

# The Role of Trust in the Relationship Between Transformational Leadership and Organizational Learning Practices

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## **Executive Summary**

This study had the broad purpose of contributing to find out what can help organizations be successful in today's fast-paced unpredictable economy. A key factor for success appears to be a flexible workforce. Flexibility, in turn, can be achieved through continuous organizational learning. Thus, the focus in this study was on two organizational learning practices. Through empowerment employees learn by taking over more decision-making authority in their daily work. Furthermore, employees can learn through the errors they or others make. Error management, constructively dealing with errors after they arose, was the second practice of interest. The target group of the study were leaders as they usually have some extent of control over empowerment and error management in organizations.

Changing a company's employee empowerment and error management through interventions appears to be very complex. Thus, the practical aim of this study was to provide indications whether both practices can possibly be enhanced through improvements in transformational leadership. Transformational leadership is a person-oriented leadership style with a core focus on the development of employees. Specifically, in this study it was hypothesized that transformational leadership style is positively related to the two organizational leadership practices because transformational leaders build more trust in their subordinates. Relational trust and trust in employees' competence were expected to enable leaders to grant their subordinates more decision-making authority and let employees practice more error management. The role of trust was mainly investigated for theoretical purposes.

81 leaders from the top two management levels of the Gothaer participated in an online study with questionnaires on transformational leadership, trust in subordinates, empowerment and error management. The results showed that transformational leadership is not related to empowerment. However, trust in subordinates is positively related to empowerment. Furthermore, transformational leadership is positively related to error management and the development of more trust in subordinates is one of the factors explaining this relationship.

It can be useful to promote transformational leadership through interventions like trainings or workshops preferably with a focus on social and team building skills to possibly also yield improvements in error management. Furthermore, enhancing trust in subordinates can be beneficial for targeting both empowerment and error management. Relational trust is increased through regular interaction with employees or through team building activities. Trust in competence is increased through regular performance feedback.

It is noteworthy that the average scores on all four assessed factors were quite high, indicating that interventions aimed at maintenance should be the focus of the investigated organization. Thus, it is recommended to use transformational leadership workshops only for newly promoted and future leaders. Additionally, leaders should make time in their daily routines to interact with and provide feedback to employees. Engaging in transformational leadership and maintaining trust to subordinates might also be integrated into a common understanding of leadership, so new supervisors know what to focus on in their role as leaders. A general takeaway of the study was that leaders play important roles in fostering organizational learning and should be aware of that.

## Abstract

Direct interventions on empowerment and error management are very complex, which is why investigating related factors is of practical relevance. In the current study it was investigated whether trust in subordinates mediates the relationship between transformational leadership and the two organizational learning practices empowerment and error management from the perspective of organizational leaders. It was hypothesized that trust in subordinates mediates the positive relationship between transformational leadership and empowerment. Similarly, it was hypothesized that trust in subordinates mediates the positive relationship between transformational leadership and error management. An online study using questionnaires was conducted. The final sample consisted of 81 organizational leaders from the German insurance company Gothaer. Two PROCESS mediation analyses were used to test the hypotheses. No relationship between transformational leadership and empowerment was found. The positive relationship between transformational leadership and error management was found to be partially mediated by trust in subordinates. The theoretical literature on transformational leadership, trust in subordinates, empowerment and error management was expanded. Regarding the practical aim, the results indicate that increasing transformational leadership may yield increases in error management. Increasing trust may yield increases in empowerment and further increase error management.

The term “VUCA world” is increasingly used to describe today’s economy. It is an acronym for volatility, uncertainty, complexity, and ambiguity. In essence it suggests that planning ahead is becoming a growing challenge for organizations nowadays (Bennett & Lemoine, 2014). A key factor for success in a fast-paced economy like this is flexibility (Millar, Groth & Mahon, 2018). Organizations with flexible workforces are able to quickly adapt to unfamiliar circumstances and handle challenges without much planning ahead. Through organizational learning, gathering knowledge that is of use for the organization, a flexible workforce can be developed (Theriou & Chatzoglou, 2009). Organizational learning creates experience and fosters innovativeness (Mishra & Bhaskar, 2010; Santos-Vijande, López-Sánchez & Trespalacios, 2012), both crucial when facing unfamiliar circumstances and challenges. In this study two organizational learning practices were evaluated, namely empowerment and error management. Since leaders take on special roles in both practices, they were the group of focus. Of specific interest was leaders’ transformational leadership. Transformational leadership is often studied in relation to learning, but like the organizational learning practices rarely assessed from the perspective of leaders.

### **Organizational Learning Practices**

Empowering employees is one way to achieve continuous learning in organizations. In the current study empowerment was viewed in accordance with structural empowerment, since this type of empowerment is regarded to be particularly important for organizational learning (Mishra & Bhaskar, 2010). Structural empowerment is the process of giving employees the authority to make own decisions and act based on these (Alsop, Bertelsen & Holland, 2006, p. 1). Through structural empowerment employees gain responsibility, which sets the foundation for organizational learning (Mishra & Bhaskar, 2010). With more responsibility employees usually have to face new challenges they can gain knowledge and develop from.

Challenges as well as routine tasks can also lead to errors. Errors are an important element of some organizational learning theories (e.g., Lipshitz, Popper & Friedman, 2002; Provera, Montefusco & Canato, 2010). Error management means paying attention to increasing positive and decreasing negative consequences of errors after they arise. Such positive consequences can include, amongst others, learning (van Dyck, Frese, Baer & Sonnentag, 2005). The authors consider error management to be a part of organizational

culture. Error management practices are, for example, an open communication about errors, support after an incident, an early detection and effective solutions, and thorough error analysis.

In summary, letting employees take over more decision-making authority while encouraging a culture in which errors are viewed as learning opportunities may be good practices to foster knowledge expansion. However, changing a company's employee empowerment and error management through interventions appears to be very complex. To foster empowerment organization-wide, structural changes would have to take place that decentralize the decision-making authority of organizational members (Hempel, Zhang & Han, 2012). Moreover, since error management is part of the organizational culture, employees are often unaware of the practices. This is a reason, cultural elements are difficult to influence (Muscalu, 2014). Due to the complexity of direct interventions, it is of practical relevance to investigate factors related to empowerment and error management that are more susceptible to change.

As mentioned, leaders have great responsibilities in an organization's empowerment and error management. In their role as leaders they, for example, provide advice, feedback, and delegate tasks and authority. Delegating authority is of specific relevance for empowering their employees (Boudrias, Gaudreau, Savoie & Morin, 2009). Furthermore, errors are often reported to leaders. This way leaders define the standards on how errors are viewed and dealt with, shaping the organization's error management culture (van Dyck et al., 2005). Therefore, leaders can be considered agents of change when aiming to influence an organization's empowerment and error management.

### **Transformational Leadership**

A common way to differentiate between leaders is by leadership style, patterns of behavior they frequently exhibit in their role (Nanjundeswaraswamy & Swamy, 2014). Among the widely accepted and validated leadership styles is transformational leadership (Gandolfi, Stone & Deno, 2017). Transformational leadership is of particular interest in relation to organizational learning practices since it is a very person-oriented leadership style with a core focus on the development of subordinates (Nanjundeswaraswamy & Swamy, 2014). Put briefly, transformational leadership is characterized by four main elements (e.g., Rufer, 2008). Idealized influence is the leader's tendency to set a good example for followers. Inspirational motivation refers to a leader's ability to create a shared vision among employees. Intellectual stimulation represents the degree to which leaders encourage followers to think innovatively. Finally, individualized consideration is the attention paid to every individual follower from a personal and developmental perspective. Leadership styles are not mutually exclusive, meaning every supervisor can display a degree of transformational leadership (Bligh, Kohles & Yan, 2018). Transformational leadership is proposed to be related to both organizational learning practices. Investigating this could be of practical relevance for organizations. Possibly improvements in empowerment and error management can be yielded by fostering transformational leadership, which requires far less complex interventions.

Due to transformational leaders' focus on development, they actively create learning opportunities for employees. Since empowerment entails such learning opportunities, transformational leadership has been found to be related to employee empowerment (Boamah, 2018). Congruently, employees' self-efficacy increases under transformational leaders and they become more open to taking over responsibility (Dvir, Eden, Avolio & Shamir, 2002). Based on this, the first hypothesis of the current research was that transformational leadership is positively related to employee empowerment.

Furthermore, transformational leaders foster appropriate conditions for error management. They create a climate of psychological safety, in which everyone is respected in and experimentation is encouraged (Edmondson, 1999). In this climate employees feel

comfortable to practice error management. They can, for example, learn from errors and openly communicate them without having to worry about negative consequences of errors (Guchait, Paşamehmetoğlu & Dawson, 2014). Therefore, the second hypothesis of the study at hand was that transformational leadership is positively related to error management.

### **Trust in Subordinates**

In addition to the practical value, the aim of this study was to also extend the theoretical literature in two ways. Firstly, a contribution of this study was the assessment of the perspective of leaders. In the literature the focus is often on supervisors' transformational leadership, employee empowerment and the error management from the perspective of employees. Since leaders play great roles in empowerment and error management their perspective is valuable to take into account. Secondly, the underlying processes that explain the positive relationships between transformational leadership, empowerment and error management are still largely unexplored (Amor, Vázquez & Faíña, 2020; Bligh et al., 2018). A factor that might contribute to explaining the relationships between transformational leadership and both organizational learning practices was examined in the current study.

In this context, trust in subordinates was proposed as a mediator. Trust in subordinates is defined as relational trust as consisting of perceived openness, concern, and reliability and trust in subordinate competence (Spreitzer & Mishra, 1999). What hinders leaders in empowering employees and possibly also in fostering error management is the loss of control they experience (Field, 1997). They may have to take personal risks when transferring some of their decision-making authority to others and they are often held responsible when errors of their subordinates are not properly resolved. Trust, in turn, allows leaders to take such risks (Spreitzer & Mishra, 1999). Thus, trust in subordinates may contribute to explaining the relationships between transformational leadership and the two organizational learning practices.

Trust in subordinates is especially fostered through joint interaction (Ladegard & Gjerde, 2014). Transformational leaders have more positive leader-member exchanges because they are so person-oriented (Shunlong & Weiming, 2012). This should imply that transformational leaders develop more relational trust in subordinates. On top of relational trust, also the trust in subordinate competences may be higher for transformational leaders since followers perform better under supervisors engaging in this leadership style (Boerner, Eisenbeiss & Griesser, 2007). Transformational leaders should perceive more trust in their employees, which is proposed to enable them to take the risks associated with organizational learning practices.

A specific risk when empowering employees is that they might act egoistically or simply lack the competence to make important decisions (Spreitzer & Mishra, 1999). If there is relational trust and trust in subordinates' competence, in turn, it should enable supervisors to empower employees by delegating greater decision-making authority to them (Schoorman, Mayer & Davis, 2016). The third hypothesis was that the positive relationship between transformational leadership and employee empowerment is mediated by trust in subordinates. This implies that transformational leadership is related to higher trust in subordinates, which in turn is positively associated with employee empowerment.

Trust is also a necessity for organizational error management (Helmreich, 1998). Specifically, it has been reported that trust is required for having open conversations about errors and how to deal with them (Chatzi, Martin, Bates & Murray, 2019). If a leader trusts that subordinates openly communicate errors and have the competence to effectively resolve them, they might show more understanding and are less castigatory after an error arose. These two tendencies of a leader, in turn, make employees engage in more error management (van Dyck et al., 2005). Based on this, the fourth hypothesis stated that the positive relationship between transformational leadership and error management is mediated by trust in

subordinates. This implies that transformational leadership is related to higher trust in subordinates, which in turn is positively associated with error management.

In the current study it was investigated whether trust in subordinates mediates the relationship between transformational leadership and the two organizational learning practices empowerment and error management from the perspective of organizational leaders. From a practical view, answering this question can give indications whether empowerment and error management can possibly be influenced through interventions on transformational leadership. The theoretical aim of this study was to expand the literature on the relationships between transformational leadership and the two organizational learning practices. The research question was examined using online questionnaires assessing transformational leadership, trust in subordinates, empowerment, and error management from the perspective of organizational leaders.

## Method

### Participants

To investigate the research question, leaders from the top two management levels of the German insurance company Gothaer were asked to participate in the study. 173 persons were eligible for participation. With 81 completed responses, the response rate was approximately 47%. The final sample consisted of 63 male and 18 female participants ( $N = 81$ ), which roughly reflects the gender distribution of leaders at the company. For anonymity purposes participants indicated their age in categories, which led to the frequencies displayed in Table 1.

Table 1

<i>Frequencies of the indicated age of participants</i>					
	$\leq 30$	31-40	41-50	51-60	$\geq 61$
<i>N</i>	1	14	27	36	3

A sensitivity analysis using G\*Power (Faul, Erdfelder, Lang & Buchner, 2007) was conducted. A two-tailed t test for a linear multiple regression with a fixed model and a single regression coefficient was selected. For a sample size of  $N = 81$ , an error probability of  $\alpha = .05$  and power = .80 including two predictors in the model, the minimum detectable effect size was  $f^2 = 0.099$ . This approximately equals a medium effect size (Cohen, 1992).

### Procedure

An online survey was created using the website [www.qualtrics.com](http://www.qualtrics.com). The link to participate was distributed via e-mail to all eligible leaders. At the start of the survey, participants were shown an information letter. It shortly described the purpose and content of the study, as well as further information about the nature of participation (see Appendices A and B). It was clearly stated that participation was anonymous, voluntary and included no form of reimbursement. Afterwards, leaders could indicate their consent to participate. After indicating gender and age, the four questionnaires aiming to measure transformational leadership, trust in subordinates, empowerment, and error management were displayed. Participants took approximately ten minutes to complete the survey. Finally, a debriefing letter revealing and explaining the exact constructs, the hypothesized relationships and the research goal was presented to participants (see Appendices A and B). Just like the information letter, it contained contact information for further questions or inquiries.

### Materials

Since the company's language was German all information and questionnaires were presented in German. Three questionnaires were originally published in English. They were translated to German with back-translations from two native German speaking students to confirm the accuracy of the translations. The back-translations were compared to the original scales afterwards. A few minor wording adjustments of the German scales followed. The German and English scales can be found in Appendices C and D.

**Transformational leadership.** Leaders' degree of transformational leadership was assessed using Felfe and Goihl's (2014) German scale, which was translated and adapted from the Multifactor Leadership Questionnaire (Avolio & Bass, 1995). It was validated in several German studies (Rufer, 2008). The scale measured the four components of transformational leadership: Inspirational motivation, individualized consideration, intellectual stimulation, and idealized influence. Participants were instructed to trust their intuition when assessing themselves in their role as a leader. The questionnaire consisted of 20 items. An example item was: "I recognize the individual needs, skills and goals of my employees". There were minor adjustments made to the wording of the items to fit the corporate language (see Appendix C). To respond, a 5-point Likert scale indicating frequency from 1 "never" to 5 "almost always" was used. The Cronbach's Alpha of the questionnaire was reported to be .89 (Kutscher, 2011), in the current study it was .79.

**Trust in subordinates.** To assess trust in subordinates, a translation of Spreitzer and Mishra's (1999) 16-item-scale was used. The validity of the scale was deemed acceptable. It was one of the few scales that assessed trust from the perspective of leaders. An instruction asking participants to think about employees they regularly work with in their role as a leader when responding to the items was added. The formulation of this instruction was similar to that provided in the questionnaire on transformational leadership for purposes of consistency. In the item "I trust that employees can help our organization survive through the 1990s" the decade was adjusted to "the 2020s". Another example item was: "I trust that employees are completely honest with me". A 7-point Likert scale indicating agreement was used to record responses from 1 "do not agree at all" to 7 "completely agree". The Cronbach's Alpha was reported to be .93 (Spreitzer & Mishra, 1999). In this study it equaled .90.

**Empowerment.** Since no suiting questionnaires that assess employee empowerment from the perspective of leaders could be found, an adapted version of Hayes' (1994) validated 8-item Employee Empowerment scale was used to measure the corresponding construct. The questionnaire fits well with the definition of empowerment in this study. The wording of all items was adapted from the first-person to the third-person perspective. Again, participants were instructed to think about employees they regularly work with in their role as a leader. An example item of the questionnaire was: "Employees do not need to get management's approval before they handle problems". A 5-point-Likert scale indicating the level of agreement from 1 "do not agree at all" to 5 "completely agree" was used to record responses. The Cronbach's alpha for Hayes' (1994) version of the questionnaire was .85, in the current study it was .81.

**Error management.** To measure error management, the "Error Management" scale (van Dyck et al., 2005) containing 16 items was translated to German. It also matched the definition of error management used in the current study. Participants were instructed to think about the error culture in their organizational department when responding. An example item was: "When mastering a task, people can learn a lot from their mistakes". Participants could use a 5-point-Likert scale ranging from 1 "does not apply at all" to 5 "applies completely" to respond. The Cronbach's alpha for the original scale was reported to be .92. The mirrored

item “in this organization, people think a lot about how an error could have been avoided” was removed to increase the Cronbach’s alpha from .83 to .87, leaving 15 items.

### Data Analysis

**Outliers.** The presence of outliers was judged by looking at the values of standardized residuals. There was no case of a residual with a value smaller than -3 or larger than 3, therefore no cases were excluded from analyses. Generally, it is not advised to exclude outliers if they are not regarded impossible observations in analyses using bootstrap, so cases that were close to the cutoff of -3 or 3 were kept in the sample. The absence of influential cases was also assessed in the context of the assumptions (see Appendix E).

**Factor analysis.** Confirmatory factor analyses could not substantiate the reported factor structures of the translated questionnaires on trust, empowerment and error management. Based on the literature the scales were thought to be unidimensional. A confirmatory factor analysis using a maximum likelihood extraction revealed the following (Table 2).

Table 2

<i>Goodness-of-fit</i>			
	$\chi^2$	<i>df</i>	<i>p</i>
Trust	229.53	104	<.001
Empowerment	48.76	20	<.001
Error management	227.43	90	<.001

However, the originally proposed factor structures may not be overturned based on the results of this factor analysis. The sample size was very small for confirmatory factor analysis to yield robust results. A large sample size is one of the statistical assumptions for maximum likelihood estimations (Boomsma & Hoogland, 2001). A sample of 200 participants is the proposed minimum sample size of the authors. With well translated items, one would not expect the factor structure to significantly change. The same is believed for the adapted questionnaire on empowerment, which was changed from the first-person to the third-person perspective. Still, the results these scales yielded should be interpreted with caution.

**Main analyses.** The variables transformational leadership, trust in subordinates (trust), empowerment, and error management were all quantitative. Mean scores were calculated for each participant, one per variable. These mean scores were used for the main analyses, neither standardized nor centralized.

The assumptions for linear regression analyses of normality, homoscedasticity, independence, absence of multicollinearity and absence of influential cases were met. Since bootstrapping was used in the main analyses, they are robust against violations of the assumption of linearity. Descriptions on how the assumptions were evaluated can be found in Appendix E. For the main analyses the PROCESS macro v3.5 (Hayes, 2013) was used. Two PROCESS mediation analyses (model 4) were utilized to assess the hypothesized relationships. The first analysis involved empowerment as outcome variable and the second involved error management as outcome variable. A confidence interval of 95.00 and 5000 bootstrap iterations were indicated.

## Results

### Descriptive Statistics

The descriptive statistics of the whole sample can be found in Table 3.

Table 3

*Means, standard deviations, and Pearson correlations*

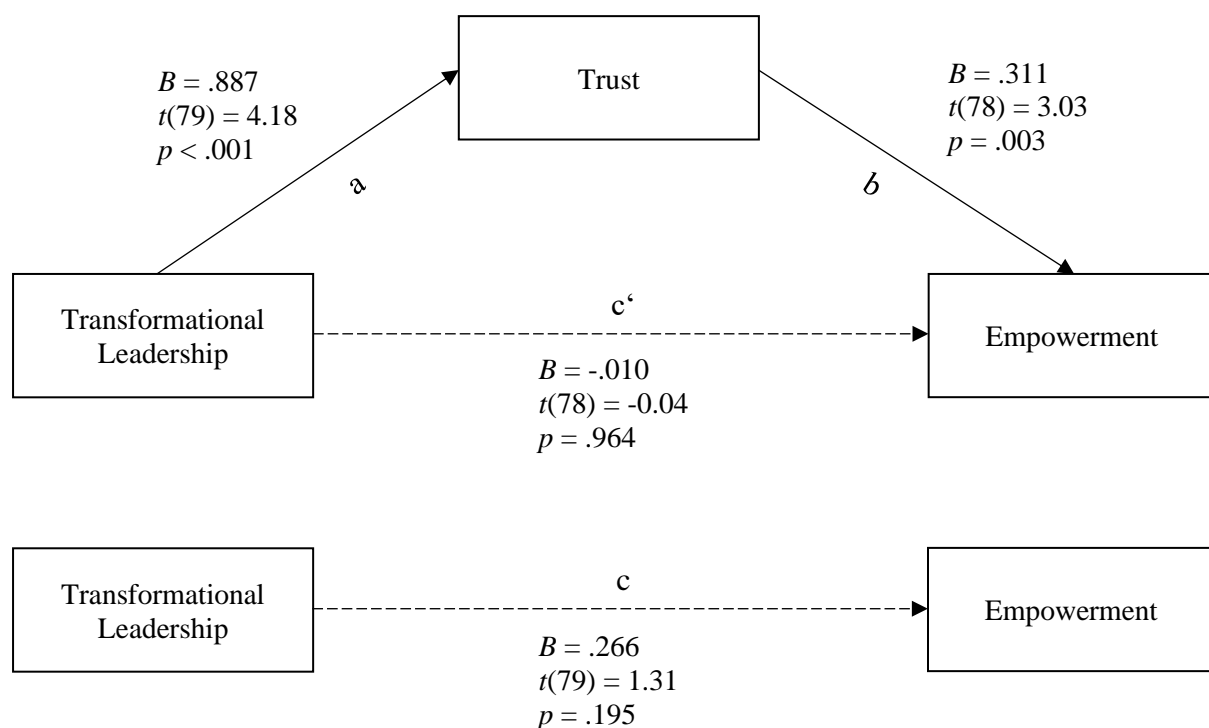
	<i>M</i>	<i>SD</i>	1	2	3
1. Transformational leadership	4.11	0.30			
2. Trust	5.71	0.62	.426*		
3. Empowerment	3.89	0.54	.146	.352*	
4. Error management	3.99	0.45	.401*	.512*	.517*

*Note.* \*  $p < .001$ , two-tailed

It is notable that the obtained mean scores for the four variables are relatively high based on the midpoint of the scales. Moreover, the Pearson correlations found between the variables were of weak and moderate strength as judged by a commonly used rule of thumb (e.g., Akoglu, 2018). It is noteworthy that empowerment has a moderate positive relationship with error management, a relationship that is not assessed in the main analyses.

### Empowerment

The results of the first main analysis using transformational leadership as predictor, trust as mediator and empowerment as outcome variable are shown in Figure 1.



*Figure 1.* Unstandardized coefficients, t-scores and p-values for the relationship between transformational leadership and empowerment mediated by trust.

The relationship between transformational leadership and empowerment is non-significant (path c; total effect). The relationship between transformational leadership and trust in subordinates is significant (path a). The relationship between trust in subordinates and empowerment is significant as well (path b). A one-point increase (on the 7-point Likert-scale) in trust in subordinates increases empowerment by 0.311 points (on the 5-point Likert-

scale). The indirect relationship between transformational leadership and empowerment through trust in subordinates is significant ( $B = .276$ , 95% CI [.09, .55]) as judged by the confidence interval not including 0. A one-point increase in transformational leadership (on the 5-point Likert-scale) increases trust in subordinates by 0.887 points. This increase in trust in subordinates leads to an increase of 0.276 points in empowerment. The relationship between transformational leadership and empowerment when controlling for trust in subordinates is non-significant (path  $c'$ ; direct effect).

### Error Management

The results of the second main analysis using transformational leadership as predictor, trust as mediator and error management as outcome variable are shown in Figure 2.

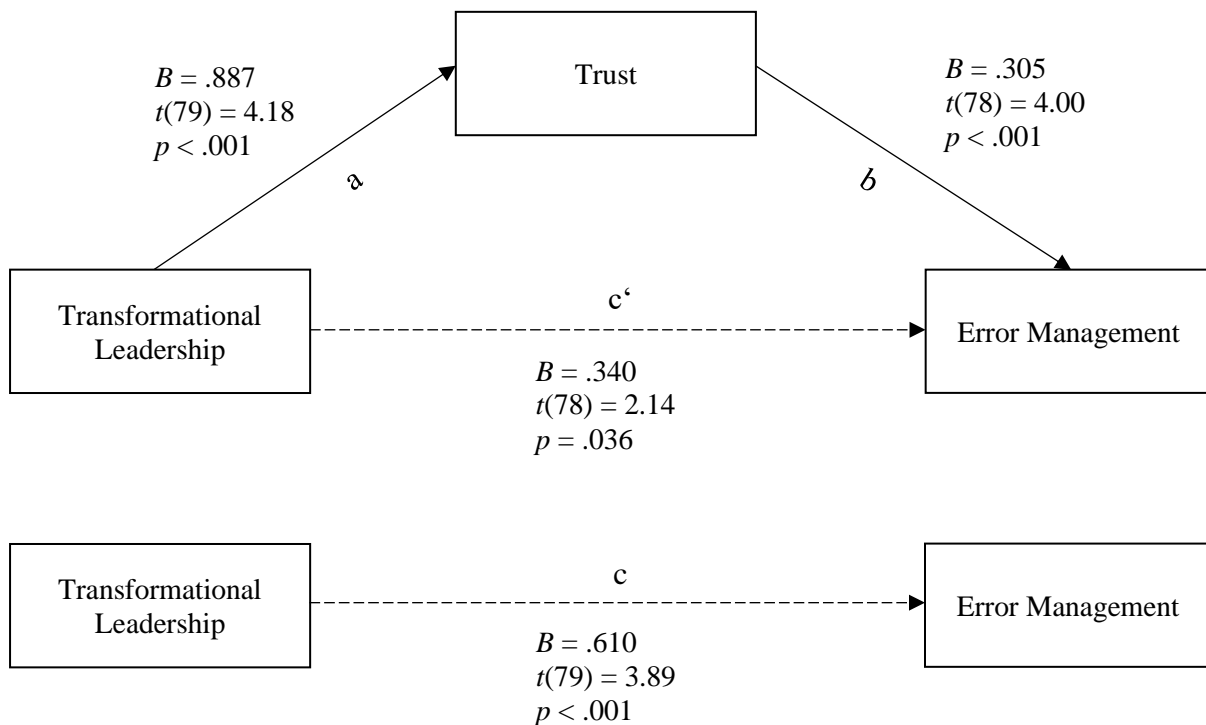


Figure 2. Unstandardized coefficients, t-scores and p-values for the relationship between transformational leadership and error management mediated by trust.

The relationship between transformational leadership and error management is significant (path  $c$ ; total effect). Transformational leadership explains approximately 16% of the variance observed in error management ( $R^2 = .16$ ). The relationship between trust in subordinates and error management is significant as well (path  $b$ ). A one-point increase in trust in subordinates (on a 7-point Likert-scale) increases error management by 0.305 points (on a 5-point Likert-scale). The indirect relationship between transformational leadership and error management through trust in subordinates is significant ( $B = .271$ , 95% CI [.07, .57]) as judged by the confidence interval not including 0. A one-point increase in transformational leadership (on a 5-point Likert-scale) increases trust in subordinates by 0.887 points. This increase in trust in subordinates leads to an increase of 0.271 points in error management. The relationship between transformational leadership and error management when controlling for trust in subordinates is also significant (path  $c'$ ; direct effect). A one-point increase in transformational leadership increases error management by 0.340 points when controlling for

trust. Since the direct and the total effect are both significant, trust in subordinates partially mediates the relationship between transformational leadership and error management.

### **Discussion**

Transformational leadership has been shown to play a promising role in organizational learning practices (e.g., Alonso Rodriguez & Griffin, 2009; Boamah, 2018). In this study it was investigated whether trust in subordinates mediates the relationship between transformational leadership and the two organizational learning practices empowerment and error management from a perspective of organizational leaders. From a theoretical view, the aim was to contribute to the understanding of the relationships between transformational leadership and both organizational learning practices. Practically the study was meant to provide indications whether promoting transformational leadership can be used to also improve empowerment and error management. To answer the research question, it was found that trust in subordinates partially mediates the positive relationship between transformational leadership and error management from the perspective of organizational leaders. On the other hand, transformational leadership was not found to be significantly related to empowerment from the perspective of organizational leaders. It is noteworthy that high averages were found for all four assessed factors in the organization. Furthermore, the more empowered leaders perceive their employees to be, the more positive they also perceive the error management in their department.

The first hypothesis stated that transformational leadership has a positive relationship with employee empowerment. Against the expectations this hypothesis was not supported by the results: There was no evidence found that transformational leadership is related to empowerment from the perspective of organizational leaders. Referring back to the literature, a lot of studies that define empowerment in terms of structural empowerment (e.g., Boamah, 2018) like it was done in the current study took place in the context of hospitals, mainly with nurses as research sample. There might be differences in the job nature of nurses and employees of non-governmental organizations. The job of nurses naturally requires them to take on a lot of authority and responsibility due to worldwide staff shortage in modern healthcare (Kerzman et al., 2015). This might make it easier for transformational leaders to structurally empower nurses because eventually they are designated to work independently. Meanwhile, other organizations often have more centralized structures meaning that most decision-making authority is formally held by top management. By itself, adopting a transformational leadership style may not be sufficient to structurally empower employees in settings where decision-making authority is supposed to remain with top management.

Secondly, it was hypothesized that transformational leadership has a positive relationship with error management. This hypothesis was supported by the results: The more transformational leadership a supervisor engages in, the more error management they perceive to be practiced in their department. Transformational leaders seem to encourage employees to engage in error management. An alternative explanation for the relationship between transformational leadership and error management is that possibly there already was a type of learning culture present in the organization. Briefly described, a learning culture is characterized by the shared belief that learning contributes significantly to the overall success of an organization. Learning is thus fostered in every possible situation at all organizational levels (Wahda, 2017). In this type of culture, supervisors become more inclined to adopt a transformational leadership style and prioritize the development of their subordinates (Nam & Park, 2019). Furthermore, in a learning culture errors might be naturally viewed as learning opportunities. Thus, transformational leadership and error management might be a reflection of an underlying learning culture. In this way, a learning culture might also account for the high average scores of transformational leadership and error management obtained in the study.

The third hypothesis stated that the positive relationship between transformational leadership and employee empowerment is mediated by trust in subordinates. This hypothesis was supported by the results: The more transformational leadership a supervisor engages in, the more trust in their subordinates they report and the more trust they have, the more empowered they perceive their subordinates to be. Transformational leaders seem to develop more trust in their subordinates. Their trust might enable them to take personal risks and empower their employees more.

However, this significant indirect relationship should be interpreted cautiously since no direct relationship between transformational leadership and empowerment was found. First of all, it is possible that there are other factors that mediate the relationship between transformational leadership and empowerment in ways opposite to trust. Thereby they could cancel out the impact of trust. This would explain why an indirect relationship, but no significant relationship between transformational leadership and empowerment per se was found. A different explanation for the indirect relationship can be traced back to data analysis. When indirect relationships are found while the independent and dependent variable are not related in regression analyses, the chance of type I errors is inflated. This translates to a higher risk for finding false positive indirect relationships (Loeys, Moerkerke & Vansteelandt, 2015). The likeliness is even higher in small samples. To draw conclusions about the relationship between transformational leadership and empowerment through trust, additional research is necessary. One way to increase statistical conclusion validity is to replicate this study with a sample that is drawn from multiple organizations to decrease the impact of extraneous factors and achieve a bigger sample size. The significant relationship between trust and empowerment was still acknowledged for practical implications.

Finally, the fourth hypothesis stated that the positive relationship between transformational leadership and error management is mediated by trust in subordinates. This hypothesis was supported by the results: The more transformational leadership a supervisor engages in, the more trust in their subordinates they report and the more trust they have, the more error management they perceive to be practiced in their department. Transformational leaders seem to develop more trust in their subordinates. Their trust might enable them to take personal risks and let employees practice error management.

There are also alternative explanations for the two indirect relationships between transformational leadership and empowerment (or error management) through trust from a theoretical perspective. An underlying factor of both transformational leadership and trust in subordinates might be a leader's empathy, the degree to which leaders are capable of recognizing and re-experiencing the feelings of others (Salovey & Mayer, 1990). Empathic leaders are likely to adapt person-oriented leadership styles (Woodall & Hill, 1982) and are able to develop trust in subordinates more easily (Guinalú & Jordán, 2016). Thus, empathy is a possible confounder in the relationship between transformational leadership and trust.

Furthermore, another alternative perspective is that the relationship between trust and the two organizational learning practices might be reversed so that great empowerment and error management elicit more trust in subordinates. When employees openly communicate and effectively resolve errors, others' trust in them increases (Dimitrova, van Hooft, van Dyck & Groenewegen, 2016; Firth-Cozens, 2004). Similarly, one can argue that when employees handle the responsibilities they have gained due to empowerment well, their leader's trust in them might increase.

### **Strengths, Limitations and Suggestions for Future Research**

This study showed strengths, but also considerable limitations that should be counteracted in future research. An important strength was the involvement of leaders, since their perspective on the assessed factors remains relatively unexplored (e.g., Ladegard & Gjerde, 2014). Furthermore, since the sample was drawn from a single organization, the

average scores provide a valuable insight into the current state of the assessed factors for the investigated organization. However, these strengths also have drawbacks to consider. One limitation is that no subordinates could be included in the sample. When using self-report measures, especially for one's own leadership style, there might be ego defense and social desirability biases that distort objectivity (Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi & Rezazadeh, 2012). Biases like these could be another reason for the high averages on all four factors observed in the study. Moreover, since the study was conducted in one organization, generalizability to other contexts is limited. A lot of extraneous factors like centralization and the presence of a learning culture cannot be controlled for in a single organization. A recommendation for future research therefore is to draw a sample from multiple organizations including leaders and their subordinates. Another limitation was the content validity of this study. As mentioned, original factor structures for the translated questionnaires could not be replicated. This should be taken into account when selecting instruments in future research. Making adjustments in the selection of the sample and possibly the instruments are general suggestions for counteracting the limitations of this study in future research.

Future research aiming to gain more insight into the relationship between transformational leadership and error management should consider conducting quasi-experimental studies involving both factors. To evaluate whether transformational leadership has a positive impact on an organization's error management, an intervention, for example a training, on transformational leadership may be performed with leaders. Pre- and posttests on transformational leadership and error management should be conducted along with it. To gain further insight into trust as a mediator, a measure on trust in subordinates may be included, too. Apart from the general suggestions regarding sample selection, control groups from participating organizations may be considered as well to further improve internal validity. A quasi-experimental study can be the next step to evaluate whether error management can be improved through interventions on transformational leadership.

Regarding the non-significant relationship between transformational leadership and empowerment, one alternative explanation was that there are factors that negatively mediate this relationship. Van Grinsven and Visser (2011) pointed out negative consequences of structural empowerment. Gaining more decision-making authority can make employees prone to pursuing individual ideas and results, and thereby lose sight of team objectives. This may contradict the focus of creating a shared vision among employees that characterizes transformational leaders (Stewart, 2006). Whether transformational leaders are concerned about individualistic behavior or other negative consequences of empowerment could best be explored in qualitative research. Future research on transformational leadership and empowerment is mainly of theoretical relevance.

### **Practical Implications and Organizational Advice**

The results of the current study provide valuable indications for organizational practice. The majority of interventions to increase transformational leadership are trainings or workshops that contain different elements and priorities as transformational leadership is popularly researched worldwide. Investigating the mechanisms that explain the relationships between transformational leadership and targeted organizational outcomes helps to determine which priorities should be set in a certain intervention. In the current case, it was discovered that increased trust in subordinates is a reason why transformational leaders' departments exhibit more error management from the view of leaders. This indicates that a transformational leadership training which prioritizes social skills and specifically team-building skills that were, for example, included as elements by Abrell, Rowold, Weibler & Moeninghoff (2011), may be particularly beneficial when targeting error management.

Enhancing trust may also play a role for increasing empowerment, while it should have further positive impact on enhancing error management. Supervisors themselves can

engage in behaviors throughout the entire year to increase trust in their subordinates. Frequent one-on-one communication, team gatherings or team building activities outside the work context are means to increase relational trust (Turaga, 2013). Trust in competence may be fostered through regular feedback conversations on employee performance (Hassan, Toylan, Semerciöz & Aksel, 2012). A general implication for leaders is to be aware of the impact they have in fostering continuous learning among the workforce. Organizations can facilitate the development of trust by offering team building interventions like described by Bayley, Wallace, Spurgeon, Barwell and Mazelan (2007), for example, or organize informal events for supervisors and their employees.

Interventions have to be adapted to organizational needs, which should also be done for the investigated organization. Based on the current results, transformational leadership, trust, empowerment and error management are very well established in the organization from the view of leaders. Repeating adapted surveys with employees could give a more complete picture of transformational leadership, empowerment and error management in the organization. If the average scores are similarly positive, the organization should only consider inexpensive interventions to maintain high levels of the assessed factors. Another argument for inexpensive interventions is the relatively low effect size reported in the results, indicating that a lot of other factors may be influential in predicting error management. A transformational leadership workshop like the one proposed can still be valuable for employees that are transferring to a supervisory role. The personnel development department might be encouraged to offer a workshop, for example once a year, to newly promoted and future supervisors.

Trust can easily be nourished in daily practice. Apart from regular work-related communication, spending informal time together like during lunch breaks or at after work events is a way to maintain relational trust to employees (Turaga, 2013). On top of planned appraisal meetings, it is useful for employees' competence development to integrate feedback into daily work (Phunthasaen & Chungviwatanant, 2020). This way trust in competence can be maintained. Leaders should be encouraged to adapt their daily routines to create time and opportunities for employee interaction and feedback.

Another recommendation for the organization is that adopting a transformational leadership style and maintaining trust in subordinates might be integrated into a common understanding of leadership. Through a common understanding of leadership new supervisors know what to focus on in their role as leaders. This way the high degree of transformational leadership can be maintained by the next generation of leaders.

## **Conclusion**

In today's VUCA economy, practices like empowerment and error management become increasingly important to establish a workforce that can flexibly react to unfamiliar circumstances and challenges. Influencing empowerment and error management directly requires timely and costly organization-wide interventions. This study has shown indications that empowerment and error management can likely be improved through interventions on transformational leadership and trust in subordinates. Furthermore, the theoretical literature was expanded by the results of the current study. Of specific theoretical value was the assessment of the perspective of leaders. Hereby the role of leaders as important agents of change in organizational learning was further emphasized. Achieving their commitment is a crucial first step toward improving the flexibility of a workforce.

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Appendix A  
Information letter, Consent Form, Debriefing (German Version)

**Informationsschreiben**

Für ein Forschungsprojekt im Rahmen einer Masterarbeit:  
*Führungsstil, Vertrauen und Organisationskultur*

Dieses Forschungsprojekt ist Teil der Masterarbeit von mir, Anne Schiller, Praktikantin in der Personalabteilung der Gothaer und Studentin des Master of Work, Organization & Health. Die Abschlussarbeit wird von der Radboud University wissenschaftlich begleitet.

Inhalt der Studie ist die Untersuchung der Zusammenhänge von einem Führungsstil, Vertrauen und der Organisationskultur.

Hierfür bitte ich die Teilnehmenden verschiedene Fragebögen auszufüllen. Diese dienen zur Messung von den genannten Themen zugehörigen Variablen. Alle Fragen werden anhand von Likert-Skalen mit 5 bzw. 7 Antwortmöglichkeiten beantwortet. Dies sollte insgesamt ca. 10 Minuten dauern. Alle Angehörigen der Führungsebene eins und zwei der Gothaer sind zur Teilnahme berechtigt. Vergütungen für die Teilnahme gibt es keine.

Sie können die Studie zu jeder Zeit abbrechen, ohne einen Grund dafür nennen zu müssen. Ein Abbruch hat keinerlei Konsequenzen für Sie.

Alle gesammelten Informationen werden anonym prozessiert und können so keinen individuellen Personen zugewiesen werden. Dementsprechend kann auch niemand über persönliche Resultate informiert werden, allerdings wird eine Zusammenfassung der Resultate der gesamten Teilnehmer\*innengruppe der Gothaer von mir zur Verfügung gestellt.

Sollten Sie nach diesem Schreiben noch Fragen haben, wenden Sie sich bitte an eine der folgenden E-Mail-Adressen:

[Anne.schiller@gothaer.de](mailto:Anne.schiller@gothaer.de) oder [A.schiller@student.ru.nl](mailto:A.schiller@student.ru.nl)

Nun bitte ich Sie, zu überlegen, ob Sie an dieser Studie teilnehmen möchten. Sollte dies der Fall sein, bitte ich Sie, es auf der folgenden Einverständniserklärung zu bestätigen. Mit der Bestätigung geben Sie an, ausreichend über die Studie informiert worden zu sein, dass Sie an dieser teilnehmen möchten und Sie dies freiwillig tun.

Viele Grüße  
Anne Schiller

**Einverständniserklärung**

Für die Teilnahme an einem Forschungsprojekt im Rahmen einer Masterarbeit:  
*Führungsstil, Vertrauen und Organisationskultur*

Hiermit bestätige ich, dass...

- Ich ausreichend über die Studie informiert wurde und ich die bereitgestellten Informationen gelesen und verstanden habe.
- Ich informiert wurde, dass die Studie von einer Studentin im Rahmen einer Masterarbeit durchgeführt wird.
- Ich die Möglichkeit hatte Fragen zu stellen (per E-Mail) und diese zufriedenstellend beantwortet wurden.
- Ich genug Zeit hatte zu überlegen, ob ich meine Zustimmung geben möchte.
- Ich aus eigenem Willen teilnehme.

Ich verstehe, dass...

- Ich die Studie jederzeit ohne jegliche Konsequenzen abbrechen kann, ohne dies begründen zu müssen.
- Meine Angaben anonym prozessiert werden.
- Die Resultate der Studie nicht als diagnostischer Test gezählt werden können.
- Ich nicht über meine individuellen Resultate informiert werde.

Wenn Sie das Feld „Ich stimme zu“ anklicken, geben Sie Ihr Einverständnis an dieser Studie teilzunehmen.

- Ich stimme zu

### **Nachbereitung**

Für die Teilnahme an einem Forschungsprojekt im Rahmen einer Masterarbeit:  
*Führungsstil, Vertrauen und Organisationskultur*

Danke für Ihre Teilnahme an der Studie! Am Anfang haben Sie erfahren, dass die Zusammenhänge eines Führungsstils, Vertrauen und der Organisationskultur untersucht werden.

Die spezifischen Variablen waren transformationale Führung, ein Führungsstil mit starkem Fokus auf die Erfüllung des Potenzials von Angestellten. Der zweite Fragebogen war auf die Messung vom Vertrauen in Angestellte ausgerichtet. Die letzten beiden Fragebögen dienten zur Erfassung von „Employee Empowerment“, in diesem Fall wie viel Entscheidungsautorität Mitarbeitende haben, und dem organisatorischen Fehlermanagement, wie nach Aufkommen von Fehlern mit diesen umgegangen wird.

Meine Absicht ist zu untersuchen, ob transformationale Führung mit Employee Empowerment und dem organisatorischen Fehlermanagement zusammenhängt, wie es in vorherigen Studien gezeigt wurde. Zudem möchte ich herausfinden, welche Rolle das Vertrauen in Angestellte möglicherweise in diesen Zusammenhängen spielt. Meine Hypothese lautet, dass transformationale Führungskräfte mehr Vertrauen in Angestellte aufbauen und ich nehme an, dass Vertrauen wiederum auf positive Weise mit Employee Empowerment und dem organisatorischen Fehlermanagement assoziiert ist.

Empowerment und Fehlermanagement sind wichtige Praktiken für die Lernkultur eines Unternehmens, allerdings sind beide sehr schwierig direkt zu beeinflussen. Sollten die untersuchten Zusammenhänge signifikant sein, könnte die Förderung von transformationaler Führung und dem Vertrauen in Angestellte als Intervention, um auch die zuvor genannten Praktiken positiv zu beeinflussen, genutzt werden.

Sollten Sie noch offene Fragen, Beschwerden oder Anmerkungen zu dieser Studie haben, kontaktieren Sie mich bitte:

[Anne.schiller@gothaer.de](mailto:Anne.schiller@gothaer.de) oder [A.schiller@student.ru.nl](mailto:A.schiller@student.ru.nl)

Viele Grüße  
Anne Schiller

Appendix B  
Information letter, Consent Form, Debriefing (English Version)

**Information letter**

concerning a study within the framework of a Master thesis:

*Leadership style, trust and organizational culture*

This study is part of the master project of me, Anne Schiller, intern in the personnel division at Gothaer and student of the Master of Work, Organization & Health. The thesis is scientifically accompanied by the Radboud University.

Content of the study is an investigation of the relationships between leadership style, trust and organizational culture.

For this purpose, I am asking the participants to fill out a row of questionnaires. Those aim to assess variables belonging to the named constructs. All questions are answered using Likert scales with either five or seven response possibilities. The length of the study should be approximately 10 minutes. All Gothaer members of the top two management levels are eligible to participate. There are no reimbursements for participation.

During the study you can indicate at any moment in time that you want to quit participating without having to indicate a reason. This will have no consequences for you whatsoever.

All information that is collected will be processed anonymously. This means that results cannot be traced back to individual persons. Consequently, nobody can be informed about their individual results of the study. However, a summary of the results of the sample as a whole will be made available to the Gothaer by me.

If you wish for any further information or have questions after reading this information letter, please contact me via e-mail:

[Anne.schiller@gothaer.de](mailto:Anne.schiller@gothaer.de) or [A.schiller@student.ru.nl](mailto:A.schiller@student.ru.nl)

Now I am asking you to think about whether you want to participate in the study. Should this not be the case I am thanking you for taking the time.

If you indicate that you want to participate, I am asking you to confirm this on the following consent form. With the confirmation you are indicating that you were sufficiently informed about the study and that you want to participate voluntarily.

Kind regards,  
Anne Schiller

**Consent form**

concerning a study within the framework of a Master thesis:

*Leadership style, trust and organizational culture*

I hereby confirm that...

- I was sufficiently informed about the study and I have read and understood the provided information.
- I was informed that the study will be conducted by a student in the context of a master thesis.
- I have had the opportunity to ask questions (via e-mail) and these were answered sufficiently.
- I have had enough time to think about whether I want to give my consent.
- I participate out of my own will.

I understand that...

- I can quit filling in the questionnaires at any moment without any consequences and without having to give an explanation.
- My information will be processed anonymously.
- The results of the study do not count as a diagnostic test.
- I will not be informed about my individual results.

If you click the field “I agree”, you indicate your consent to participate in this study.

- I agree

### **Debriefing**

concerning a study within the framework of a Master thesis:

*Leadership style, trust and organizational culture*

Thanks for participating in the study! At the beginning you were informed that the relationships between leadership style, trust, and organizational culture will be investigated. Specifically, transformational leadership was measured, a leadership style that has a strong focus on fulfilling employees’ potential. The second questionnaire aimed to assess participants’ trust in subordinates. The latter two aimed to measure employee empowerment, in this case meaning how much (decision-making) authority employees are granted, and the organizational error management, how errors are perceived and treated after they have occurred.

My research purpose is to investigate whether transformational leadership is related to employee empowerment and organizational error management as it was shown in previous studies. Furthermore, I want to find out what role trust in subordinates possibly plays in these relationships as I hypothesize that transformational leaders have more trust in their subordinates and trust, in turn, is hypothesized to be related to employee empowerment and organizational error management in a positive way.

Apart from the theoretical value of this study, empowerment and error management are important practices for the learning culture of an organization. However, they are very difficult to change directly. If the investigated relationships are significant, fostering transformational leadership and trust in subordinates could be used as interventions to also have a positive impact on the formerly mentioned constructs.

If you have any further questions, complaints or remarks about this study please do not hesitate to contact me:

[Anne.schiller@gothaer.de](mailto:Anne.schiller@gothaer.de) or [a.schiller@student.ru.nl](mailto:a.schiller@student.ru.nl)

Kind regards,  
Anne Schiller

Appendix C  
Personal Information & Scales (German Version)

**Persönliche Informationen**

Alter:

- 30 oder jünger
- 31-40
- 41-50
- 51-60
- 61 oder älter

Geschlecht:

- weiblich
- männlich
- divers

**Führungsstil**

Eigener Führungsstil: In diesem Teil des Fragebogens geht es um Ihren eigenen Führungsstil. Bitte beantworten Sie alle Fragen zügig und vertrauen Sie dabei Ihrem spontanen Urteil. Auf dieser Seite sind Aussagen aufgelistet, die Sie als Führungskraft beschreiben. Schätzen Sie ein, wie häufig diese Aussagen auf Sie zutreffen.

Ich...

1 prüfe stets aufs Neue, ob zentrale/wichtige Annahmen noch angemessen sind.

2 spreche mit den Mitarbeitern über ihre wichtigsten Überzeugungen und Werte.

*Adjusted:* spreche mit den Mitarbeitenden über ihre wichtigsten Überzeugungen und Werte.

3 suche bei der Lösung von Problemen nach unterschiedlichen Perspektiven

4 äußere mich optimistisch über die Zukunft.

5 bin jemand, bei dem die Mitarbeiter stolz sind, mit ihm/ihr zu tun zu haben.

*Adjusted:* bin jemand, bei dem die Mitarbeitenden stolz sind, mit ihm/ihr zu tun zu haben.

6 spreche mit Begeisterung über das, was erreicht werden soll.

7 mache den Mitarbeitern klar, wie wichtig es ist, sich 100%-ig für eine Sache einzusetzen.

*Adjusted:* mache den Mitarbeitenden klar, wie wichtig es ist, sich 100%-ig für eine Sache einzusetzen.

8 nehme mir Zeit für Führung und dafür, den Mitarbeitern etwas beizubringen.

*Adjusted:* nehme mir Zeit für Führung und dafür, den Mitarbeitenden etwas beizubringen.

9 stelle meine eigenen Interessen zurück, wenn es um das Wohl der Gruppe geht.

10 berücksichtige die Individualität jedes einzelnen Mitarbeiters und behandle ihn nicht nur als irgendeinen unter vielen.

*Adjusted:* berücksichtige die Individualität jedes einzelnen Mitarbeitenden und behandle ihn/sie nicht nur als irgendeine/-n unter vielen.

11 handele in einer Weise, die bei anderen Respekt erzeugt.

12 berücksichtige die moralischen und ethischen Konsequenzen meiner Entscheidungen.

13 strahle Stärke und Vertrauen aus.

14 formuliere eine überzeugende Zukunftsvision.

15 erkenne die individuellen Bedürfnisse, Fähigkeiten und Ziele meiner Mitarbeiter.

*Adjusted:* erkenne die individuellen Bedürfnisse, Fähigkeiten und Ziele meiner Mitarbeitenden.

16 bringe meine Mitarbeiter dazu, Probleme aus verschiedenen Blick-winkeln zu betrachten.

*Adjusted:* bringe meine Mitarbeitenden dazu, Probleme aus verschiedenen Blickwinkeln zu betrachten.

17 helfe meinen Mitarbeitenden, ihre Stärken auszubauen.

*Adjusted:* helfe meinen Mitarbeitenden, ihre Stärken auszubauen.

18 schlage neue Wege vor, wie Aufgaben/Aufträge bearbeitet werden können.

19 betone die Wichtigkeit von Teamgeist und einem gemeinsamen Aufgabenverständnis.

20 habe großes Vertrauen, dass die gesteckten Ziele erreicht werden.

*Note.* The original scale used the word “Mitarbeiter”, which was replaced by “Mitarbeitenden” in the current study to fit the corporate language regarding gender inclusivity.

Antwortmöglichkeiten:

- 1 • nie
- 2 • selten
- 3 • hin und wieder
- 4 • oft
- 5 • regelmäßig, fast immer

### **Vertrauen**

Im folgenden Teil geht es um Ihre Wahrnehmung von Mitarbeitenden. Bitte denken Sie dabei an die Angestellten, mit denen Sie regelmäßig in Ihrer Rolle als Führungskraft zusammenarbeiten. Geben Sie an, zu welchem Grad Sie diesen Aussagen zustimmen.

Ich vertraue darauf, dass Mitarbeitende...

- 1 komplett ehrlich mit mir sind.
- 2 die Interessen unseres Unternehmens über ihre eigenen stellen.
- 3 die Versprechen, die sie machen, halten.
- 4 kompetent bei der Ausübung ihres Jobs sind.
- 5 ihre wahren Gefühle über wichtige Angelegenheiten ausdrücken.
- 6 um mein Wohlbefinden bedacht sind.
- 7 zum Erfolg unseres Unternehmens beitragen können.
- 8 nach ihren eigenen Worten handeln.
- 9 wichtige Informationen mit mir teilen.
- 10 um die Zukunft unseres Unternehmens bedacht sind.
- 11 dabei helfen können, wichtige Probleme in unserem Unternehmen zu lösen.
- 12 konsequente Erwartungen an mich haben.
- 13 persönliche Opfer für unser Unternehmen bringen würden.
- 14 ihre eigenen Fehler anerkennen würden.
- 15 unserem Unternehmen helfen können, durch die 2020er zu kommen.
- 16 auf sich verlassen können.

Antwortmöglichkeiten:

- 1 • Stimme überhaupt nicht zu
- 2 • Stimme nicht zu
- 3 • Stimme eher nicht zu
- 4 • Stimme weder zu noch lehne ich ab
- 5 • Stimme eher zu
- 6 • Stimme zu
- 7 • Stimme voll und ganz zu

### **Autorität von Mitarbeitenden**

Im folgenden Teil geht es um Ihre Wahrnehmung der Autorität von Mitarbeitenden. Bitte denken Sie dabei an die Angestellten, mit denen Sie regelmäßig in Ihrer Rolle als Führungskraft zusammenarbeiten. Geben Sie an, zu welchem Grad Sie diesen Aussagen zustimmen.

- 1 Mitarbeitende dürfen fast alles tun, um einen qualitativ guten Job zu machen.
- 2 Mitarbeitende besitzen die Autorität Probleme zu korrigieren, wenn sie auftreten.
- 3 Mitarbeitende dürfen kreativ sein, wenn sie mit Problemen bei der Arbeit zu tun haben.
- 4 Mitarbeitende müssen nicht viele Hürden überwinden, wenn sie etwas ändern möchten.
- 5 Mitarbeitende haben viel Kontrolle darüber, wie sie ihren Job ausführen.
- 6 Mitarbeitende brauchen nicht erst die Zustimmung Höhergestellter, bevor sie Probleme behandeln.
- 7 Mitarbeitende sind dazu ermutigt, mit arbeitsrelevanten Problemen selbst umzugehen.
- 8 Mitarbeitende können Änderungen in ihrem Job vornehmen, wann immer sie möchten.

Antwortmöglichkeiten:

- 1 • Stimme überhaupt nicht zu
- 2 • Stimme nicht zu
- 3 • Stimme weder zu noch lehne ich ab
- 4 • Stimme zu
- 5 • Stimme voll und ganz zu

### **Fehler**

Im folgenden Teil geht es um Ihre Wahrnehmung der Fehlerkultur in Ihrer Unternehmensabteilung. Schätzen Sie ein, zu welchem Grad diese Aussagen zutreffen.

- 1 Für uns sind Fehler sehr hilfreich, um Arbeitsprozesse zu verbessern.
- 2 Nach einem Fehler überlegen Leute, wie sie ihn korrigieren können
- 3 Nachdem ein Fehler passiert ist, wird er gründlich analysiert.
- 4 Wenn etwas schiefgegangen ist, nehmen sich Leute Zeit, um es zu überdenken.
- 5 Wenn ein Fehler gemacht wurde, analysieren Leute, was diesen ausgelöst hat.
- 6 In diesem Unternehmen denken Leute viel darüber nach, wie ein Fehler vermieden hätte werden können.
- 7 Ein Fehler gibt wichtige Informationen für die Fortsetzung der Arbeit.
- 8 Unsere Fehler zeigen uns an, was wir verbessern können.
- 9 Beim Bewältigen einer Aufgabe können Leute viel aus ihren Fehlern lernen.
- 10 Wenn ein Fehler passiert ist, wissen wir oft, wie wir diesen ausbessern können.
- 11 Wenn ein Fehler gemacht wurde, wird dieser sofort korrigiert.
- 12 Auch wenn wir Fehler machen, verlieren wir nicht unser Endziel aus den Augen.
- 13 Wenn Leute unfähig sind, einen Fehler selbst zu korrigieren, wenden sie sich an ihre Kollegen.
- 14 Wenn Leute unfähig sind, ihre Arbeit nach einem Fehler fortzusetzen, können sie sich auf andere verlassen.
- 15 Wenn Leute einen Fehler machen, können sie andere um Rat fragen, wie sie weitermachen sollen.
- 16 Wenn jemand einen Fehler begeht, teilt sie/er diesen mit anderen, sodass sie nicht denselben Fehler machen.

Antwortmöglichkeiten:

- 1 • Trifft überhaupt nicht zu
- 2 • Trifft eher nicht zu

- 3 • Trifft teils zu
- 4 • Trifft eher zu
- 5 • Trifft vollkommen zu

Appendix D  
Personal Information & Scales (English Version)

**Personal information**

Age:

- 30 or younger
- 31-40
- 41-50
- 51-60
- 61 or older

Gender:

- female
- male
- diverse

**Leadership**

Own leadership style: This part of the questionnaire is about your own leadership style. Please answer all questions quickly and trust your spontaneous judgement. On this page are statements about you in your role as a leader. Estimate how frequently these statements apply to you.

I...

- 1 regularly check if central / important assumptions are still adequate.
- 2 speak to employees about their most important beliefs and values.
- 3 look for different perspectives when solving problems.
- 4 talk optimistically about the future.
- 5 am somebody that employees are proud to be around.
- 6 speak enthusiastically about what is aimed to achieve.
- 7 make it clear to employees that it is important to 100% advocate for a matter.
- 8 take my time for leadership and for teaching employees something.
- 9 put my own interests back whenever it benefits the group.
- 10 respect the individuality of every employee and don't treat them like one in many.
- 11 act in a way that makes others respect me.
- 12 keep the moral and ethical consequences of my decisions in mind.
- 13 radiate strength and trustworthiness.
- 14 formulate a convincing future vision.
- 15 recognize the individual needs, skills and goals of my employees.
- 16 get my employees to consider problems from multiple perspectives.
- 17 help my employees to work on their strengths.
- 18 propose new ways to complete tasks.
- 19 emphasize the importance of team spirit and a common understanding of tasks.
- 20 have great trust that set goals can be accomplished.

Response possibilities:

- 1 • Never
- 2 • Rarely
- 3 • Sometimes
- 4 • Often
- 5 • Regularly, almost always

**Trust**

The following part will be about your perception of employees. Please think of the employees that you regularly deal with in your role as a leader. Indicate to which degree you agree with the following statements.

I trust that employees...

- 1 are completely honest with me.
- 2 place our organization's interests above their own.
- 3 will keep the promises that they make.
- 4 are competent in performing their jobs.
- 5 express their true feelings about important issues.
- 6 care about my well-being.
- 7 can contribute to our organization's success.
- 8 take actions that are consistent with their words.
- 9 share important information with me.
- 10 care about the future of our organization.
- 11 can help solve important problems in our organization.
- 12 have consistent expectations of me.
- 13 would make personal sacrifices for our organization.
- 14 would acknowledge their own mistakes.
- 15 can help our organization survive through the 1990s.
- Adjusted:* can help our organization survive through the 2020s.
- 16 can be relied on.

Response possibilities:

- 1 • Do not agree at all
- 2 • Do not agree
- 3 • Rather do not agree
- 4 • Rather agree nor disagree
- 5 • Rather agree
- 6 • Agree
- 7 • Completely agree

### **Employees' authority**

The following part is about your perceptions of the authority of employees. Please think of employees that you regularly work with in your role as a leader. Indicate to which degree you agree with the following statements.

- 1 I am allowed to do almost anything to do a high-quality job.  
*Adjusted:* employees are allowed to do almost anything to do a high-quality job.
- 2 I have the authority to correct problems when they occur.  
*Adjusted:* employees have the authority to correct problems when they occur.
- 3 I am allowed to be creative when I deal with problems at work.  
*Adjusted:* employees are allowed to be creative when they deal with problems at work.
- 4 I do not have to go through a lot of red tape to change things.  
*Adjusted:* employees do not have to go through a lot of red tape to change things.
- 5 I have a lot of control over how I do my job.  
*Adjusted:* employees have a lot of control over how they do their job.
- 6 I do not need to get management's approval before I handle problems.  
*Adjusted:* employees do not need to get management's approval before they handle problems.
- 7 I am encouraged to handle job-related problems by myself.  
*Adjusted:* employees are encouraged to handle job-related problems by themselves.

8 I can make changes on their job whenever I want.

*Adjusted:* employees can make changes on their job whenever they want.

Response possibilities:

- 1 • Do not agree at all
- 2 • Do not agree
- 3 • Do not agree nor disagree
- 4 • Agree
- 5 • Completely agree

### **Errors**

The following part is about your perception of the error management culture in your organizational department. Indicate to which degree the statements apply.

- 1 For us, errors are very useful for improving the work process.
- 2 After an error, people think through how to correct it.
- 3 After an error has occurred, it is analyzed thoroughly.
- 4 If something went wrong, people take the time to think it through.
- 5 After making a mistake, people try to analyze what caused it.
- 6 In this organization, people think a lot about how an error could have been avoided.  
(reversed)
- 7 An error provides important information for the continuation of the work.
- 8 Our errors point us at what we can improve.
- 9 When mastering a task, people can learn a lot from their mistakes.
- 10 When an error has occurred, we usually know how to rectify it.
- 11 When an error is made, it is corrected right away.
- 12 Although we make mistakes, we don't let go of the final goal.
- 13 When people are unable to correct an error by themselves, they turn to their colleagues.
- 14 If people are unable to continue their work after an error, they can rely on others.
- 15 When people make an error, they can ask others for advice on how to continue.
- 16 When someone makes an error, (s)he shares it with others so that they don't make the same mistake.

Response possibilities:

- 1 • Does not apply at all
- 2 • Does rather not apply
- 3 • Does partly apply
- 4 • Does rather apply
- 5 • Applies completely

## Appendix E

### Assessing Statistical Assumptions of the two Main Analyses

In a linear regression analysis the unstandardized and standardized predicted values and residuals for empowerment as dependent variable with transformational leadership and trust as independent variables were saved. The same was repeated replacing empowerment with error management as dependent variable. In the following sections the statistical assumptions of linear regression analyses were assessed.

#### **Normality of the Residuals**

The assumption of normality was assessed by running a Shapiro-Wilk test with the residuals of both analyses. The Shapiro-Wilk test showed no significant deviations from normality for the residuals of the analysis involving empowerment ( $W(81) = .981, p = .288$ ). Likewise, the Shapiro-Wilk test showed no significant deviations from normality for the residuals of the analysis involving error management ( $W(81) = .987, p = .604$ ). Thus, the assumption of normality was holding for both main analyses.

#### **Linearity**

The standardized residuals of the analysis involving empowerment were plotted against the standardized predicted values. A Loess line was fitted at total and was relatively even on the Y-axis at 0. Regarding the plots of the analysis involving error management, there could be slight violations of linearity as judged by the Loess curve. However, since bootstrapping is used in the main analyses, they are robust against violations of the assumption of linearity.

#### **Homoscedasticity of the Residuals**

The same plot that was used to assess linearity was used to check for homoscedasticity. The dots were relatively evenly spread out across the plot, not forming a funnel shape. This indicates no violation against homoscedasticity for both groups of residuals and predicted values.

#### **Absence of Multicollinearity**

The presence of multicollinearity was assessed by first looking at the Pearson correlation's between transformational leadership and trust. Multicollinearity might be present when strong correlations between independent variables are observed. This was not the case as judged by the the correlation between transformational leadership and trust, which was .426 (see Table 2). Furthermore, the collinearity statistics for transformational leadership (Tolerance = .82, VIF = 1.22) and for trust (Tolerance = .82, VIF = 1.22) were obtained. As the values for the Tolerance statistic were above .1 and the values for the variance of inflation were below 10, there appeared to be no violations of the absence of multicollinearity.

#### **Independence**

The assumption of independence was assessed by looking at the Durbin-Watson statistic for the residuals. Violations can be considered when the Durbin-Watson value is below 1 or above 3. In the case of the analysis involving empowerment the assumption of independence was not violated (Durbin-Watson value = 1.70). Similarly, in the case of the analysis involving error management the assumption of independence was not violated (Durbin-Watson value = 1.68).

#### **Absence of Influential Cases**

The absence of influential cases biasing the models was assessed by looking at the values of Cook's Distance. For both regression analyses there was no value of Cook's Distance that was greater than 1. Therefore, the assumption of the absence of influential cases was met.

Appendix F  
Ethical Checklist

Title study: The Role of Trust in the Relationship Between Transformational Leadership and Organizational Learning Practices

Names researchers: Anne Schiller

Supervising teacher: Pam ten Broeke

<b>General</b>	<b>NA</b>	<b>Yes</b>	<b>No</b>
1. When the study is not taking place at the university: Is there written consent of the director of the organisation where the study takes place?	<b>x</b>		
<b>Participants in the study</b>	<b>NA</b>	<b>Yes</b>	<b>No</b>
1. Does the study concern a medically and psychologically healthy population?		<b>x</b>	
2. Are the participants in your study aged 18 years or older <b>and</b> are they mentally competent?  If the answer to this question is no, then answer the following question: If the research involves under-aged (<18 years) participants, is this research target-bound?		<b>x</b>	
3. Do participants receive <i>at most</i> a relatively small and reasonable reimbursement for their participation? Which type of reimbursement is given? x no reimbursement O assigning participant credits O Gift card or cash money with a maximum value of 10 euro O other, i.e. ....		<b>x</b>	
<b>Interaction with participants</b>	<b>NA</b>	<b>Yes</b>	<b>No</b>
1. Are participants completely free to participate in the study?		<b>x</b>	
2. Are participants allowed to stop their participation at any time during the study whenever they want to, without stopping having any consequences and without the need to give a reason?		<b>x</b>	
3. Is the information about the study clear <b>and</b> adjusted to the participants? (for example, are under-aged participants informed conform their level and not conform the level of an adult?)		<b>x</b>	
4. Are participants offered time for reflection between receiving the written information and giving consent?		<b>x</b>	
5. Are participants actively asked for consent to participation in the study?		<b>x</b>	

6. Are parents/guardians of the participants actively asked for consent to participation in the study? (this question is only relevant if the participants are under-aged).	<b>x</b>		
7. If video and/or audio recordings are made and the participant is recognizable on the image or the audio: Is explicit consent asked for making these recordings?	<b>x</b>		
8. If prior to the study, the nature of the study makes it impossible to provide complete information to the participants, is it ensured that participants are completely being debriefed afterwards?	<b>x</b>		
9. Is it clear to the participants where complaints about participation in the study can be expressed, and how these will be treated?		<b>x</b>	
10a. Are the research data anonymously processed? If the answer is yes, then indicate below how this is guaranteed. x The data are gathered anonymously O The data are not gathered anonymously, but the data are saved anonymously.  10b. Is the key stored separately from the data?		<b>x</b>	
11. If video and/or audio recordings are made and the participant is recognizable on the image or the audio: Are these recordings stored at an extra secure location (e.g., thus not at home or at an usb-stick, but at a secure server of the university).	<b>x</b>		
<b>Research set-up</b>	<b>NA</b>	<b>Yes</b>	<b>No</b>
1. Do you declare that you do <b>not</b> use clinical diagnostic instruments in your study?		<b>x</b>	
2. Do you declare that you do <b>not</b> use a method with which it is possible to collect coincidental findings about which the participants should be informed?		<b>x</b>	
3. Do you declare that you do <b>not</b> use unobtrusive methods in your study?		<b>x</b>	
4. Do you declare that you do <b>not</b> use bodily material in your study?		<b>x</b>	
5. Do you declare that you do <b>not</b> use stimulus material that can be perceived as shocking or offensive?		<b>x</b>	
6. Do you declare that participants are <b>not</b> subjected to certain activities or forced to act in a certain way that falls outside a normal way of behaving?		<b>x</b>	
7. Are the risks and objections for participation minimal? Is the risk that participants run comparable to the risk that people run in daily life?		<b>x</b>	

8. Do you declare that you do <b>not</b> use deception in your study?		<b>x</b>	
If the answer to this question is no, then also answer question 8.1 to 8.5.			
8.1 Do you declare that the deception is necessary to answer the research question? (i.e. it would be impossible to answer the research question without deception?)			
8.2 Do you declare that you do <b>not</b> deceive participants about the possible risks of participating in the study?			
8.3 After deception, do you always and completely debrief the participants about the ways in which they were deceived?			
8.4 Do you declare that the deception <b>cannot</b> lead to temporary negative effects? (e.g. if participants are given false feedback about their intelligence scores)			
8.5 Does the debriefing take place immediately after the end of the study, or at latest within one month after the end of the study?			