

On the mediating role of team psychological safety in the relationship between transformational leadership and team process improvement

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Resumo

O objetivo do presente estudo é analisar a relação entre a liderança transformacional e a melhoria de processos da equipa, considerando o papel desempenhado pela segurança psicológica da equipa. Argumentamos que um líder transformacional, dando suporte à sua equipa, promoverá uma atmosfera em que os membros da equipa se sintam suficientemente seguros para assumir riscos e questionar os processos em curso, a fim de implementar estratégias mais apropriadas para enfrentar novos desafios. A amostra é composta por 82 grupos de trabalho (82 líderes e 353 membros da equipa) pertencentes a organizações portuguesas. Os grupos possuem, em média, 6 membros. Para recolha de dados adotou-se uma abordagem incluindo duas fontes de informação: os membros da equipa foram questionados sobre a liderança transformacional e a segurança psicológica da equipa, enquanto os líderes foram questionados acerca da melhoria de processos da equipa. A dimensão da equipa, bem como a antiguidade da equipa e a antiguidade dos membros na equipa foram incluídas como variáveis de controlo. As hipóteses foram testadas com recurso ao PROCESS. Os resultados revelaram que os comportamentos de liderança transformacional adotados pelos líderes de equipa influenciam os níveis de segurança psicológica dos membros da equipa. Os resultados também apoiam uma relação positiva entre a segurança psicológica da equipa e a melhoria de processos da equipa. Além disso, foi identificado um papel mediador (mediação total) da segurança psicológica da equipa na relação entre a liderança transformacional e a melhoria de processos da equipa. Os resultados deste estudo destacam o papel da segurança psicológica da equipa como um mecanismo intermediário entre a liderança transformacional e a eficácia da equipa. Líderes e supervisores de uma equipa devem promover a segurança psicológica da mesma, adotando comportamentos de liderança transformacional, a fim de contribuir para aumentar a capacidade da

equipa para implementar novos e mais eficazes processos na realização das tarefas, tendo em vista atingir os objetivos grupais.

Palavras-Chave: Liderança Transformacional, Segurança Psicológica da Equipa, Processos de Melhoria da Equipa

Abstract

The purpose of this study is to analyse the relationship between transformational leadership and team process improvement, considering the role played by team psychological safety. We argue that by giving support to the team, a transformational leader will promote an atmosphere where people feel safe enough to take risks and to question current processes in order to implement more appropriate strategies to face new challenges. The sample is composed of 82 workgroups (82 leaders and 353 team members) from Portuguese organizations, with six members on average. A two-source approach was implemented in data collection: team members were surveyed about transformational leadership and team psychological safety, whereas team leaders were surveyed about team process improvement. Hypotheses were tested using PROCESS. Results revealed that the transformational leadership behaviours adopted by team leaders influence the levels of psychological safety of team members. Results also support the positive relationship between team psychological safety and team process improvement. Furthermore, a mediating role (full mediation) of team psychological safety in the relationship between transformational leadership and team process improvement was identified. The findings of this study highlight the role of team psychological safety as an intervening mechanism between transformational leadership and team effectiveness. Supervisors should promote team psychological safety by adopting transformational leadership behaviours in order to contribute to an increased ability of the team to implement new and more effective processes to accomplish group tasks and achieve group goals.

Keywords: Transformational Leadership, Team Psychological Safety, Team Process Improvement.

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1. Introduction

Nowadays, teams are omnipresent in organizations worldwide (Mathieu, Tannenbaum, Donsbach, & Alliger, 2014). Because teams are created with the aim of generating value for the organization, exploring the conditions and processes that foster team effectiveness has received increasing attention (Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017).

Team effectiveness has been conceptualized in the literature as a multidimensional construct (Hackman, 1987; Rousseau & Aubé, 2010) and this paper will focus on one of its criteria: team process improvement. This dimension is conceived as the ability team members have to detect deficits on groups' processes and correct or delete them, developing innovative solutions to achieve better performance (Kirkman, Rosen, Tesluk, & Gibson, 2004; Rousseau & Aubé, 2010).

Leaders' behaviours have a central role in the way teams interact and achieve their objectives (Dimas, Rebelo, & Lourenço, 2016; Volmer, 2012). The present study focuses on the role of transformational leader behaviours in team process improvement. Transformational leaders have the ability to increase and develop their followers' interests, stimulating them to look beyond their own self-interests to the group's wellness. These leaders give support to their team members, which might contribute to creating a psychologically safe environment (Bass, 1990). This means team members will feel comfortable and safe enough to take risks and to present innovative ideas and solutions to problems (Edmondson, 1999), which might be related to team process improvement.

Accordingly, the aim of this study is to contribute towards clarifying the role of transformational leadership (i.e. a leadership style that generates a strong commitment to the team in followers) on team process improvement (i.e. a team effectiveness dimension) considering

the role of team psychological safety (i.e. the group shared belief of being safe enough to take interpersonal risks) as the intervening variable.

Two significant contributions of the present study to the teamwork literature can be highlighted. First, the contribution to the study of the indirect influence of transformational leadership on team results (e.g., Weng, Huang, Chen, & Chang, 2013), by considering the mediating role of team psychological safety. Second, the focus on a team outcome that has received little attention in the literature. In an economic context that is continuously changing, the ability of a group to react and adapt, rethinking processes and strategies, emerges as a key criterion of team effectiveness (Rousseau & Aubé, 2010). Thus, clarifying the processes that lead to team process improvement presents both theoretical and practical relevance.

2. Theoretical Framework

2.1. Transformational Leadership

Transformational leadership is a flexible leadership style that mobilizes individuals and groups to perform beyond expectations by appealing to their values, emotions and beliefs (Bass & Avolio, 1994). Transformational leaders have the capacity to motivate team members and direct their energy towards achieving a common goal instead of focusing on individual interests (Bass, 1999). These leaders make their followers feel important; they highlight how valuable their work is for the team/organization. As a result, team members feel confident, and trust and respect their leader. Transformational leaders pay attention to the individual needs of their followers and help them to look at their problems in a new way (Robbins & Judge, 2010; Yammarino, 1994; Yukl & Van Fleet, 1992).

Carless, Wearing and Mann (2000), inspired by the conclusions of the literature review of Podsakoff, McKenzie, Moorman, and Fetter (1990), identified seven behaviours that characterize leaders with a transformational leadership style: having a vision of the organization/team and having the capacity to communicate it clearly; diagnosing the weaknesses and strengths of the employees to continually contribute towards developing them; giving them support to learn and work; empowering staff, giving them authority to decide about the work; being innovative, thinking about problems in new ways and presenting new approaches to facing challenges; leading by example, acting as a model for the employees; and being charismatic, inspiring staff to be highly competent.

2.2. Transformational Leadership and Psychological Safety

Edmondson (1999) defines team psychological safety as every member's perception about what the consequences will be of taking interpersonal risks in the work environment. It means taking for granted beliefs about how others will react when one speaks up or participates. We are in the presence of a psychologically safe climate when people feel able and free to have productive discussions, without the need to protect themselves. Accordingly, team psychological safety promotes risk-taking and learning behaviours (Edmondson, 2002).

Team psychological safety is conceptualized as a group-level construct since it characterizes the team as a whole and not the individual members (Edmondson, 1999, 2003). According to Edmondson (2003), team leaders have a central role in promoting team psychological safety and should present three fundamental behaviours in order to foster the emergence of this team perception: firstly, they must be available and approachable; secondly, leaders must welcome

feedback from followers; and finally, leaders must show a model of openness and fallibility.

Previous studies found support for the relationship between transformational leadership and team psychological safety (e.g., Carmelli, Sheaffer, Binyamin, Reiter-Palmon, & Shimoni, 2014; Zhou & Pan, 2015). For instance, Zhou and Pan (2015) argued that transformational leaders help to create a safe interpersonal environment, where employees feel confident to exchange ideas and ask challenging questions. Through idealized influence and inspirational motivation, transformational leaders stimulate mutual support and trust within team members. They create a cooperative climate rather than a competitive one, which will lead to a high level of team psychological safety.

Building on the arguments and evidence above presented, we expect that:

Hypothesis 1: Transformational leadership has a positive influence on team psychological safety.

2.3. Team Psychological Safety and Team Process Improvement

Team process improvement is conceived as the ability of team members to remove deficits in group processes, improve current ones and develop pioneering solutions to achieve better task outcomes (Kirkman et al., 2004; Rousseau & Aubé, 2010). This dimension is related to innovation, because in both cases the focus is on how a team establishes new ways of doing things (Gumusluoglu & Ilsev, 2009; Reuvers, Van Engen, Vinkenburgh, & Wilson-Evered, 2008).

The importance of studying team process improvement is due to the potential impact it has on the organization. When new practices and procedures are implemented, productivity tends to increase, quality tends to improve, and production times and costs may be reduced

(Fuller, Marler, & Hester, 2006; Hackman & Wageman, 1995). As Edmondson and Mogelof (2004) state, the organization's ability to innovate is crucial for its success in such a dynamic and changing world. But, as innovation involves risk, uncertainty and, sometimes, also failure, a psychologically safe climate is needed. By reducing the fear of participating or to taking interpersonal risks, team psychological safety enables team members to feel much more comfortable suggesting new and revealing ideas and thinking out of the box, and so promotes innovation (Behafar, Friedman, & Oh, 2015; Edmondson, 2002; West, 1990). Accordingly, we expect a positive relationship between team psychological climate and team process improvement:

Hypothesis 2: Team psychological safety has a positive relationship with team process improvement.

2.4. Transformational Leadership, Team Psychological Safety and Team Process Improvement

The empirical support regarding the direct positive effect of transformational leadership on team outcomes is extensive (Judge & Piccolo, 2004; Wang Oh, Courtright, & Colbert, 2011). However, recently, the focus has shifted to the study of the processes that convey the effects of this type of leadership style to team results (Moynihan, Pandey, & Wright, 2012).

Previous studies gave support to the indirect relationship of transformational leadership with team outcomes, through its impact on supportive behaviours (Pessoa, Dimas, Lourenço, & Rebelo, 2018), on team commitment (Paolucci, Dimas, Zapalà, Lourenço, & Rebelo, 2018) or on team psychological capital and team learning (Rebelo, Dimas, Lourenço, & Palácio, 2018).

Regarding team psychological safety, there are numerous studies pointing to its mediating role in the relationship between antecedent

conditions and outcomes. In a recent literature review, Newman, Donohue, and Eva (2017) identified 44 empirical studies focused on the antecedents of team psychological safety, and 38 of them analysed it as a mediator to explain how different inputs such as organizational practices, behaviours, relationships and team characteristics, among others, influenced workplace outcomes at different levels (individual, team and organizational). Edmondson and Lei (2004) mention that several studies have investigated the role of team psychological safety as a mediator between leadership and learning or performance. However, to the best of our knowledge, the intervening role of psychological safety in the relationship between transformational leadership and team process improvement has not yet been explored.

By giving support to team members, stimulating individual and team development and valuing innovation, transformational leaders will contribute to creating a psychologically safe climate, where members feel free to present suggestions, to take risks and to rethink existing processes and strategies, which translates into higher levels of team process improvement. Accordingly, the third hypothesis is proposed:

Hypothesis 3: Team psychological safety has a mediating role in the relationship between transformational leadership and team process improvement.

3. Method

3.1. Sample

The following criteria were established in order to decide whether a group could participate in the study: 1) at least 50% of team members and the team leader needed to deliver valid questionnaires; 2) questionnaires could not have 10% or more of the items unanswered, in each of the scales of the questionnaire; 3) teams had to be composed of

at least three people that regularly interact, interdependently, to accomplish a common goal; and 4) they needed to have a formal leader (Bryman & Cramer, 2004).

Most of the organizations are from the services sector (73%) and 42% have 10 or less workers. Teams have six members on average ($SD = 3.55$) and are composed mostly of females (67.1%), with an average age of 38 ($SD = 12.33$). The average tenure of members in the team was six years ($SD = 7.25$). Team leaders are 42 years of age on average ($SD = 10.86$); 55.7% were males and have been leading the team for approximately 5 years ($SD = 4.87$).

3.2. Data Collection Procedures

Data was collected between October 2016 and January 2017. Firstly, companies were contacted face-to-face, by phone or by mail, and an explanation about the study was provided with a presentation letter. After this first contact, the collaboration project was presented.

Two strategies were used for data collection. In the majority of the organizations, the questionnaires were administered by a member of the research team or by a person with authority at the organization and with a strategic relationship with the employees (and who had been previously instructed by a research team member). However, when it was not possible to implement this strategy, the questionnaires were filled in online via an electronic platform, with the link being provided to the participants. In both cases, participation in the study was voluntary and it was clarified on the front page of the survey that only aggregated data would be reported and that all identifying information would be removed.

Team members were surveyed about their perception of transformational leadership and team psychological safety, whereas team leaders were asked to evaluate team process improvement.

3.3. Measures

Transformational Leadership: The instrument used to measure transformational leadership is the Global Transformational Leadership (GTL) scale developed by Carless and colleagues (2000), adapted and validated for the Portuguese language by Van Beveren, Dimas, Lourenço and Rebelo (2017). This scale considers transformational leadership as a single construct that is represented by seven behaviours which identify transformational leaders following Carless et al.'s (2000) model. Hence the GTL is composed of seven items, measured on a 5-point Likert-type scale, that goes from 1 “almost never applies” to 5 “applies fully”. The items were preceded by the stem “My leader”. A sample item is “communicates a clear and positive vision about the future”.

Team Psychological Safety: This construct was measured by the Team Psychological Safety Scale developed by Edmondson (1999) and adapted and validated for the Portuguese language by Ferreira (2017). It is composed of seven items measured on a 7-point Likert-type scale that goes from 1 “very inaccurate” to 7 “very accurate”, with three of these items being reverse. Items include statements like this: “If we make a mistake in this team, this will usually be used against us”.

Team Process Improvement: Team process improvement was assessed using the Team Process Improvement Scale developed by Rousseau and Aubé (2010), adapted and validated to the Portuguese language by Albuquerque (2016). It contains five items, measured on a 5-point Likert-type scale, that goes from 1 “almost never applies” to 5 “applies fully”. Items are preceded by the stem “Team members have successfully implemented new ways of working...”. A sample item is “to facilitate achievement of performance goals”.

Control Variables: Previous studies showed that the effect of team processes and conditions might be influenced by employee and team characteristics (e.g., Barrick, Stewart, Neubert, & Mount, 1998; Mohammed & Angell, 2004). Therefore, team size and overall team tenure (from the team level), and member's tenure in the team (from the individual level) were included as control variables.

3.4. Data Analysis and Preliminary Procedures

As this study was conducted at the group level of analysis and measures provided by team members were collected individually, it was necessary to aggregate variables obtained from team members (i.e. transformational leadership and psychological safety) to the team level. This was achieved by calculating the averages scores of the answers of team members for each scale. As suggested by Woehr, Loughry, and Ohland (2015), to justify aggregation, across-group and within-group indices were calculated, namely ICC (1), ICC (2) and r_{WG} (James, Demaree, & Wolf, 1984). Overall, the results justified the aggregation of data to the team level (r_{WG} , ICC (1) and ICC (2) were, respectively, .91, .38 and .72 for transformational leadership and .73, .33 and .68 for psychological safety).

4. Results

Table 1 provides the descriptive statistics, scale reliabilities and the correlations between the study variables. Since the control variables were not correlated with the variables of interest, they were dropped from further analysis (Becker, 2005). Transformational leadership was positively correlated with psychological safety ($r = .47, p < .001$) and psychological safety was positively correlated with team process

improvement ($r = .45, p < .001$). Accordingly, support was found for hypotheses 1 and 2, respectively.

Table 1. *Descriptive statistics, scales reliabilities and correlations between variables*

	M	SD	1	2	3
1. Transformational leadership	3.94	0.65	(.93)		
2. Team psychological safety	4.86	1.00	.47**	(.63)	
3. Team process improvement	3.89	0.78	.25*	.45**	(.98)
4. Team size	6.41	3.55	.02	-.05	-.20
5. Overall team tenure	6.17	6.45	-.06	.01	.11
6. Member's tenure in the team	5.35	5.42	-.14	-.22	-.09

Note. $N = 82$ teams. Reliability coefficients (Cronbach's alpha) are reported in brackets.

* $p < .05$; ** $p < .001$

Hypothesis 3 was tested using PROCESS, a macro from SPSS developed by Hayes (2013). Through bootstrapping, Model 4 of this macro allows the construction of a 95% confidence interval for assessing a simple mediation (a 5000 estimated bootstraps sample was used to build the interval). The indirect effect on the simple mediation is calculated from the product of the independent variable coefficient on the mediator, and from the mediator on the dependent variable. The effect is statistically significant if zero is not included between the maximum and minimum limits of the 95% confidence interval generated by PROCESS.

As shown in Table 2, results indicated that the indirect coefficient was significant, as zero is not included between the maximum and minimum

limits of the 95% confidence interval generated by PROCESS ($b = 0.24$, $SE = 0.08$, $95\% CI = 0.11 - 0.41$), supporting the third hypothesis. Since the direct effect was not significant ($b = 0.07$, $SE = 0.14$; $p = .63$), the mediation identified was a full mediation.

Table 2. *Mediation analysis*

DV/ Predictor	b	SE	95% CI		R ²
			LLCI	ULCI	
Team Psychological Safety					.22**
<i>Transformational Leadership</i>	0.73*	0.15	0.43	1.03	
Team Process Improvement					.20**
<i>Team Psychological Safety</i>	0.33**	0.09	0.15	0.5	
<i>Transformational Leadership</i>	0.07	0.14	-0.21	0.34	
Indirect effect	0.24	0.08	0.11	0.41	

Note: N = 82 teams. DV = dependent variable. b = non-standardized regression coefficient. SE = Standard error. CI = confidence interval. LLCI = lower CI limit. ULCI = Upper CI limit. * $p < .05$ ** $p < .001$.

5. Discussion

When studying group processes, it is of utmost importance to analyse the leader's influence on members, as well as on group functioning and performance. The importance of adopting a transformational leadership style in order to achieve team objectives has strong empirical support in the literature (Judge & Piccolo, 2004; Wang et al., 2011). Behaviours adopted by leaders influence team results, both directly and indirectly, because of the impact they have on how the group works. Thus, literature has emphasized the importance of studying the behaviours that leaders

use to influence the working team's results (Podsakoff, MacKenzie, & Bommer, 1996).

In line with previous findings (e.g., Zhou & Pan, 2015), our results supported the positive relationship between transformational leadership and team psychological safety. This means that, as Edmondson (1999, 2003) stated, leaders can foster team psychological safety if they behave in a certain way. For example, they should be available to the group, give feedback and encourage their followers, behaviours that describe transformational leadership (Edmondson, 2003). Likewise, they should be supportive, develop their staff, empower them (Carless et al., 2000), and motivate them to participate in debates and to express their feelings (Boerner et al., 2007). When leaders present these behaviours, according to our results, they will contribute to the establishment of a psychological safety environment.

Furthermore, and in line with previous literature, our results supported the positive relationship between team psychological safety and team effectiveness, more precisely, team process improvement (e.g. Edmondson, 1999; Edmondson & Mogelof, 2004; West, 1990). These results are relevant because, as highlighted above, team process improvement has received scant attention in scientific research. Our findings are in line with Edmondson's results, who stated in several studies (2002, 2003) that people in a psychologically safe environment do not need to take care or be worried about protecting themselves. A safe environment allows people to focus on discussions and stimulates the exchange of ideas and creativity and, as a result, innovative solutions will emerge (e.g. Behafar et al., 2015; Edmondson, 2002, 2003; Edmondson & Lei, 2004). So, in order to achieve team process improvement, team members should have the shared belief that the team is safe and receptive to new ideas and to suggestions (Kirkman et al., 2004).

The indirect relationship between transformational leadership and team process improvement, mediated by team psychological safety, was also supported by the results of this study. A leader is someone who stimulates, influences and guides their followers, and the whole team, towards the achievement of certain objectives (Gyanchandani, 2017). Transformational leaders have the ability to influence team outcomes, often in an indirect way, through different mediating variables (Moynihan et al., 2012). Accordingly, transformational leaders influence their followers' behaviours, feelings and interactions, and in that way, they end up influencing team outcomes (Podsakoff et al., 1990). In line with this, our results emphasize team psychological safety as an indirect mechanism through which transformational leaders will influence team process improvement. By contributing to creating a psychologically safe environment where people are not worried about what others can think or say about them, where team members feel encouraged to take risks and be creative, transformational leaders influence the level of process improvement that team members implement. In this way, team functioning can be improved, looking forward to better ways of doing things, achieving better results and pioneering solutions.

6. Conclusions

The main objective of the present research was to add knowledge to the team research field, contributing to a deeper understanding of the intervening mechanisms that relate transformational leadership to team effectiveness. In line with this, our results highlighted the key role of transformational leadership on team process improvement, through its influence on the creation of a psychologically safe environment.

At an intervention level, considering the relationships found among the variables under study, the present research draws attention to the advantages of including measures of transformational leadership

competencies in selection procedures. In addition, leader training programmes should be developed, as a way to enhance and promote transformational leadership behaviours in actual leaders. Accordingly, leaders should be taught how to modify their supervision style, focusing on the main behaviours of a transformational leader.

The findings of the present study also emphasize the benefits of creating psychologically safe team environments. Apart from having the right leaders, the organization should implement initiatives that can also promote teams' perception of psychological safety. For example, promoting moments of discussion and idea generation on a regular basis, when team members have the opportunity to speak up and express their ideas. Furthermore, another suggestion for organizations is to implement team-building activities, with a special focus on improving communication, confidence and respect among members, in order to enhance social relations between their members and facilitate the development of team psychological safety.

The present study has some limitations that need to be mentioned. One of the limitations is related to its cross-sectional nature, which limits the conclusions about the causality of the relationship between the studied variables. Being aware of this and, consequently, of the fact that the proposed direction of the studied relationships could be the reverse, we anchored our hypotheses in the literature. Another limitation is related to the possible common source bias that can be caused because transformational leadership and team psychological safety were both evaluated by team members. However, as the third variable of team process improvement was obtained from a different source, team leaders, we have a multi-source approach which lowers the risk of the aforementioned bias. Additionally, by aggregating the variables to the group level, the risk of having common source bias is also reduced (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Future research should test the model we analysed from a causal standpoint, adopting longitudinal designs that feature time precedence. The use of other methods of data collection (such as objective measures, interviews and video recording of team interactions) should also be considered.

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