Chapter 1

Person–supervisor fit, needs–supplies fit, and team fit as mediators of the relationship between dual-focused transformational leadership and well-being in scientific teams

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This paper is published in:

Klaic, A., Burtscher, M. J., & Jonas, K. (2018). Person–supervisor fit, needs–supplies fit, and team fit as mediators of the relationship between dual-focused transformational leadership and well-being in scientific teams. *European Journal of Work and Organizational Psychology, 27,* 669-682. doi: 10.1080/1359432X.2018.1502174.

Person–supervisor fit, needs–supplies fit, and team fit as mediators of the relationship between dual-focused transformational leadership and well-being in scientific teams

Team-based work structures have become prevalent in science. Scientific teams, however, are characterized by competing individual-level and team-level needs (i.e., by mixed-motive situations). This makes leading scientific teams particularly challenging: Balancing competing individual-level goals and common team-level goals requires a specific type of leadership that simultaneously considers both satisfying individual-level needs as well as team-level needs. The current study addresses this issue by combining the dual-focused model of transformational leadership with person–environment fit theory. Specifically, we investigated needs–supplies fit, person–supervisor fit, and team fit as mediators of the relationship between transformational leadership and scientific team members' job satisfaction and work-related strain. In doing so, we provide a new perspective on leadership in scientific teams by explicitly differentiating individual-level and team-level effects of transformational leadership. We tested our hypotheses using a three-wave design with a sample of 134 members of 42 scientific teams. The relationships between individual-focused transformational leadership, job satisfaction, and work-related strain were mediated by needs–supplies fit and person–supervisor fit. Team-focused transformational leadership was positively related to job satisfaction and negatively related to work-related strain. Our findings contribute to further clarifying the mechanisms underlying the relationship between transformational leadership and members' well-being in scientific teams.

Keywords: team science; dual-focused transformational leadership; person–job fit; person–supervisor fit; team fit

Introduction

Over the last decades, teams have become the building blocks of most organizations and nowadays constitute main drivers of organizational effectiveness (Hollenbeck et al., 2012; Kozlowski & Ilgen, 2006; Mathieu et al., 2017). This development is even more pronounced in science where team-based work structures have become prevalent across all scientific disciplines (Cooke & Hilton, 2015; Vabø et al., 2016). Although scientific teams have many similarities with other types of teams such as project teams (e.g., Sundstrom, McIntyre, Halfhill, & Richards, 2000), they have also several characteristics that set them apart from other team settings. For example, contingent employment (e.g., part-time temporary contracts), conflicting role requirements (e.g., research, teaching, and service activities), distinct mixed-motive situations (i.e., competing individual-level and team-level goals and needs), and limited promotion prospects are main characteristics of the scientific work context (Feldman & Turnley, 2004; Goastellec et al., 2013; van der Weijden et al., 2016). Taken together, these factors make scientific teams a unique and particularly challenging team setting. As a consequence of these challenging work characteristics, high levels of work-related stress and anxiety as well as low levels of employee well-being are major problems in science (Levecque et al., 2017; Reevy & Deason, 2014).

In view of these issues, research has started to investigate factors that have a positive impact on well-being in scientific teams. Initial studies have identified leadership as a central factor (Braun et al., 2013; Bryman, 2007). For instance, a recent study by Braun et al. (2013) found that transformational leadership was positively related to individual followers' job satisfaction. Building on this research, the current study seeks to clarify the mechanisms through which transformational leadership relates to team members' well-being in the context of scientific teams. As mentioned earlier, scientific teams are characterized by competing goals and needs (i.e., by a mixed-motive situation): Although members of a scientific team share common team-level goals – e.g., publishing their research in a prestigious journal – they also have competing individual goals – e.g., everyone wants to be the first author. This makes leading scientific teams particularly challenging: Balancing competing individual-level goals and common team-level goals requires a specific type of leadership that simultaneously considers both satisfying individual-level needs as well as team-level needs.

As a consequence, it is crucial to differentiate between leading individual team members and leading the team as a whole. The dual-focused model of transformational leadership exactly

addresses this issue (X.-H. Wang & Howell, 2010): This model differentiates between leadership behaviours directed towards individual employees – i.e., individual-focused transformational leadership – and leadership behaviours directed to a team as a whole – i.e., group-focused transformational leadership. Moreover, depending on the focus, the effects for transformational leadership are proposed to affect work-related outcomes through different mechanisms (X.-H. Wang & Howell, 2010). In the current study, we apply the dual-focused model of transformational leadership to the context of scientific teams. We thereby aim to clarify the mechanisms through which transformational leadership relates to team members' well-being at different level of analysis (i.e., individual vs. team). This is important because the needs of team members on the individual-level might be in stark contrast to the needs of team members on the team-level, and consequently, leadership behaviours that are beneficial for the team as a whole might not be as helpful for the individuals in the team and vice versa. For example, doing regular team-building activities (e.g., hiking trips) is likely beneficial for the team-level goal of having a pleasant team climate. However, these activities interfere with some PhD-students' individual-level goal of spending as much time as possible working on their thesis.

In order to clarify how transformational leadership affects team members' well-being, we combine the dual-focused model of transformational leadership (X.-H. Wang & Howell, 2010) with person–environment fit theory (PE Fit; Kristof-Brown et al., 2005). Specifically, we propose that different aspects of fit (i.e., person–job fit, person–supervisor fit, team fit) mediate the relationship between transformational leadership and indicators of well-being (i.e., job satisfaction, work-related strain). By leading their teams in a transformational way, team leaders can enhance the perceived fit between their team members and the characteristics of the workplace: A high degree of team fit is likely to result in team members working together more smoothly (e.g., having fewer interpersonal conflicts). This is in line with recent studies showing that the effect of transformational leadership on individual work outcomes can be explained via need satisfaction processes (Kovjanic, Schuh, & Jonas, 2013; Kovjanic, Schuh, Jonas, van Quaquebeke, & van Dick, 2012).

We envision three contributions of the current study. First, by integrating the dual-focused model of transformational leadership (X.-H. Wang & Howell, 2010) and person–environment fit theory (Kristof-Brown et al., 2005), the current study contributes to a better understanding of the positive effects of transformational leadership on work-related outcomes in scientific teams. Second, we provide a more nuanced perspective on transformational

leadership by explicitly investigating individual-level and team-level effects of transformational leadership simultaneously. Specifically, by examining the role of different fit indicators as mediators of leadership effects on job satisfaction and work-related strain, we increase our knowledge of the psychological processes that explain the relationship between transformational leadership and work-related outcomes in the team context at different levels (i.e., individual- vs. team-level). As competing goals and needs can also be found in many other team settings (Levi, 2017), this constitutes an important contribution not only to research on scientific teams but also to team research in general. Third, as a potential practical contribution, our findings can be used by leaders of scientific teams and human resource managers in higher education institutions to improve scientists' well-being.

Theory and hypotheses

Teams in science

Due to significant advancements in scientific knowledge and methodology in the last decades, conducting research has become more complex and challenging (Cooke & Hilton, 2015). To cope with these challenges, scientists have turned increasingly to collaborative research, and, as a result, there has been a continuous shift from individual-based to team-based work structures in science (Vabø et al., 2016). Scientific teams are nowadays most common in medicine and the natural sciences, but even in the social sciences, which were traditionally characterized by research conducted by individuals, team-based work structures have become the norm (Brew, Boud, Namgung, Lucas, & Crawford, 2016; Wuchty et al., 2007).

Scientific teams usually have a formal team leader (e.g., professor, principal investigator) who directs the strategic alignment of the team's performance and supports the team's plans and projects through provision of relevant resources. Thus, not surprisingly, leadership has been recognized as a central determinant of work outcomes in scientific teams (Braun et al., 2013; Braun et al., 2016; Bryman, 2007; Peus et al., 2016). However, to create and maintain a high-quality research environment, leaders of scientific teams need to consider the specific characteristics of scientific teams if they wish to improve group dynamics (Braun et al., 2016; Peus et al., 2016; Vabø et al., 2016).

Importantly, scientific teams are characterized by specific individual-level needs and team-level needs. Such team settings, in which team members' individual interests are at odds with the interest of the team as a whole, have been described as mixed-motive situations (Larson, 2010; McGrath, 1984). As an example for conflicting individual- versus team-level

needs, team members need to *work collaboratively* to produce innovative high-quality research. At the same time, individual team members, particular junior researcher, need to advance their scientific career by demonstrating their potential for *independent work*, which usually means first authorships or even single authorship (e.g., see eligibility criteria for an ERC starting grant, European Commission, 2017, p. 21). Another example relates to the conflicting role requirements in scientific teams mentioned above (Feldman & Turnley, 2004; Goastellec et al., 2013; van der Weijden et al., 2016): Besides research, members of scientific teams in higher education institutions usually have teaching obligations and service activities. Because these tasks interfere with the primary goal of research, team members naturally try to minimize their workload in these areas. This, however, interferes with the team goal of providing high-quality teaching and service.

These examples indicate that needs at the different levels (i.e., individual vs. team) can be in stark contrast, and thus, balancing these needs is a main challenge for leaders of scientific teams. In line with this notion, Lowman (2010) argued that "leadership in the corporate arena, however complex that might be, is substantially less complex than leading in academia" (p. 241). Importantly, we do not argue that mixed-motive situations do not occur in other team settings; quite the contrary, we think they can be found in all types of teams. However, for the reasons stated above, we do think that mixed-motive situations are more prevalent in scientific teams, which makes them a suitable setting for investigating these situations.

Scientific teams as a challenging work environment

Besides mixed-motive situations, work characteristics in science are challenging due to contingent employment, budget cuts, and increased competition for research resources (Feldman & Turnley, 2004; Goastellec et al., 2013; Levecque et al., 2017; Reevy & Deason, 2014; van der Weijden et al., 2016). In particular, contingency employment is one of the biggest stressors for scientists, resulting in high job insecurity, anxiety, and enormous pressure to succeed in academia (Reevy & Deason, 2014). If scientists fail in their endeavour to reach a certain position in their career (i.e., tenured professorship), they are forced to start a career outside of academia.

As a result of these challenges, occupational stress among scientific team members is remarkably high (Bozeman & Gaughan, 2011; Levecque et al., 2017; Reevy & Deason, 2014). For example, due to the stressful experiences, the dropout rates for junior researchers range from 30 to 50 percent (Stubb, Pyhältö, & Lonka, 2012). In addition to the high dropout rates,

the challenging working environment in science has been linked to stress symptoms: The prevalence for having or developing health issues such as having troubles sleeping and concentration problems was twice as high in PhD students as compared to highly educated employees from other work contexts (Levecque et al., 2017). Similarly, studies on the prevalence for mental health issues reported 32% in a study of senior lecturers (McClenahan, Giles, & Mallett, 2007) and 42% in a study of academic employees (Kinman & Jones, 2008). To reduce the prevalence of these negative work outcomes in science, calls have been made to focus on "soft outcomes" such as job satisfaction and work-related strain (Levecque et al., 2017). Accordingly, the current study investigates the effects of transformational leadership on these two indicators of employees' well-being. This is in line with current models of occupational stress (Bakker & Demerouti, 2007), which conceptualize job satisfaction and work-related strain as main outcomes of the stress process.

Dual-focused model of transformational leadership

We consider transformational leadership a potentially remedy for the challenges of the scientific work context. This is in line with Braun et al. (2016) who recently suggested that "transformational leadership appears to be a fruitful approach to research leadership." (p. 357). Specifically, we argue for investigating transformational leadership at different levels. X.-H. Wang and Howell (2010) proposed a multilevel model of transformational leadership that differentiates transformational leadership a) as leadership behaviours directed towards *individual employees* and, b) as leadership behaviours directed towards a *group as a whole*. On the one hand, individual-focused transformational leadership refers to leadership behaviours that aim to motivate employees through high expectations, to foster employees' development, to stimulate employees intellectually, and to acknowledge employees' efforts (X.-H. Wang & Howell, 2010). On the other hand, group-focused transformational leadership refers to leadership behaviours that aim to communicate a group vision, to emphasize group identity, and to promote team-building (X.-H. Wang & Howell, 2010).

Individual-focused transformational leadership has been related to identification with the leader, individual performance (X.-H. Wang & Howell, 2012), and individual skill development (Dong et al., 2017); group-focused transformational leadership has been related to identification with the group, group performance (X.-H. Wang & Howell, 2012), team knowledge sharing, and team creativity (Dong et al., 2017). Moreover, recent research suggests positive effects of transformational leadership on indicators of employee well-being. For example, Nielsen and Daniels (2012) investigated 56 work groups from the financial and health

care sector and found that shared (group-level) and differentiated (individual-level) transformational leadership are positively related to job satisfaction. In addition, Diebig, Bormann, and Rowold (2016) found that transformational leadership on the individual-level is negatively related to employees' daily levels of stress.

As of today, however, little is known about the differential effects of individual-focused versus group-focused transformational leadership in scientific teams. According to X.-H. Wang and Howell (2010), leaders of teams need to show different leadership behaviours when interacting with the whole team (e.g., developing shared values) than when interacting with individual team members (e.g., offering specific training opportunities). As a consequence, different leadership behaviours affect work-related outcomes through different mechanisms, depending on the level in question: Leaders of teams need to satisfy individual-level needs (e.g., career opportunities), and they need to meet team-level needs (e.g., consensus regarding team goals; Morgeson, DeRue, & Karam, 2009; X.-H. Wang, & Howell, 2010). As mentioned earlier, mixed-motive situations represent a major obstacle for effective leadership in scientific teams: Balancing scientific team members' individual goals and scientific teams' common goals requires a type of leadership behaviours, which focus on satisfying individual-level needs while simultaneously addressing team-level needs. In the following, we will describe how individual-focused and group-focused transformational leadership might differently affect team members' well-being.

Effects of individual-focused transformational leadership

X.-H. Wang and Howell (2010) describe four dimensions of individual-focused transformational leadership behaviour: Communicating high expectations, follower development, intellectual stimulation, and personal recognition. Specifically, leaders showing individual-focused transformational leadership behaviours encourage their employees to set high goals for themselves, suggest training opportunities for improving their work-related abilities, challenge them to think about old problems in new ways, and acknowledge them for improving the quality of their work.

Meta-analytic evidence suggests positive correlations between transformational leadership and employee job satisfaction (Judge & Piccolo, 2004). Similarly, Braun et al. (2013) found transformational leadership to be positively related to job satisfaction of members of scientific teams. In the current study, we aim to replicate and extend Braun et al.'s (2013) main findings. We argue that by engaging in individual-focused transformation leadership

behaviours, leaders contribute to enhanced team members' well-being. Specifically, by showing confidence in their team members' abilities to meet performance expectations (e.g., publish in a high-quality journal), by providing their team members with developmental experiences (e.g., financial resources for conferences), by encouraging creative thinking and innovative approaches (e.g., new analytical methods), and by giving constructive feedback and acknowledging their individual needs (e.g., acknowledging improvements in manuscript writing), team leaders' individual-focused transformational leadership behaviours will be associated with higher job satisfaction and lower work-related strain. Accordingly, we hypothesize:

> **Hypothesis 1.** Team leaders' individual-focused transformational leadership is positively related to individual team members' job satisfaction and negatively related to individual team members' work-related strain.

Effects of group-focused transformational leadership

Besides individual-level effects, we explicitly consider group-level effects of transformational leadership. X.-H. Wang and Howell (2010) suggest three group-focused transformational leadership dimensions: Emphasizing group identity, communicating a group vision, and team-building. Specifically, leaders showing group-focused transformational leadership behaviours encourage team members to place the interests of the team ahead of their own interests, communicate a clear direction of where the team is going, and resolve frictions among team members in the interest of teamwork.

In the context of research and development teams, which are similar to scientific teams, group-focused transformational leadership has been positively related to group performance (X.-H. Wang & Howell, 2010), collective efficacy (X.-H. Wang & Howell, 2012), team performance (Chun et al., 2016), team creativity (Dong et al., 2017), and team innovation (Jiang et al., 2015; Li et al., 2016). We propose that group-focused transformational leadership is similarly positively related to team members' well-being, because group-focused transformational leadership promotes positive experiences with team-based work structures. From a social-psychological perspective, certain dynamics in teams can have an effect on individual team members' perceived work attitudes and behaviours, as people at work are embedded in a social context (Salancik & Pfeffer, 1978). Transformational leaders promote positive teamwork experiences within scientific teams and thus higher well-being. Specifically, by encouraging team members to take pride in their team (e.g., emphasizing the high

compatibility between team members), by talking enthusiastically about what the team needs to accomplish (e.g., highlighting the importance of collaboration for publishing in high-quality journals), and by developing a team attitude and team spirit among team members (e.g., resolving conflicts), team leaders contribute to higher job satisfaction and lower work-related strain. Accordingly, we hypothesize:

> **Hypothesis 2.** Team perceptions of leaders' group-focused transformational leadership are positively related to individual team members' job satisfaction and negatively related to individual team members' work-related strain.

Person–job fit, person–supervisor fit, and team fit as mediators

Turning to the central contribution of our study, we aim to clarify the psychological processes through which individual- and group-focused transformational leadership affect work outcomes in scientific teams. In doing so, we draw on person–environment fit theory, which constitutes a central stress theory in work and organizational psychology (Kristof-Brown et al., 2005). Person–environment fit is defined as compatibility between the characteristics of an individual and his/her (work) environment. The basic assumption of the person–environment fit theory is that the degree of congruence between person and environment is an important predictor of work outcomes (Kristof-Brown et al., 2005). A high degree of person–environment fit is perceived as a resource that leads to positive outcomes, whereas a low degree of person–environment fit is perceived as a stressor that has a negative effect on (work) attitudes and behaviours (Edwards, 1996). Kristof-Brown et al. (2005) have confirmed these assumptions in their meta-analysis: For example, higher perceived person–group fit is related to higher job satisfaction, organizational commitment, and group cohesion.

Person–environment fit includes different aspects (Kristof-Brown et al., 2005). In the current study, we focus on three of them: Person–supervisor fit, needs–supplies fit, and team fit[1]. Person–supervisor fit is defined as attitudinal compatibility between supervisors and their subordinates. Needs–supplies fit is defined as correspondence between employee needs (e.g., for autonomy at work) and what the job supplies (e.g., giving employees a high level of discretion over performing their work; Kristof-Brown et al., 2005). Team fit is defined as compatibility between co-workers in terms of having similar values and attitudes.

We propose that person–environment fit theory as a central stress theory pertains to explaining work outcomes in scientific teams, because the scientific work environment is characterized by work-related stressors such as high workload and pressure to publish (Hardré

et al., 2011; Levecque et al., 2017; Reevy & Deason, 2014; White et al., 2012). In this highly competitive and demanding environment, a high person–environment fit represents a potentially important resource that increases motivation and well-being. For example, team members requiring a lot of autonomy and recognition for their work will more likely thrive in a work environment that offers them a high level of discretion to perform their work and expresses appreciation for their contributions. By contrast, a low person–environment fit can be perceived as an additional stressor that could lead to a deterioration of motivation. For example, team members who need well-organized teamwork structures are less likely to thrive in a work environment that does not provide guidance and structure for teamwork.

Team leaders' transformational behaviours have been positively related to person–supervisor fit, such as when team leaders behave in a manner that team members can identify with (Hoffman, Bynum, Piccolo, & Sutton, 2011). Transformational leadership is associated with high satisfaction with the leader and high perceived leader effectiveness (Judge & Piccolo, 2004). Team members thus see transformational leadership behaviours as desirable. This may be a result of team members identifying with the attributes and behaviours of team leaders leading in a transformational way (Haslam, Reicher, & Platow, 2011; X.-H. Wang & Howell, 2012; Zacher & Johnson, 2014). Hoffman et al. (2011) explain the effects of transformational leadership on person–supervisor fit and group effectiveness through a "sense-making" process (e.g., leaders engender in their followers a strong sense of pride). We argue that individual-focused transformational leadership behaviours affect team member's well-being through a need-satisfaction process (see Kovjanic et al., 2012; Kovjanic et al., 2013). Team members desiring for "good" leadership perceive team leaders with similar attitudes and behaviours to be more effective and supportive, resulting in high levels of person–supervisor fit. This, in turn, leads to person–environment fit being perceived as a resource, which leads to enhanced team members' well-being. Therefore, we propose that individual-focused transformational leadership enhances team members' well-being by increasing the perceived attitudinal compatibility between team members and team leaders. Accordingly, we hypothesize:

> **Hypothesis 3.** Person–supervisor fit mediates a) the positive relationship between team leaders' individual-focused transformational leadership and individual team members' job satisfaction, and b) the negative relationship between team leaders' individual-focused transformational leadership and individual team members' work-related strain.

Similarly, leadership behaviours can be positively related to team members' perception of needs–supplies fit. Team members having certain expectations concerning their employment

may perceive team leaders who acknowledge these needs by fostering follower development, offering intellectual stimulation, and personal recognition as more supportive. For example, a team leader showing individual-focused transformational leadership behaviour by acknowledging improvement in the quality of a team member's work is likely to enhance the well-being of the team member, because the team leader is recognizing the team member's need for competence (Kovjanic et al., 2012; Kovjanic et al., 2013). This high match between team member needs and what the job supplies may be perceived as a resource, resulting in higher levels of well-being (Bui, Zeng, & Higgs, 2017; Tepper et al., 2018). Therefore, we propose that individual-focused transformational leadership enhances team members' well-being by increasing the perceived fit between team members' needs and what the job supplies. Accordingly, we hypothesize:

> **Hypothesis 4.** Needs–supplies fit mediates a) the positive relationship between team leaders' individual-focused transformational leadership and individual team members' job satisfaction, and b) the negative relationship between team leaders' individual-focused transformational leadership and individual team members' work-related strain.

Moreover, team fit can be affected by team-oriented leadership behaviours. For example, team leaders showing group-focused transformational leadership behaviours by emphasizing group identity and fostering team-building activities may enhance the well-being of their team members, because they recognize their members' need for efficient and well-coordinated teamwork and the importance of management strategies to enhance effective teamwork (Cha et al., 2015). Thus, group-focused transformational leadership may enhance team members' well-being by promoting positive experiences with team-based work structures. By emphasizing group identity, by communicating a group vision, and by promoting team-building activities, team leaders may enhance the perceived compatibility between co-workers and thus effective teamwork. As a result, team members will experience higher levels of job satisfaction and lower levels of work-related strain, because high levels of team fit will be perceived as a resource and increase motivation and persistence (Cooman, Vantilborgh, Bal, & Lub, 2015; Kristof-Brown et al., 2014; Pierro, Sheveland, Livi, & Kruglanski, 2015). Kristof-Brown et al. (2014) found that team-level person–group fit (i.e., collective fit perceptions) was a significant predictor of group cohesion, team efficacy, team performance, and individual performance in a sample of research and development teams. Similarly, we propose that group-focused transformational leadership is positively associated with team members' well-being by

increasing the perceived compatibility between team members. Accordingly, we hypothesize the following:

> **Hypothesis 5.** Team fit mediates a) the positive relationship between team perceptions of team leaders' group-focused transformational leadership and individual team members' job satisfaction, and b) and the negative relationship between team perceptions of team leaders' group-focused transformational leadership and individual team members' work-related strain.

To summarize, we propose a multilevel model of transformational leadership in scientific teams (Figure 1). In this regard, we followed the propositions of Klein and Kozlowski (2000) on multilevel research. Specifically, we argue that our constructs of interest at the team-level, namely group-focused transformational leadership and team fit, represent shared team properties. In this regard, our model represents a referent-shift consensus model (Chan, 1998). By integrating the dual-focused model of transformational leadership (X.-H. Wang & Howell, 2010) and person–environment fit theory (Kristof-Brown et al., 2005), this model aims to clarify the role of person–supervisor fit, needs–supplies fit, and team fit as mediators of the relationship between team leaders' transformational leadership and scientific team members' job satisfaction and work-related strain. We propose that person–environment fit variables help explaining the relationships between transformational leadership and team members' well-being.

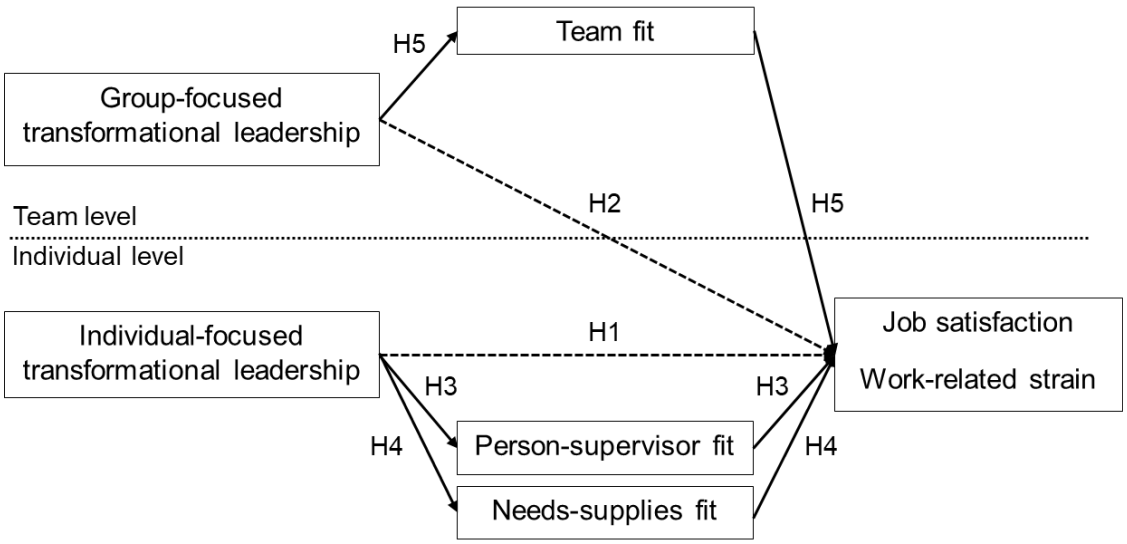

Figure 1. Multilevel model of transformational leadership, person–supervisor fit, needs–supplies fit, team fit, job satisfaction, and work-related strain. H = hypothesis. Dashed lines indicate direct relations.

Method

Participants and procedure

Data for this study stem from 42 teams at two large research universities and comprise ratings by 134 team members. Team members were part of the scientific staff (e.g., junior and senior researchers). Similar to other studies, we considered team members working under the supervision of the same leader as a team. Team leaders were mainly professors leading research laboratories or other teams (e.g., chair teams) at the universities. The average number of members per team was 3.2 (*SD* = 1.5), ranging from 2 to 9 members. Members were already working in their teams for 28.2 months (*SD* = 13.4) on average. Team members were on average 31 years old (*SD* = 6.2), and 43% of the members were female. The majority of team members were junior researchers/PhD students (65%), the remaining were senior researchers/postdocs (25%), and research associates (10%). Teams worked in the natural sciences (32%), social sciences (29%), engineering sciences (20%), economic sciences (14%), and medicine (5%).

Data collection took place at three measurement time points (T1, T2, T3), each of them separated by approximately six weeks (i.e., three-wave methodological design; see McCarthy, Trougakos, & Cheng, 2016) in 2015 and 2016. The independent variables were assessed at T1, the mediator variables at T2, and the dependent variables at T3. Team members filled out online surveys or, if they requested it, paper-and-pencil surveys. Team leaders received an e-mail invitation accompanied by a cover letter explaining the purpose of the study and assuring anonymity and voluntary participation. Team leaders were asked to forward the request for participation in the study to their scientific staff. Of over 100 teams invited to take part in the study, 42 teams responded to the invitation and participated in the study. At T1, team members rated their team leader's individual-focused and group-focused transformational leadership behaviours. At T2, team members rated their perceptions of needs–supplies fit, person–supervisor fit, and team fit. At T3, team members rated their perceptions of job satisfaction and work-related strain.

Measures

Survey items were drawn from existing literature on work and organizational psychology to ensure construct validity. The study was conducted in English and German. As some of the questionnaires were available in English only, items had to be translated into German using a back-translation procedure that involved two bilinguals. To account for other potential influences on individual followers' job satisfaction and well-being, we controlled for age and

gender, which have been found to influence employees' well-being (Bernerth & Aguinis, 2016).[2]

Individual-focused and group-focused transformational leadership

Individual-focused and group-focused transformational leadership were measured with the Dual-Level Transformational Leadership Scale (X.-H. Wang & Howell, 2010). Team members rated their team leaders' individual-focused (18 items) and group-focused (16 items) transformational leadership on a 5-point scale, with responses ranging from 1 (*not at all*) to 5 (*frequently, if not always*). A sample item for individual-focused transformational leadership is "My direct supervisor encourages me to set high goals for myself". The scale had excellent reliability (Cronbach's α = .93). A sample item for group-focused transformational leadership is "My direct supervisor encourages team members to take pride in our team" (Cronbach's α = .95).

Person–supervisor fit

Person–supervisor fit was measured with a scale developed by van Vianen, Shen, and Chuang (2011). Team members rated their person–supervisor fit (5 items) on a 5-point scale, with responses ranging from 1 (*no match*) to 5 (*total match*). A sample item for person–supervisor fit is "How would you describe the match between the things you value in life and the things your supervisor values?" (Cronbach's α = .82).

Needs–supplies fit

Needs–supplies fit was measured using a scale developed by Saks and Ashforth (1997). Team members rated their needs–supplies fit (4 items) on a 5-point scale, with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item for needs–supplies fit is "I feel that this job enables me to do the kind of work I want to do" (Cronbach's α = .94).

Team fit

Team fit was measured with a scale developed by Kristof-Brown et al. (2014) to explicitly measure fit perceptions at the team-level. Team members rated their team fit (6 items) on a 5-point scale, with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item for team fit is "The things that our team members value in life are very similar to each other" (Cronbach's α = .80).

Job satisfaction

Job satisfaction was measured with the Michigan Organizational Assessment Questionnaire Job Satisfaction Subscale (MOAQ-JSS; Bowling & Hammond, 2008). Team members rated their job satisfaction (3 items) on a 5-point scale, with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item for job satisfaction is "All in all I am satisfied with my job" (Cronbach's $\alpha = .85$).

Work-related strain

Work-related strain was measured with the Work-Related Strain Inventory (WRSI; Revicki et al., 1991). Team members rated their work-related strain (18 items) on a 5-point scale, with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item for work-related strain is "My preoccupation with work makes it hard to disengage from the job at home" (Cronbach's $\alpha = .83$).

Data augmentation, analytic strategy, and levels of analysis

Because we proposed relationships between leadership behaviours, different aspects of fit, and outcomes at the individual- (level 1) and the team-level (level 2; see Figure 1), we chose a mixed-models approach as an analytic strategy. We tested the main hypotheses (H1 and H2) by applying multilevel modelling with the lme4 package (Bates, Mächler, Bolker, & Walker, 2015) in the statistical software R (R Core Team, 2016). We specified random intercept models and compared them to random intercept and slope models with chi-square tests. For all the main hypotheses, the random intercept models had the best fit. Because the residuals for job satisfaction as a dependent variable were not normally distributed, which is a requirement for analysing linear mixed-effects models, we analysed the hypotheses by applying generalized mixed models (a Poisson distribution proved to be the best fit; see Meyer, Schermuly, & Kauffeld, 2016, for a similar procedure). We tested the mediation hypotheses (H3, H4, and H5) with the "mediation"-package in R (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014).

To test whether the mixed methods approach and the aggregation of variables to the team-level were appropriate for further analysis, we calculated $r_{WG(J)}$ as a measure of agreement within teams, interclass correlations (ICC1), reliability of team means (ICC2), and F-tests indicating whether average scores differed significantly across teams (Bliese, 2000; LeBreton & Senter, 2007). Although the ICC1 values for needs–supplies fit (.07), person–supervisor fit (.10), job satisfaction (.02), and work-related strain (.02) were relatively low and not significant, we proceeded with the mixed models approach, because we had made the theoretical

assumption of a multilevel framework (i.e., team members are nested in teams). For group-focused transformational leadership, $r_{WG(J)}$ was .89, ICC1 was .26, and ICC2 was .53, $F(41,92) = 2.11$, $p < .01$. For team fit, $r_{WG(J)}$ was .92, ICC1 was .14, and ICC2 was .34, $F(41,92) = 1.57$, $p < .05$.

Notably, the ICC2 values were somewhat lower than expected. This could be explained by the fact that on average, only three members per team participated in this study (Bliese, 2000). If more members per team had participated in the study, teams might have been more easily distinguishable by their average level of group-focused transformational leadership and team fit. Another explanation for the low ICC2 values could be due to some kind of differentiated leadership processes (Kunze, de Jong, & Bruch, 2016; A.-C. Wang, Hsieh, Tsai, & Cheng, 2012; Wu, Tsui, & Kinicki, 2010): It may be that members of the same team differed regarding their perception of group-focused transformational leadership and team fit, even though we explicitly measured perceptions of group-focused transformational leadership and team fit at the team-level following Chan's (1998) referent-shift consensus model. Given the high $r_{WG(J)}$ values, we concluded that agreement in the perception of group-focused transformational leadership and team fit was satisfactory. Overall, our results support the aggregation of the individual-level measures of group-focused transformational leadership and team fit for further analyses. However, we included the standard deviation of the group-level means of group-focused transformational leadership and team fit as control variables (see Meyer & Schermuly, 2012).[3]

Scale evaluation

We used confirmatory factor analysis (CFA) to establish discriminant validity of the seven self-report scales (i.e., individual-focused transformational leadership, group-focused transformational leadership, person–supervisor fit, needs–supplies fit, team fit, job satisfaction, and work-related strain). For this purpose, we employed the lavaan package (Rosseel, 2012) of the R software (R Core Team, 2016) and used MLM estimation – a maximum likelihood estimation with robust standard errors and a Satorra-Bentler scaled tests statistic: The CFA revealed that a seven-factor model, in which items associated with each construct loaded onto distinct factors, had tolerable fit, ($\chi^2 = 3907.57$, $df = 2256$; RMSEA = .08, SRMR = .09; CFI = .67). In this model, all item loadings from the items to their latent factors were significant at $p < .05$. Given that some of the goodness-fit indices of the seven-factor model were suboptimal, we chose to further investigate discriminant validity by comparing this model to different alternative models. For each comparison, the seven-factor model provided superior fit (see

Table 1). These results offer additional evidence of discriminant validity between the latent constructs.

Notably, the CFI values in all models were below acceptable fit. To address this issue, we performed another set of CFAs using the item parcelling approach, as our dataset did not provide ideal conditions (i.e., relatively small sample size in combination with a large number of parameters to be estimated) for assessing CFA (Little, Rhemtulla, Gibson, & Am Schoemann, 2013; Marsh, Hau, & Wen, 2004)[4]. In total, we created 12 parcels for the constructs used in this study to increase the power of latent variable models (Little et al., 2013): four parcels for individual-focused transformational leadership (18 items), three parcels for group-focused transformational leadership (16 items), 2 parcels for team fit (6 items), and 3 parcels for work-related strain (18 items). Item parcelling was based on theoretical considerations as well as on item content. For example, according to X.-H. Wang and Howell (2010) individual-focused transformational leadership is composed of four dimensions while group-focused transformational leadership is composed of three dimensions. Consequently, we created four parcels for individual-based transformational leadership and three parcels for group-focused transformational leadership based on this theoretical rationale.

We compared our seven-factor model to different alternative models (see Table 2). Similar to the previous analysis, for each comparison, the seven-factor model provided superior fit. Importantly, as opposed to the unparcelled solution, this model had an acceptable fit, in particular CFI values were much improved ($\chi^2 = 304.64$, $df = 231$; RMSEA = .05, SRMR = .06; CFI = .96). In sum, we concluded that the hypothesized seven-factor model fitted the data best.

Table 1. Comparison of measurement models for study variables

Model description	X^2	*df*	ΔX^2	RMSEA [90% CI]	SRMR	CFI
Seven-factor model	3907.57	2256	-	.079 [.074, .083]	.086	.668
Six-factor model**:** ITFL and GTFL as one factor	4071.41	2262	236.76***	.082 [.078, .086]	.087	.636
Six-factor model: JS and Strain as one factor	3962.83	2262	28.93***	.080 [.076, .084]	.088	.657
Five-factor model: PJ NS Fit, PS Fit and T Fit as one factor	4248.86	2267	128.69***	.086 [.082, .090]	.119	.598
Four-factor model: ITFL and GTFL as one factor, PJ NS Fit and PS Fit as one factor, T Fit as one factor, JS and Strain as one factor	4336.44	2271	336.6***	.088 [.084, .092]	.112	.584
Three-factor model: ITFL and GTFL as one factor, PJ NS Fit, PS Fit and T Fit as one factor, JS and Strain as one factor	4465.66	2274	250.19***	.091 [.087, .095]	.120	.554
Two-factor model: ITFL, GTFL, PJ NS Fit, PS Fit and T Fit as one factor, JS and Strain as one factor	4688.72	2276	400.34***	.095 [.091, .099]	.101	.510
One-factor model	5027.92	2277	502.70***	.102 [.098, .105]	.107	.440

Note. ITFL = individual-focused transformational leadership; GTFL = group-focused transformational leadership; JS = job satisfaction; Strain = work-related strain; PJ NS Fit = person–job needs–supplies fit; PS Fit = person–supervisor fit; T Fit = team fit; ΔX^2 = Satorra-Bentler scaled differences; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index. $N = 134$;

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2. Comparison of measurement models for study variables using item parceling

Model description	X^2	*df*	ΔX^2	RMSEA [90% CI]	SRMR	CFI
Seven-factor model	304.64	231	-	.052 [.035, .067]	.059	.955
Six-factor model**:** ITFL and GTFL as one factor	317.49	237	13.39*	.054 [.037, .069]	.059	.951
Six-factor model**:** JS and Strain as one factor	318.23	237	13.01*	.054 [.037, .069]	.063	.950
Five-factor model**:** PJ NS Fit, PS Fit and T Fit as one factor	533.12	242	143.75***	.103 [.091, .115]	.145	.815
Four-factor model: ITFL and GTFL as one factor, PJ NS Fit and PS Fit as one factor, T Fit as one factor, JS and Strain as one factor	527.96	246	184.03***	.100 [.088, .111]	.137	.824
Three-factor model**:** ITFL and GTFL as one factor, PJ NS Fit, PS Fit and T Fit as one factor, JS and Strain as one factor	555.00	249	180.92***	.104 [.093, .116]	.145	.805
Two-factor model**:** ITFL, GTFL, PJ NS Fit, PS Fit and T Fit as one factor, JS and Strain as one factor	751.02	251	300.19***	.134 [.123, .145]	.124	.677
One-factor model	906.28	252	373.19***	.154 [.143, .164]	.124	.571

Note. ITFL = individual-focused transformational leadership; GTFL = group-focused transformational leadership; JS = job satisfaction; Strain = work-related strain; PJ NS Fit = person–job needs–supplies fit; PS Fit = person–supervisor fit; T Fit = team fit; ΔX^2 = Satorra-Bentler scaled differences; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index. $N = 134$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

To account for potential common method variance (CMV), we applied different procedural remedies before data collection and statistical remedies after data collection (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As suggested by Podsakoff et al. (2003), we separated the measurement of independent and dependent variables temporally by assessing the independent variables at T1, the mediator variables at T2, and the dependent variables at T3.

In addition, we performed partial correlation procedures to test for CMV by partialling out a marker variable in line with the methods used by Lindell and Whitney (2001) and Podsakoff et al. (2003) by using the Smart PLS software (Ringle, Wende, & Becker, 2015). As a marker, we chose *post hoc* the variable "telework", because it is theoretically unrelated to our independent and dependent variables. Team members rated their amount of telework (1 item, "How much time do you currently spend teleworking from home on average in a week?") on a 6-point scale, with responses ranging from 1 (*I never telework from home, 0%*) to 6 (*at least four to five working days in a week, 80-100%*). Following Lindell and Whitney (2001), we partialled out the marker variable by adding it to the mediator and dependent variables and examined the correlation among latent variables through PLS-algorithm. The correlations among the latent variables and the marker variable were low (i.e., -.09 with needs–supplies fit, -.03 with person–supervisor fit, -.11 with team fit, .05 with job satisfaction, and .02 with work-related strain), indicating that CMV is not an issue.

Moreover, following Podsakoff et al. (2003), we first tested our hypothesized model and checked R^2-values of the mediator and dependent variables (i.e., .07 for needs–supplies fit, .10 for person–supervisor fit, .06 with team fit, .24 for job satisfaction, and .49 for work-related strain). We then partialled out the marker variable by adding it to the mediator and the dependent variables and again observed the R^2-values (i.e., .08 for needs–supplies fit, .10 for person–supervisor fit, .07 with team fit, .24 for job satisfaction, and .50 for work-related strain). The changes in R^2-values before and after adding the marker variable were small. Thus, we concluded that CMV was not an issue.

Results

Table 3 shows the means, standard deviations, and correlations of independent and dependent variables on the individual-level. Please note that the correlations between the fit variables (i.e., needs–supplies fit, person–supervisor fit, and team fit) were low, which provides further support that they represent three distinct constructs. Somewhat unexpectedly, on the team-level, the correlations between team fit, job satisfaction, and work-related strain were unexpectedly

low and not significant (.08 for job satisfaction and -.16 for work-related strain). When team fit was analysed on the individual-level, however, the correlations with job satisfaction and work-related strain were .34 and -.32, respectively, and significant. Overall, the correlations between the independent and the dependent variables were in most cases significant at the 1% level.

Table 3. Means, standard deviations, and correlations of study variables.

	M	*SD*	1	2	3	4	5	6
1. ITFL	3.46	.77						
2. GTFL	3.37	.79	.77**					
3. PS Fit	332	.66	.56**	.59**				
4. PJ NS Fit	4.12	.82	.34**	.32**	.34**			
5. T Fit	3.76	.53	.43**	.44**	.44**	.22*		
6. JS	4.23	.72	.38**	.42**	.40**	.66**	.34**	
7. Strain	2.32	.49	-.40**	-.46**	-.44**	-.39**	-.32**	-.64**

Note. ITFL = individual-focused transformational leadership; GTFL = group-focused transformational leadership; PJ NS Fit = person–job needs–supplies fit; PS Fit = person–supervisor fit; T Fit = team fit; JS = job satisfaction; Strain = work-related strain.
All variables are at the individual-level (i.e., level 1); $N = 134$.
* $p < .05$, ** $p < .01$ (two-tailed).

Hypothesis testing

Table 4 reports the results of the multilevel modelling analyses predicting job satisfaction and work-related strain. Hypothesis 1 predicted significant relationships between perceptions of team leaders' individual-focused transformational leadership and team members' job satisfaction and work-related strain. As expected, perceptions of team leaders' individual-focused transformational leadership were positively related to individual team members' job satisfaction ($\gamma = .07$, $SE = .02$, $z = 4.36$, $p < .01$) and negatively related to individual team members' work-related strain ($b = -.25$, $SE = .05$, $t(130) = -4.88$, $p < .01$). Thus, Hypothesis 1 was fully supported.

Hypothesis 2 predicted a significant cross-level relationship between team perceptions of team leaders' group-focused transformational leadership and team members' job satisfaction and work-related strain. As expected, team perceptions of team leaders' group-focused

transformational leadership were positively related to individual team members' job satisfaction ($\gamma = .06$, $SE = .02$, $z = 2.40$, $p < .05$) and negatively related to individual team members' work-related strain ($b = -.19$, $SE = .07$, $t(130) = -2.56$, $p < .05$). Thus, Hypothesis 2 was fully supported.

Hypothesis 3 predicted that person–supervisor fit mediates the relationships between individual perceptions of team leaders' individual-focused transformational leadership and team members' a) job satisfaction and b) work-related strain (i.e., a level-1 mediation effect). The significant relationships between individual-focused transformational leadership and job satisfaction and work-related strain at the individual-level (i.e., level 1) had already been established in testing Hypothesis 1 (i.e., step 1). Following the three-step mediation model approach (Baron & Kenny, 1986), we predicted the mediator person–supervisor fit from the mean-centred antecedent individual-focused transformational leadership (i.e., step 2). The relationship between individual-focused transformational leadership and person–supervisor fit was significant ($b = .39$, $SE = .06$, $t(130) = 6.19$, $p < .01$). To establish the mediation effect of person–supervisor fit, we regressed the outcomes job satisfaction and work-related strain from the mean-centred antecedent individual-focused transformational leadership, while introducing the mean-centred mediator person–supervisor fit (i.e., step 3).

With regard to Hypothesis 3a (i.e., job satisfaction as outcome), we found that the relationship between person–supervisor fit and job satisfaction was significantly positive ($\gamma = .01$, $SE = .00$, $z = 3.17$, $p < .01$), while the direct effect of individual-focused transformational leadership on job satisfaction became smaller ($\gamma = .05$, $SE = .02$, $z = 2.35$, $p < .05$), which suggests a partial mediation. To confirm this finding, and to explicitly test the mediation effect, we used the mediate-package. The significance of the mediation effect (i.e., the average causal mediation effect [ACME]) of person–supervisor fit was confirmed (ACME = 1.91, 95% CI [0.50, 4.00], $p < .01$).

With regard to Hypothesis 3b (i.e., work-related strain as outcome), the relationship between person–supervisor fit and work-related strain was significantly negative ($b = -.23$, $SE = .06$, $t(129) = -3.35$, $p < .01$), while the direct effect of individual-focused transformational leadership on work-related strain became smaller ($b = -.14$, $SE = .06$, $t(129) = -2.50$, $p < .01$), which suggests a partial mediation. Again, applying the mediate package, the significance of the mediation effect of person–supervisor fit was confirmed (ACME = -0.10, 95% CI [-0.16, -0.04], $p < .01$). Thus, in sum, we consider Hypothesis 3 as fully supported.

Hypothesis 4 predicted that needs–supplies fit mediates the relationships between individual perceptions of team leaders' individual-focused transformational leadership and team members' a) job satisfaction and b) work-related strain (i.e., a level-1 mediation effect). The significant relationships between individual-focused transformational leadership and job satisfaction and work-related strain at the individual-level had already been established in testing Hypothesis 1 (i.e., step 1). Following the three-step mediation model approach (Baron & Kenny, 1986), we predicted the mediator needs–supplies fit from the mean-centred antecedent individual-focused transformational leadership (i.e., step 2). The relationship between individual-focused transformational leadership and needs–supplies fit was significant ($b = .29$, $SE = .09$, $t(130) = 3.31$, $p < .01$). To establish the mediation effect of needs–supplies fit, we regressed the outcomes job satisfaction and work-related strain from the mean-centred antecedent individual-focused transformational leadership, while introducing the mean-centred mediator needs–supplies fit (i.e., step 3).

With regard to Hypothesis 4a (i.e., job satisfaction as outcome), we found that the relationship between needs–supplies fit and job satisfaction was significantly positive ($\gamma = .01$, $SE = .00$, $z = 7.25$, $p < .01$), while the direct effect of individual-focused transformational leadership on job satisfaction became smaller ($\gamma = .04$, $SE = .02$, $z = 2.05$, $p < .05$), which suggests a partial mediation. The significance of the mediation effect of needs–supplies fit was confirmed (ACME = 3.12, 95% CI [0.62, 6.10], $p < .01$).

With regard to Hypothesis 4b (i.e., work-related strain as outcome), the relationship between needs–supplies fit and work-related strain was significantly negative ($b = -.17$, $SE = .05$, $t(129) = -3.55$, $p < .01$), while the direct effect of individual-focused transformational leadership on work-related strain became smaller ($b = -.19$, $SE = .05$, $t(129) = -3.77$, $p < .01$), which suggests a partial mediation. Again, the significance of the mediation effect of needs–supplies fit was confirmed (ACME = -0.05, 95% CI [-0.10, -0.02], $p < .01$). Thus, in sum, we consider Hypothesis 4 as fully supported.

Hypothesis 5 predicted the cross-level relationship whereby team fit mediates the relationships between team perceptions of team leaders' group-focused transformational leadership and team members' a) job satisfaction and b) work-related strain (i.e., a level-2 to level-1 mediation effect). The significant relationships between group-focused transformational leadership at the team-level (level 2) and job satisfaction and work-related strain at individual-level had already been established in testing Hypothesis 2 (i.e., step 1). Following the three-step mediation model (Baron & Kenny, 1986) approach, we predicted the mediator team fit

from the mean-centred antecedent group-focused transformational leadership (i.e., step 2). The relationship between group-focused transformational leadership and team fit was significant ($b = .39$, $SE = .06$, $t(130) = 7.03$, $p < .01$). To establish the mediation effect of team fit, we regressed the outcomes job satisfaction and work-related strain from the mean-centred antecedent group-focused transformational leadership, while introducing the mean-centred mediator team fit (i.e., step 3).

With regard to Hypothesis 5a (i.e., job satisfaction as outcome), we found that the relationship between team fit and job satisfaction was not significant ($\gamma = .00$, $SE = .00$, $z = 0.19$, $p > .05$). Moreover, the direct effect of group-focused transformational leadership on job satisfaction did not become smaller ($\gamma = .06$, $SE = .03$, $z = 2.04$, $p < .05$) and the mediation effect of team fit was not significant (ACME = 0.23, 95% CI [-0.83, 2.08], $p > .05$).

With regard to Hypothesis 5b (i.e., work-related strain as outcome), the relationship between team fit and work-related strain was not significant ($b = -.06$, $SE = .14$, $t(129) = -0.41$, $p > .05$). Moreover, the direct effect of group-focused transformational leadership on work-related strain did not become smaller ($b = -.17$, $SE = .08$, $t(129) = -2.05$, $p < .05$) and the mediation effect of team fit was not significant (ACME = -0.02, 95% CI [-0.12, 0.08], $p > .05$). Thus, in sum, we consider Hypothesis 5 as not supported.

Supplementary analyses

We ran several additional analyses of cross-level indirect effects, which have not been proposed in our model, to check whether our model is sufficient[5]: Team fit did not significantly mediate the relationships between individual-focused transformational leadership and job satisfaction (ACME = -0.05, 95% CI [-0.66, 0.69], p > .05) and work-related strain (ACME = -0.00, 95% CI [-0.00, 0.00], p > .05). Likewise, needs–supplies fit did not mediate the relationships between group-focused transformational leadership and job satisfaction (ACME = 3.08, 95% CI [-0.39, 7.24], p > .05) and work-related strain (ACME = -0.05, 95% CI [-0.13, 0.00], p > .05). Interestingly, person–supervisor fit proved to be a significant mediator of the relationships between group-focused transformational leadership and job satisfaction (ACME = 2.74, 95% CI [0.75, 5.59], p < .05) and work-related strain (ACME = -0.11, 95% CI [-0.21, -0.05], p < .05). In view of these findings, it appears that person–supervisor fit is affected not only by individual-focused transformational leadership but also by group-focused transformational leadership.

Table 4. Results of multilevel analyses predicting job satisfaction and work-related strain.

	Job satisfaction		Work-related strain	
	γ	*SE*	*b*	*SE*
(Intercept)	3.68**	0.08	2.67**	0.22
Level 1				
ITFL	0.07**	0.02	-0.25**	0.05
PS-Fit	0.01**	0.00	-0.23**	0.06
PJ NS Fit	0.01**	0.00	-0.17**	0.05
Level 2				
GTFL	0.06*	0.02	-0.19*	0.07
T Fit	0.00	0.00	-0.06	0.14

Note. ITFL = individual-focused transformational leadership; PS-Fit = person–supervisor fit; PJ NS Fit = person–job needs–supplies fit; GTFL = group-focused transformational leadership; T Fit = team fit; *γ* = estimate for generalized linear mixed model; *b* = estimate for linear mixed model; *SE* = standard errors.

Level 1 = individual-level ($N = 134$); Level 2 = team-level ($N = 42$).

* $p < .05$, ** $p < .01$ (two-tailed).

Discussion

In sum, our findings highlight the importance of considering transformational leadership at different levels when investigating work outcomes of (scientific) team members. Perceptions of team leaders' individual-focused transformational leadership were positively related to individual team members' job satisfaction and negatively related to individual team members' work-related strain. Person–supervisor fit and needs–supplies fit mediated the relationships between individual-focused transformational leadership and job satisfaction and work-related strain. This means that higher levels of individual-focused transformational leadership, which includes promoting team members' development, stimulating team members intellectually, and considering the importance of personal recognition, were associated with higher levels of team members' well-being. The likely mechanism behind this relationship is that transformational leadership relates to the fulfilment of individual team members' needs, which is indicated by higher levels of person–supervisor fit and needs–supplies fit.

In addition, our findings indicate that perceptions of team leaders' group-focused transformational leadership are positively related to individual team members' job satisfaction and negatively related to individual team members' work-related strain. Contrary to our predictions, team fit did mediate neither of these relationships. This means that higher levels of group-focused transformational leadership, which includes emphasizing group identity, communicating a group vision, and promoting team-building, were associated with higher levels of team members' well-being. Unexpectedly, team fit was neither positively associated with job satisfaction nor negatively associated with work-related strain. We had proposed that team fit contributes to well-being by promoting positive experiences with working within a team (Cha et al., 2015). One explanation could be that team fit is considered less important than other team processes, such as effective communication.

Our supplementary analyses suggest that person–supervisor fit mediates the relationships between group-focused transformational leadership and job satisfaction and work-related strain. A possible explanation for this finding is that group-focused transformational leadership is positively associated with person–supervisor fit, because team members perceive not only individual-focused transformational leadership but also group-focused transformational leadership as an effective type of leadership. Scientific team members may identify with their team leaders when leaders show leadership behaviours directed towards individual team members' thereby fostering individual-level need satisfaction, and also when they show leadership behaviours directed towards a team as a whole thereby fostering need satisfaction on the team-level. It follows that group-focused transformational leadership may contribute to higher levels of job satisfaction and lower levels of work-related strain via the perceived fit between team members and team leaders. Thus, our model may be extended by this cross-level indirect effect.

Altogether, our results yield partial support for our multilevel model of transformational leadership in scientific teams, which is based on the integration of the dual-focused model of transformational leadership (X.-H. Wang & Howell, 2010) and person–environment fit theory (Kristof-Brown et al., 2005). Our findings support the notion that leadership research should clearly differentiate between individual-focused leadership behaviours and team-focused leadership behaviours. Additionally, the psychological processes underlying the relationship between leadership and work-related outcomes need to be distinguished as well, as leadership, depending on the level in question, is associated with work-related outcomes through different mechanisms (X.-H. Wang & Howell, 2010). As we pointed out, leading individual team

members differs from leading a team as a whole, because individual-focused leadership is concerned with satisfying individual-level needs (e.g., giving recognition), whereas group-focused leadership is concerned with satisfying team-level needs regarding effective teamwork (e.g., integrating team members into a cohesive, working whole).

Interesting questions arise when our findings are seen in the context of other team settings. In our study, team fit did not mediate the relationship between group-focused transformational leadership and team members' well-being. However, team fit may be more important in other team contexts such as action teams in high-reliability occupations (Devine, 2002; Sundstrom et al., 2000; Wilson, Burke, Priest, & Salas, 2005), which are characterized by higher levels of both task and outcome interdependence (Courtright, Thurgood, Stewart, & Pierotti, 2015). In action teams, team members rely heavily on each other to fulfil their task and responsibilities, which includes dealing with emergency situations in healthcare (Weiss, Kolbe, Grote, Spahn, & Grande, 2018), aviation (Bienefeld & Grote, 2014), and firefighting (Burtscher, Meyer, Jonas, Feese, & Tröster, 2018). Importantly, in these settings, a team's failure to complete its goals can have serious consequences including the loss of human life. Given this importance of team-level goals, team members should be more likely be willing to set aside their individual-level needs and goals. As a result, group-focused transformational leadership, and in turn team-fit, should be more important as compared to the scientific teams in our study. In general, it would be interesting to test our multilevel model of transformational leadership in other team contexts, as teams in other contexts also have to cope with mixed-motive situations (Larson, 2010; McGrath, 1984).

Practical implications

Our results support the notion that transformational leadership represents an important correlate of members' well-being in scientific teams. As most leaders in higher education institutions are appointed based mainly on their research output and their scientific proficiency, they may lack management expertise and formal leadership training (Cooke & Hilton, 2015). Higher education institutions should therefore offer training that conveys recommendations for action based on research on leadership and management in higher education institutions. Specifically, our findings emphasize the need for clearly differentiating between individual-focused transformational leadership behaviours (e.g., individualized consideration) and team-focused transformational leadership behaviours (e.g., emphasizing group identity). Scientific team leaders should provide both leadership of individual employees and team leadership, as leadership on the individual-level involves satisfaction of individual-level needs (e.g.,

promoting work-life balance) and leadership on the team-level involves satisfaction of team-level needs (e.g., providing team-building activities).

Our results also stress the importance of a close match between personal and environmental characteristics as a resilience factor in a highly demanding work environment such as the scientific teams. We propose that person–environment fit is an antecedent to emergent states like trust (Braun et al., 2013), and unlike trust, it may be somewhat more readily affected by team leaders' leadership behaviours (e.g., staff selection). Team leaders should try to maximize the degree of fit between personal and environmental characteristics by adopting transformational leadership behaviours – namely, by behaving in a manner with which an employee can identify (e.g., communicating openly), by supporting the fulfilment of subordinates' needs (e.g., personal recognition), and by showing team-directed behaviours (e.g., team-building). In support of this notion, Tepper et al. (2018) conclude that "subordinates need more transformational leadership when they experience more challenge stressors, face greater uncertainty at work, and perform more meaningful work." (p. 1344). Annual performance appraisals offer a good opportunity to not only evaluate an employee's performance but also to clarify expectations and needs. As well as being devoted to the achievement of team objectives, regularly held team meetings should focus on reflecting on team processes (e.g., communication) within the team.

Limitations and future research

The following limitations should be kept in mind when interpreting the findings of this study. Our results are based solely on questionnaire data obtained from one source (i.e., employees), which may introduce common method biases. To address this issue, and in line with Podsakoff et al.'s (2003) propositions, we applied procedural remedies before data collection (i.e., multi-wave study) and statistical remedies after data collection (i.e., marker variable) to account for common method variance. However, future research should consider including ratings by supervisors (e.g., individual/team performance) and/or peers (e.g., organizational citizenship behaviours) as well as other behavioural indicators of team members' well-being such as absent days or mental health. Relatedly, the correlational design of the current study does not allow the establishment of causal relationships between transformational leadership and indicators of team members' well-being. This issue could potentially be addressed in an intervention study, in which randomly chosen groups of team leaders would receive transformational leadership training at different points in time (i.e., delayed intervention design).

Additionally, we did not assess negative forms of leadership (e.g., laissez-faire leadership, abusive supervision, exploitative leadership), even though these leadership behaviours may occur in scientific teams as well. In our study, we focussed on the most effective leadership behaviours (i.e., transformational leadership; Avolio & Bass, 1991). Future studies could investigate the effects of negative forms of leadership on team dynamics and well-being in scientific teams. For example, team leaders who show some forms of exploitative leadership (e.g., to play off team members against each other; see Schmid, Pircher Verdorfer, & Peus, 2017) may undermine team functioning (e.g., collaboration and high-quality communication) and, in turn, affect team members' well-being negatively.

Future studies should also consider behavioural team processes, in addition to emergent states such as team fit (Marks, Mathieu, & Zaccaro, 2001), to further specify the mechanisms between leadership behaviours and work-related outcomes. For example, it would be worthwhile to assess communication processes as potential mediators: The quality of communication within a scientific team may have a strong effect on team functioning and well-being, since high-quality communication is essential for a team's project success (Hirst & Mann, 2004; Hoegl & Gemuenden, 2001). Thus, future studies could assess the effect of communication practices within scientific teams (e.g., knowledge sharing, developmental feedback) on team performance (e.g., team creativity, innovation performance) and team members' well-being (Dong et al., 2017). In sum, future research should investigate additional team-level constructs as mediators between team leadership and work-related outcomes to further illuminate the relationships between team leadership and outcomes.

Conclusion

By combining different theoretical perspectives (i.e., dual-focused model of transformational leadership and person–environment fit theory) and by applying a multilevel framework, the currents study increases our knowledge of the factors that contribute to enhanced well-being in scientific teams. Our results show that individual-focused transformational leadership is positively associated with team members' job satisfaction and negatively associated with work-related strain, and that this relationship is mediated via person–supervisor fit and needs–supplies fit. Group-focused transformational leadership is positively related to job satisfaction and negatively associated with work-related strain, but team fit does not seem to be the mechanism behind these relationships. In sum, this study highlights the importance of considering different levels of analysis to achieve a more complete understanding of the

relationships between transformational leadership and work-related outcomes in scientific teams.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. Person–vocation fit and person–organization fit are not subjects of this study, as we propose that regarding person–vocation fit, ceiling effects (i.e., conducting research is the vocation) could be an issue, and regarding person–organization fit, floor effects (i.e., scientists with a temporary contract identify with their work and less with their organization) could be an issue. We did not investigate demands-abilities fit in this study, as we propose ceiling effects for senior scientists in particular. Even junior scientists may perceive their demands-abilities fit to be high, when they receive training and support from their supervisors and from a graduate school.
2. Analyses without control variables yielded the same pattern of findings.
3. Analyses yielded the same pattern of findings. Results from these analyses can be obtained from the corresponding author.
4. We thank one of the anonymous reviewers for this suggestion.
5. We thank one of the anonymous reviewers for this suggestion.

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