Analysis of competencies for effective virtual team leadership in building successful organisations.	Benchmarking: An International Journal	Yes	Yes
Purvanova and Bono (2009)	Transformational leadership in context: Face-to-face and virtual teams.	The Leadership Quarterly	Yes	Yes
Sosik et al. (1997)	Effects of leadership style and anonymity on group potency and effectiveness in a group decision support system environment.	Journal of Applied Psychology	Yes	Yes
Sosik et al. (1998)	Computersupported work group potency and effectiveness: the role of transformational leadership, anonymity, and task interdependence.	Computers in Human Behaviour	Yes	Yes
Strang(2011)	Leadership substitutes and personality impact on time and quality in virtual new product development projects.	Project Management Journal	Yes	Yes



n= number of publications

Fig. 1. Literature search approach.

management, organisational behaviour, applied psychology, and human-computer interaction. The initial literature search was not limited to a time frame, however, due to the set criteria of “virtual teams”, the search results only went back approximately 25 years. While we did not restrict our search to articles, we mainly garnered results published in academic journals. Furthermore, since the topic is a broad field within different research areas, including different angles of perspective, we did not limit our search to articles in business and management academic journals.

We solely included articles from academic peer-reviewed journals in our analysis with a Journal Citation Report  $\geq 1.5$  and ranked in VHB  $\geq C$  as this indicates a reasonable re-citation rate and, therefore, the scientific relevance of the academic journal. After the initial literature review, we conducted a quality threshold. First, we aimed to focus on significant research results of peer-reviewed studies and did not include conference presentations or books. Secondly, we decided to concentrate on empirical work and primary research, making some cross-checks with secondary research. Thirdly, we ensured that all peer-reviewed primary research journals were listed on the Web of Science.

The Web of Science, which examines recently published literature, is a database that entails the Social Science Citation Index and the Science Citation Index (Li et al., 2018). All Social Science Citation Index journals published by Thomson Reuters are used to generate a journal impact factor, which reflects a journal’s relevance within its field (Li et al., 2018). The calculated Journal Impact Factor, used as a proxy for the annual average number of citations of articles released within two years in a stated journal, is published yearly by Clarivate and listed in a Journal Citation Report (Li et al., 2018). As our journal quality threshold for our target journals, we used the Journal Citation Reports 2020, released with the reference year 2019, and the VHB ranking. Since not all of our target journals entail a VHB ranking, we used a conversion table of leading academic journal rankings by Kraus et al. (2020) to supplement our threshold analysis.

As per the literature search approach defined by Webster and Watson (2002), we identified the articles defined by search criteria and quality thresholds as leading articles. In the following step, we executed a profound content analysis and manual literature search to ensure that our literature search led to meaningful results. To confirm a holistic understanding of the topic of interest and close possible

literature gaps, we conducted a backward and forward search based on the leading articles (Webster et al., 2002). As the first step of a systematic backward search to study the theory’s origins, we reviewed the articles’ citations (Webster et al., 2002). In the second step, the forward search, which helped expand knowledge on the topic, we identified articles citing the key articles marked in the previous steps (Webster et al., 2002).

Conceptualisation of the literature

After identifying a phenomenon of interest and defining the relevant set of data, an analysis process explained by Gioia et al. (2013) was applied. The results were outlined using the labelling methods of “first-order categories”, “second-order themes”, and “aggregate dimensions” in a systematic data tree (see Fig. 2 below).

In the first step of this process, 96 items of “first-order categories” were identified by scanning the target literature with an open mind to all relevant concepts within. In the second step, the unstructured “first-order categories” were named and marked with the letters of the related target article for orientation. Discovering similarities within the data, the 96 “first-order categories” were grouped into 12 “second-order themes”. After developing and analysing the “second-order themes”, three emerging “aggregate dimensions” were identified.

The three developed overarching theoretical dimensions, (i.) team perspective, (ii.) leadership perspective, and (iii.) motivation factors, are indicators for the relationship within the predefined categories and themes. Going through the evaluated literature’s conceptual framework, we identified that some variables were less well presented. Based on the conceptual and systemic analysis of the target literature, we outlined that the lack of research on some variables constitutes an interesting pillar for further research. Since the subject of interest is relatively new and emerging, the field could benefit from a profound literature analysis and a conceptualisation of the literature, as outlined within the subsequent chapter (Torraco, 2005).

Integration of literature

Following the conceptual framework of Gioia et al. (2013), three dependant dimensions were discovered. The interrelation between

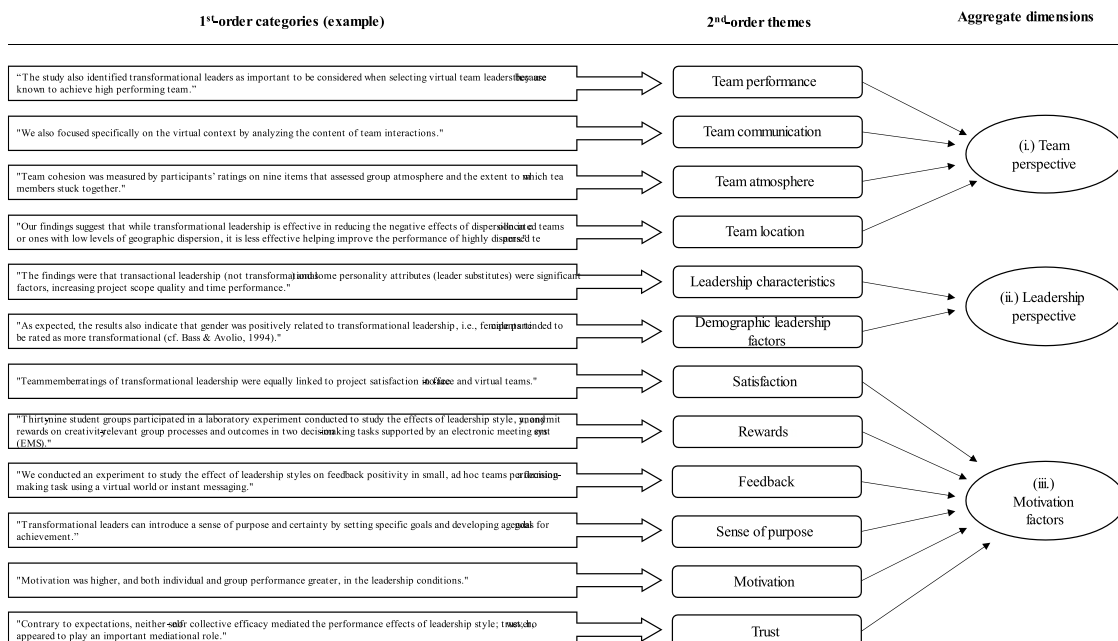


Fig. 2. Applied conceptual framework of Gioia et al. (2013).

the dimensions becomes more apparent by looking closely at the developed matrix (see Table 2 below).

Based on the literature and interrelationship analysis, we identified fields and blind spots within every dimension. Aside from motivation factors, which are at least partially researched, all three perspectives reveal a dearth of research on demographic leadership factors. More precisely, a lack of interrelation was discovered for the variables of demographic leadership factors, motivation, trust, and team location (see Table 2 above). Therefore, a potential research question could lead to a closer examination of the underrepresented variables and their interplay. The literature analysis's main findings are discussed for every dimension with consideration to the dimensions' interrelationships and subsequently synthesised (Torraco, 2005).

**Team perspective**

In the following, we look closely at the team perspective variables and their representation within the target papers. Within the dimension of team perspective, we discovered a strong interrelation between team performance, communication, and atmosphere (Table 2 above) and a lack of research on team location. Moreover, the three most represented variables within this dimension interplay more with the leadership perspective than motivation factors (Table 2 above).

Team location is essential for virtual team settings, relating to team performance, communication, and leadership characteristics. Since the target literature rarely deals with the topic and there is no interrelation with the dimension of motivation factors, the research on geographical team location and dispersion and the effect on virtual interaction and transformational leadership could potentially be a field of further research.

From the team perspective, it becomes apparent that there are still contradictory statements regarding a transformational leadership style and the form of communicating with and motivating a team. For instance, one study shows that transformational leadership is more effective with written communication tools, while another paper outlines that transformational leadership is less effective in highly dispersed teams. As a result, the possibility of additional research could obtain a clearer picture of the variables influencing the team perspective.

**Team performance**

Another important field within the analysed literature is performance, which can measure the success of a virtual team. Team performance can be found in the literature with different nomenclatures, like "team performance", "group performance", or "team outcome" (Hoyt & Blascovich, 2003; Kelloway et al., 2003; Purvanova et al., 2009; Kahai et al., 2012; Maduka et al., 2017; Eisenberg et al., 2019). The literature suggests that a transformationally led team is less effective when highly dispersed (Eisenberg et al., 2019). That being said, the target literature outlines that transformational leadership has a more substantial effect in virtual - rather than in face-to-face - team interactions (Purvanova et al., 2009).

Like in a face-to-face environment, performance can be measured by different methods. Another measurable variable is individual performance, which indicates an individual's success within the team and can be added to team performance (Kelloway et al., 2003; Balthazard et al., 2009). Performance can be measured by quantitative performance indicators or by qualitative performance factors that cannot be easily measured by figures (Hoyt et al., 2003). Quantitative performance indicators, which interact with a transformational leadership style and the communication medium, include factors like task performance, task interdependence, time performance, and task time (Sosik et al., 1998; Hambley et al., 2007; Strang, 2011; Kahai

**Table 2**  
Interrelations within 2nd-order themes.

Aggregate dimensions	(i.) Team perspective			(ii.) Leadership perspective			(iii.) Motivation factors										
	Team performance	Team communication	Team atmosphere	Team location	Leadership characteristics	Demographic leadership factors	Satisfaction	Rewards	Feedback	Sense of purpose	Motivation	Trust					
<b>2nd-order themes</b>																	
Team performance	X																
Team communication		X															
Team atmosphere			X														
Team location				X													
Leadership characteristics					X												
Demographic leadership factors						X											
Satisfaction							X										
Rewards								X									
Feedback									X								
Sense of purpose										X							
Motivation											X						
Trust												X					
<b>Number of interrelations with other variables</b>	7	7	3	10	1	6	5	5	4	2	2	2					

et al., 2012). One qualitative success factor of an individual team member within the group can be self-efficacy (Hoyt et al., 2003). Further qualitative factors of team performance can be indicated as group potency, project scope quality, and decision quality (Sosik et al., 1997, 1998; Strang, 2011; Kahai et al., 2012). As with face-to-face environments, virtual teams led by transformational leaders show a decrease in quantitative performance but increases in qualitative performance (Hoyt et al., 2003).

Combining quantitative and qualitative performance factors provides a holistic picture that can display the mood within a team. To measure performance by quantitative figures alone misses out on qualitative performance factors that, for instance, better describe the group dynamic within a virtual setting (Hoyt et al., 2003).

Group efficacy, collective efficacy, and group effectiveness can be used to measure qualitative team success, which favours transformational leadership (Sosik et al., 1997, 1998; Hoyt et al., 2003; Kahai et al., 2003; Kahai et al., 2012). However, efficiency in a virtual team setting has no performance effects on the leadership style (Hoyt et al., 2003). Additionally, group potency and effectiveness do not affect project scope quality or time performance in a virtual team setting guided by transformational leadership (Sosik et al., 1998; Strang, 2011).

In summary, it is evident that transformational leadership in a virtual setting has a similar impact on team and individual performance in many ways.

#### *Team communication*

Within the literature, the form of communication in a virtual team setting is measured with different communication variables. The terms “team interaction” and “team interaction style” contain different forms of characteristics, like constructive, defensive, passive, and aggressive (Hambley et al., 2007; Balthazard et al., 2009). A virtual team environment can be distinguished from a face-to-face environment by group setting and team type (Hoyt et al., 2003; Purvanova et al., 2009).

Team interaction styles are dependant and can be defined by the frequency of participation and the initiation of ideas (Balthazard et al., 2009). Within virtual team interactions, the activity level of team members, especially in written communication, favours transformational leadership (Balthazard et al., 2009).

In general, the spectrum of media richness can range between richer communication mediums, such as videoconferencing, and poorer communication mediums, such as written communication in the form of instant messaging or chats (Hambley et al., 2007; Balthazard et al., 2009; Kahai et al., 2012). As previously outlined, the nomenclature of team communication depends on the communication medium and interacts with transformational leadership (Hambley et al., 2007; Kahai et al., 2012; Eisenberg et al., 2019). The literature indicates that transformational leadership greatly influences teams working with computer-mediated communication and the more precise influence is dependant on and can be distinguished by media richness (Purvanova et al., 2009; Ben Sedrine et al., 2020). On the other hand, Hambley et al. (2007) state that the impact of transformational leadership on teams working in richer or poorer communication mediums is marginal. In the field of written communication, linguistic quality plays a significant role and interplays with transformational leadership (Balthazard et al., 2009). Here, the effect is also marginal, differences depend on media richness - for instance, team cohesion is higher in videoconferencing than in chat teams (Hambley et al., 2007).

Transformational leadership is more effective when the communication medium becomes more anonymous (Hambley et al., 2007). Dependant on the form of virtual communication and especially in written communication, anonymity and anonymous interactions - distinguished from identified interactions - play an essential role in

team communication and interplay with the transformational leadership style (Sosik et al., 1997, 1998; Kahai et al., 2003; Hambley et al., 2007).

Taking all this into account, since the form of communication is an important topic in virtual teams led by transformational leadership and is consciously evolving, there is immense potential here for further research.

#### *Team atmosphere*

Team atmosphere is an essential topic within a virtual working environment and cannot be considered independently from motivation factors. It is outlined in the target literature that an increase in team cohesion will increase team commitment within a transformational-led team (Hambley et al., 2007). Research shows that the form of communication has an important effect on team interaction styles and cohesion (Hambley et al., 2007). Group atmosphere can measure how a team is united and connected, which - in a virtual environment - is dependant on social presence, which is distinguished from and contrary to social loafing and consensus (Kahai et al., 2003; Hambley et al., 2007; Kahai et al., 2012). Moreover, the way a team sticks together can be defined by team cohesion, group cohesiveness, and operational group cohesion (Hoyt et al., 2003; Hambley et al., 2007; Kahai et al., 2012; Ben Sedrine et al., 2020).

Although team atmosphere is a topic of discussion within virtual teams, the long-term effect of virtual work on how a team sticks together and the interaction with motivation factors could be a broad field for future research.

#### *Team location*

As per the initial definition of virtual teams, the location of the team members plays a vital role in remote working.

Literature indicates that a transformational leader can reduce the adverse effects of dispersion in teams (Eisenberg et al., 2019). In highly dispersed teams, transformational leadership is less effective since it is difficult for leaders to facilitate team communication (Eisenberg et al., 2019). This contradicts the point that transformational leadership is stronger when written communication tools are used. The team location - which, in the initial definition, is a reason for virtual interaction - influences all the outlined factors of team communication, performance, and atmosphere, making a team's location or geographical dispersion related to transformational leadership (Eisenberg et al., 2019).

Given the required virtual working situation during the COVID-19 crisis and a future trend toward a more individual option of working from any location, the choice of location within teams has the potential to be a broad research topic.

#### *Leadership perspective*

Since a transformational leader leads by example, personality traits and external circumstances play an important role in motivating a team. The leadership perspective entails the two interrelated dimensions of leadership characteristics and demographic leadership factors.

Researching transformational leaders by their characteristics is a common approach, as well as an evolving trend that is also accelerated by a more flexible and virtual work setup. Moreover, as there is less correlation with motivation factors, transformational leadership characteristics and backgrounds entail the possibility of further research.

While leadership characteristics are represented in the literature, demographic leadership factors are underrepresented. Observing a lack of research analysing the variety of demographic factors of leadership within our target literature and considering that virtual

working provides more flexibility for leadership, it would be interesting to know how demographic factors interact with the outlined variables and each other.

#### *Leadership characteristics*

Taking a more detailed look at personality traits, a transformational leader can be characterised as high-level and one who leads by example. Our defined literature shows that leaders who increase their transformational leadership in virtual teams are more successful than those who do not (Purvanova et al., 2009). This contradicts our previous findings, which outlined that more face-to-face contact strengthens transformational leadership.

The primary literature describes the transformational leadership style and its characteristics in a virtual team setting, often distinguishing it from the transactional leadership style (Sosik et al., 1997, 1998; Hoyt et al., 2003; Kahai et al., 2003; Hambley et al., 2007; Purvanova et al., 2009). When it comes to transformational leadership characteristics in a virtual setting, a leader's personality and attributes influence team performance and atmosphere (Balthazard et al., 2009; Strang, 2011).

It is outlined in the target literature that the type of communication medium influences emotional stability (Balthazard et al., 2009). Moreover, when leaders were asked to describe themselves, the five highest-ranked characteristics were also attributes of transformational leadership (Balthazard et al., 2009). Our target literature examined the leadership attributes and personality characteristics of transformational leaders that interact with the communication medium as variables of extraversion, conscientiousness, agreeableness, openness to experience, emotional stability, interpersonal justice, continuity, commitment, and solution originality (Balthazard et al., 2009; Kahai et al., 2003; Kelloway et al., 2003). Beyond the more general leadership personality characteristics, there are also attributes related to a transformational leadership style, such as idealised influence or charisma, inspirational motivation, intellectual stimulation, and individualised consideration (Kelloway et al., 2003; Purvanova et al., 2009).

The literature describes transformational leadership as occurring less often in virtual than face-to-face project teams (Purvanova et al., 2009). Knowing that transformational leadership characteristics help motivate leaders and their followers, there is a potential for further research on transformational leadership characteristics in a virtual working environment.

#### *Demographic leadership factors*

A leader evolves and sustains an individual leadership style through their characteristics and personality. These leadership personalities and related characteristics are shaped by demographic factors such as age, gender, ethnicity, or level of education (Balthazard et al., 2009). The literature indicates that certain demographic factors influence the transformational leader: female leaders, for instance, tend to act more transformationally (Balthazard et al., 2009). It would be helpful to know more about leaders to learn further about the roots and development of leadership characteristics.

Given that virtual working environments can also influence flexibility within a job and the hiring market, and since there is a lack of research on demographic leadership factors, this is an open field for further research.

#### *Motivation factors*

A transformational leader aims to motivate a team by example. For this reason, we must take a closer look at the motivation factors of a transformation leader in a virtual team. While motivation factors and underlying variables strongly interrelate with team and

leadership perspectives, we discovered less interplay between variables within the dimensions of motivation factors and demographic leadership factors. Two variables that stand out for having nearly no interactions with each other are motivation and trust.

The lack of interrelation between and research around the variables of motivation and trust is an opportunity to conduct research measuring the mood and atmosphere of team and leadership interaction in a virtual setting.

#### *Satisfaction*

For a transformational leader in a virtual working environment, satisfaction is the basis for motivating a team. The identified literature demonstrates that a transformational leadership style leads to higher supervisory satisfaction (Kelloway et al., 2003), and the satisfaction of team members in a virtual setting is contingent on the satisfaction of supervision and leadership (Hoyt et al., 2003; Kelloway et al., 2003; Kahai et al., 2012).

According to our findings, team project satisfaction is the same whether the working environment is face-to-face or virtual (Purvanova et al., 2009). The satisfaction of each individual team member is also correlated with variables of job satisfaction, project satisfaction, and satisfaction with the task (Kahai et al., 2003; Kelloway et al., 2003; Purvanova et al., 2009).

Since satisfaction has a high potential for change, it is helpful to measure satisfaction continuously and when working methods are changing. Therefore, satisfaction is a broad potential field for further research.

#### *Rewards*

Monetary or other rewards are an essential component of motivation factors. Likewise, rewards can never be seen as independent of other motivation factors. The literature studies the effect of individual and group rewards on the variables of transformational leadership style and anonymity (Kahai et al., 2003). Notably, factors that influence the motivation of the team members can be rewarded on both an individual and group level (Kahai et al., 2003).

As one pillar within motivation factors, rewards should be considered for further research regarding virtual teams led by transformational leaders.

#### *Feedback*

A transformational leader is open to change and willing to adopt an individual leadership style. Continuous feedback is thus a valuable indicator for adjusting motivation and leadership style.

In a virtual setting using instant messaging, the transformational leadership style is influenced by constructive feedback (Kahai et al., 2012). Another critical motivator is the receipt and provision of positive feedback from both the leader and the peer team (Kahai et al., 2012). Since feedback in a virtual setting can have different channels, it is an important field for further research.

#### *Sense of purpose*

In a virtual working environment, a leader's setting a vision and leading by example can give a team a sense of purpose.

Our predefined resources outline how transformational leaders can establish a sense of purpose within virtual teams by setting goals and developing agendas to achieve them (Purvanova et al., 2009). Purvanova et al. (2009) identify a sense of purpose as an essential motivator for the team and each individual in general, particularly in daily tasks.

Sense of purpose can have a different meaning in a virtual setting since it is, for instance, independent of going to a work location every



day. Sense of purpose can be guided by a transformational leader and is a potential topic for further research.

### *Motivation*

One driver in a virtual setting is the motivation of each individual within a team setup.

Literature predicts that higher motivation will lead to better individual and group performance in virtual settings with a transformational leader (Kelloway et al., 2003). The team's performance and atmosphere depend on the individual's motivation within a virtual team (Kelloway et al., 2003).

Knowing that the motivation of the individual has a high impact on the motivation of the group, the interplay of individual and group motivation gains potential for further research.

### *Trust*

In a relationship between leaders and their followers, trust plays a vital role in sustaining and building new relationships.

The literature demonstrates trust's important mediational role for virtual-led teams (Hoyt et al., 2003). Trust is a crucial indicator not only for team interaction and atmosphere but also for the relationship between leaders and their followers (Hoyt et al., 2003). Since trust is an underrepresented research variable in the relationship between transformational leaders and virtual teams, it has the potential to be more precisely defined in further research.

## **Discussion**

Renowned as a standard form for synthesising literature, the following chapter will discuss the results of the literature analysis as an outlook for further research (Torraco, 2005). Having outlined our findings in detail, we will reflect on them in light of existing literature and discuss similarities and differences.

The dispersion of teams interacting with a new type of leadership embedded in a working environment of motivation and trust, regardless of distance by location, is a wide-open field for possible academic research. As previously outlined, the lack of interrelation within and between all three of these dimensions entails a variety of opportunities.

Taking all three perspectives into account with the knowledge of the importance of team motivation in a virtual setting, we considered which factors, in particular, warrant further investigation.

### *Geographical team dispersion*

After taking a closer look at the interrelationship variables of team location, we discovered a lack of interrelationship with team atmosphere and all outlined motivation factors. Based on this observation, one potential research field could be how team location influences the team atmosphere and motivation factors in a team setting. More precisely, this includes factors such as how team location influences not only the place but also the space of working (i.e. a home office setting). Moreover, within virtual and hybrid settings, how a team is located and geographically dispersed affects virtual interactions and opens a field of research that can be explored in more detail.

Assuming a global job market or hiring process involves a range of holistic choices of location for the candidate and the hiring organisation, intercultural diversity within a team can be influenced and determined by demographic factors such as ethnicity. Beyond considerations like compliance and federal legislation, virtual working methods and team dispersion can allow organisations to hire talent worldwide. For example, considering that candidates may be restricted to a particular home location for various reasons, applying for a job no longer depending on its location could influence the

decision to apply for the job and the motivation variable. In today's global job market, data analytics is becoming increasingly important in human resources-related topics (Korherr & Kanbach, 2021). Only occasionally needing to meet with one's team or client face-to-face brings about a new dimension of job opportunities and flexibility for organisations, leaders, and employees.

### *Leadership diversity*

A diverse leadership setup shapes a company's culture (Korherr et al., 2022). Analysing the interrelationship behaviours of the variable demographic leadership factors opens up research possibilities for factors of team perspective and motivation. Since geographical team dispersion is a topic of interest, a potential research field could be how team location relates to demographics of leadership and various motivation factors.

Analysing the leadership perspective, we recognised a lack of research on various demographic factors that characterise and create transformational leaders in virtual team settings. In a world that favours diverse ways of working, diverse methods of leading should be considered. Demographic factors like age, gender, ethnicity, or level of education could be the focus of further research and analysis. For example, given the worldwide diversity debate, institutional and organisational challenges for women in a changing workplace - considering different ethnicity and minority factors - could be one potential focus (Cho, Ghosh, Sun, & McLean, 2017).

Investigating demographic leadership factors and their impact on team interaction can be a profound indicator of the variables of motivation and trust. Since diversity encompasses a wide range of factors, it should not be limited to leadership characteristics and should also include the diversity of team members and diversity within a team, as well as cooperation and organisation.

### *Motivation and trust*

After taking a closer look at the motivation factors of individual motivation and trust, we detected potential research opportunities in all three dimensions of our research. Considering the lack of research on team location and demographic leadership factors, an analysis including the variables of motivation and trust could be a potential area for future study.

Furthermore, motivation factors present not only an opportunity to conduct research measuring the mood and atmosphere of the team but also a possibility to discover new and various facets within the factor. Having observed a lack of research on singular motivation factors like trust, for instance, in particular, the variable of reliability could be one of these new facets.

When leaders and followers rely on virtual communication tools to stay connected, they must outperform in already critical skills such as good communication and empathic relationship building to form and maintain a trustful relationship based on motivation. Studies revealed superior sought-after competencies like relationship building in diverse management teams mixed by age, gender, and cultural background (Zenger & Folkman, 2020). In a work environment that requires life-long upskilling, training, and learning, leaders and followers should be equipped with skills and competencies that provide respite from their daily work routine. Not only competencies and hard skills related to a job can be learned but also soft skills like motivation and trust, which can build relationships and bring a team's dynamics to a new level.

## **Conclusion**

Staying connected solely through virtual communication opens up a global job market and hiring process and allows for intercultural diversity within a transformational-led team that can form and

maintain a trusting relationship based on motivation. In our integrative literature review, we discovered literature gap variables within motivation factors and demographic leadership factors that hold potential for various research fields and facets in the megatrend areas of a global job market, diversity, and upskilling. The results are based on the interrelation and interplay of the three methodologically discovered angles of (i) team perspective, (ii) leadership perspective, and (iii) motivation factors.

In addition to its contribution to research, this study provides managerial implications. The labour market is changing since the onset of the COVID-19 pandemic—there is a lack of qualified workforce, it is difficult to retain and attract employees across all sectors, and there is less time to search for qualified staff due to cost pressure and workload—making it even more important to keep employees satisfied. Therefore, having cognizance of motivation factors can help companies attract and maintain talent.

This study has some limitations owing to a limited number of researchers and papers, as well as the lack of an existing theoretical framework for virtual teams and transformational leadership. Due to our approach of solely focusing on the defined terms of virtual teams and transformational leadership, we believe that, despite any limitations, our literature review provides useful guidance and a worthwhile starting point for a variety of detailed academic research opportunities in the outlined fields. Promising avenues for further research may intensify the research on the identified research gaps with a larger sample size and more data after the COVID-19 pandemic. Furthermore, the identified factors could also be distinguished depending on the form of remote or hybrid communication.

A virtual working environment is a concept of a sustainable future, and transformational leadership skills and personalities are a proven approach to motivating a team. For these reasons, our work entailing outlooks for further research and discussion not only opens the door for further academic research but can also offer beneficial opportunities and implications in practice.

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