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ARTICLE

Perceived Efficacy of Virtual Leadership in the Crisis of the COVID-19 Pandemic

Sanja Bizilj, Eva Boštjančič, Gregor Sočan
University of Ljubljana, Ljubljana, Slovenia

ABSTRACT
As a crisis response to the COVID-19 pandemic, many companies quickly established virtual leadership systems and enabled employees to continue their work from home. This cross-sectional research addresses virtual leadership efficacy assessed by the leaders and by their employees. The findings suggest that leaders evaluate themselves significantly better than their employees, and their leadership efficacy mainly depends on their previous experience of working from home and ability to use communication technologies. This research contributes to the understanding of the factors that have the biggest influence on the belief in leadership efficacy in the context of a rapidly evolving system of remote work.

KEYWORDS
COVID-19 pandemic, virtual leadership, leadership efficacy, work from home, communication technology

Introduction

On 11 March 2020, the World Health Organization (WHO Director-General's opening remarks, 2020) declared a pandemic due to the outbreak of the new coronavirus COVID-19. Many countries thus introduced strict measures to limit interpersonal contact and impose social distance for most of the population in order to control the infection. In Slovenia, based on Article 7 of the Infectious Diseases Act, the government declared an epidemic on March 12, 2020 (Ministry of Health, 2020) due to the growing number of coronavirus cases and took measures to close educational institutions, reduce public life and encourage people to work from home.

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sabizilj@gmail.com
eva.bostjancic@ff.uni-lj.si
gregor.socan@ff.uni-lj.si

As many people switched to working from home, work processes became more flexible. However, although the lockdown was generally received positively, as it helped curb the spread of the pandemic, it also meant inequality among employees. Broadly speaking, more educated and skilled employees could continue their work from home, while those who could not do so were forced to claim income support. Moreover, while working from home was possible for people employed in education or finance or working for large corporations, and so on, those employed as truck drivers, as sales staff in grocery shops, or as production workers continued to go to work as usual to ensure the supply of essential goods. Finally, many workers simply lost their jobs and became dependent on state aid. As this was a health crisis, the order to work from home did not apply to healthcare professionals and other healthcare employees.

In this empirical cross-sectional research, we focused on leaders of those organizations that were able to adapt to the lockdown and allowed their staff to work from home. As all educational institutions were also closed, the work of some employees became very difficult to manage since they had to share time and space with their children, which could result in extra stress and disruptions.

Crisis situations threaten the viability of companies, generating feelings of doubt and uncertainty among the staff. In such a situation, everyone expects guidance from the management and leaders (Rosenthal et al., 2001). Much of the research dealing with crises focuses precisely on the responses of leaders (Boin & Hart, 2003; Halverson et al., 2004).

Research on virtual work has intensified since 1990, when virtual communication options such as email, video and/or audio conferencing, and other forms of internet-enabled communication gained popularity. There are several definitions of virtual work and virtual teams. An earlier study (Cohen & Gibson, 2003) summarized the definitions of virtual teams according to three characteristics. First, virtual teams are functional workgroups, that is, groups of individuals who are interdependent and working towards achieving a common goal. Second, the individuals who make up a virtual team are in some ways dispersed. Third, instead of personal, face-to-face business contacts that take place in traditional work environments, members of such teams mostly rely on computer technology to connect and communicate with each other.

Virtual leadership is one of the most important challenges in virtual teamwork, even under normal circumstances. The lack of personal contact with employees in different locations can cause difficulties in monitoring the performance of work tasks, coordinating the working group, establishing and maintaining trust, and resolving conflicts. Researchers agree that virtual leadership is more challenging than traditional leadership due to the lack of personal contact (Bell & Kozlowski, 2002; Cohen & Gibson, 2003; Hoch & Kozlowski, 2014). Leadership effectiveness plays a central role in the performance of a virtual team (Bell & Kozlowski, 2002; Morgeson et al., 2010; Zigurs, 2003), and the studies of virtual leadership mostly focus on two areas: the behaviours and personality traits of the leaders (Gilson et al., 2015).

Virtual leadership is usually related to the organizational structure of the related organization, which enables such work and is normally introduced in a structured and planned manner, together with changed work processes and the organizational

climate that supports such a way of working. Leadership encompasses many definitions and includes different leadership styles. In this research, we understand leadership in a broad sense, with a leader as a person who guides a group of people or an organization to achieve common goals.

In response to the pandemic, the remote work mode was quickly introduced in many organizations. This change in the mode of work due to the pandemic has not been studied explicitly in the literature so we sought to answer the following research question: do digital communication skills affect the perception of leadership efficacy when remote work modes were introduced during the COVID-19 crisis?

To answer this research question, we empirically examined the perception of leadership efficacy from the perspective of leaders and employees in connection with their digital communication skills and previous experience of working from home. In the next section *Theory and Hypotheses*, we review the existing literature and develop the hypotheses guiding this research. In the section *Research Methodology,* we describe the methods and present the data analysis. The results are discussed in section *Results*. Finally, in section *Discussion,* we assess the contribution of this study to the existing research field and consider its implications for management scholars and practitioners.

Theory and Hypotheses

Albert Bandura (1986) showed that the concept of self-efficacy, defined as an individual's belief in one's ability, can be a powerful predictor of an individual's performance. Empirical research has investigated the links between how self-efficacy predicts and affects performance (Haase et al., 2018; Miao et al., 2017). However, according to social cognitive theory, we understand an individual's action as a triad of reciprocal relations between cognition, behaviour and the immediate, current situation.

The concept of efficiency has recently been expanded to include the concept of "collective efficacy", which would not only derive from the self-related perception about one's own ability but would be part of the whole (social) system, which includes also an external source of efficacy (Bandura, 1997; Gibson & Earley, 2007). An additional external source of efficacy is the perception of efficacy, which is defined as an individual's perception of the usefulness of external resources that can affect their success (e.g., tools, technologies, etc.) and is complementary to self-efficacy in performance predictions (Eden et al., 2010; Eden & Sulimani, 2013; Walumbwa et al., 2008; Yaakobi, 2018).

Since most empirical research has focused on self-efficacy, we have introduced both concepts into our work. On the one hand, we examined the aspect of leadership self-efficacy as a self-perception and compared it with the aspect of leadership effectiveness based on the employees' perceptions. We proceeded from the definition that perceptions of collective efficacy and the effectiveness of another individual represent an external perception of effectiveness that affects an individual's perception in the available human and other resources that are important

to a performance of individual whose performance is assessed (Eden et al., 2010). We assumed that the models of self-perception and perception are related as stated in the following hypothesis (Hypothesis 1):

Hypothesis 1: According to the average scores on the items, there is a positive relationship between a leader's self-perception (self-efficacy) and an employee's perception of their immediate superior (efficacy).

Leaders, as key individuals in groups or organizations, are described as highly committed individuals, determined, goal-oriented, and capable of effective, practical, and rapid problem-solving (Yukl, 2016). As studies show, the individuals in leadership roles usually have a high sense of self-efficacy and put a lot of effort into meeting leadership expectations and persevering in the face of problems (Bandura, 1997; McCormick et al., 2002; Yukl, 2016). Based on these findings, we propose the following hypothesis (Hypothesis 2):

Hypothesis 2: Average assessments of leadership efficacy are higher when assessed by leaders (self-efficacy) than when assessed by employees.

Because many companies operate globally, they have introduced virtual work to harness the talents of employees regardless of location, enabling more innovative, efficient, and financially advantageous operations (Bell & Kozlowski, 2002; Hertel et al., 2005). In addition to the benefits, there are also challenges involved in virtual work. Hertel et al. (2005) describe individual challenges such as social isolation, misunderstandings, limited social contacts, and unclear roles and responsibilities. It is generally accepted that regardless of where work is performed—at the same location or remotely, the role of the leader requires similar skills (Davis & Bryant, 2003; Kayworth & Leidner, 2002; Zigurs, 2003). However, reduced interpersonal contact and asynchronous communication are the main challenges of virtual leadership, as leadership is highly dependent on the quality of the leader-employee interaction (Malhotra et al., 2007). The massive and rapid shift to remote work modes during the pandemic contributed to our interest in whether the previous experience of working from home had a positive effect on leadership efficacy, assessed by leaders and employees. Therefore, we propose the following hypotheses (Hypothesis 3a and 3b):

Hypothesis 3a: Previous experience of remote work has a positive effect on leaders' self-perception of their efficacy.

Hypothesis 3b: Previous experience of remote work has a positive effect on employees' perception of leadership efficacy.

Over the last 20 years, virtual work has become widespread due to the development of electronic communication technologies. For leaders, their ability to create a positive organizational environment that fosters strong collaboration has become vital. In addition to the social skills, they now need to master a variety of digital communication tools and be able to adapt digital communication to the receivers' expectations and preferences (Roman et.al., 2018). To test whether digital communication skills have a positive effect on leadership efficacy, we propose Hypothesis 4:

Hypothesis 4: Digital communication skills have a positive effect on the perception of virtual leadership efficacy.

Research Methodology

Data Collection and Sample

We performed a cross-sectional study. Data were collected from April 12 to May 2, 2020 using the services for online surveys 1KA[1]. The questionnaire was divided into two sets of items. The first set was completed by leaders who assessed their leadership self-efficacy. The second set was completed by employees who evaluated the leadership efficacy of their immediate superiors. An invitation to take part in the study was sent to 2,120 potential participants (1,050 leaders and 1,070 employees) via several platforms facilitating convenience and snowball sampling methods. In total, 908 respondents completed the survey, of which 382 (42.1%) were leaders who assessed themselves and 526 (57.9%) employees who evaluated their immediate superiors.

The group of leaders was composed of 223 males (58.4%) and 159 females (41.6%). As for their current jobs, 52.7% were employed in Slovenian private sector companies; 5.6%, in the public sector; 41.7%, in foreign private sector companies. A total of 278 (72.8%) leaders at the time of the COVID-19 pandemic reported working from home. Of those working from home, 48.6% reported no previous experience of virtual leadership. As for the type of organization, the lack of previous experience of virtual leadership was the highest (76.9%) in the public sector, followed by 55.4% in Slovenian companies and 44.5% in foreign companies. Finally, 69.5% of the male leaders and 47.2% of the female leaders assessed their digital communication skills with scores of 9 or 10, on a scale from 0 to 10 (with 0 meaning "communication technologies are a big challenge", so they mostly use phone calls, and 10, that they are well acquainted with the communication technologies and take full advantage of them).

The group of employees who evaluated their immediate superiors was composed of 324 males (61.6%) and 202 females (38.4%). This group evaluated their immediate superiors, composed of 372 male leaders (70.7%) and 154 female leaders (29.3%). As for their current jobs, 44.2% were employed in Slovenian private sector companies, 12.8% in the public sector, 43.0% in foreign private sector companies. A total of 378 (71.9%) employees at the time of the COVID-19 pandemic reported working from home. Of those working from home, 34.4% reported no previous experience of remote work. As for the type of organization, the lack of previous experience of working from home was the highest (56.8%) in the public sector, followed by 32.2% in Slovenian companies and 30.0% in foreign companies. Finally, 55.6% of the male leaders and 41.7% of the female leaders were assessed by their employees with scores of 9 or 10 on a scale from 0 to 10 (with 0 meaning "communication technologies are a big challenge for my boss, so they mostly use phone calls", and 10, that the leaders are well acquainted with communication technologies and take full advantage of them).

[1] https://www.1ka.si/

Measures

In this study, we used the Leadership Self-Efficiency Scale (LSE), developed by Andrea Bobbio and Anna Maria Manganelli (2009), as a multidimensional scale for the self-assessment of leaders. To better suit the measurement object, we have adjusted the scale to the Leadership Efficiency Scale (LE), which was used by the employees to assess their immediate superiors. The instrument has not yet been translated and adapted for the Slovene cultural and linguistic environment, so for this research we translated the questionnaire from English into Slovene. All items are shown in Appendix 1.

We used this questionnaire to ask the respondents who were in the role of leaders to self-evaluate their leadership efficacy and those who were in the role of employees to evaluate the leadership efficacy of their immediate superiors.

The LSE scale includes 21 items grouped into six first-order scales, highly correlated but conceptually distinct (introducing and leading the change process, selecting effective employees, building and managing interpersonal relationships, self-awareness and self-confidence, motivating employees, reaching consensus within the team). The response scale ranged from 1 = "I do not agree at all" to 5 = "I completely agree". The reliability of the original scales computed with ρ coefficients (Bagozzi, 1994) ranges from 0.65 to 0.79.

The LE scale was derived from the LSE scale. All questions are semantically the same, but instead of self-perceived efficacy for LE we ask about the leadership efficacy perceived by the employee. It is thus basically the same instrument, where only the object of measurement (myself/another) differs.

Data analysis

The data were processed using the statistical software package IBM SPSS Statistics 25, R programming language and environment (R Core Team, 2019) and Microsoft Excel. All statistical tests were performed at the significance level $\alpha = .05$. The factor structure of the LSE and LE scales was checked by confirmatory factor analysis using the lavaan package for R (Rosseel, 2012). In our case, we wanted to determine whether the empirical data fitted the LSE theoretical model, as assumed by Bobbio and Manganelli (Bobbio & Manganelli, 2009), with the assumption of six latent, mutually correlated factors with a second-order factor.

Goodness-of-fit was checked by using several indices simultaneously (Bollen, 1989). A combination of different fit indices is generally used to determine the suitability of a model. The following indices and criteria were selected to determine the suitability of the models: χ^2, the ratio between χ^2 and degree of freedom (χ^2/df), RMSEA (Root Mean Square Error of Approximation), SRMR (Standardized Root Mean Square Residual), and CFI (Comparative Fit Index). Non-significant χ^2, $\chi^2/df < 3$, RMSEA < 0.06, SRMR < 0.08 and CFI > 0.95 were considered as critical values of indices indicating the adequacy of the model (Hu & Bentler, 1999; Schumaker & Lomax, 1996).

Results

Confirmatory factor analysis

To verify the goodness-of-fit of the six-factor model to the expected structure of the LSE and LE scales, we performed a confirmatory factor analysis. According to the recommendations in the literature, we chose a combination of different fit indices, which are shown in Table 1.

Table 1

Evaluation of the General Fit Indices for the Models

Model	χ^2	χ^2/df	CFI	SRMR	RMSEA
LSE Scale	256.40	1.47	0.95	0.05	0.04
LE Scale	370.77	2.13	0.97	0.04	0.05

Note. LSE = Leadership Self-Efficacy (assessed by leaders), LE = Leadership Efficacy (assessed by employees).

Kenneth A. Bollen (1989) recommends citing more indices of the goodness-of-fit to the assumed model compared to the null model. The value of χ^2 was statistically significant for both LSE and LE ($p < .001$), indicating that the two models do not perfectly fit in the population. The value of relative χ^2 (χ^2/df) was considered when assessing the general suitability of the model. In our case, the value of χ^2/df was less than 3, which means an acceptable model fit (Schumaker & Lomax, 1996). Encouraging findings were also provided by the CFI indices (0.95 and 0.97), which likewise indicate a good fit of the model. An RMSEA value below or equal to 0.05 means a good fit to the model. In our measurement model, the RMSEA was 0.04 for LSE and 0.05 for LE, which means a good or appropriate fit of our data to the model. The SRMR values were 0.04 and 0.05, which also shows a good fit of the model.

Table 2 summarizes the relationships between the observed and latent variables. Standardized coefficients ranged from |.34| to |.69| for LSE and from |.54| to |.89| for LE, and all the items loaded significantly on their own factor ($p < .001$). Based on this, we can confirm the hypothesized latent structure.

Correlations among the six latent variables are shown in Table 3.

High correlation coefficients ($r > .90$) between dimensions 2 and 4, dimensions 4 and 5, and dimensions 5 and 6, led us to evaluate whether they were distinct by comparing the six-factor model (baseline) to nested models with fewer factors. In the first alternative representation (A1) we fixed the correlation between factors 2 and 4 to one, and we constrained these two factors to have equal correlations with all the other factors. In the second representation (A2) the correlation between factors 4 and 5 was fixed to one, and in the third representation (A3) the correlation between factors 4 and 5 was fixed to one, and the correlations with all the other factors were constrained to be equal. We looked at the validity of alternative models with respect to χ^2, χ^2/df and AIC. A significant χ^2, χ^2/df along with lower AIC indicate better models (Schumaker & Lomax, 1996). The results are summarized in Table 4.

Given that the baseline six-factor model proved to be better than the three alternative models (with the lowest values on all indices), we did not reject it despite the high intercorrelations.

Table 2
Values of Standardized Parameters of the Measurement Models

Latent variables	Items	Standardized loadings		R^2	
		LSE	***LE***	***LSE***	***LE***
Starting and leading change processes in groups	y_1	0.66	0.87	0.44	0.76
	y_2	0.63	0.80	0.40	0.65
	y_3	0.61	0.80	0.38	0.64
	y_4	0.53	0.78	0.28	0.61
Choosing effective employees and delegating responsibilities	y_5	0.63	0.87	0.40	0.75
	y_6	0.67	0.87	0.45	0.75
	y_7	0.68	0.80	0.46	0.64
Building and managing interpersonal relationships within the group	y_8	0.63	0.86	0.39	0.74
	y_9	0.34	0.54	0.12	0.30
	y_{10}	0.69	0.89	0.47	0.80
	y_{11}	0.52	0.71	0.27	0.50
Showing self-awareness and self-confidence	y_{12}	0.40	0.73	0.16	0.53
	y_{13}	0.57	0.76	0.33	0.58
	y_{14}	0.61	0.84	0.37	0.70
	y_{15}	0.56	0.76	0.31	0.58
Motivating people	y_{16}	0.57	0.87	0.33	0.75
	y_{17}	0.67	0.88	0.45	0.78
	y_{18}	0.63	0.87	0.40	0.76
	y_{19}	0.58	0.88	0.34	0.77
Gaining consensus of group members	y_{20}	0.68	0.79	0.46	0.63
	y_{21}	0.47	0.78	0.22	0.62

Note. LSE = Leadership Self-Efficacy (assessed by leaders), LE = Leadership Efficacy (assessed by employees).

Table 3
Correlations between LSE (N = 382) and LE (N = 526) Dimensions

	1	2	3	4	5	6
Starting and leading change processes in groups		0.88*	0.80*	0.90*	0.90*	0.86*
Choosing effective employees and delegating responsibilities	0.65*		0.82*	0.93*	0.89*	0.85*
Building and managing interpersonal relationships within the group	0.50*	0.68*		0.85*	0.88*	0.92*
Showing self-awareness and self-confidence	0.73*	0.75*	0.75*		0,94*	0,93*
Motivating people	0.71*	0.75*	0.83*	0.86*		0,94*
Gaining consensus of group members	0.65*	0.72*	0.88*	0.76*	0.86*	

Note. LSE coefficients below the diagonal and LE coefficients above the diagonal. *$p < .001$

Finally, the data-fit of the second-order factor loadings was checked, and the results were satisfactory, as summarized in Table 5.

All the *γ* coefficients were significant. See Figure 1.

Table 4

Comparative Fit Indices and Chi-Square Test for Model Comparison

Model	χ^2	Df	χ^2/df	p <	AIC
Baseline six-factor model	370.77	174	2.13	0.001	23559.59
Alternative model (A1)	565.73	178	3.18	0.001	23618.33
Alternative model (A2)	526.52	178	2.96	0.001	23579.00
Alternative model (A3)	528.02	178	3.18	0.001	23580.60

Table 5

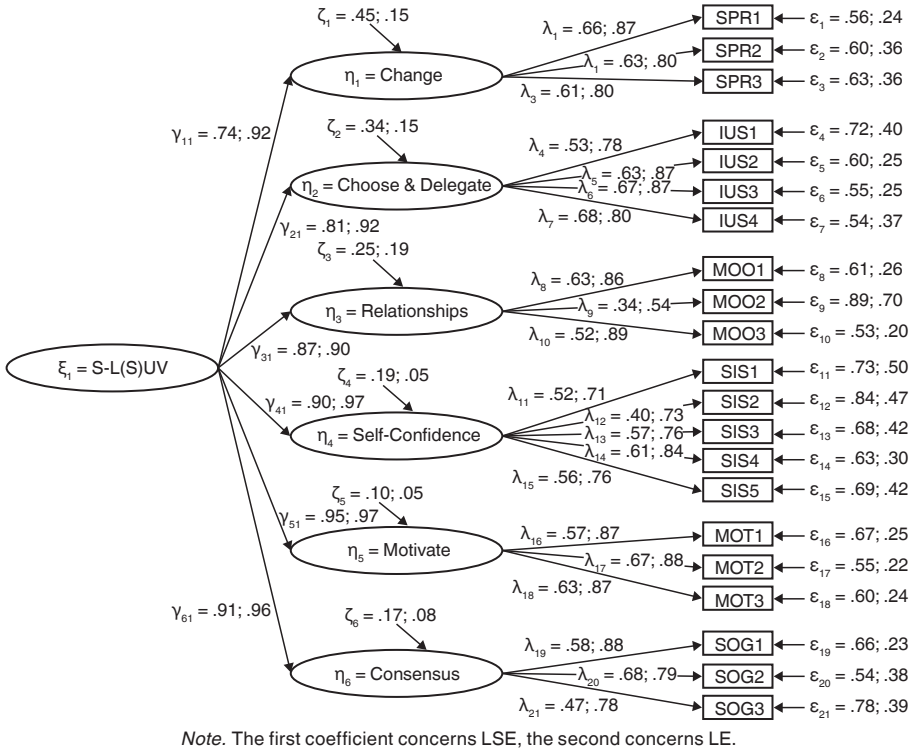
Evaluation of the General Fit Indices for the Second-Order Model

Model	χ^2	χ^2/df	CFI	SRMR	RMSEA
LSE scale	273.36	1.49	0.94	0.05	0.04
LE scale	418.98	2.29	0.97	0.06	0.04

Note. LSE = Leadership Self-Efficacy (assessed by leaders), LE = Leadership Efficacy (assessed by employees).

Figure 1

General Model of the LSE and LE Scales



Note. The first coefficient concerns LSE, the second concerns LE.

The reliability of the scales proved to be adequate (α for the Leadership Self-Efficiency Scale is 0.88 and for the Leadership Efficiency Scale is 0.96). The study also confirmed the simultaneous validity of both questionnaires and the positive correlation ($r = .726$, $p < .001$) between them.

Test of hypothesis

We assumed that there is a statistically significant relationship between the average scores on the items between the self-perception (self-efficacy) and employee perception (efficacy) models. The calculated positive correlation coefficient ($r = .726$, $p < .001$) indicates a statistically significant relationship between the models of self-perceived (LSE) and perceived (LE) leadership efficacy, which supports Hypothesis 1.

In addition, we were interested in whether the average assessments of leadership efficacy on all six factors and the overall assessment of the whole scale (21 items) differ between the self-perception of the leaders and the perceptions of their employees. The difference was statistically significant ($p < .001$) on all six dimensions as well as overall. The Cohen's *d* for estimating the overall effect size of the differences between the dimensions on the scales was 0.67, as shown in Table 6. Therefore, Hypothesis 2 was also supported.

Table 6

The Mean Score Differences between Leadership Self-Efficacy (LSE) and Efficacy (LE) on Six Dimensions of the Scale

		LSE		LE		*p* <	Cohen's *d*
		M	SD	M	SD		
Starting and leading change processes in groups	M	4.13	0.51	3.78	0.87		0.45
	F	4.10	0.47	3.57	0.96		0.66
	Total	**4.12**	**0.49**	**3.72**	**0.90**	**0.001**	**0.51**
Choosing effective employees and delegating responsibilities	M	4.20	0.41	3.72	0.87		0.63
	F	4.26	0.46	3.53	0.97		0.88
	Total	**4.23**	**0.43**	**3.66**	**0.90**	**0.001**	**0.71**
Building and managing interpersonal relationships within the group	M	4.19	0.48	3.75	0.92		0.55
	F	4.25	0.51	3.46	0.95		0.92
	Total	**4.22**	**0.49**	**3.66**	**0.94**	**0.002**	**0.67**
Showing self-awareness and self-confidence	M	4.21	0.43	3.85	0.79		0.51
	F	4.27	0.38	3.63	0.90		0.85
	Total	**4.24**	**0.41**	**3.79**	**0.83**	0.001	0.62
Motivating people	M	4.14	0.53	3.70	0.98		0.52
	F	4.25	0.48	3.41	1.09		0.90
	Total	4.19	0.51	3.61	1.02	0.001	0.65
Gaining consensus of group members	M	3.88	0.50	3.66	0.89		0.29
	F	3.97	0.52	3.48	0.94		0.61
	Total	**3.92**	**0.51**	**3.61**	**0.91**	**0.001**	**0.40**
General Leadership Efficacy Score	M	4.14	0.36	3.75	0.79		0.57
	F	4.20	0.35	3.53	0.89		0.89
	Total	**4.16**	**0.35**	**3.69**	**0.82**	**0.001**	**0.67**

Note. LSE = Leadership Self-Efficacy (assessed by leaders), LE = Leadership Efficacy (assessed by employees).

In addition, we assumed that the leaders who had previous experience of working from home would score higher on the leadership efficacy scale. With regard to LSE, the assessment of self-perceived leadership efficacy compared between the group of leaders with previous experience with the group without such experience differed statistically only in the scale of introduction and management of change (p = .03, Cohen's d = 0.3), where self-perceived efficiency was higher for those leaders who had previous experience. With regard to LE, previous experience of working from home had significant effects on perceived leadership efficacy (p < .05) on all scales, except for that of choosing effective employees and delegating responsibilities. Based on the results, Hypothesis 3a was not supported while Hypothesis 3b was supported (Table 7).

Table 7

Results of Hypotheses Testing

Dimension on LSE/LE Scale	3a	3b	4
Starting and leading change processes in groups	0.003 (0.27)*	0.006 (0.31)*	< 0.001 (0.61)*
Choosing effective employees and delegating responsibilities	0.246	0.207	< 0.001 (0.65)*
Building and managing interpersonal relationships within the group	0.177	0.001 (0.34)*	< 0.001 (0.63)*
Showing self-awareness and self-confidence	0.064	0.046 (0.26)*	< 0.001 (0.58)*
Motivating people	0.941	0.005 (0.30)*	< 0.001 (0.73)*
Gaining consensus of group members	0.638	0.002 (0.30)*	< 0.001 (0.65)*
General Leadership Efficacy Score	0.101	0.007 (0.30)*	< 0.001 (0.70)*

Note. Numbers above the brackets are p-values; the number in the bracket is Cohen's d value. *p < .05.

Given that leadership is related to communication skills (Eisenberg et al., 2019), we concluded that experience with digital communication technologies has a positive effect on leadership efficacy. We compared the group of leaders whose communication technology skills were rated by their employees as excellent (scores 9 and 10) with the group of leaders whose skills were assessed as poorer (scores ≤ 6). In Table 7, we see that the leadership efficacy scores were statistically significantly higher in those leaders whose digital communication skills were assessed as excellent (p < 0.001, d = 0.7). Therefore, Hypothesis 4 was supported.

Discussion

The purpose of the research was to examine virtual leadership in times of crisis when the COVID-19 pandemic was declared in Slovenia. For this reason, we used the model of leadership self-efficacy to examine the self-perceived leadership in relation to different groups of leaders. As we also wanted to study the perception of leadership efficacy by employees, we adapted the model into a model of leadership efficacy.

This research was based on social cognitive theory and used the concept of efficacy from the point of view of both self-perception (self-efficacy) and that of the

environment (efficacy). The concept of self-efficacy originates from individuals' belief in their own effectiveness and is an important motivational construct. It influences an individual's decisions, goals, and emotional reactions, and the effort that they invest in a focal activity. Given that in addition to internal influences there are also external ones that contribute to an individual's belief that they can function successfully, we have added the concept of efficacy to the concept of self-efficacy. Thus, we wanted to find out the external belief in the efficacy of leadership, which then indirectly affects the individual's belief in the external human resources important for success in the workplace. These external human resources are, in our case, the skills of a leader that contribute to successful team guidance, motivation, and consensus among employees.

The main findings of the research relate to the differences between self-perceived and perceived leadership efficacy between different groups of leaders. Based on the results, we can conclude that the self-perception of leaders in all six dimensions (starting and leading change processes in groups, choosing effective employees and delegating responsibilities, building and managing interpersonal relationships within the group, showing self-awareness and self-confidence, motivating people and gaining consensus of group members) is statistically significantly higher than it is perceived by employees. Experience is needed for virtual leadership, as our results showed that leaders who had previous experience of working from home were perceived as more effective. The efficacy of virtual leadership is also influenced by communication digital skills, which was also shown by our research.

This study was a response to the COVID-19 crisis and the general shift to working from home, and therefore the implementation of virtual leadership as a reaction to the pandemic. Our study focuses on the context of the crisis and attempts to contribute to a better understanding of leadership efficacy in a virtual setting, as we anticipate that working from home will become more common and organizations will gradually introduce it even under normal circumstances. Thus, the current study contributes to the critical body of research demonstrating how virtual leadership experience and communication technology skills influence the way leaders are perceived by themselves and their employees.

Moreover, the findings associated with our research have practical implications. First, as we have seen from the results, in addition to the general leadership skills, in the time of crisis, if one has previous experience of working from home, it makes them perceive themselves as more efficient. In practice, this can mean that leaders with previous experience of virtual work are less prone to micromanagement and feel less anxious about not being able to see their employees work and monitor their work progress. Minimizing the gap of perception between the leaders and their employees is the key to preventing remote workplace harassment, i.e., excessive behaviour management by leaders, such as reprimanding and instructing employees in front of a large group of people during online meetings and issuing work-related instructions via chat or video phone after working hours. Therefore, it is important to discuss and decide in advance how to report one's progress to the manager when working remotely. Second, virtual leaders must develop excellent communication technology skills.

Chat functions should be utilized to create a work environment in which employees can consult their leaders anytime. Third, leaders need to pay more attention to their self-perceived leadership efficacy and have some scepticism about it, as it is significantly higher than the leadership efficacy that is perceived by their employees. In this new form of work, leaders should put greater effort into setting up some rules in advance for areas that require care when working remotely. This will put both leaders and their employees at ease and make it easier for leaders to manage and for their employees to work comfortably.

Although the sample in the study was appropriately large and we were able to confirm most of the hypotheses, one of the main shortcomings of the sample was the selection of participants. The survey covered the general population of employees, regardless of their affiliation to an organization. Since the organizational cultures of individual companies differ from each other, it would be better to conduct a survey of leadership efficacy within individual organizations. The use of self-assessment questionnaires in this study is also worth mentioning, at least in the case of leaders. Since the respondents could give answers based on various cognitive biases and might also have been inclined to give socially desirable answers (Moorman & Podsakoff, 1992), it should thus be noted that the results are likely to be subject to certain biases or errors associated with this method (Spector, 2006).

Linking self-perception of leadership efficacy and the perceptions of the employees is one of the possible starting points for the analysis of leadership effectiveness, as it allows us to understand the factors that indirectly affect performance. A large divergence in leaders' and employees' leadership efficacy assessments in measuring different latent variables could be an indicator of the interventions necessary in terms of developing better leadership skills. However, testing this assumption would require empirical studies in the context of a larger organization.

Despite these limitations, our findings reveal that leaders with previous experience of working from home and better digital communication skills are perceived as more effective by both themselves and their employees. Therefore, appropriate preparation, support, education and guidance for such individuals (i.e., mentoring, coaching, consulting) with regard to leadership, communication, motivation, and stress management, are crucial for their successful work online and at home.

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