

## Telework and Creativity of Professional Employees: The Mediating Roles of Autonomy and Time Pressure

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### Abstract

Although telework has become increasingly popular among professional employees who engage in creativity required jobs, the mechanisms through which telework influences on their creativity remains unanswered. Addressing this gap, the present study aimed to examine the mechanisms through which telework impacts on creativity. An empirical study has been conducted, drawing on data collected from professional employees in software developing companies in Sri Lanka using a web-based survey data (N=218). The mediating effects of autonomy and time pressure in between telework and creativity were identified in the light of job demands-resources model. The empirical results show that there is a positive impact of telework on creativity of professional employees. Specifically, it found that the positive impact of telework on creativity was partially mediated by autonomy and time pressure. The results inform the practitioners that the appropriateness of telework to enhance the creativity of professional employees. This research makes a novel contribution to creativity literature by unearthing the mechanisms through which telework flows on creativity.

**Keywords:** telework, creativity, autonomy, time pressure, professional employees, Sri Lanka

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### Introduction

Employee creativity is imperative in pursuing organizational aspirations in a dynamic business environment (Joo, McLean & Yang, 2013). Creativity is “products, ideas, or procedures that satisfy two conditions; (1) they are novel or original and (2) they are potentially relevant for, or useful to, an organization” (Oldham & Cummings, 1996, p. 20). Recognizing the critical role of employee creativity, there exist studies at both individual level (eg., Chen, Chang & Chang, 2015; Gumusluoglu & Ilsev, 2009; Liu, Jiang, Shalley, Keem & Zhou, 2016; Perry-Smith & Shalley, 2003; Shalley, Gilson & Blum, 2009) and team level (eg., Kratzer, Leenders & Van Engelen, 2010; Somech & Drach-Zahav, 2013). Notably, creativity at the individual level still receives more attention from researchers (Joo et al., 2013; Perry-Smith & Shalley, 2003).

In contemporary organizations, the way of working has been dramatically

transformed with the emergence of the knowledge-driven economy which is facilitated by new technologies. Consequently, telework has become a popular form of job design (Biron & Veldhoven, 2016). Telework is “an alternative work arrangement in which employees perform tasks elsewhere that are normally done in a primary or central workplace, for at least some portion of their work schedule, using electronic media to interact with others inside and outside the organization” (Gajendran & Harrison, 2007, p. 1525). Further, there is mounting evidence that telework is popular among professional employees (Shin et al., 2000; Taskin & Bridoux, 2010) who can work independently and engaged in knowledge-intensive jobs (Shin et al., 2000). These professional employees are expected to be highly creative since they represent the creative sector (Joo et al., 2013).

Stimulating curiosity a recent research by Vega et al. (2015) found a positive relationship between telework and creativity. Further, they called for further studies to examine the mechanisms through which telework impacts on creativity. based on the above ground, we propose the impact of telework on creativity is likely to occur through time pressure and autonomy. In examining the effect of telework on creativity, according to Job Demands-Resources (JD-R) model (Demerouti et al., 2001), employees’ engagement in telework may affect job demands and job resources, leading to different job outcomes (Sardeshmukh et al., 2012). Particularly, telework can alter job demand of time pressure, and job resource of autonomy. Accordingly, we argue that the changes in time pressure and autonomy as a result of telework should affect the job outcome of the creativity of employees. In sum, we seek to examine the direct and indirect effects of telework on creativity by answering the following research questions.

Does telework impact the creativity of professional employees?

Does time pressure mediate the effect of telework on the creativity of professional employees?

Does autonomy mediate the effect of telework on the creativity of professional employees?

## **Theoretical Background and Hypotheses**

### ***Telework and Creativity***

An empirical study conducted by Vega et al. (2015), found a positive impact of telework on creativity in a sample of supervisors and non-supervisors from a large U.S. government organization. They have shown that telework is beneficial for individual creativity as it is less susceptible to obstacles and interruptions. Also, working relatively alone in a private context is favourable for creativity because it helps individuals to think independently which is necessary for divergent thinking in producing novel ideas (Nouri et al., 2015). Therefore, given the benefits of telework in terms of concentration and positive affect (Biron & Veldhoven, 2016) as well as from the recent empirical evidence, we expect a positive impact of

telework on creativity. In measuring telework, previous studies have utilized the extent of telework which is the time spent in telework (Gajendran et al., 2015; Golden & Veiga, 2005; Sardeshmukh et al., 2012) since it is critical in determining outcomes (Taskin & Bridoux, 2010). Therefore, in this study, we used the extent of telework to measure telework. Accordingly, we propose;

H1: Extent of telework positively impacts on the creativity of professional employees

### ***Impact of telework on creativity through time pressure and autonomy: A job demand and resource perspective***

According to the JD-R model (Demerouti et al., 2001) job aspects can be classified into two categories; job demands and job resources (Demerouti et al., 2001). Job demands are the aspects of a job that require sustained effort and thereby associated with costs (Demerouti et al., 2012). Job demands are not necessarily evil but often lead to adverse outcomes (Demerouti et al., 2012). Time pressure is a specific job demand (Demerouti et al., 2012) that leads to adverse job-related outcomes such as exhaustion (Sardeshmukh et al., 2012) and job dissatisfaction (Wickramasinghe, 2010). In contrast, job resources are the aspects of a job that are functional in achieving job-related outcomes (Demerouti et al., 2012). One such resource is job autonomy which refers to the extent to which employees have freedom or discretion to make decisions and perform a job in their way (Spreitzer, 1995). Job autonomy as a job resource has a positive impact on various job outcomes such as engagement (Sardeshmukh et al., 2012), satisfaction (Gajendran & Harrison, 2007) and performance (Gajendran et al., 2015).

Time pressure as a mediator in between the effect of telework on creativity

Telework let work to move the worker rather than worker move to the work (Gajendran & Harrison, 2007). Teleworker surveys in the USA and UK reported that time saved on commuting is one of the main benefits of telework (Haddon & Lewis, 1994). Telework helps saving employee's time mainly in three ways. First, telework as an alternative to physical commuting allows people to save time otherwise would have been wasted in traffic jams (Mann & Holdsworth, 2003). Second, telework helps saving time through reduced interactions with colleagues (Haddon & Lewis, 1994). Third, the flexibility given in telework allows employees to change the schedules and task demands according to their daily rhythm and thereby accomplish tasks more efficiently (Mann & Holdsworth, 2003; Pyöriä, 2011). In this way, employees save their time and get more work done during telework (Haddon & Lewis, 1994). In sum, we expect that the combination of time saved in commuting, reduced interactions, and scheduling flexibility will result in reduced time pressure. Also, empirical evidence supports that the extent of telework has a negative impact on time pressure (Sardeshmukh et al., 2012).

Time availability is a critical factor in generating novel and useful ideas (Amabile, 1988; Amabile et al., 1996). Reduced time pressure helps to explore alternative

possibilities and produce creative ideas (Amabile et al., 2002; Andrews & Smith, 1996). Conversely, when people work under high time pressure, they will struggle to meet deadlines rather than engage in creative thinking. From the cognitive evaluation theoretical perspective (Deci & Ryan, 1980), working under high time pressure reduces perceived competence and self-determination and this will result in reduced intrinsic motivation and creativity (Amabile et al., 2002). Also, empirical work has provided evidence for the negative effect of time pressure on creativity (Andrews & Smith, 1996; Chen et al., 2015). In this vein, the impact of telework on creativity is likely to occur through the reduced time pressure at telework. Therefore;

H2: Time pressure mediates the impact of telework on the creativity of professional employees

### ***Autonomy as a mediator in between the effect of telework on creativity***

Separation from collocated work context and engage in telework enhances autonomy in several ways. For instance, it allows flexibility to schedule longer working hours while having appropriate breaks (Huws as cited in Haddon & Lewis, 1994). Also, employees can choose the best and more preferable time to work while engaging in family demands during off-peak (Mann & Holdsworth, 2003). Besides, the given greater control over the physical work environment allows designing an appropriate work layout according to the individual's working style (Mokhtarian & Salomon, 1994). The experienced autonomy at telework is higher among professional employees who work based on expertise and skills than those whose work is more bound by office routines (Pyöriä, 2011). Given this background, though at times, employees feel social isolation, employees prefer and value telework (Pyöriä, 2011). A meta-analytic result revealed that telework positively associates with autonomy (Gajendran & Harrison, 2007). Also, the positive effect of telework on autonomy has been repeatedly found in empirical research (Gajendran & Harrison, 2007; Gajendran et al., 2015; Sardeshmukh et al., 2012).

The control over scheduling and accomplishing one's job provides a sense of autonomy leading to the investigation of novel and useful ideas (Amabile et al., 1996). Also, autonomy results in a relaxed mind leading to higher creativity (Sia & Appu, 2015). As such, job autonomy is considered as a necessary job resource for creativity (Amabile 1988; Amabile et al., 1996). Given this theoretical background, empirical research reported the positive impact of autonomy on creativity (Amabile et al., 1996; Sia & Appu, 2015). Accordingly, the positive effect of telework on creativity is likely to occur through the enhanced autonomy at telework.

H3: Autonomy mediates the impact of telework on the creativity of professional

employees

## Research Methodology

### *Participants and Procedure*

The participants of this study were professional employees who engage in IT-related jobs in software developing companies in Sri Lanka. There are two reasons for choosing professional employees in software companies as the context of the present study. First, preliminary investigations revealed that Sri Lankan software developing companies offer telework for their professional employees. The prevalence of technology and inexpensive audio-visual telecommunication mechanisms encouraged software developing companies to provide to telework to their employees while facilitating the knowledge exchange with colleagues. Second, as mentioned in the introduction, the present study focuses on creativity at the individual level. Professional employees, as they engage in the functions of software development, require immense individual creativity (SLICTA, 2007). Therefore, the software developing industry is a proper context to investigate creativity at the individual level (see., Gumusluoglu & Ilsev, 2009).

We conducted an anonymous and self-administered web-based survey developed by using Google docs. The survey link with a description of the study was sent to IT professional those who were working in the IT companies and specifically allowed to engage in telework. 218 completed questionnaires were returned and used in final data analysis. The sample comprised of 98 software engineers, 64 system analysts, 41 project managers and 15 web developers. The majority of the respondents were male 165 (75.69%) and 53 (24.31%) were female. 44 (20.18%) of the participants belonged to the 18-24 age category, 106 were within 25- 34 (48.62%) and the remaining 68 (31.19%) were more than 35 years. Within this sample, 53(24.31%) participants worked in the organization for less than one year, 86 (39.45%) for 2-3 years, 42 (19.27%) for 4-5 years, and the remaining 37 (16.97%) worked more than five years. Respondents in this sample teleworked on average 1.3 days per week, ranging from 0 to a maximum of 3 days per week. The selected software developing organizations offer voluntary telework arrangements which permit employee to decide whether to telework or not. As a result, 55 respondents did not choose to telework, though they are allowed to telework. Similar to Gajendran et al. (2015), we included those 55 respondents to the final analysis to have a variation in terms of the extent of telework.

### *Measures*

Except for the extent of telework, all the other constructs were measured using a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). Creativity was measured by using three items (e.g., “The work I produce is creative”) developed by Oldham and Cummings (1996). Similar to Shalley et al. (2009), we also used self-reported creative performance. Self-reported creativity is more appropriate since they are the ones who feel and aware of their creativity

(Janssen, 2000). Job autonomy was measured by using a three-item autonomy/self-determination scale (e.g., “I have significant autonomy in determining how I do my job”) developed by Spreitzer (1995). Time Pressure was measured by using a five-item scale (e.g., “I feel sense of time pressure in my work”) developed by Amabile et al. (1996). The extent of telework was measured asking from participants to indicate the number of days (per week) spent in telecommuting.

### **Analyses**

We employed structural equation modeling (SEM) via AMOS (version 16.0) to test the measurement and structural models. A separate confirmatory factor analysis (CFA) was conducted to assess the validity of the three measurement scales: autonomy, time pressure, and creativity. Average variance extracted (AVE) values of all constructs were greater than 0.5, supporting convergent validity (Hair et al., 2010). Also, AVE for each construct was greater than the squared correlations between the constructs and all the other constructs in the model, proving discriminant validity (Hair et al., 2010). The measurement model reported good fit (e.g.  $\chi^2/df = 1.44$ , CFI = .98, RMSEA = 0.045) indicating that the model adequately fit the data. The mediation analysis was conducted in two stages. First, the bootstrap approach was used to estimate the direct effect, total indirect effect, and the total effect of the mediation model in AMOS by following the procedure recommended by Cheung and Lau (2008). However, AMOS does not provide specific indirect effects of the individual intervening variable. Thus, second, we followed the recommendations of Hayes (2013) to assess the specific indirect effects of autonomy and time pressure on the link between the extent of telework and creativity. The hypothesis related to each specific mediation effect is supported if the lower and upper limits of the confidence intervals do not contain zero (Hayes, 2013).

### **Conclusions**

#### **Results**

*Table 1. Reliability, descriptive statistics and correlations among the variables*

Variable	1	2	3	4	$\infty$	M	SD
(1) Autonomy	1				0.80	5.48	0.67
(2) Time pressure	-.25**	1			0.96	4.70	1.24
(3) Creativity	.46**	-.43**	1		0.79	5.15	0.81
(4) Extent of telework (days per week)	.49**	-.39**	.43**	1	-	1.32	0.84

\*\* p < 0.01

Table 2 reports the fit indices of the hypothesized model and two alternative models. The

hypothesized model (figure 1) included both direct and indirect effects of the extent of telework on creativity. Alternative model 1 included only the indirect effects of the extent of telework on creativity. Alternative model 2 included the link between the extent of telework and creativity without indirect effects. As shown in table 2, hypothesized model reported a better fit ( $\chi^2/df = 1.1$ , GFI = .99, CFI = .99, RMSEA = 0.025, AIC = 19.13) than the two alternative models. Therefore, the hypothesized model was used to test hypotheses.

*Table 2. Results of model fit and model comparison*

Model	$\chi^2/df$	GFI	CFI	RMSEA
Hypothesized model (figure 1)	1.1	0.996	0.997	0.025
Alternative model 1	3.7	0.983	0.970	0.112
Alternative model 2	15.5	0.906	0.762	0.259

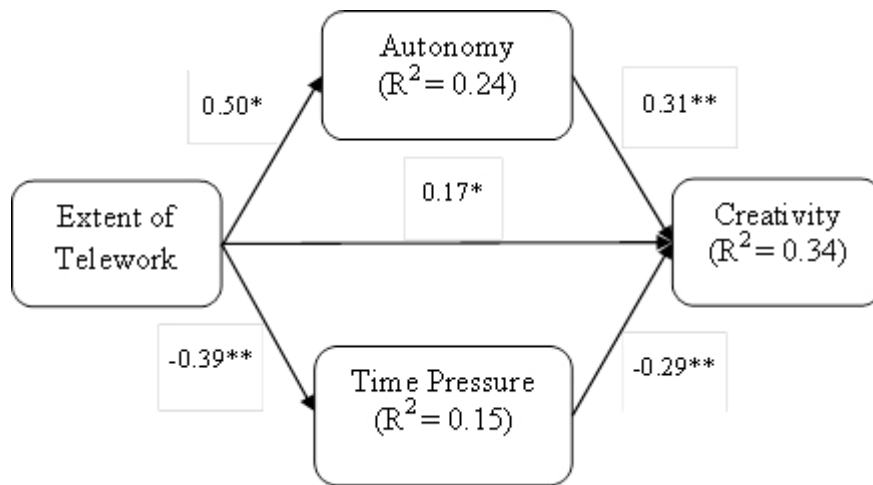


Figure 1. Results of the model

Note: Standardized coefficients are reported. \*\*  $p < 0.01$ , \*  $p < 0.05$ . R2 in parentheses

The results of the hypotheses testing are presented in Table 3. Hypothesis 1 proposed that the extent of telework positively impacts on the creativity of professional employees. The results revealed a significant positive impact of extent of telework on creativity before entering two mediators ( $\beta = .43$ ,  $p < 0.01$ ;  $R^2 = 0.19$ ). Once time pressure and autonomy were entered as mediators, the direct effect of the extent of telework on creativity dropped but remained significant ( $\beta = .17$ ,  $p < 0.05$ ). Thus, H1 was supported. Hypothesis 2 proposed that time pressure mediates the effect of the extent of telework on creativity of professional employees. The results showed that the extent of telework has a significant and positive indirect effect on creativity through time pressure ( $\beta = .11$ ,  $p < 0.01$ ; 95% CI: .05, .18). Thus, H2 was supported. Hypothesis 3 proposed that autonomy mediates the effect of telework on creativity of professional employees. Results revealed that telework has a significant and positive indirect effect on creativity through autonomy ( $\beta = .15$ ,  $p < 0.01$ ; 95% CI: .08, .23) thereby H3 was supported.

*Table 3. Summary of Hypotheses Testing*

Path	Estimate	s.e.	Percentile bootstrap 95% confidence level	
			Lower	Upper
<b>Direct Effect</b>				
<i>Hypothesis 1</i>				
EOT → Creativity	0.17*	0.06	0.02	0.30
<b>Indirect Effects</b>				
<i>Hypothesis 2</i>				
EOT → Time pressure → Creativity	0.11**	0.03	0.05	0.18
<i>Hypothesis 3</i>				
EOT → Autonomy → Creativity	0.15**	0.03	0.08	0.23
<b>Total Effect</b>				
EOT → Creativity	0.43**	0.05	0.30	0.54

\*\*  $p < 0.01$ , \*  $p < 0.05$

### ***Discussion***

The present study attempted answering three research questions. The first research question of this study aimed to find out; does telework impact the creativity of professional employees? Concerning this, results revealed that telework has a significant and positive impact on creativity. This finding generally accords with Vega et al. (2015), who reported a positive effect of telework on objectively rated creativity. Vega et al. (2015) measured creativity by using two indices; self-rated and objective rating of creativity. Though they found a positive impact of telework on objectively rated creativity, telework had no significant positive impact on self-rated creativity. In contrast, our study reported a positive effect of telework on self-rated creativity. A possible reason for this difference is that our sample was from professional employees work in software development companies, whereas the sample of Vega et al. (2015) was supervisors and non-supervisors work in a government organization. When compared to the government organizations, creative performance is a large component of professional employees' job who engaged in software development; thereby self-rated creativity measure captures the creativity in the present study.

Next, we examined the mediating effects of autonomy and time pressure in between telework and creativity. Accordingly, the second research question referred to; does time pressure mediate the impact of telework on creativity? We found that time pressure mediates the effect of telework on creativity. In line with prior research (Sardeshmukh et al., 2012), we found a negative direct impact of the extent of telework on time pressure. Also, our study confirms a direct negative



effect of time pressure on creativity reported by previous research (Andrews & Smith, 1996; Chen et al., 2015). Because of that, our research, based on the job demand perspective, integrated these two sets of relationships which were examined separately in previous studies.

The third research question referred to; does autonomy mediate the effect of telework on creativity. We found that autonomy mediates the impact of telework on creativity. The direct positive impact of the extent of telework on autonomy is consistent with previous findings (Gajendran et al., 2015; Sardeshmukh et al., 2012). Also, in line with Amabile et al. (1996) and Sia and Appu (2015), autonomy had a positive direct impact on creativity. Although prior studies reported the mediation role of autonomy in between the extent of telework and the job-related outcomes such as job satisfaction (Gajendran & Harrison, 2007); engagement (Sardeshmukh et al., 2012) and performance (Gajendran et al., 2015), it has not been linked to creativity. Therefore, our study extended the effect of telework on a new downstream consequence of creativity through autonomy. This finding is consistent with the insights of the JD-R model that theorize job autonomy as a valuable resource in achieving job-related outcomes.

### **Conclusions**

Individual creativity is a fundamental driver of subsequent team and organizational innovations. However, scant attention has been paid to investigate the effect of telework, a modern job designing technique, on individual creativity. Given this background, grounded on the JD-R model, this study attempted to link telework and individual creativity by examining the mechanisms by which telework impacts on the creativity of professional employees. In concluding, first, the extent of telework impacts positively on the creativity of professional employees. However, since our sample represented part-time teleworkers, caution should be taken in assuming the same positive impact for those who engage in extensive telework. Second, the positive impact of telework on creativity was partially mediated by autonomy and time pressure. Finally, our study sheds new light on both telework and creativity fields while setting the stage for further research in clarifying the effect of telework on creativity.

### **Guidelines for Applying Research to Practice**

Our research found telework fosters creativity of the professional employees in software developing companies. Particularly, telework as a job design of working remotely has found to be associated with positive outcomes of job satisfaction (Fonner & Roloff, 2010; Gajendran & Harrison, 2007) and performance (Gajendran et al., 2015). Hence, our findings inform the practitioners in software developing companies the appropriateness of telework as a job design to enhance the creativity of professional employees. The sample of the present study was

comprised of the part time teleworkers. The present study informs the practitioners that the part time teleworking serves as a better option in fostering creativity rather than high intensity teleworking. The employees belong to part time teleworking category engages in telework for 1-3 days per week (Biron & Veldhoven, 2016) which allows to experience the unique advantages associated with both collocated and teleworking context.

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