

Transformational leadership and work engagement in remote work settings: the moderating role of the supervisor's digital communication skills

Gabriele Boccoli, Luca Gastaldi and Mariano Corso
*Department of Management, Economics and Industrial Engineering,
Polytechnic University of Milan, Milan, Italy*

Abstract

Purpose – This study explores the impact of transformational leadership on work engagement within remote work settings. More specifically, we investigate whether supervisor's perceived digital communication skills moderate the relationship between perceived supervisor support and work engagement.

Design/methodology/approach – Moderated mediation model has been tested using a sample of 410 consultants in Italy who worked within a fully remote work setting during Covid-19 pandemic.

Findings – Drawing on construal level theory and social presence theory, our study provides insights into the dynamics of leadership and work engagement in remote work settings. We demonstrate that, despite the challenges posed by physical distance, transformational leaders can effectively stimulate the work engagement of remote collaborators. Moreover, our findings suggest that the perceived digital communication skills of supervisors play a crucial role in moderating the relationship between perceived supervisor support and work engagement. This underscores the importance of supervisors' adept use of digital tools in conveying psychological presence and fostering employee engagement in remote work environments.

Practical implications – Our study highlights the importance of developing supervisors' digital communication skills to support and stimulate employee engagement in remote work settings.

Originality/value – This study contributes to the literature by providing one of the first empirical tests of the relationship between transformational leadership, perceived supervisor support, supervisor's digital communication skills and work engagement within a remote work setting. By challenging prior assumptions and offering novel insights, our research enhances understanding of leadership dynamics and provides practical guidance for organizations navigating the challenges of remote work.

Keywords Transformational leadership, Work engagement, Perceived supervisor support, Remote working, Construal level theory, Social exchange theory, Social presence theory

Paper type Research paper

1. Introduction

It has been widely demonstrated (Kahn, 1990; Bakker *et al.*, 2005; Rich *et al.*, 2010) that work engagement underpins job satisfaction and positive behavior, leading, on the one hand, to higher productivity and profitability (Eldor and Harpaz, 2016; Saks, 2006) and, on the other, to lower absenteeism and turnover (Harter *et al.*, 2002).

Social support is a crucial antecedent of work engagement, encompassing various workplace interactions (Boccoli *et al.*, 2023). Literature extensively analyzed the relationship between peers and supervisors, highlighting the significance of constructive feedback



(Xanthopoulou *et al.*, 2008) and effective leadership styles (McGrath *et al.*, 2017). Notably, transformational leadership emerges as one of the most impactful styles to foster work engagement (Boccoli *et al.*, 2023) as elucidated by social exchange theory (Eisenberger *et al.*, 2002).

So far, these relationships have been investigated within traditional work settings, where collaborators and supervisors are physically in the same location. In the new normal after Covid-19 pandemic, however, there is an increasing shift towards a virtual workplace (Franken *et al.*, 2021; Hodder, 2020), with significant changes in the way we work and interact with each other (Becker *et al.*, 2022). As emphasized by Liebermann *et al.* (2021), there is a dearth of empirical evidence regarding the effectiveness of transformational leaders in remote working contexts. According to their study, communication challenges emerge as the primary obstacle to adapt the transformational leadership style to new ways of working. One key difficulty leaders face, in maintaining close connections with their peers, is the lack of authorization and proper technical equipment for leading video conferences. The quality of available technological tools significantly influences the development of effective leadership, trust, social exchange, and team effectiveness in virtual collaborations (Liebermann *et al.*, 2021).

In this unfolding scenario, there is a growing need to explore whether transformational leaders can support their teams and enhance their engagement, even in remote workplaces. Our study contributes to the literature on transformational leadership, work engagement, and remote work in several ways.

Firstly, contrary to previous findings (Liebermann *et al.*, 2021; Zigurs, 2003), we show that transformational leaders are perceived as supportive even in remote work settings. More specifically, results show that maintaining quality relationships between supervisors and employees is achievable through behaviors such as providing feedback, presenting a compelling vision, and motivating teams towards common goals. This challenges the notion that virtual interactions inherently obstruct effective communication. Our findings, consistent with construal level theory, indicate that physical distance might prompt remote employees to perceive social interactions in a more abstract manner, thus aiding in the assimilation of leaders' messages. Moreover, remote workers, experiencing a sense of depersonalization, could become more open to embracing social norms presented by their supervisors, further enhancing the beneficial effects of transformational leadership. Construal level theory investigates individuals' cognitive interpretations of experiences (Short *et al.*, 1976), while depersonalization theory (Lee, 2006) delves into the emotional distancing individuals exhibit towards certain interactional aspects. These theoretical lenses not only provide valuable insights into how employees mentally shape and personalize their workplace interactions, but have been also suggested (e.g. Whitford and Moss, 2009) to better comprehend the intricate dynamics of supervisor support and its impact on employee engagement.

Secondly, our study highlights a positive link between perceived supervisor support and work engagement among remote workers. We propose that the effective use of digital communication tools, such as video calls, fosters social interactions and emotional connections, crucial for engagement. Transformational leaders leveraging these tools can convey vision, offer individualized consideration, and stimulate intellectual engagement, mitigating challenges of isolation in remote work settings.

Thirdly, we highlight the crucial role of supervisors' digital communication skills in moderating the relationship between perceived support and work engagement. Proficient use of digital tools amplifies the supervisor's psychological presence, bolstering the perception of support and ultimately boosting engagement levels. This emphasizes the importance of leaders' digital proficiency in remote work contexts. This recommendation aligns with the social presence theory (Short *et al.*, 1976), which posits that a medium's ability to convey the psychological presence of the message sender significantly impacts performance and work

attitudes. By displaying confidence in digital communication (Dennis *et al.*, 2008), transformational leaders enhance social presence within digitally-mediated work environments, reinforcing the theoretical link between communication medium and task performance or work attitudes.

Finally, our research offers practical insights for post-Covid-19 remote work challenges. Leaders can leverage transformational leadership and digital solutions to support remote employees effectively, fostering engagement. Prioritizing perceived supervisor support is crucial for employee wellbeing in remote settings. Investing in leaders' digital communication skills is vital for navigating digitally-mediated work environments and enhancing support to remote teams through training programs.

2. Theoretical background and hypotheses

2.1 Transformational leadership and perceived supervisor support within the remote working context

Transformational leadership is one of the most investigated leadership approaches characterized by four factors (Bass, 1985): idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. Literature has shown that transformational leaders may be perceived as more supportive (Liaw *et al.*, 2010; Görgens-Ekermans and Roux, 2021), bringing improvements in employee performance (Kovjanic *et al.*, 2013) as well as in other aspects linked to their wellbeing, such as job satisfaction and positive emotions (Bono *et al.*, 2007; Breevaart *et al.*, 2014).

Although transformational leadership and its impact on individuals and organizations have been widely investigated in traditional, face-to-face work settings, only a few studies have covered these matters in remote work environments, where they have mostly analyzed the impact of transformational leadership on virtual teams (Balthazard *et al.*, 2009; Ben Sedrine *et al.*, 2020; Mutha and Srivastava, 2021).

Remote working has increased significantly over the past years (Kerman *et al.*, 2022) due to the diffusion of modern digital technologies, which have substantially simplified remote communication and collaboration (Kossek *et al.*, 2012), and the progressive improvements in work-life balance (Allen *et al.*, 2013). Other relevant reasons are the general willingness to improve organizational effectiveness and productivity (Brumley and George, 2022), and, more recently, the Covid-19 pandemic (Kerman *et al.*, 2022).

Within this changed work context, there arises the necessity to investigate whether (and how) transformational leaders are capable of exhibiting their leadership effectively and efficiently. Ruggieri (2009) demonstrated that a transformational leadership style is more satisfying than a transactional one and that a transformational leader is judged to be better than a transactional one in virtual teams. An experimental study conducted by Purvanova and Bono (2009) demonstrated that: (1) the most effective leaders were those who upscaled their transformational leadership in virtual teams; (2) the effect of transformational leadership on team performance was stronger in virtual than in face-to-face teams. Furthermore, it has been demonstrated that transformational leaders may influence employees' perception and acceptance of workplace digitalization (Hooi and Chan, 2022).

In our study, we investigate how aspects of transformational leadership – such as individualized consideration, intellectual stimulation, and visionary leadership – may influence work engagement through perceived supervisor support when supervisors and their collaborators work from different locations.

Considering construal level theory (Short *et al.*, 1976), people who work at a distance from their leaders may see their behavior in a different light from those working close by (Henderson *et al.*, 2006). In fact, according to the theory, entities can be described or perceived either concretely or abstractly (Trope and Liberman, 2003; Forster *et al.*, 2004). Individuals

who describe an entity in concrete terms refer to specific and observable actions and use narrow categories to classify the related experience. On the contrary, individuals who make use of abstract representations describe entities through broad, unobservable and intangible aspects, extrapolating only their essence (Nussbaum *et al.*, 2003). People usually prefer to use tangible representations to define entities that are close in time or space, and abstract representations for entities that are instead remote in time or space (Forster *et al.*, 2004).

Following this theoretical lens, employees may extract only the essence of a message, suggestion or proposal transmitted by their leaders (Henderson *et al.*, 2006). Hence, the value of an inspiring vision could be even greater when leaders and collaborators work separately, as implied by Whitford and Moss (2009).

Furthermore, it has been proven that people are more inclined to embrace the social norms and values of their team when they feel a sense of depersonalization, a state that may be more easily observed when teams are dispersed (Lee, 2006). Employees with feelings of depersonalization could detach themselves from the sense of their work, inducing leaders to further stimulate their collaborators intellectually about their work's meaning and purpose (Lee, 2006).

Lastly, we suppose that the individualized considerations typical of transformational leadership styles will become more emphasized as leaders will try to bridge the social gap intrinsic to remote working. Remote work could induce leaders to strengthen their ability to preserve the quality of the relationship with their collaborators, providing greater (perceived) support. For all these reasons, we are proposing the following hypothesis:

H1. Transformational leadership is positively related to perceived supervisor support in remote work settings.

2.2 Fostering work engagement of remote workers through supervisor support

In response to the unprecedented changes brought about by Covid-19, many organizations have embraced various forms of remote work. This shift not only changes how employees interact but also affects their levels of work engagement (Galanti *et al.*, 2021). Several studies (Zhong *et al.*, 2016; Rich *et al.*, 2010) have shown that higher levels of work engagement improve individual performance, increasing satisfaction in both professional (Haynie *et al.*, 2016) and personal life (Bakker *et al.*, 2005). Social interactions, particularly those with supervisors, appear to be crucial in enhancing employees' engagement levels (Boccoli *et al.*, 2023), influencing employees' perception of the entire company (Saks, 2006). This remains true even in remote working scenarios, which might lead to physical and psychological isolation (Wang *et al.*, 2021).

Psychological isolation involves feeling disconnected from others and perceiving a lack of support and other social and emotional aspects (Golden *et al.*, 2008). Physical isolation relates to the physical separation of workers from colleagues, collaborators, and supervisors (Bartel *et al.*, 2012).

Literature (e.g. Murthy, 2017), demonstrates that these senses of isolation can have adverse effects on individuals' mental and physical health, leading to decreased productivity and an increased likelihood of procrastination or quitting their jobs (Wang *et al.*, 2021). Furthermore, the perception of isolation may erode individuals' sense of support from their organizations and supervisors, putting organizational commitment and engagement in job roles at risk (Wang *et al.*, 2021).

In this scenario, it is crucial to consider the role of supervisor support in reducing the sense of isolation experienced by remote workers. When employees perceive adequate support from their supervisors, they are more likely to feel connected to their colleagues and the organization, which in turn can increase their engagement in job roles, mitigating the detrimental impact of isolation on employee wellbeing and performance (Boccoli *et al.*, 2023). Building upon these considerations, we propose the following hypothesis:

H2a. Perceived supervisor support is positively related to work engagement in remote work settings.

Previous research has demonstrated a positive correlation between transformational leadership and work engagement in traditional work settings when coupled with social support (Schmitt *et al.*, 2016; Breevaart *et al.*, 2014). Transformational leaders foster work engagement through social support by creating a supportive work environment that enhances employees' wellbeing and performance (Makowski, 2023). The support from leaders helps in mitigating negative emotions and providing a supportive work environment (Goswami *et al.*, 2016).

In accordance with social exchange theory (Rhoades and Eisenberger, 2002), organizations and supervisors that address the concerns and needs of their employees typically observe heightened levels of work engagement. For example, regular communication from supervisors has been shown to positively influence work engagement by bridging physical and social distance barriers, thereby providing support to employees (Rahmadani *et al.*, 2020).

Despite extensive exploration of this relationship in conventional workplaces, there is a noticeable gap in evidence within the context of remote work (Freeney and Fellenz, 2013; James *et al.*, 2011).

Given the distinct challenges of remote work, it's reasonable to infer that transformational leaders could significantly impact engagement levels. This influence may occur through the mediation of the support provided by leaders to their team members. Through their unique behaviors, transformational leaders could potentially alleviate the physical isolation experienced by remote workers. The remote work environment may necessitate leaders to enhance their skills in maintaining high-quality relationships with their team, thereby offering heightened perceived support. Based on these premises, we posit the following hypothesis:

H2b. The relationship between transformational leadership and work engagement in remote work settings is partially mediated by perceived supervisor support.

2.3 The importance of the supervisor's digital communication skills in remote work settings

In the current landscape, various digital solutions facilitate remote work, fostering connectivity and collaboration among companies, teams, and employees (Choudhury *et al.*, 2021). Extensive research on computer-mediated work, telecommuting, and virtual teams explored how digital solutions enable synchronous communication, rivaling traditional face-to-face interactions (Daft and Lengel, 1984, 1986; Dennis *et al.*, 2008).

Interest is growing across disciplines regarding the adoption of suitable leadership approaches in digitally mediated contexts. Avolio *et al.* (2014, p. 107) term this phenomenon as e-leadership: "A social influence process embedded in both proximal and distal contexts mediated by Advanced Information Technology, capable of producing changes in attitudes, feelings, thinking, behavior, and performance." While many studies focus on the technologies themselves, we center our study on the supervisor's digital communication skills, considering them essential for effective virtual communication and collaboration (Van Wart *et al.*, 2019; Roman *et al.*, 2018).

Clear and organized communication through digital media is identified as a principal competency for effective remote leadership (Roman *et al.*, 2018). These digital skills become particularly crucial for leaders managing challenges arising from remote work (Spagnoli *et al.*, 2020).

Starting with the premise that the support provided by a supervisor is influenced by the leaders' communication and transmission of their approach, we can suppose that the more

proficient they are in digital communication skills, the better they can effectively communicate in remote work settings, making them appear more supportive. Thus, by improving their digital communication skills, supervisors can increase their presence among remote workers, fostering higher engagement.

This phenomenon can be understood through the social presence theory (Short *et al.*, 1976), which explains how effective communication can reinforce the supervisor’s social presence, increasing the perceived support and, consequently, both the wellbeing as well as the performance of their collaborators. Additionally, certain communication channels, such as synchronous and rich ones, can cultivate a sense of social presence, facilitating connections among individuals engaging digitally (Karahanna and Straub, 1999). For all these reasons, we hypothesize that the supervisor’s digital communication skills can positively moderate the relationship between perceived supervisor support and the work engagement of remote workers. In other words, in digitally mediated work environments, we expect that transformational leaders can amplify their supportive function through proficient use of digital communication tools, leading their peers to higher levels of engagement. Thus, we propose this last hypothesis:

- H3. The supervisor’s perceived digital communication skills moderate the relationship between perceived supervisor support and work engagement in remote work settings.

Figure 1 presents the hypotheses set out in this paper and the overall model that will be empirically tested.

3. Method

3.1 Context, participants and procedure

To test our model, we gathered data from a survey conducted in November and December 2020 within an Italian information consultancy company whose staff (consultants) were all required to work remotely during the height of the Covid-19 pandemic. The consultants selected for our sample predominantly rely on computer-mediated tools, particularly those facilitating synchronous and information-rich communication, for most of their work tasks. They exhibited effectiveness and efficiency in the use of digital technologies.

This selection highlights the suitability of the chosen work organization for the aim of this research. The enforced supervisor-collaborator remote relationship provided a suitable sample for investigating the effect of transformational leadership approaches on work engagement within a remote work setting.

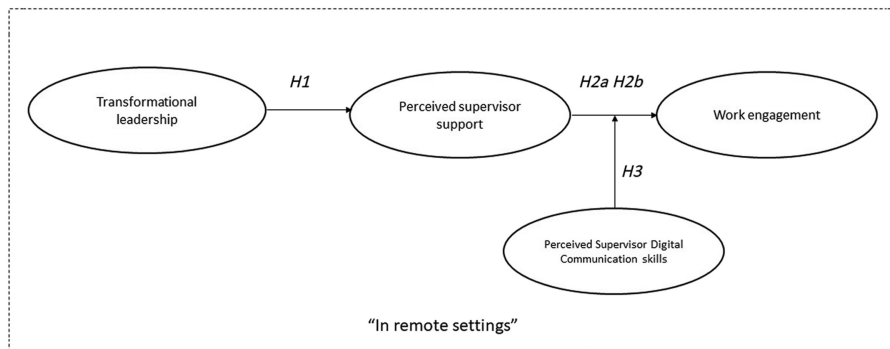


Figure 1.
Model and hypotheses

The questionnaire was distributed by email via the company's HR department, explaining the research aim and ensuring anonymity regarding the data gathered. The questionnaire consisted of two parts.

The first covered demographic matters (e.g. age, gender, etc.) whereas the second included all the constructs of transformational leadership, the supervisor's perceived support, the supervisor's perceived digital communication skills and work engagement.

In total, 410 out of 1,540 employees took part in the study, giving a good response rate (27%) and providing representativeness of the whole population (Poynton *et al.*, 2019). The final sample was composed by 127 women (31%) and 283 men (69%), with a mean age of 42 years (SD = 10.08). The participants' mean presence at the company was over five years (SD = 5.35).

3.2 Measures

The participants were asked to answer questions on a seven-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree). All the measures scales have been tested and validated by scientific literature.

Transformational leadership was measured with the seven-item scale developed by Carless *et al.* (2000).

Perceived supervisor support was measured with a four-item scale adapted from Rhoades *et al.* (2001).

The *supervisor's perceived digital communication skills* were measured through five items based on the scale developed by Roman *et al.* (2018).

Work engagement was measured through the nine-item version of the Utrecht Work Engagement Scale (UWES; Schaufeli *et al.*, 2002).

Control variables. In agreement with previous studies (Breevaart *et al.*, 2014), three socio-demographic variables – age, gender, and years of working in the organization – were included in the model as control variables.

3.3 Statistical analyses

Firstly, descriptive statistics were used to show a general overview of the constructs considered.

Secondly, Structural Equation Modeling (SEM) was used to test the hypotheses and the relationships between the various constructs. SEM combines factor and regression analyses on one or more dependent and independent variables (Muthén and Muthén, 1998-2015). All the analyses were carried out using Stata 14.

The Comparative Fix Index, CFI (Bentler, 1990), the Standardized Root Mean Square Residual, SRMR, and the Root Mean Square Error of Approximation, RMSEA (Steiger, 1990), were used to test the model's fit and these values have also been reported.

4. Results

4.1 Descriptive statistics

Table 1 presents the means, Standard Deviations (SDs), and the correlations between the studied variables. The results indicated that demographic variables (age, gender, years at the company) were not significantly correlated with the variables investigated in this study. Transformational leadership was positively related to perceived supervisor support, to the supervisor's perceived digital communication skills and to work engagement. The results showed that: (1) high levels of work engagement coincide with higher levels of transformational leadership and perceived supervisor support; (2) the supervisor's

	Mean	SD	1	2	3	4	5	6
1. Transformational leadership	5.37	1.15	(0.93)*					
2. Perceived supervisor support	4.75	0.87	0.6952**	(0.87)*				
3. Supervisor's perceived digital communication skills	4.23	0.69	0.5133**	0.4213**	(0.88)*			
4. Work engagement	5.35	1.11	0.5620**	0.4054**	0.3567**	(0.94)*		
5. Gender	1.31	0.46	0.0864	0.0283	0.0077	0.0587		
6. Age	40.88	10.08	0.0099	0.0954	0.0227	0.0970	-0.1847**	
7. Years at company	5.39	5.35	0.0439	0.0100	0.0113	0.0143	-0.0640	0.2844**

Note(s): ** = Significant at $p < 0.05$

Table 1.
Means, standard deviations, inter-correlations and internal consistencies*

perceived digital communication skills were positively related to transformational leadership and perceived supervisor support.

4.2 Common method variance

With the aim of eliminating ambiguity from the questionnaire, items have been designed to be specific, concise, and simple with the help of the HR department of the company (Podsakoff *et al.*, 2012).

First, we used the Harman single-factor test method and conducted an exploratory factor analysis of the measurement items of all variables. The maximum unrotated factor variance interpretation rate in this study was 48.19%, which was less than 50%, indicating that the common method bias of the sample data was not problematic (Podsakoff *et al.*, 2003).

Second, we used the Unmeasured Latent Method Construct (ULMC) approach to test common method bias (Richardson *et al.*, 2009). We define two models: Model 1 include all the constructs considered in this study; Model 2 adds a latent variable named “CMB” on which all items of the four variables were loaded. The results reveal that there was no significant difference in the model fit between Model 1 (χ^2 (293, $N = 410$) = 1145.974, $p < 0.001$; TLI = 0.89, CFI = 0.90 and RMSEA = 0.08) and Model 2 (χ^2 (291, $N = 410$) = 1125.025, $p < 0.001$; TLI = 0.89, CFI = 0.90 and RMSEA = 0.08). Hence, no serious common method bias exists in our study.

4.3 Exploratory factor analysis

Although all measures have been already tested and based on the literature, we run an exploratory factor analysis including all 25 items corresponding to the 4 constructs analyzed. This provides further evidence of the discriminant validity of the measures. We used the KMO test to evaluate sampling adequacy. All the items are greater than 0.80. The overall KMO for the complete model is 0.94. This indicates that the proportion of common variance is low and that data are suitable for PCA. Table 2 shows the results of the exploratory factor analysis. All factor loadings are greater than the 0.3 thresholds and they all load on a single factor (no cross-loadings with values greater than 0.3). The Cronbach's alpha values confirm the internal consistency reliability of the measures.

Construct	Item	Factor loading	Cronbach's alpha
Transformational leadership	My supervisor communicates a clear and positive vision of the future	0.37	0.93
	My supervisor treats staff as individuals, supports and encourages their development	0.42	
	My supervisor gives encouragement and recognition to staff	0.33	
	My supervisor fosters trust, involvement, and cooperation among team members	0.41	
	My supervisor encourages thinking about assumptions	0.32	
	My supervisor is clear about his/her values	0.30	
	My supervisor instills pride and respect in others and inspires me by being highly competent	0.36	
	My supervisor shows very little concern for me (<i>R</i>)	0.64	
Perceived supervisor support	My supervisor cares about my opinions	0.30	0.87
	My work supervisor really cares about my well-being	0.40	
	My supervisor strongly considers my goals and values	0.34	
	My supervisor shows very little concern for me (<i>R</i>)	0.64	
Supervisor's perceived digital communication skills	My supervisor knows how to communicate competently through digital communication channels	0.50	0.88
	My supervisor has never not been able to convey something via digital communication channels	0.35	
	My supervisor uses email and the Internet with ease	0.43	
	My supervisor always knows how to communicate properly whatever digital communication channel is being used	0.48	
	My supervisor knows how to adapt his/her message to the digital communication channel being used when interacting via computer	0.44	
	My supervisor knows how to adapt his/her message to the digital communication channel being used when interacting via computer	0.44	
Work engagement	At work, I feel bursting with energy	0.31	0.94
	At my job, I feel strong and vigorous	0.35	
	I am enthusiastic about my job	0.34	
	My job inspires me	0.36	
	When I get up in the morning, I feel like going to work	0.36	
	I feel happy when I am working intensely	0.33	
	I am proud of the work that I do	0.32	
	I am immersed in my job	0.30	
	I get carried away when I am working	0.30	
	I get carried away when I am working	0.30	

Table 2.
Results of the
exploratory factor
analysis

4.4 Confirmatory factor analysis

We considered four nested models with various numbers of factors. In particular, Model A is a single-factor model that incorporates all four constructs. Model B is a two-factor model combining transformational leadership, perceived supervisor support, and the supervisor's perceived digital communication skills (factor 1) and work engagement (factor 2). Model C is a three-factor model combining perceived supervisor support and the supervisor's perceived digital communication skills (factor 1), transformational

leadership (factor 2), and work engagement (factor 3). Model D considers each construct as a separate factor. The fit indexes of the models are presented in Table 3 and confirm that the four-factor model gives the best fit (for all the indexes). Thus, it is the best model for the measurement part of our model. The factor loadings of all items were significant at $p < 0.01$.

4.5 Path analysis

Figure 2 shows the structural model of the relationship between the various constructs. The hypothesized model is a good fit to the data ($\chi^2(341) = 1135.182$, CFI = 0.90, SRMR = 0.060 and RMSEA = 0.079).

The results indicate that: (1) transformational leadership is significantly and positively related to perceived supervisor support ($\beta = 0.81, p < 0.01$); (2) perceived supervisor support significantly and positively relates work engagement ($\beta = 0.76, p < 0.01$); (3) the supervisor’s perceived digital communication skills significantly and positively moderate the relationship between perceived supervisor support and work engagement ($\beta = 0.14, p < 0.01$).

With regards to the control variables, age has a significant effect on work engagement ($\beta = 0.09, p < 0.05$), whereas the effect is insignificant for gender and number of years at the company ($\beta = 0.05, \beta = -0.03$).

The results show in Table 4 indicate a significant indirect effect of transformational leadership on work engagement through the mediating variable of perceived supervisor support. The estimated indirect effect is 0.580, with a 95% confidence interval of 0.442–0.719. The high z-value (8.225) and low p-value (0.002) demonstrate strong statistical significance, suggesting that the relationship between transformational leadership and work engagement is partially explained by the mediated pathway through perceived supervisor support. These findings support the hypothesis that perceived supervisor support plays a substantial role in transmitting the impact of transformational leadership on work engagement. In summary, the study provides evidence for a mediated indirect effect involving perceived supervisor support in the relationship between transformational leadership and work engagement.

Figure 3 shows the results of the moderation analysis conducted in our study, examining how supervisor’s perceived digital communication skills influence the relationship between perceived supervisor support and work engagement using simple slope tests. Results highlighted that for employees with low supervisor’s perceived digital communication skills levels, the association between perceived supervisor support and work engagement was significantly positive, with a slope coefficient of 0.7137 ($t = 3.0822, p = 0.0022$). This suggests that for each unit increase in perceived supervisor support, work engagement increased by approximately 0.7137 units. Conversely, for employees with high supervisor’s perceived digital communication skills levels, the relationship remained positive but slightly weaker, with a slope coefficient of 0.7861 ($t = 2.6056, p = 0.0095$). In general, these results indicate that supervisor’s perceived digital communication skills moderates the association between perceived supervisor support and work engagement.

Model	CFI	TLI	RMSEA	SRMR	χ^2	df	Difference
A-1 factor	0.565	0.527	0.181	0.133	4065.058	299	
B-2 factors	0.776	0.756	0.130	0.80	2235.877	298	1829.181*
C-3 factors	0.811	0.792	0.120	0.77	1932.314	296	303.563*
D-4 factors	0.901	0.891	0.087	0.46	1145.974	293	786.340*

Note(s): * = Significant at $p < 0.01$

Table 3.
Results of the
confirmatory factor
analysis

Figure 2.
SEM results of the
hypothesized model

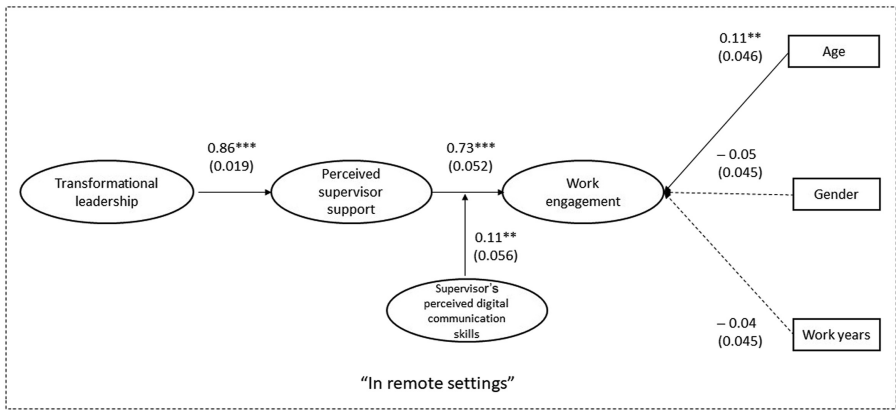
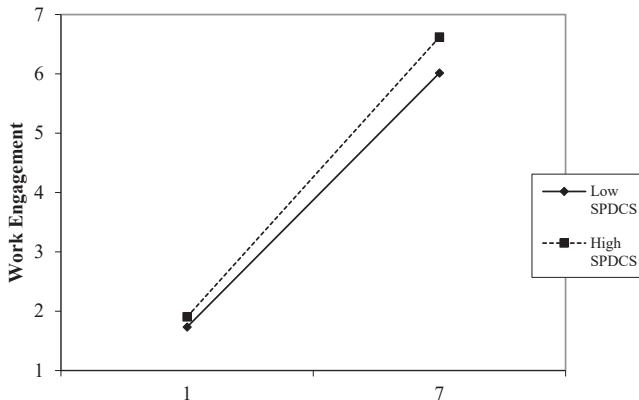


Table 4.
Significance testing of
the indirect effect.
Sobel test

	Indirect effect	Std Err	z-value	p-value	Conf. Interval
TL → PSS → WE	0.580*	0.071	8.225	0.002	0.442–0.719

Note(s): * = Significant at $p < 0.01$

Figure 3.
Moderating effect
simple slope test
results



5. Discussion and conclusions

5.1 Theoretical contribution

Our study contributes to the literature streams on transformational leadership, work engagement, and remote work in three ways.

Firstly, and contrary to Liebermann *et al.* (2021) and Zigurs (2003), our results demonstrate that transformational leaders are perceived as supportive even when employees work remotely. Additionally, our findings suggest that the quality of the relationship between supervisors and employees does not necessarily deteriorate in terms of quality. This happens when these leaders engage in behaviors such as providing constructive feedback, presenting an appealing vision of the future, and motivating and inspiring their teams toward shared goals. We contradict previous empirical evidence, which stated that virtual social interaction could create obstacles to effective communication between supervisors and collaborators. In line with construal level theory, our

results indicate that the supportive behaviors of transformational leaders are positively perceived by remote collaborators due to the physical distance between them and their supervisors (Henderson *et al.*, 2006). In other words, the distance may lead remote employees to interpret the transmitted information in abstract terms, allowing them to internalize the essence of social interactions more effectively, such as the supervisor's vision and shared goals. Furthermore, our study introduces the possibility that remote collaborators may be more inclined to embrace social norms and values presented by their supervisors, due to a sense of depersonalization experienced by remote workers (Lee, 2006). This state of depersonalization may create conditions conducive to amplifying the positive influence of transformational leadership. Importantly, we emphasize the role of individualized consideration in bridging the physical gap experienced during remote work, suggesting that leaders tailor their approaches to strengthen support and cultivate high-quality relationships with remote collaborators. These theoretical implications, rooted in construal level theory and depersonalization theory, enhance the understanding of how transformational leaders positively support their remote collaborators.

Secondly, our results underscore a positive correlation between perceived supervisor support and work engagement among remote workers. In line with social exchange theory, when supervisors take care of the needs and concerns of remote employees, in turn these respond offering high levels of work engagement. For instance, the extensive use of video calls during the pandemic provides a real-time and immersive communication experience, including paraverbal language like tone and body language. These digital communication channels facilitate social interactions, knowledge exchange, and emotional connections, creating essential conditions for fostering individual engagement (Boccoli *et al.*, 2023). In this scenario, transformational leaders who effectively utilize digital communication tools are able to provide support, bridging the physical gap in remote work scenarios. For instance, the use of video calls allows leaders to convey an inspiring vision, offer individualized consideration, and stimulate intellectual engagement. These supportive actions are crucial in mitigating the challenges posed by physical isolation characterizing remote working settings, ultimately enhancing engagement levels (Rhoades and Eisenberger, 2002).

Thirdly, our research demonstrates for the first time that the supervisor's perceived digital communication skills play a positive role in moderating the relationship between perceived supervisor support and work engagement. We demonstrate that, when the relationship between supervisor and her/his peers shifts from the physical to the virtual space, individuals feel that they are receiving more support when their supervisor clearly knows how to handle the digital tools used to communicate and collaborate. In line with social presence theory, the effectiveness of a communication medium in conveying the supervisor's psychological presence significantly influences the work engagement of their remote collaborators. Competent use of digital communication tools can create a sense of social presence, which, in turn, reinforces the perception of support from the supervisor. In other words, when transformational leaders demonstrate digital communication skills, they enhance the quality of their psychological presence in a remote work setting, thereby intensifying the positive influence of perceived supervisor support on the work engagement of their remote collaborators. Furthermore, considering work engagement as a psychological dimension of wellbeing (Grant *et al.*, 2007), our results suggest that supervisor's perceived digital communication skills may improve the perception of the support offered by supervisor that, in turn, will enhance the psychological wellbeing of employees from a eudaimonic perspective.

5.2 Practical contributions

This research provides useful indications for organizations and managers on how to deal with the challenges of working remotely as an outcome of the Covid-19 pandemic, where the ensuing difficulties impacted negatively on the wellbeing of employees (Wang *et al.*, 2021).

Firstly, the results of this study offer a new understanding of how transformational leadership can have a positive influence on perceived supervisor support and, consequently, on employee work engagement within a remote working context. We suggest that, by adopting suitable digital solutions, leaders can communicate in a more efficient and effective way with their peer, stimulating, influencing and supporting them effectively even if at distance. A culture of experimenting with new remote collaboration and communication solutions is needed. It's important to critically assess different options and understand when to employ the most suitable one.

Secondly, we demonstrated that perceived supervisor support can stimulate the employees' engagement and wellbeing. If we consider engagement as a key element of psychological wellbeing, it's imperative to highlight the support that leaders extend to remote employees. This support becomes even more critical in remote settings, where establishing it can be particularly challenging. Similarly, high levels of work engagement could assist companies in achieving their organizational goals by enhancing the individual performances of employees.

Thirdly, our research demonstrates that, in a forced remote work environment, supervisors' proficiency in digital communication aids in navigating the digitally-mediated setting and offering enhanced support, consequently impacting employee engagement levels. In this scenario, the development of leaders' digital communication skills is crucial for effectively managing digitally-mediated work environments and providing increased support to their team members. Prioritizing the cultivation of these skills through appropriate training programs and on-the-job experiences can lead to leaders becoming increasingly effective in exercising leadership in modern and remote contexts.

5.3 Limitations and avenues for future research

This study has some limitations. Firstly, the sample analyzed consists of a single category of workers (consultants). For this reason, the final considerations cannot be extended to the general working population.

Secondly, as in many countries, remote working was mandatory in Italy during the pandemic, limiting the freedom and flexibility of all employees. This forced form of flexibility, which only allowed employees to work from home, did not offer true spatial flexibility, where individuals could freely choose their work location.

Thirdly, it would be possible to include other variables relating to communication channels, and their features, in the test model, in order to gain a better understanding of their impact on the relationship between supervisors and employees.

In future research, it might be interesting to investigate other aspects relating to e-leadership or the different subdimensions of transformational leadership on perceived supervisor support and work engagement. At the same time, it could be interesting to study the impact of transformational leadership within a remote working context that is not forced, as it was during the pandemic. It could also be interesting to understand whether the relationship investigated in this research could influence other dimensions of psychological wellbeing, such as relational wellbeing, as well as employee performance. Lastly, it would be interesting to investigate which features of digital technologies and communication channels could influence the relationship between supervisor and collaborator within a remote work context. In this sense, considering the growing interest in adopting AI in the workplace, it could be interesting to understand how this new way of working and communicating may influence the interaction between leaders and their collaborators. Additionally, it could be intriguing to analyze the differences between bidirectional and authentic communications compared to those of AI. This area of research is an attractive avenue of study that, so far, it has been poorly investigated.

5.4 Conclusions

Our study challenges previous assumptions by revealing that in remote work scenarios, transformational leaders may be perceived as supportive even when they work from different locations. This empirical evidence goes against the worry that virtual interactions might make communication between leaders and team members less effective. The construal level theory explains how transformational leaders positively perceived by remote collaborators despite the physical distance.

Moreover, and in line with social exchange theory, our research shows a positive correlation between perceived supervisor support and work engagement among remote workers. We highlight that the relationship between transformational leadership and work engagement is partially mediated by perceived supervisor support, emphasizing the pivotal role of digital communication tools in mitigating challenges posed by physical isolation and enhancing engagement.

Furthermore, our results demonstrate that the supervisor's perceived digital communication skills positively moderate the relationship between perceived supervisor support and work engagement. This underscores the importance of supervisors' adept use of digital tools in conveying psychological presence. In line with social presence theory, remote employees feel more supported when supervisors demonstrate proficiency in digital communication, translating into higher levels of work engagement.

Comprehensively, our research provides valuable guidance for organizations and managers navigating remote work challenges, highlighting the need for transformational leaders to leverage suitable digital solutions to effectively communicate, stimulate, and support remote collaborators.

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Corresponding author

Gabriele Boccoli can be contacted at: gabriele.boccoli@polimi.it

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