



Short research note

Transformational leadership and performance: An experimental investigation of the mediating effects of basic needs satisfaction and work engagement

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The aim of the present research was to integrate and extend theorizing on transformational leadership, self-determination, and work engagement. Specifically, we tested experimentally our hypotheses that the satisfaction of followers' basic psychological needs (i.e., for competence, relatedness, and autonomy) and work engagement mediate the relationship between transformational leadership and performance. A total of 190 participants worked on a brainstorming task under either a transformational or a non-transformational leadership condition. Followers' performance was operationalized through quantity, quality, and persistence. Results revealed that satisfaction of the needs for competence and relatedness mediated the relationship between transformational leadership and work engagement, which, in turn, was positively related to quality, quantity, and persistence. Taken together, these findings are largely in line with our theoretical model and support Bass' (*Leadership and performance beyond expectations*. New York, NY: Free Press, 1985) and Burns' (*Leadership*. New York: Harper & Row, 1978) theories on needs satisfaction being a central mechanism behind transformational leadership.

Practitioner points

- The results of this study suggest that organizations can benefit from implementing measures to increase employees' work engagement, because this can enhance employees' performance.
- Furthermore, the study provides an indication of how to design such measures. It suggests that initiatives focusing on followers' basic psychological needs satisfaction (especially of the needs for competence and relatedness) are particularly effective.
- Finally, our findings indicate that transformational leadership is one concrete way to foster employees' needs satisfaction and, consequently, work engagement and performance. Hence, integrating the frameworks of transformational leadership and followers' psychological needs can provide valuable insights for leadership development.

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Transformational leadership (TFL) is widely regarded as one of the most effective leadership styles (Judge & Piccolo, 2004). Researchers have attempted to explain its effectiveness, and several studies have explored the mediating mechanisms that underlie the effect of TFL on follower performance. Extant research has largely focused on three kinds of mediators: (1) followers' attitudes (e.g., leader satisfaction), (2) followers' self-perception (e.g., social identification), and (3) followers' perception of their job (e.g., purpose; for overviews, see Bass & Riggio, 2006; Felfe, 2006). Although these studies have significantly enhanced our understanding of TFL, they seem to have neglected a central mechanism proposed by the TFL theory: The mediating role of followers' needs. Indeed, Burns (1978) stated that 'the essence of the leaders' power is [...] the extent to which they can satisfy – or appear to satisfy – specific *needs* of the followers' (p. 294; emphasis in original). Moreover, Burns defined the transformational leader as a person who 'seeks to satisfy higher needs and engages the full potential of the follower' (p. 4). Similarly, Bass (1985) characterized TFL as addressing and meeting followers' higher psychological needs, which in turn motivates them to show 'performance beyond expectations'.

Surprisingly, to date, only two studies have examined followers' needs satisfaction as mediators of TFL (Hetland, Hetland, Andreassen, Pallesen, & Notelaers, 2011; Kovjanic, Schuh, Jonas, Van Quaquebeke, & van Dick, 2012). Drawing on self-determination theory (Deci & Ryan, 2000), these studies suggest that (1) TFL is related to followers' psychological needs satisfaction, and (2) needs satisfaction mediates the relationship between TFL and followers' attitudes (e.g., job satisfaction and affective commitment).

The purpose of this study is to advance the analyses of followers' needs satisfaction as mediators of TFL by addressing three central, yet unanswered questions: First, this study seeks to extend the existing analyses by examining the central yet untested tenet of TFL theory that transformational leaders foster followers' performance by satisfying their higher psychological needs. Although TFL and needs satisfaction have been linked to followers' attitudes, it seems too early to automatically infer that the same mediating processes will apply to followers' behaviours. This is because theoretical and empirical work suggests that attitudes are relatively weak indicators of actual behaviour (Maio & Haddock, 2010) and because TFL has been found to affect different followers' outcomes via different mediators (Kark, Shamir, & Chen, 2003). Second, we seek to effectively complement the existing empirical tests, which may have suffered from limitations associated with correlational and self-report-based field studies. By adopting an experimental design, this study aims to eliminate potential alternative explanations (e.g., common-method variance) and to provide support for causality. Third, we seek to extend the needs-based model of TFL by responding to Greguras and Diefendorff (2009) who argued that examining basic needs satisfaction without considering its impact on intrinsic motivation omits a crucial intervening step. Moreover, Walumbwa and Hartnell (2011) noted that most studies on TFL processes have examined rather basic models and largely neglected the possibility of sequential mediation. Therefore, building on the self-determination literature, we examined work engagement – a key indicator of intrinsic motivation (Salanova & Schaufeli, 2008) – as a second, sequential mediator linking TFL and followers' outcomes (Figure 1).

Transformational leadership and basic needs satisfaction

Bass (1985) conceptualized TFL as containing four dimensions: *Idealized influence* refers to role modelling, the articulation of high expectations and confidence in followers. *Inspirational motivation* refers to providing vision and meaning and being optimistic

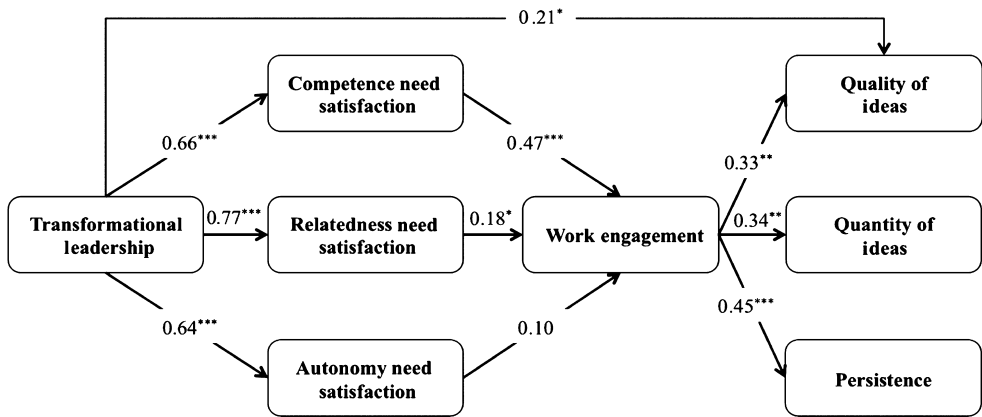


Figure 1. Standardized path coefficients for the proposed mediation model. Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

about the future. *Intellectual stimulation* refers to encouraging followers to challenge existing approaches, reframe problems, and think in new ways. *Individualized consideration* refers to taking followers' differences and perspectives into account and being a coach and mentor.

With these behaviours, transformational leaders seem to address three central follower needs (Hetland *et al.*, 2011; Kovjanic *et al.*, 2012): The need for competence (i.e., a sense of mastery and effectiveness), relatedness (i.e., feeling connected and significant to others), and autonomy (i.e., experiencing of volition and choice). These needs are central aspects of self-determination theory (SDT; Deci & Ryan, 2000), which describes satisfaction of these needs as essential for effective performance. In the workplace, leaders are one of the most important factors for needs satisfaction. They influence followers' (perceptions of) goals, tasks, and rewards, and, in that, they craft followers' jobs in ways that are more or less beneficial for needs satisfaction (Gagné & Deci, 2005). Contrary to other, specific forms of satisfaction that relate to TFL (e.g., job or leadership satisfaction), SDT's needs specify three universal conditions the satisfaction (or fulfilment) of which supports individuals' growth, development, and performance. This focus on personal growth and development is consistent with the concept of higher-order needs for self-actualization and personal growth (Maslow, 1943) and, accordingly, with Burns (1978) and Bass (1985), who suggested that transformational leaders' effectiveness is rooted in their ability to elevate and satisfy these higher-order needs among followers (Shamir, House, & Arthur, 1993).

Specifically, transformational leaders likely foster competence need satisfaction by providing challenges while also showing confidence in and enhancing followers' abilities (e.g., through coaching and role modelling). Further, they respect their followers' individuality (e.g., when helping them to overcome personal challenges) while simultaneously strengthening team spirit by voicing a compelling vision for the group and by emphasizing the importance of the group's purpose. This likely supports relatedness need satisfaction. Finally, when voicing their vision, transformational leaders refer to attractive and universalistic values. Hence, followers likely experience the group's goals as consistent with their personal principles and, accordingly, accept them as their own. Moreover, transformational leaders encourage followers to develop individual solutions to existing problems and consider followers' perspectives when making decisions. Hence, they create an environment enabling autonomy need satisfaction.

Hypothesis 1: TFL has positive effects on followers' satisfaction of the needs for competence, relatedness, and autonomy.

Basic needs satisfaction, work engagement, and performance

One concept that is strongly associated with SDT, given its close relation to intrinsic motivation, and that has recently been linked to TFL is work engagement (Tims, Bakker, & Xanthopoulou, 2011). Schaufeli, Bakker, and Salanova (2006) define work engagement as a positive, work-related state that is characterized by *vigour* (i.e., high levels of energy and persistence), *dedication* (i.e., enthusiasm, inspiration, and a strong psychological identification with one's work), and *absorption* (i.e., being fully concentrated and happily engrossed in one's work). They noted that work engagement 'is not focused on any particular object, event, individual, or behaviour' (p. 702). Further, Salanova and Schaufeli (2008; see also Deci & Ryan, 2000) specified that work engagement is a work-related state of mind that reflects high intrinsic motivation.

Self-determination theory posits that to experience work engagement, individuals need to feel competent, related, and autonomous (Deci & Ryan, 2000). Gagné and Deci (2005) noted, 'satisfaction of basic psychological needs provides the [required] nutriment for intrinsic motivation' (p. 336). Individuals are likely to internalize their tasks and show high degrees of energy, concentration, and persistence to the degree that their needs for competence, relatedness, and autonomy are satisfied (Deci & Ryan, 2000). In line with this reasoning, van den Broeck, Vansteenkiste, De Witte, and Lens (2008) showed that basic needs satisfaction mediated the link between job resources and work engagement.

Hypothesis 2: Satisfaction of the needs for competence, relatedness, and autonomy mediates the relationship between TFL and work engagement.

Bass (1985) argued that TFL motivates followers to overcome their self-interest and to put effort into their assigned goals and tasks. By inspiring and supporting their followers, providing challenges, being optimistic about the future, and acting as a role model, transformational leaders enhance followers' involvement in and identification with their goals and tasks. Consequently, as demonstrated by past research, TFL enhances followers' performance (Judge & Piccolo, 2004).

Building on the rationales developed above, we propose that the relationship between TFL and followers' performance will be mediated by followers' needs satisfaction and, in turn, their work engagement. Specifically, we expect that followers of transformational leader will accomplish higher quantities of tasks (because of the heightened energy, motivation, and concentration associated with work engagement), will provide higher quality output (as they experience high inspiration and use their full resources to provide suitable solutions), and will show strong persistence (because they feel energetic, enthusiastic, and absorbed and thus tend to forget about time; Schaufeli *et al.*, 2006).

Hypothesis 3: Followers' needs satisfaction and, in turn, work engagement mediate the relationship between TFL and followers' performance.

Method

Participants

To reach individuals from diverse backgrounds, we recruited participants via several German-language Websites, including 20 Minuten Online, a general news Website, and

psychologie-heute.de. Our sample consisted of 190 individuals (73% were female), whose average age was 28.36 years ($SD = 8.51$). At the time of the study, 62.6% of the participants were employed, working an average of 24.54 ($SD = 14.17$) hours per week. Participants were randomly assigned to the experimental conditions.

Procedure

We invited the participants to take part in an online experiment about 'leadership behaviour and work performance'. Participants provided demographic information and, following instructions, imagined that they worked as part of a R&D team in a paper manufacturing company and that the leader of a new project was going to speak to them. Then, participants read one of the two vignettes (TFL vs. non-TFL). This was followed by the manipulation check and the measurement of needs satisfaction and work engagement. Next, all participants were instructed that their leader had assigned them the task of generating as many ideas as possible about the future use of paper. Participants were informed that they had 4 min to do so; after 4 min, the next online page would (and did) automatically appear. Further, they were informed that they could quit the task earlier by clicking the 'next button'. Participants filled in the ideas that they generated in an online form.

Manipulation of TFL

Following previous experimental research on TFL (Bono & Judge, 2003), we contrasted transformational and non-TFL. Specifically, we adapted vignettes developed by Felfe and Schyns (2006), which were based on scripts by Kirkpatrick and Locke (1996). Whereas the transformational leader vignette was inspiring and included key elements of TFL such as vision, high expectations, confidence, and mentoring, the non-transformational vignette was factual (i.e., clarified timetables, responsibilities, and control procedures).

Measures

All constructs were measured with established scales adopted from previous research. To be consistent with the original scales, responses were made on 5-point (TFL, needs satisfaction) and 7-point (work engagement) Likert type scales (1 = *totally disagree*, 5/7 = *totally agree*). Questionnaires in English were translated into German and then back-translated by two bilingual researchers; comparisons supported conceptual equivalence of the items with the original versions. The internal consistency of all scales exceeded .70 (Table 1). Before filling in the survey, participants were reminded to answer all items referring to the described scenario.

Transformational leadership was assessed using 19 items from Bass and Avolio's (1995) Multifactor Leadership Questionnaire. Consistent with previous research (Walumbwa & Hartnell, 2011), we combined all items into one factor. Sample items are 'My supervisor ...expresses confidence that goals will be achieved' and '...specifies the importance of having a strong sense of purpose'.

Needs satisfaction was assessed with the scale by La Guardia, Ryan, Couchman, and Deci (2000), measuring each need with three items. Following previous research (Kovjanic *et al.*, 2012), we chose this scale due to our interest in the leader as the central factor for needs satisfaction. Sample items are 'In the working relationship with my

Table 1. Means, standard deviations and zero-order correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Age	28.36	8.51											
2. Gender ^a	—	—	-.16										
3. Work experience ^b	—	—	.41	.28 ^e									
4. TFL ^c	—	—	-.02	.00 ^e	.20 ^e								
5. TFLp	3.02	1.05	-.13	.03	-.04	.85	.97						
6. Competence	3.37	0.98	-.04	-.01	.00	.66	.75	.89					
7. Relatedness	2.61	1.15	-.10	.02	-.04	.77	.81	.75	.88				
8. Autonomy	2.88	1.05	-.06	-.05	-.12	.64	.75	.79	.77	.86			
9. Work engagement	4.28	1.19	-.01	-.02	.01	.65	.76	.77	.71	.69	.95		
10. Quantity	3.97	4.62	.06	.13	.08	.06	.04	-.01	-.00	.03	.13	.21	
11. Quality	2.14	1.54	.06	.12	.07	.26	.25	.15	.20	.10	.27	.52	.47
12. Persistence ^d	153.18	87.38	-.01	.03	-.10	.23	.23	.18	.18	.16	.32	.52	.47

Note. TFLp, perceived transformational leadership.

^a0 = male, 1 = female.

^b0 = not working at the moment, 1 = working at the moment.

^c0 = non-TFL condition, 1 = TFL condition.

^dScore is in seconds.

^eThe Pearson chi-square test was used to analyse the relationships between categorical data. All relationships examined were not significant. Values on the diagonal are Cronbach's alpha. All correlations above .14 are significant, $p < .05$.

supervisor ...I feel very capable and effective' (competence), '...I feel cared about' (relatedness), and '...I feel free to be who I am' (autonomy).

Work engagement was assessed with the 9-item scale by Schaufeli *et al.* (2006). As Schaufeli *et al.* recommended, we calculated an overall work engagement score. Sample items are 'My job inspires me' and 'I feel happy when I am working intensely'.

Performance was measured in three ways: Quantity of ideas, quality of ideas, and persistence on the task. These indicators follow previous research (Jung & Avolio, 2000). Quantity was assessed by two trained research assistants independently counting the number of unduplicated ideas ($\kappa = .89$). Quality was measured by the two assistants independently rating the innovativeness of each idea on a 5-point scale. For each participant, an overall quality score was created ($\kappa = .83$). Persistence was measured by how much time participants spent on the idea-generating task (i.e., after how many seconds they moved on to the next page).

Controls

In line with previous research (Walumbwa & Hartnell, 2011), we included participants' age, gender, and work experience as control variables, because these variables can influence performance.

Results

Table 1 shows descriptive statistics and correlations.

Manipulation check

Results of an ANOVA indicated successful manipulation of TFL ($M_{\text{TFL}} = 3.91$, $SD = 0.50$ vs. $M_{\text{Non-TFL}} = 2.16$, $SD = 0.60$, $F(1, 188) = 485.25$, $p < .001$).

Validity analyses

As perceived TFL, satisfaction of the basic needs, and work engagement were measured from the same source, we conducted CFAs to examine their discriminant validity. Results show that the proposed five-factor model fits the data well ($\chi^2/df = 1.81$; CFI = 0.98; RMSEA = 0.07) and significantly better than theoretically plausible alternative models, that is, the 3-factor model combining the three basic needs ($\Delta\chi^2 [7] = 107.09$, $p < .001$), the 2-factor model combining all three needs and work engagement ($\Delta\chi^2 [9] = 311.80$, $p < .001$), and the 1-factor model combining all scales ($\Delta\chi^2 [10] = 459.73$, $p < .001$).

Hypotheses testing

We applied structural equation modelling to test all of the proposed relationships simultaneously. TFL was represented by TFL condition (not by participants' perceived TFL). To test the proposed mediation effects, we followed Preacher, Zyphur, and Zhang (2010) and conducted bias-corrected bootstrap confidence intervals (CI). We computed 90% CI, as they correspond to a one-tailed $\alpha = .05$ hypothesis test (Preacher *et al.*, 2010).

The proposed model showed a good fit to the data ($\chi^2/df = 1.17$; CFI = 0.99; RMSEA = 0.03). Moreover, it fits the data significantly better than the alternative model

assuming needs satisfaction and work engagement as parallel mediators ($\Delta\chi^2 [3] = 93.26, p < .001$).

Hypothesis 1 received full support: TFL had a positive effect on satisfaction of followers' needs for competence ($\beta = .66, p < .001$), relatedness ($\beta = .77, p < .001$), and autonomy ($\beta = .64, p < .001$). Hypothesis 2 received partial support: The influence of TFL on followers' work engagement was mediated by satisfaction of the need for competence ($b = .74, SE = 0.16, CI = 0.49-1.02$) and for relatedness ($b = .32, SE = 0.18, CI = 0.03-0.63$). Unexpectedly, satisfaction of the need for autonomy was not a significant mediator ($b = .14, SE = 0.14, CI = -0.08$ to 0.37). Finally, our data provided partial support for Hypothesis 3. Table 2 and Figure 1 show the results: First, the relationship between TFL and performance quality was mediated through both competence and relatedness need satisfaction and, in turn, work engagement. No mediation was observed for autonomy need satisfaction. Besides the mediated effect, TFL also had a direct effect on performance quality after including the mediator variables into the model. Second, the relationship between TFL and persistence was mediated through both competence and relatedness need satisfaction and, in turn, work engagement. Again, autonomy need satisfaction was not a mediator. Third, TFL did not significantly correlate with performance quantity. However, there was an indirect effect between TFL and performance quantity through competence and relatedness need satisfaction (but not through autonomy need satisfaction) and, in turn, work engagement. Please note that following Mathieu and Taylor (2006), a significant relationship between an independent variable and an outcome is a prerequisite condition for mediation but not for an indirect effect.

To rule out the control variables as an explanation of our results, we also conducted all analyses without any controls. The results were essentially identical.

Discussion

This study sought to integrate and extend recent insights on TFL, basic needs satisfaction, and work engagement. We proposed that the relationship between TFL and followers' performance would be sequentially mediated by followers' needs satisfaction and work engagement. As predicted, results revealed that TFL induced satisfaction of the needs for competence, relatedness, and autonomy, with competence and relatedness needs satisfaction subsequently predicting followers' work engagement. Work engagement, in turn, led to greater performance quality and quantity and greater task persistence.

Our study makes several contributions. First, linking TFL, needs satisfaction, and performance, we deliver further support for the assumption that followers' needs satisfaction is a central mechanism through which transformational leaders influence their followers. Second, this research is the first to establish causality between TFL and (1) followers' needs and (2) their work engagement. Third, by integrating the literatures on needs satisfaction and work engagement, this study answers recent calls for multi-step mediation models, which provide a more detailed understanding of the processes that link TFL and its outcomes.

On a broader level, this study may also contribute to a more integrative view of TFL mediation. Specifically, noting that extant research has largely focused on the 'continued generation of individual mediator variables', Judge, Woolf, Hurst, and Livingston (2006, p. 210) argued that 'it is difficult to integrate and make sense of the efforts' and called for integrative efforts. We believe that SDT provides a sound fundament for such an integration because (1) it addresses TFL theory's focus on follower needs satisfaction, (2)

Table 2. Results of multiple mediation analysis

	Dependent measures											
	Quality				Quantity				Persistence			
	Point estimate	SE	Lower	Upper	Point estimate	SE	Lower	Upper	Point estimate	SE	Lower	Upper
Effect of TFL through												
Competence and WE	0.32	0.13	0.15	0.56	0.99	0.44	0.42	1.93	24.23	8.04	12.97	39.74
Relatedness and WE	0.14	0.09	0.03	0.33	0.43	0.31	0.08	1.16	10.52	6.60	1.77	24.34
Autonomy and WE	0.06	0.07	-0.02	0.19	0.19	0.21	-0.06	0.65	4.60	5.00	-1.96	14.67
Direct Effects of TFL	0.65	0.36	0.06	1.24	0.72	1.01	-1.08	2.24	26.15	20.67	-7.50	60.28

Note. TFL, transformational leadership; WE, work engagement; CI, confidence interval for the population parameter; BC, bias-corrected bootstrapping; Bootstrap sample size = 5,000.

it specifies the rather dissimilar psychological conditions that are required for high follower performance, and, as such, (3) it may be well suited to consolidate and make sense of the dissimilar mediators that have been identified in previous studies. For example, social identification may be summarized as an aspect of relatedness need satisfaction and self-concordance as an aspect of autonomy need satisfaction.

Two findings warrant further discussion. First, autonomy need satisfaction did not mediate the influence of TFL on work engagement and performance. We suspect that this result was caused by the substantial correlations among the need satisfaction scores, which decrease the statistical power of detecting unique effects (Field, 2009). Second, TFL did not correlate with performance quantity. However, TFL indirectly affected quantity through needs satisfaction and work engagement. This pattern of results can often be found when the relationship between an independent variable and an outcome is relatively weak, while the more proximal relationships between independent variable and mediator and between mediator and outcome are statistically significant (Shrout & Bolger, 2002).

The present findings regarding follower performance also make an important contribution to research linking TFL and follower creativity. Leadership researchers have speculated that TFL may cause followers to trade off creative quantity for quality (Herrmann & Felfe, 2012). Encouraged to think in new ways while facing high leader expectations, followers might make efforts to generate a few original ideas instead of many trivial ones. In support of this view, our results show that TFL is positively related to followers' qualitative performance in an idea-generation task but is unrelated to their quantitative performance. This finding is consistent with previous studies using similar operationalizations of followers' performance (some of which even found a small negative correlation between TFL and creative performance quantity; Jung & Avolio, 2000). Moreover, they are congruent with Herrmann and Felfe's (2012) findings that TFL had a stronger effect on creative quality but a weaker effect on creative quantity than transactional leadership. Taken together, these results point the way to a more nuanced understanding of the link between (transformational) leadership and followers' creativity. Elaborating on these insights can be an important avenue for future research.

A limitation of our study is that we did not control for participants' job type. Hence, we cannot rule out that participants having jobs similar to the experimental task performed better than other participants. However, as we randomly assigned participants to the experimental conditions and because the number of participants per condition was relatively large (i.e., 95 participants), it is unlikely that this affected our results in a systematic way.

Because we measured needs satisfaction and work engagement at the same point in time, a second limitation relates to the order of these variables in mediating the TFL-performance link. We were able to rule out needs satisfaction and work engagement as being parallel mediators. Moreover, the proposed sequential order strictly follows a central tenet of self-determination theory (Deci & Ryan, 2000) and is in line with prior empirical findings (van den Broeck *et al.*, 2008). However, we cannot rule out the possibility of reciprocal effects between needs satisfaction and work engagement. We would like to encourage researchers to examine this possibility in future studies.

A related limitation is that we measured work engagement before the experimental task. Thus, it can be argued that work engagement as reported by the participants did not directly reflect the engagement that participants experienced during the task. However, we chose this approach because measuring work engagement after the task would have

left room for the plausible assumption that work engagement did not link leadership and performance but rather performance linked leadership and work engagement. Specifically, it could have been argued that to reduce cognitive dissonance, participants who had performed poorly reported lower work engagement not because of the leader manipulation but because of their lower performance.

A final limitation pertains to the controlled setting associated with experimental research. Specifically, as in most leadership experiments, the time and form of the leader encounter were restricted. Remarkably, however, despite this restricted leadership experience, we found consistent effects on participants' needs satisfaction, work engagement, and performance. Moreover, following Dipboye (1990), the present experiment offers an optimal complement to the previous field studies: The weakness of one approach (internal validity of field research, mutual realism of experiments) is compensated by the strength of the other.

In conclusion, this experiment, together with the previous field studies, provides a robust test and consistent support for a central tenet of TFL theory: The pivotal role of followers' needs satisfaction in linking TFL and followers' performance. These findings underscore the often neglected importance of followers' needs satisfaction in the leadership process and suggest that needs-based theories can be a powerful approach to further our understanding of (transformational) leadership.

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