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**Constant Connectivity and its Impact on Employee Well-being: A
Mediating Role of Cognitive Overload and Mobile Work Device
Anxiety**

Mr Biswadeep Tamang

Vinod Gupta School of Management, Indian Institute of Technology, Kharagpur and
School of Population Health, Curtin University, Perth

Email: biswadeep.tamang@postgrad.curtin.edu.au

Dr Aradhna Malik

Vinod Gupta School of Management, Indian Institute of Technology, Kharagpur

Email: amalik@iitkgp.ac.in

Prof Jaya AR Dantas

School of Population Health, Curtin University, Perth

Email: jaya.dantas@curtin.edu.au

Prof Piyush Sharma

School of Management and Marketing, Curtin University, Perth

Email: Piyush.Sharma@curtin.edu.au

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ABSTRACT

The advent and integration of mobile information and communication technology (MICT), high-bandwidth cellular services, laptops and mobile phones have created a boundaryless workspace where employees are expected to remain constantly connected for work purposes even after-hours. This study intends to measure the conditional direct and indirect impact of constant connectivity after work hours on employee well-being and the mediating role of cognitive overload and mobile work device anxiety. Based on online panel data, a pilot study was performed to test the measurement model by assessing the convergent validity and reliability. Discriminant validity was also tested using a heterotrait-monotrait ratio. After a pilot study, data collection was relaunched, and all the data was collected in two periods with a minimum gap of two weeks. Based on 218 complete responses, a preliminary analysis was performed.

Keywords: constant connectivity, employee well-being, cognitive overload, mobile device anxiety

INTRODUCTION

Studies on mental health and well-being have made significant progress. Buchler, ter Hoeven, and van Zoonen (2020) made a significant contribution by studying the relationship of constant connectivity and subjective psychological well-being following the theoretical framework of Mazmanian, (2013). This study will attempt to extend the study of Buchler et al., (2020) by studying the mediating role of cognitive overload and mobile work device anxiety. Therefore, the main research question of this study is to investigate the mediating role of cognitive overload and work device anxiety in the relationship between constant connectivity and employee well-being.

Constant connectivity

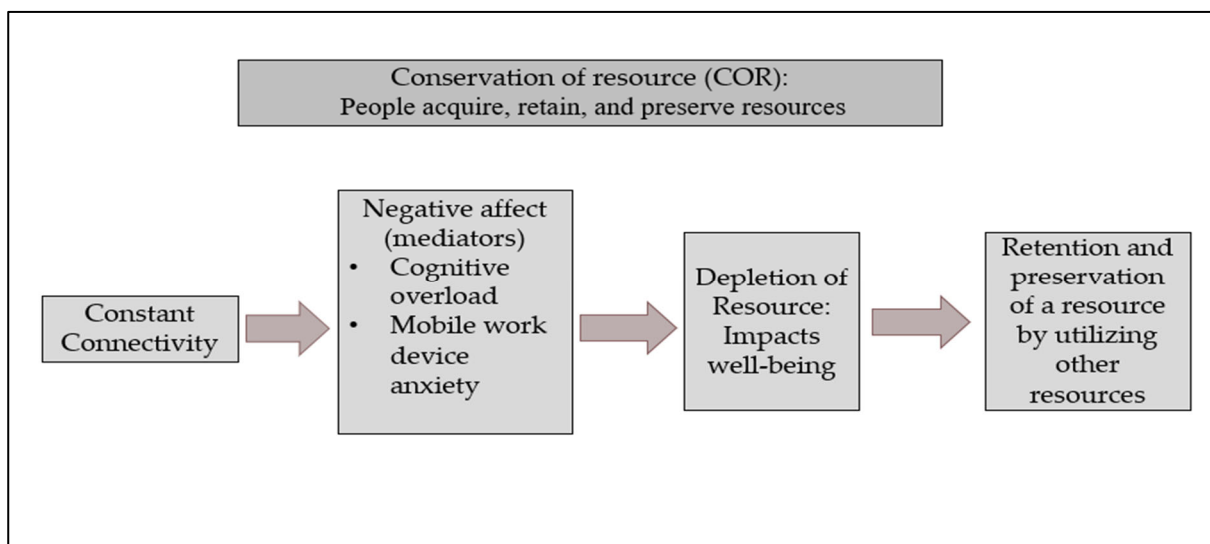
Constant or ubiquitous connectivity refers to employees' constant availability for work through mobile work devices that have blurred the boundary between work and home and require 24/7 connectedness (Buchler et al., 2020; Mazmanian, 2013). The state of constant connectedness is facilitated by the constant use of mobile information and communication technologies (ICT), mobile work devices (laptops, tablets, smartphones), high-bandwidth cellular services, wi-fi services and their applications. Social environment and desirability to stay connected and competitive in the workplace can also motivate employees to remain connected through mobile work devices (Mazmanian, 2013). On the other

hand, social pressure and management coercion to remain constantly connected can contribute to ill-being or the absence of employee well-being, which in turn can harm employee productivity (Buchler et al., 2020; Mazmanian, Orlikowski & Yates, 2013).

Cognitive overload

Cognitive overload is the “state in which an individual feels overloaded with interactive information that they must process simultaneously” (van Gog, Paas, & Sweller, 2010, p. 375) or overload related to using digital technologies excessively. According to the conservation of resource (COR) theory, employees may experience stress when required to invest resources and may miss important leisure time due to after-hours connectivity (van Zoonen, Treem, & Sivunen, 2023). The COR theory states that workers who experience a constant drive to be engaged in their work run a greater danger of exhausting their physical, mental, and time resources.

Figure 1: Theoretical model. This model is based on the study of Hobfoll, Halbesleben, Neveu, and Westman (2018).



Constant connectivity can affect the cognitive capacity of an individual when they are overwhelmed by information (Schmitt, Breuer, & Wulf, 2021). Therefore, a hypothesis can be proposed:

Hypothesis 1a: Constant connectivity positively influences cognitive overload.

Mobile work device anxiety

Drawing from the definition of technology anxiety, this study defines mobile work device anxiety as the tension that results from anticipating a bad consequence associated with using mobile work devices, which can be attributed to behavioral, physiological, and experiential factors (Wilson, Huggins-Manley, Ritzhaupt, & Ruggles, 2023). When an individual is faced with the prospect of utilising mobile devices, they may experience mobile device anxiety, which is a negative emotion associated with mobile device use or the level of their apprehension or even terror (Sánchez-Prieto, Olmos-Migueláñez, & García-

Peñalvo, 2016). Being constantly connected to work implies constantly using work devices. Therefore, constantly using work devices due to performance pressure can trigger or enhance work device-related anxiety. So, a hypothesis can be put forth:

Hypothesis 1b: Constant connectivity positively influences mobile work device anxiety.

Employee well-being

Well-being covers a person's state of happiness, or, to an extent, self-actualisation, and if succinctly put, it is optimal functioning (Tay, Batz-Barbarich, Yang, & Wiese, 2023). It can be conceptualised on three levels: individual (employee), organizational, and societal well-being. This research focuses on the relationship between constant connectivity and individual-level employee well-being. According to Hobfoll et al. (2018), COR theory proposes that people strive to acquire, hold onto, and preserve resources and that the loss or danger to resources can result in an absence of well-being. The infiltration and pervasiveness of mobile technology and devices in employees' work and personal lives have created a situation of constant connectedness even after work hours. So, a hypothesis can be put forth:

Hypothesis 2a: Constant connectivity negatively influences employee well-being.

Cognitive overload and mobile device anxiety are the negative effects of constant connectivity, as hypothesized above, due to impaired psychological health. Excessive use of digital work tools as a result of constant connectivity can lead to cognitive overload due to feeling overwhelmed by work-related information overload, which can lead to stress reactions, absence of well-being and further resource depletion (Schmitt et al., 2021). So, a hypothesis can be put forth:

Hypothesis 2b: Cognitive overload negatively influences employee well-being.

In the scenario, when employees are constantly using mobile work devices even after work hours due to organizational requirement, it can lead to inaccurate information processing, stress, burnout and anxiety due to longer screen-time (Matthes, Karsay, Schmuck, & Stevic, 2020; Reinecke, Aufenanger, Beutel, Dreier, Quiring, & Müller, 2017). As literature suggest, anxiety has negative effect on well-being (Xiao & Huang, 2022). So, a hypothesis can be put forth assuming negative impact of mobile work device anxiety on employee well-being:

Hypothesis 2c: Mobile work device anxiety negatively influences employee well-being.

Mediating role of cognitive overload and mobile work device anxiety

The ubiquity and pervasiveness of mobile work devices affect the psychological and emotional health of the employee. There is a reason to assume that due to constant connectivity and its subsequent impact on an individual's the cognitive capacity, cognitive overload mediates the relationship between constant connectivity and employee well-being. Likewise, due to anticipated mobile device-related fear and apprehension, mobile work device anxiety mediates the relationship between constant connectivity and employee well-being. In this study, cognitive overload and mobile device anxiety are the negative effects

or mediators between constant connectivity (through constant use of work devices) and employee well-being, i.e., constant connectivity causes the negative effect (mediator). In turn, the negative effect causes the changes in employee well-being (Wu & Zumbo, 2008).

Hypothesis 3a: Cognitive overload mediates the relationship between constant connectivity and employee well-being.

Hypothesis 3b: mobile work device anxiety mediates the relationship between constant connectivity and employee well-being.

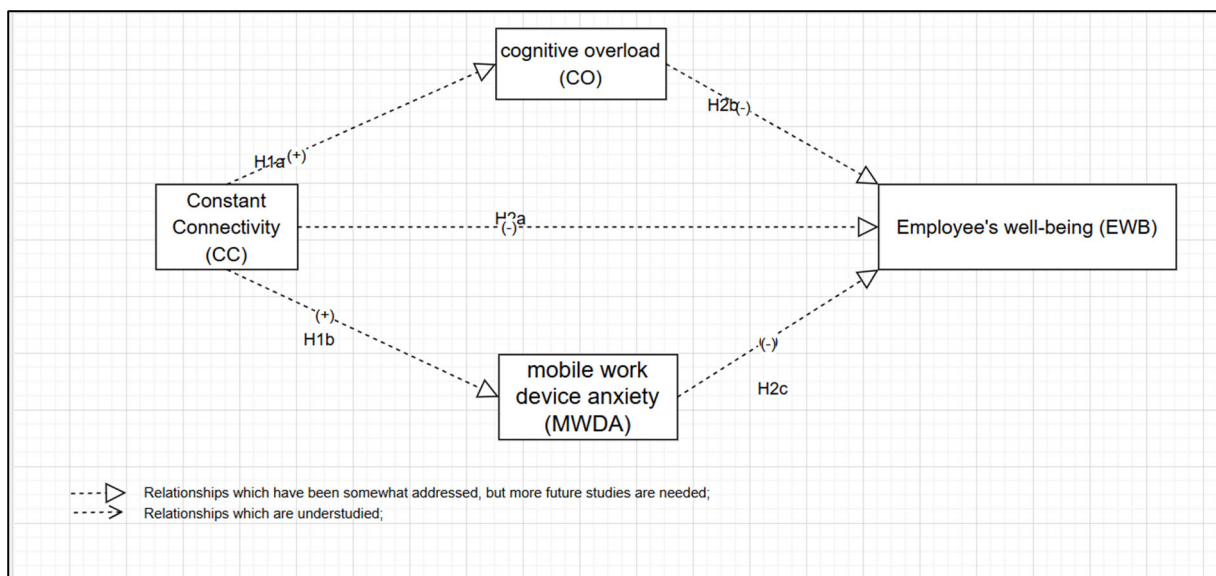
Research Question

What is the role of cognitive overload and work device anxiety in the relationship between constant connectivity and employee well-being?

Research Objective

To measure the conditional direct and indirect impact of constant connectivity after work hours on employee well-being through cognitive overload and mobile work device anxiety.

Figure 2: Conceptual model. This model is a modified model adapted from the studies of Schmitt et al. (2021) and Buchler et al. (2020).



Research Implications

Firstly, the findings from this study will be significant for organisational leaders and all the stakeholders in the organisation, as employee well-being is a crucial component that influences employee performance. Secondly, the timely study on constant connectivity, mobile work device anxiety and cognitive overload will significantly help the management in organizations in developing a better work design that can incorporate the impact of overload, anxiety and constant connectivity on employee well-being. Lastly, this study will empirically make contributions to the literature on employee well-being,

constant connectivity after work hours and cognitive overload. This study will help in extending the body of knowledge on the theory of conservation of resources. The findings of this study can also be potentially insightful for policymakers in organizations across sectors, and occupational health professionals can use the findings of this study to help employees attain a higher state of well-being.

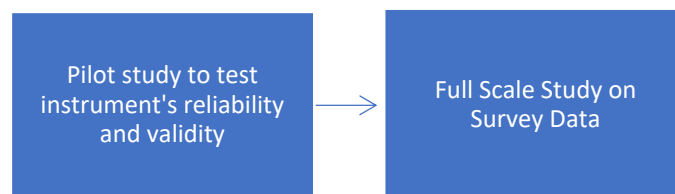
RESEARCH DESIGN AND METHOD

Phase 1: A pilot study was done based on data from 27 respondents to test the reliability and validity of the instrument. The values of Cronbach's alpha, composite reliability, average variance extracted, and HTMT ratio were within an acceptable range.

To get a more accurate and immediate impact of constant connectivity on employee well-being and to reduce participants' recall bias, employees' experiences of constant connectivity from the past two weeks will be captured (Buchler et al., 2020). Temporal (different timeframes) separation was followed during data collection to address the concern of common method bias (Kock, Berbekova, & Assaf, 2021). Data was collected in two different time periods with a gap of two weeks.

Phase 2: A preliminary analysis was performed based on 218 complete responses after the pilot study. The model was tested using structural equation modelling (SEM) in SPSS AMOS version 29.

Figure 3: Flowchart of research stages



Data Collection

Data was collected with the help of an online panel research company, Research Pty Ltd, focusing on knowledge workers in Australia. The identified constructs were measured using the existing scales with the help of the questionnaire floated among the individuals working in an organisation where employees use laptops and mobile phones for work purposes. A pilot test of the survey tool was performed to test the instrument's reliability and validity. For the pilot study, data were collected from 27 respondents in two different time frames with a gap of two weeks between the independent and mediating variables collected in T1 and the dependent variable collected in T2. The data were collected between 10 October 2024 to 31 October 2024. 57 per cent were male; the mean age was 42.37 (SD = 9.89), all respondents had a high school qualification, and 57 per cent had a bachelor's or higher degree.

After checking the instrument's convergent validity and reliability and the discriminant validity, we proceeded with the full data collection and collected data from 218 respondents. Initially, 445 invites

were sent to people working in various industries. Out of which, 12 were either part-timer or had less than 6 months of experience working in their current organisation, and these responses were removed for better results. 364 respondents agreed to reconnect for the T2 data collection. After two weeks, 252 invites were sent to participants who wished to reconnect during T1. After removing the flatliners and incomplete responses, we received 218 complete responses.

48.62 % were female in the main sample, with a median age of 42.76 years (SD: 11.48). These numbers are close to 47 % of the female ratio in the Australian workforce, with a median working age of 42. The larger chunk of respondents was from software & IT (18.35%), health care (16.51%), consultancy (9.63%), education (8.26%), banking & finance (7.34%), retail (5.5%), government (5.05%) and remaining from other sectors.

Measures

All items were measured on a seven-point Likert-type scale, with 1 corresponding to “strongly disagree” and 7 to “strongly agree”. *Constant connectivity* was measured using a five-item scale developed by Buchler et al. (2020). An example of the adapted item is “*Through the use of my office laptop and mobile phone, I stay connected to work during non-work hours.*” *Employee well-being* was measured using two dimensions: *psychological and work-related well-being*.

Psychological well-being was measured using the WHO well-being index (Topp et al., 2015), also used by Buchler et al. (2020). An example of the adapted item is, “*During the past two weeks, I woke up feeling fresh and rested.*” Work-related well-being was measured using six items from Zheng et al. (2015), where the items have been slightly modified as per the requirement of the study. An example of the adapted item is, “*During the past two weeks, I have been able to find real enjoyment in my work.*”

Cognitive overload was measured using a four-item scale developed by Choi and Lim (2016) and later by Schmitt, Breuer, and Wulf (2021). An example of the adapted item is, “*I am forced by my office laptop and mobile phone to do more work than I can handle.*” Mobile work device anxiety was measured using a scale developed by Venkatesh et al. (2003) and later used by Nikou and Economides (2017). An example of the adapted item is, “*I feel apprehensive about using my office laptop and mobile phone during non-work hours.*” The validity and reliability of all the scales have been established. The value for Cronbach alpha ranged from 0.81 to 0.94 in the pilot study and from 0.87 to 0.95 in the main study, as shown in Table 1.

Results:

Validating the structural model

The initially designed measurement model did not fit sufficiently: $\chi^2/df = 2.35$; RMSEA= 0.079 (CI: 0.067-0.091); CFI= 0.94; GFI=0.871; TLI=0.927; and SRMR=0.052. Identifying low-standardised regression weights (<0.69) of one of the items and removing it improved the model fit. The third item of cognitive overload ($\beta=0.67$) was removed. The retained measurement model demonstrated good model

fit: $\chi^2/df=2.056$; RMSEA=0.07 (CI: 0.056-0.083); CFI= 0.956; GFI=0.897; TLI=0.947; and SRMR=0.0508.

Construct reliability and validity of the scales were established, as shown in Table 1. The values of Cronbach's alpha (α), average variance extracted (AVE), and composite reliability (CR) were above the threshold of 0.70, 0.50 and 0.70 both in the pilot and main study.

Table 1: Construct reliability and validity of the scale: α , CR and AVE

Pilot study				Main study			
	α	CR	AVE		α	CR	AVE
CC	0.920	0.945	0.758	CC	0.912	0.917	0.688
CO	0.928	0.936	0.823	CO	0.872	0.862	0.611
EWB	0.947	0.979	0.675	EWB	0.919	0.889	0.668
MWDA	0.812	0.888	0.619	MWDA	0.875	0.964	0.686

Table 2 shows the Heterotrait-Monotrait ratio (HTMT) ratio for discriminant validity. All the values are less than the threshold of 0.85, which explains that the items of the different constructs are not highly correlated. The pilot study did not observe the expected negative correlation of CO and MWDA with EWB. However, it was observed during the later main study. This may be due to the low sample size in the pilot study.

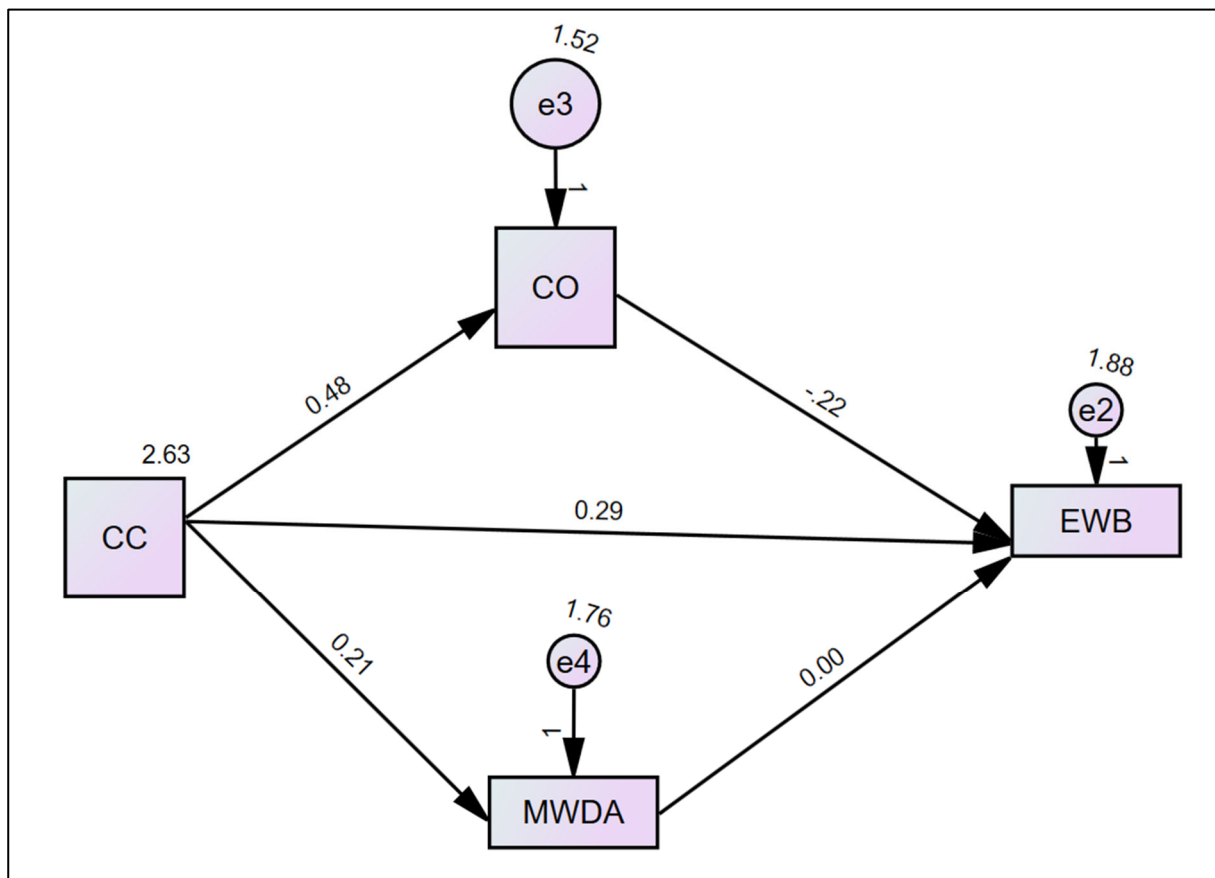
Table 2: Heterotrait-Monotrait ratio (HTMT) ratio for discriminant validity

Pilot study					Main study				
	CC	CO	EWB	MWDA		CC	CO	EWB	MWDA
CC					CC				
CO	0.672				CO	0.524			
EWB	0.180	0.174			EWB	0.227	-0.045		
MWDA	0.348	0.787	0.349		MWDA	0.249	0.570	-0.031	

Preliminary findings

The direct relationship between constant connectivity and cognitive overload was significant ($b^*=0.4767$; $t=9.2218$; BC 95% [0.3748; 0.5786], $p<0.0001$). So, *Hypothesis 1a* was supported, which states that Constant connectivity positively influences cognitive overload. The direct relationship between constant connectivity and mobile work device anxiety was significant ($b^*=0.2115$; $t=3.7988$; BC 95% [0.1018; 0.3213], $p<0.001$). So, *Hypothesis 1b*, Constant connectivity positively influences mobile work device anxiety, was supported. The direct relationship between constant connectivity and

Figure 4: Structural equation modeling results. The values shown are unstandardised parameter estimates.



employee well-being was significant but not in the expected direction ($b^*=0.2939$; $t=4.2974$; BC 95% [0.1591; 0.4287], $p<0.0001$). Hence, *Hypothesis 2a*, Constant connectivity negatively influences employee well-being, was not supported. The direct relationship between cognitive overload and employee well-being was significant ($b^*=-0.2199$; $t=-2.4340$; BC 95% [-0.3979; -0.0418], $p<0.05$). So, *Hypothesis 2b*, Cognitive overload negatively influences employee well-being, was supported. The direct relationship between Mobile work device anxiety and employee well-being was non-significant ($b^*=0.0004$; $t=0.0053$; BC 95% [-0.1648; 0.1657], $p>0.10$). So, *Hypothesis 2c*, Mobile work device anxiety negatively influences employee well-being, was not supported.

The indirect relationship between constant connectivity and employee well-being through Cognitive overload was significant ($b^*=-0.1048$; $t=2.36$; BC 95% [-0.1935; -0.0232]). So, *Hypothesis 3a*, Cognitive overload mediates the relationship between constant connectivity and employee well-being, was supported. The indirect relationship between constant connectivity and employee well-being through mobile work device anxiety was non-significant ($b^*=0.0001$; $t=0.005$; BC 95% [-0.0384; 0.0403]). So, *Hypothesis 3b*, mobile work device anxiety mediates the relationship between constant connectivity and employee well-being, was not supported.

Conclusion

We have assessed constant connectivity's direct and indirect impact on employee well-being. Contrary to our expectation, constant connectivity is positively associated with employee well-being, which aligns with findings from a recent longitudinal study by van Zoonen et al. (2023), who found a positive impact of after-hours connectivity on employee well-being. Further, we found that cognitive overload mediates the relationship between constant connectivity and employee well-being. Constant connectivity positively affected mobile work device anxiety (MWDA). However, no direct effect of mobile work device anxiety was found on employee well-being. Therefore, no mediating effect of MWDA can be assessed between constant connectivity and employee well-being.

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