



# Nexus among cyberloafing behavior, job demands and job resources: A mediated-moderated model

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## Abstract

This study examines the influence of job demands and job resources on cyberloafing behavior through the mediating role of job stress and work engagement and the contingent role of employee motivation at universities. The research model draws on border theory and the JD-R model. The partial least square structural equation modeling (PLS-SEM) technique is followed for testing the hypotheses. Data from 534 questionnaires was used for final analysis. The main findings of the study are: 1) job demands significantly increase job stress and cyberloafing behavior; 2) job resources significantly enhance work engagement, while reducing cyberloafing behavior; 3) job stress increases cyberloafing behavior, but work engagement reduces it; 4) job stress and job resources significantly mediate the relationship between job demands and cyberloafing behavior; and 5) employee motivation significantly reduces cyberloafing behavior and significantly moderates the relation between job stress and cyberloafing behavior. Theoretical and practical implications are discussed.

**Keywords** Job demands · Job resources · Job stress · Work engagement · Employee motivation · Cyberloafing behavior

## 1 Introduction

The productive use of information and communication technology, particularly the internet and its associated tools, is considered the most important index of economic and national development (Saghih & Nosrati, 2020). Positive use of the internet provides various benefits to organizations, such as lower organizational transaction costs and enhanced organizational performance (Zhong et al., 2020). However, misuse of the internet, such as increased cyberloafing behavior,

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presents problems; workers may not perform work well if they are involved in online engagements not linked to their job activities, resulting in reduced firm performance (Lim et al., 2020; Abbasi et al., 2021; Alsaad et al., 2018). Deviant work behavior, or cyberloafing, has been widely studied in recent decades (Lim, 2002; Lim et al., 2020; Mazidi et al., 2020). Cyberloafing is the employee's engagement in non-work activities during working hours (e.g. using WhatsApp, YouTube, Facebook, and Twitter, sending private messages, and opening other non-work-related websites). Most organizations are facing issues of cyberloafing (Mazidi et al., 2020).

Personal use of the internet by workers threatens organizations with low productivity, security issues, sexual harassment, and waste of organizational resources (Sheikh et al., 2015). Cyberloafing is a serious issue which can be difficult to halt once it has taken root. In educational settings, cyberloafing adversely affects the efficiency and productivity of learning and teaching activities (Saritepeci, 2020). The literature confirms that cyberloafing behavior may be good for employees but not for organizations overall (Koay & Soh, 2019). Restubog et al. (2011) found that workers cyberloafed roughly 192 min a day, and Lim & Chen (2012) that workers wasted some 300 min daily on personal work. There are several reasons for cyberloafing behavior by workers, including job demands, job resources, higher job stress, and less attachment to work (Jiang et al., 2020a, b; Syrek et al., 2018).

Border theory argues that people proactively try to attain a work-life balance and reduce role conflicts by constantly crossing the borders between work and non-work in order to satisfy both needs (Clark, 2000). The theory can be used to explain the association between job demands and cyberloafing behavior, as workers regularly cross the border between work and non-work domains to lessen the demands of their work (Clark, 2000). Prior researchers used job demands to determine employees' well-being (Nauman et al., 2019), authenticity at work (Metin et al., 2016), exhaustion (Beraldin et al., 2019), and burnout (Kim & Wang, 2018). Job resources are used to determine turnover intention (Agarwal & Gupta, 2018), burnout (Adil & Baig, 2018; Kotze, 2018), and job satisfaction (Elanain, 2009). However, previous research has paid less attention to job demands and job resources to measure cyberloafing behavior.

Some previous research has examined cyberloafing behavior from different theoretical perspectives such as containment theory (Soral et al., 2020), conservation of resource theory and social exchange theory (Lim et al., 2020), the theory of job embeddedness, reactance theory, and conservation of resource theory (Mazidi et al., 2020), social cognitive theory (Zhang et al., 2019), and theory of planned behavior (Askew et al., 2014). However, such studies are still at an emerging stage, suggesting the need for more research to determine cyberloafing behavior through other potential predictors. Our study assesses cyberloafing behavior by using border theory and the JD-R model. The previous research has paid scant attention to job demands, job resources, and cyberloafing behavior in connection with job stress, work engagement, and employee motivation. Therefore, our study will assess the nexus among job demands, job resources, and cyberloafing behavior, with the mediating role of job stress and work engagement. Employee

motivation is used as a moderating variable in the relationship between job stress and cyberloafing behavior, ignored by prior researchers.

## 2 Literature review and hypothesis development

### 2.1 Job demands, job stress, cyberloafing behavior

Work and family systems are different but interrelated (Clark, 2000). Border theory postulates that individuals are border-crossers and do not balance the non-work and work domains (Clark, 2000). The work and non-work domains are distinct but have a major influence on each other, and if individuals cross the border between them, for example by celebrating a wife's birthday during working hours, the organization can suffer in terms of cyberloafing. Border theory proposes that individuals have multiple simultaneous roles in non-work domains, like social networks, family, or part-time business. The literature indicates that individuals in non-work domains have more job demands and will try to fulfill those demands during the job (Koay et al., 2017). Employees involved in cyberloafing might be justified by working outside the job hours. Researchers have used job demands in examining burnout (Kim & Wang, 2018), exhaustion (Beraldin et al., 2019), employees' well-being (Nauman et al., 2019), and authenticity at work (Metin et al., 2016). However, they have paid scant attention to measuring cyberloafing behavior through job demands; our study attempts to fill this gap.

Job stress is normal, and several researchers have examined its causes and consequences. Bakker et al. (2003) found that employees face job stress because of scarce organizational job resources to meet their job demands. According to the job demands-resources (JD-R) model, job demands significantly increase strain in workers (Bakker & Demerouti, 2007). Individuals have limited resources of energy, time, attention, and money to meet their job demands, leading to job stress. Few studies have found a relationship between job demands (role ambiguity, role conflict, and work overload) and job stress. Therefore, the following hypotheses were formulated:

H1: Job demands will be positively related to cyberloafing behavior.

H2: Job demands will be positively related to job stress.

### 2.2 Job resources, work engagement, cyberloafing behavior

Job resources have five dimensions: task identity, skill variety, task significance, feedback, and job autonomy (Hackman & Oldham, 1975). Task identity means the degree to which a person participates in the completion of an entire piece of work. Skill variety is the extent to which a person may use various skills to perform work. Task significance refers to the significance of a job concerning other individuals. Feedback portrays the accessibility of information regarding performance effectiveness (Alatailat et al., 2019). Finally, job autonomy means the degree of decision-making independence during a job.

Some aspects of job resources may lessen job demands and their attached psychological and physiological costs, be functional in achieving work objectives, and encourage workers to learn and develop (Bakker & Demerouti, 2007). The JD-R model indicates that job resources significantly reduce turnover among employees (Bakker & Demerouti, 2007). In turn, a reduction in employee turnover intention indicates that employees are happy and committed to the existing job. The committed and motivated worker performs well and output increases (Bakker & Demerouti, 2007). Some researchers have used job resources to measure burnout (Kotze, 2018), job satisfaction (Elanain, 2009), and turnover intention (Agarwal & Gupta, 2018).

Job resources within firms include autonomy, participation in decision making, role clarity, and feedback. Job resources' social and interpersonal relations include team climate, supervisors, and co-worker support (Elrehail, 2020). The JD-R model conceptualizes work engagement (Bakker, 2011), the outcome of job resources (Schaufeli & Bakker, 2004). Researchers investigating the association between job characteristics and work engagement found mixed results (Othman & Nasuridin, 2019). While some concluded that job characteristics significantly enhance work engagement (Agarwal & Gupta, 2018; Kotze, 2018), their association remains inconclusive and needs further study. This study therefore postulates the following hypotheses:

H3: Job resources have a negative influence on cyberloafing behavior.

H4: Job resources have a positive influence on work engagement.

### 2.3 Job stress, work engagement, cyberloafing behavior

The JD-R model postulates that job strain significantly reduces organizational outcomes (Bakker & Demerouti, 2007), although it does not include job stress in determining cyberloafing behavior. The literature reveals that cyberloafing can be decreased to reduce job stress among employees (Blanchard & Henle, 2008), and that job stress significantly increases deviant workplace behavior (Swimberghe et al., 2014). Data collected through group interviews regarding reasons for cyberloafing found that a decrease in job stress will reduce it (Lim & Teo, 2005). Koay et al. (2017) found that job stress increased negative emotions and therefore cyberloafing in the ICT sector.

Work engagement means positive, fulfilling, and work-related feelings that include absorption, dedication, and vigor (Schaufeli & Bakker, 2004). Absorption indicates a higher focus in one's work without being conscious of time, and one's ability to detach oneself from work. Vigor means mental resilience, willingness, and energy to work hard, and dedication means being strongly concerned in one's work and experiencing a sense of significance, challenge, commitment, enthusiasm, motivation, pride, and inspiration (Schaufeli et al., 2002, p. 74). Some researchers used work engagement to measure job performance (Grobelna, 2019), turnover intention (Agarwal & Gupta, 2018), innovative behavior (Wu & Wu, 2019), and job satisfaction (Ghosh et al., 2019). They ignored the effect on cyberloafing behavior of work engagement. Therefore, the following hypotheses are postulated:

H5: Job stress has a positive influence on cyberloafing behavior.

H6: Work engagement has a negative influence on cyberloafing behavior.

## 2.4 The mediating role of job stress and work engagement

The earlier discussion on the association between job demands, job resources, job stress, work engagement, and cyberloafing behavior suggested that job demands influence the job stress that increases cyberloafing behavior. Moreover, job resources significantly enhance the work engagement that decreases cyberloafing behavior. The revised JD-R model states that job stress mediates the relationship between job demands and organizational outcomes, and that work engagement explains the relationship between job resources and organizational outcomes (Schaufeli & Taris, 2014). The JD-R theory ignores cyberloafing behavior. Therefore, the following hypotheses are proposed:

H7: Job stress significantly mediates the relationship between job demands and cyberloafing behavior.

H8: Work engagement significantly mediates the relationship between job resources and cyberloafing behavior.

## 2.5 Employees' motivation, cyberloafing behavior

Employee motivation is largely shaped by a firm's rewards system, both extrinsic and intrinsic (Rehman et al., 2019a). The JD-R model postulates that employee motivation is positively related to organizational outcomes (Bakker & Demerouti, 2007). Edgar et al. (2020) found that employee motivation significantly improves the job performance of workers. Although some researchers have used employee motivation to measure job performance (Pindek et al., 2019), knowledge transfer (Cruz et al., 2009), and organizational performance (Rehman et al., 2019a), less attention has been paid to its effect on cyberloafing behavior. Hensel & Kacprzak (2020) asserted that employee motivation has no influence on cyberloafing, indicating the need to study this relationship further to account for the variation in findings.

Job stress is positively associated with cyberloafing in the ICT sector (Koay et al., 2017). Despite this, Garrett and Danziger (2008) asserted that job stress has an insignificant influence on personal email use or web browsing during work. As the relationship between job stress and cyberloafing is inconsistent and needs the addition of another variable, our study used employee motivation as a moderator between job stress and cyberloafing behavior. Thus, the following hypotheses were formulated:

H9: Employee motivation has a negative influence on cyberloafing behavior.

H10: Employee motivation significantly moderates the relationship between job stress and cyberloafing behavior (Fig. 1).

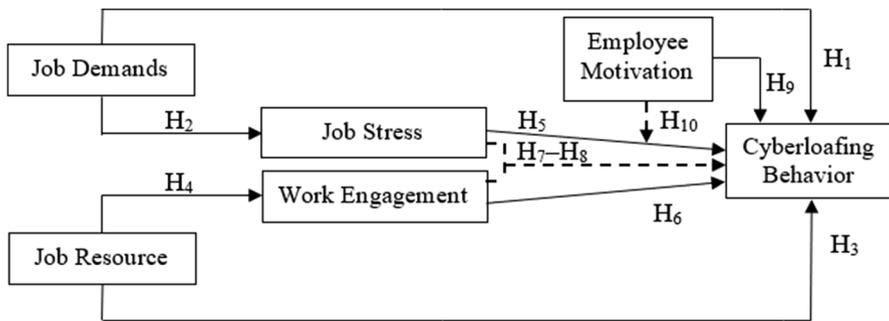


Fig. 1 Proposed research model

### 3 Methodology

#### 3.1 Measures

The items to be measured in the questionnaire are taken from various authors. Job demands have three dimensions: role ambiguity, role conflict, and work overload, each represented by three items adopted from (Firth, Mellor, Moore, & Loquet, (004) and a sample item is “At my job, I have to do things which should be done differently”. Job resources have five dimensions: skill variety, task significance, task identity, autonomy, and feedback, again represented by three items each adopted from (Hackman & Oldham, 1975) and this as sample item “The job requires me to utilize a variety of different skills in order to complete the work”. Job stress comprises eight items (Firth et al., 2004). Work engagement consists of three dimensions: vigor (6 items), dedication (5 items), and absorption (6 items), adapted from Schaufeli et al. (2006) and the following item one of the questions being asked “At my job, I feel strong and vigorous”. Employee motivation comprises seven items adapted from Barbuto and Scholl (1998) and sample item is “I always put forward my best efforts to get the job done regardless of the difficulties I experience”, and cyberloafing behavior 13 items adapted from Lim and Teo (2005) and the following sample of the items used “ I visit non-job related Websites”.

#### 3.2 Participants

Our study followed a quantitative approach to fulfill the research objectives, assuming a positivist stance. Pakistan has a total of 216 universities, 65 of which are located in Punjab. Our study used area cluster sampling technique for data collection, with the clusters based on districts. Pakistan has 36 districts, but only 15 have HEC recognized universities: Lahore, Multan, Faisalabad, Bahawalpur, Rawalpindi, Gujranwala, Dera Ghazi Khan, Sialkot, Rahim Yar Khan, Mianwali, Okara, Sahiwal, Sargodha, Narowal, and Gujrat. Table 1 shows the seven clusters randomly chosen for data collection, Lahore, Rawalpindi, Multan, Faisalabad, Bahawalpur, Sialkot, and Mianwali, because they have 87.69% of the universities.

Respondents are randomly selected from each cluster to complete the questionnaire. The area cluster sampling technique has several characteristics, especially reduced data collection cost and a more suitable approach where the population is spread over a wide area (Sekaran & Bougie, 2016). A total of 1,000 questionnaires were distributed among faculty members, and 534 were used for the final analysis, a response rate of 53.4%. Only established variables from prior studies have been used, measuring the constructs in a 5-point Likert scale (Khan et al., 2019; Kraus et al., 2020). Data was collected from January to March 2020. 68.16% of respondents were male and 31.84% female.

### 3.3 Common method bias (CMB)

As the data regarding exogenous and endogenous variables was gathered through questionnaires at the same time, CMB may be present (Kraus et al., 2020), which happens in behavioral studies. The literature confirms that CMB is linked with rigorous issues associated with self-survey reports (Podsakoff & Organ, 1986), although procedural remedies to decrease the impact of CMB are suggested. For example, at the time of data gathering, the researchers must assure respondents that all information, whether right or wrong, is in the safe hands (Kraus et al., 2020). The questions are unambiguous and free from grammatical mistakes (Podsakoff et al., 2012). Our study followed Herman's single factor for CMB, which explains 36.59% of total variance that is less than 50%. Hence, the CMB criterion is fulfilled.

### 3.4 Model estimation

Our study followed the SEM technique for hypotheses testing, using SmartPLS 3.2.9. PLS is a non-parametric variance-based SEM that works with small samples (Sarstedt et al., 2014). It is a suitable method when data does not fulfill the normality criterion (Khan et al., 2014). The PLS model presents more established results than the ordinary least square (OLS) model in a situation where study data have missing values, a multicollinearity issue, and a small sample size, and is therefore our primary research method. The research model has six reflective constructs, where job resources, job demands, and work engagement have several dimensions (see Section 3.1). PLS-SEM produces measurement and structural models.

**Table 1** Number of universities

Districts	No	Districts	No	Districts	No
Lahore	32	Sialkot	2	Okara	1
Rawalpindi	7	Mianwali	2	Sahiwal	1
Multan	6	Gujranwala	1	Sargodha	1
Faisalabad	5	Dera Ghazi Khan	1	Narowal	1
Bahawalpur	3	Rahim Yar Khan	1	Gujrat	1

Indicator reliability, internal consistency reliability, convergent reliability, and discriminant reliability are covered under the measurement model (Hair et al., 2014). Table 2 highlights that factor loadings are higher than the 0.50 suggested by Hair et al. (2014). This validates that the individual item reliability criterion is fulfilled. Data with factor loadings between 0.40 and 0.50 can be retained if average variance extracted (AVE) and composite reliability (CR) are not disturbed (Kraus et al., 2020). Internal consistency reliability is determined to calculate CR of variables, with a CR threshold value of at least 0.60 (Hair et al., 2014). In exploratory research, CR of 0.60 to 0.70 is acceptable, CR value of 0.70 to 0.90 is satisfactory to good, and values above 0.95 are deemed problematic (Kraus et al., 2020). Table 2 demonstrates that the lowest CR value is 0.763 and the highest 0.932 which is more than the threshold value. Hence, the internal consistency reliability criterion was fulfilled. Convergent validity refers to the degree to which variable items examine an identical variable (Rehman et al., 2019a, b, c). Table 2 highlights that the upper AVE value is 0.801 and the lower AVE is 0.515, which is higher than the threshold value of 0.50 (Hair et al., 2014).

Discriminant validity ensures that two factors are not statistically identical (Rehman et al., 2019a, b, c). Two methods are used to compute discriminant validity under traditional metrics (Fornell & Larcker, 1981): comparing AVE values with squared correlation values or comparing the square root of AVE with the correlation values. Henseler et al. (2015) stated that this traditional metric is unsuitable where factor loadings are little different, and instead proposed heterotrait-monotrait (HTMT) for discriminant validity. The HTMT value is 0.85 for constructs conceptually different and 0.90 for constructs conceptually the same (Henseler et al., 2015). Table 3 indicates that the discriminant validity criterion is fulfilled. Variance inflation factor (VIF) is computed to investigate multicollinearity issues; Hair et al. (2014) confirmed that VIF value must be less than 5. Table 3 shows that VIF is lower than 5, thus, there is no issue of multicollinearity.

#### 4 Regression model test

This section covers use of the structural model to test the research hypotheses. Bootstrapping runs use 2,000 subsamples. Table 4 presents the results of the hypotheses. Job demands have a significant influence on cyberloafing behavior ( $\beta=0.103$ ,  $p=0.006$ ,  $t\text{-value}=3.029$ ) and  $H_1$  is supported. Similarly, Koay et al. (2017) found that employees' private demands are positively associated with cyberloafing. Secondly, job demands are positively associated with job stress ( $\beta=0.321$ ,  $p=0.000$ ,  $t\text{-value}=7.962$ ), supporting  $H_2$ . The outcome is in line with Bakker et al. (2003) who found that employees face job stress because of inadequate job resources to fulfill their job demands. Job resources significantly decrease cyberloafing behavior ( $\beta=-0.617$ ,  $p=0.000$ ,  $t\text{-value}=5.230$ ) and  $H_3$  is supported, agreeing with Elanain (2009) who found that job resources are positively associated with job satisfaction. Thus, satisfied employees will not engage in cyberloafing activities. Job resources are positively associated with job engagement ( $\beta=0.768$ ,  $p=0.000$ ,  $t\text{-value}=8.513$ ), supporting  $H_4$ . The outcome is similar to Kotze (2018) who concludes that job

**Table 2** Convergent validity

First Order Constructs	Second-Order Construct	Items	Factor Loading	AVE	CR	R <sup>2</sup>	$\alpha$
Role Conflict		RC1	0.832	0.718	0.884		0.802
		RC2	0.904				
		RC3	0.802				
Work Overload		WO1	0.879	0.750	0.900		0.832
		WO2	0.894				
		WO3	0.822				
Role Ambiguity		RA1	0.741	0.560	0.763		0.728
		RA2	0.769				
		RA3	0.734				
	Job Demands	Role Conflict	0.898	0.687	0.868		0.851
		Work Overload	0.818				
		Role Ambiguity	0.766				
Skill Variety		SV1	0.741	0.608	0.822		0.776
		SV2	0.712				
		SV3	0.876				
Task Significance		TS1	0.713	0.560	0.790		0.745
		TS2	0.659				
		TS3	0.859				
Task Identity		TI1	0.873	0.801	0.923		0.875
		TI2	0.880				
		TI3	0.931				
Autonomy		AUT1	0.835	0.688	0.869		0.775
		AUT2	0.856				
		AUT3	0.797				
Feedback		FB1	0.841	0.673	0.860		0.755
		FB2	0.765				
		FB3	0.852				
	Job Resources	Skill Variety	0.722	0.623	0.891		0.885
		Task Significance	0.758				
		Task Identity	0.716				
		Autonomy	0.874				
		Feedback	0.861				
Job Stress		JS1	0.802	0.523	0.896	0.103	0.875
		JS2	0.766				
		JS3	0.726				
		JS4	0.565				
		JS5	0.601				
		JS6	0.836				
		JS7	0.692				
		JS8	0.752				
Vigor		VI1	0.806	0.623	0.907		0.875
		VI2	0.881				
		VI3	0.874				
		VI4	0.780				
		VI5	0.749				
		VI6	0.612				

**Table 2** (continued)

First Order Constructs	Second-Order Construct	Items	Factor Loading	AVE	CR	R <sup>2</sup>	$\alpha$
Dedication		DE1	0.821	0.633	0.896		0.857
		DE2	0.837				
		DE3	0.746				
		DE4	0.814				
		DE5	0.755				
Absorption		AB1	0.639	0.626	0.908		0.878
		AB2	0.743				
		AB3	0.847				
		AB4	0.876				
		AB5	0.848				
		AB6	0.770				
Work Engage- ment	Vigor		0.715	0.609	0.823	0.589	0.894
		Dedication	0.819				
		Absorption	0.804				
Cyberloafing Behavior		CBL1	0.627	0.515	0.932	0.529	0.921
		CBL2	0.684				
		CBL3	0.731				
		CBL4	0.774				
		CBL5	0.738				
		CBL6	0.677				
		CBL7	0.653				
		CBL8	0.669				
		CBL9	0.728				
		CBL10	0.720				
		CBL11	0.785				
		CBL12	0.778				
		CBL13	0.741				
Employees Moti- vation		EM1	0.775	0.544	0.892		0.738
		EM2	0.604				
		EM3	0.686				
		EM4	0.802				
		EM5	0.699				
		EM6	0.781				
		EM7	0.794				

**Table 3** Discriminant validity (HTMT)

Variables	VIF	CBL	EM	JD	JR	JS	WE
Cyberloafing Behavior (CBL)	--						
Employees Motivation (EM)	1.093	0.280					
Job Demands (JD)	1.439	0.707	0.328				
Job Resources (JR)	1.671	0.737	0.296	0.796			
Job Stress (JS)	1.155	0.130	0.151	0.319	0.373		
Work Engagement (WE)	2.470	0.474	0.250	0.725	0.793	0.321	

**Table 4** Direct and indirect relationships

Hypotheses	Paths	$\beta$ Value	Std. Dev	T-values	P-values	BCI LL	BCI UL	$f^2$
H <sub>1</sub>	JD $\rightarrow$ CBL	0.103	0.100	3.029	0.006	0.089	0.185	0.025
H <sub>2</sub>	JD $\rightarrow$ JS	0.321	0.040	7.962	0.000	0.261	0.381	0.115
H <sub>3</sub>	JR $\rightarrow$ CBL	-0.617	0.118	5.230	0.000	-0.390	-0.728	0.121
H <sub>4</sub>	JR $\rightarrow$ WE	0.768	0.020	8.513	0.000	0.734	0.774	1.436
H <sub>5</sub>	JS $\rightarrow$ CBL	0.120	0.036	3.342	0.007	0.170	0.082	0.027
H <sub>6</sub>	WE $\rightarrow$ CBL	-0.249	0.048	2.482	0.032	-0.160	-0.093	0.022
H <sub>7</sub>	JD $\rightarrow$ JS $\rightarrow$ CBL	0.039	0.012	3.289	0.008	0.052	0.023	—
H <sub>8</sub>	JR $\rightarrow$ WE $\rightarrow$ CBL	-0.191	0.037	2.499	0.032	-0.125	-0.069	—
H <sub>9</sub>	EM $\rightarrow$ CBL	-0.047	0.020	2.339	0.041	-0.072	-0.028	0.021
H <sub>10</sub>	EM*JS $\rightarrow$ CBL	-0.169	0.026	6.462	0.000	-0.222	-0.153	—

JD=Job demands; CBL=Cyberloafing behavior; JS=Job stress; JR=Job resources; WE=Work engagement

resources enhance work engagement in employees. Job stress is positively associated with cyberloafing behavior ( $\beta=0.120$ ,  $p=0.007$ ,  $t\text{-value}=3.342$ ) and supports H<sub>5</sub>. The outcome is similar to Garrett and Danziger (2008) who found that due to job stress workers use the internet for personal use during working hours.

Work engagement significantly decreases cyberloafing behavior ( $\beta=-0.249$ ,  $p=0.032$ ,  $t\text{-value}=2.482$ ), supporting H<sub>6</sub> and agreeing with the findings of Grobelna (2019), that work engagement significantly enhances job performance. There is an inverse relationship between cyberloafing and job performance; the greater the cyberloafing, the lower is job performance, and vice versa. Job stress significantly mediates the relationship between job demands and cyberloafing behavior ( $\beta=-0.039$ ,  $p=0.008$ ,  $t\text{-value}=3.289$ ) and supports H<sub>7</sub>. The results are in line with border theory, that workers are expected to frequently cross the border between non-work and work domains to meet their job demands on time (Clark, 2000). Moreover, job engagement significantly mediates the relationship between job resources and cyberloafing behavior ( $\beta=-0.191$ ,  $p=0.032$ ,  $t\text{-value}=2.499$ ), supporting H<sub>8</sub>. This agrees with Salanova and Schaufeli (2008), who found that work engagement significantly mediates the relationship between job resources (feedback, control, and variety) and proactive behaviour. Finally, employee motivation significantly reduces cyberloafing behavior ( $\beta=-0.047$ ,  $p=0.041$ ,  $t\text{-value}=2.339$ ), supporting H<sub>9</sub>. The results are similar to Rehman et al. (2019a), who found that intrinsic and extrinsic rewards significantly improve organizational performance. As the cyberloafing decreases, this will significantly improve the firm's performance. Employee motivation significantly moderates the relationship between job stress and cyberloafing behavior ( $\beta=-0.169$ ,  $p=0.000$ ,  $t\text{-value}=6.462$ ) and supports H<sub>10</sub>. The findings are similar to Edgar et al. (2020), that employee motivation significantly improves their job performance.

## 4.1 Predictive relevance of the model and effect size

Prior studies recommend computing  $Q^2$  to estimate the predictive relevance of the research model (Geisser, 1974; Stone, 1974). In SmartPLS, the blindfolding technique is used to compute  $Q^2$  as suggested by Kraus et al. (2020); its value must be greater than zero (Chin, 1998), and values of at least 0.02, 0.15, and 0.25 are considered small, moderate, and high predictive relevance respectively (Cohen et al., 2013). Table 4 demonstrates that job stress (0.043), work engagement (0.192), and cyberloafing behavior (0.250) have small, moderate, and high predictive relevance respectively. Hence, our study reveals that exogenous variables significantly enlighten endogenous constructs. Ringle et al. (2012) suggest computing the effect size ( $f^2$ ) of structural model paths, where values of more than 0.35, 0.15, and 0.02 are deemed large, medium, and smaller effect sizes, as recommended by Cohen (1988). Table 4 indicates that job demands, job resources, job stress, employee motivation, and work engagement have a smaller effect on cyberloafing behavior. Moreover, job demands have a smaller effect on job stress, and job resources have a high effect on work engagement.

## 5 Discussion and conclusion

This study intends to determine the relationship between job demands, job resources, and cyberloafing behavior with the mediating role of job stress and work engagement in Pakistani universities. It examines the moderating role of employee motivation in the relationship between job stress and cyberloafing behavior. The results demonstrate that job demands (i.e. role ambiguity, role conflicts, and work overload) significantly increase cyberloafing behavior among employees. The findings agree with those of Koay et al. (2017), that employees' private demands increase cyberloafing. Moreover, the outcomes are in line with border theory: although work and home are different they frequently impinge on each other (Clark, 2000). Our study recommends that workers' responsibilities from non-job activities have a significant influence on cyberloafing behavior, due to the need to fulfill job demands. Another reason for an increase in cyberloafing behavior is that employees try to balance their lives by utilizing working hours instead of spare time. Moreover, job demands significantly increase job stress among employees. The outcomes are similar to Bakker et al. (2003), who found that workers within organizations face job stress due to inadequate job resources to meet their job demands. The results are also in line with the JD-R model (Bakker & Demerouti, 2007) that job demands increase strain among workers. Individuals have finite resources of time, money, attention, and energy to fulfill their job demands. Thus, this will lead to job stress.

Job resources (i.e. skill variety, task significance, task identity, autonomy, and feedback) significantly reduce cyberloafing behavior. The findings are similar to Kotze (2018), that job resources significantly reduce burnout among employees. Furthermore, job resources are positively associated with job satisfaction (Elanain, 2009) and reduce employees' intention to leave (Agarwal & Gupta, 2018).

These results are in line with the JD-R model, that job resources reduce turnover among workers. This reduction in turnover intention demonstrates that the workers are happy with their current job and committed to it. This study suggests job resources decrease cyberloafing behavior and is beneficial for organizations. Moreover, job resources are positively associated with work engagement. The results agree with Kotze (2018), that job resources significantly enhance work engagement (i.e. vigor and dedication) in employees. The findings are also in line with the JD-R model; Schaufeli and Bakker (2004) found that job resources significantly stimulate work engagement. Job stress significantly increases cyberloafing behavior among employees. The outcomes are similar to Garrett and Danziger (2008), that job stress increases internet use for personal use. Job stress is a major issue and is not beneficial for organizations. Under job stress, employees' attention is diverted and they do not work productively, killing time in non-work activities such as opening personal emails, visiting news websites, playing online games, shopping online, and searching for new jobs through the internet. Work engagement significantly reduces cyberloafing behavior. The results are similar to Grobelna (2019), that job engagement improves job performance. There is an inverse relationship between cyberloafing behavior and job performance: the lower the cyberloafing behavior the better the job performance, and vice versa.

Job stress mediates the relationship between job demands and cyberloafing behavior. The findings are supported by border theory, that employees are expected to regularly cross borders between work and non-work domains to meet their job demands during working time (Clark, 2000). This study confirms that job stress increases cyberloafing behavior due to the existence of job demands. Job engagement mediates the relationship between job resources and cyberloafing behavior. Agarwal and Gupta (2018) found that job engagement mediates between job resources and turnover intention; job engagement significantly reduces turnover intention. Our study shows that job resources with the inclusion of work engagement reduce cyberloafing behavior. Cyberloafing behavior is a kind of cost borne by organizations, which reduces organizational performance and increases burnout. Employee motivation significantly reduces cyberloafing behavior. The outcomes are like those of Rehman et al. (2019a), that extrinsic and intrinsic rewards enhance firm performance. In other words, the lower the cyberloafing behavior the higher the organizational performance. Finally, employee motivation moderates the relationship between job stress and cyberloafing behavior. Job stress has a direct positive relationship with cyberloafing behavior, but adding employee motivation as a moderating variable changes this relationship from positive to negative, meaning that employee motivation significantly reduces cyberloafing behavior. The results agree with Edgar et al. (2020), who found that employee motivation enhances job performance.

In conclusion, job demands are positively associated with cyberloafing behavior and job stress. Job resources are negatively associated with cyberloafing behavior but are positively associated with work engagement. Job stress significantly enhances cyberloafing behavior among employees. Despite this, cyberloafing behavior is reduced through work engagement. Job stress significantly mediates the relationship between job demands and cyberloafing behavior. Work engagement significantly mediates the relationship between job resources and cyberloafing behavior.

Employee motivation significantly reduces cyberloafing behavior. Finally, employee motivation significantly moderates the relationship between job stress and cyberloafing behavior.

## 5.1 Theoretical contributions

A theoretical contribution entails a specific type of research result that can present original insights into a phenomenon that is regarded as vital for increasing a firm's value (Kraus et al., 2020). Our study offers various contributions, by examining the relationship between job demands, job resources, and cyberloafing behavior with the mediating role of job stress and work engagement and the moderating role of employee motivation on the relationship between job stress and cyberloafing behavior. This study incorporates job demands, job resources, job stress, work engagement, employee motivation, and cyberloafing behavior in a single framework that has been ignored in prior studies. It contributes to the current literature by examining the association between exogenous and endogenous variables, based on JD-R theory and border theory.

We extend the work of König and De La Guardia (2014) that examined the relationship between private demands and cyberloafing in light of border theory. Their results revealed that private demands have a significant but weak influence on cyberloafing, although they were not clear why job demands increase cyberloafing. Our study fills this gap, using job stress as a mediating variable in the relationship between job demands and cyberloafing behavior. Thus, our results confirm that job demands significantly increase job stress, leading to cyberloafing behavior. Sometimes, employee non-work domains have a strong effect on workers' emotions and behavior during the job. Employees must manage both their work domain and their non-work domain.

Our study extends the work of Othman and Nasurdin (2019), who determined the relationship between job resources and work engagement. The findings explained that job resources have mixed findings with work engagement as job autonomy, job feedback, task identity, and task significance are positively associated with work engagement, although skill variety is not. The relationship between job resources and work engagement is not clear and needs further investigation. Our study used work engagement as a mediating variable in the relationship between job resources and cyberloafing behavior. The JD-R model suggests that work engagement mediates the relationship between job resources and turnover intention (Schaufeli & Bakker, 2004). Thus, our study reveals that job resources make employees more engaged with their jobs, reducing cyberloafing behavior. Finally, this study extends the work of Koay et al. (2017) that investigated the relationship between job stress and cyberloafing. The outcome is in line with Bakker and Demerouti (2007), that job stress significantly decreases organizational outcomes. Our study adds employee motivation as a moderating variable in the relationship between job stress and cyberloafing behavior. The reason for using employee motivation as a moderating variable is that, if the employees are motivated within the organization, this can reduce the impact of job stress and will decrease cyberloafing behavior.

## 5.2 Practical implications

The outcomes of our study have significant implications for university management. The research model aims to present directions for the management of public and private universities about the influence of job resources, job demands, job stress, work engagement, and employee motivation on the implementation of cyberloafing behavior. The university management can stop their teachers from moving from work domains to non-work domains that causes cyberloafing behavior, by applying some countermeasures, for instance, imposing punishments, introducing internet usage policies, blocking websites that are normally open during working hours, and investing in internet monitoring systems to reduce cyberloafing behaviors. Management can issue warnings to teachers who frequently engage in cyberloafing, although there should be some relaxation for teachers for the most important activities in which they can use their mobile phone or the internet. This relaxation can reduce job stress during working hours and minimize cyberloafing behavior. In Pakistan, long working hours significantly increase job stress, reducing job satisfaction (Khan & Imtiaz, 2015). The university management should balance the work and non-work domains in order to reduce job stress, as is in favor in universities.

The results of our study indicate the significant role of job resources and work engagement on cyberloafing behavior. The universities should concentrate on job skills, autonomy, task identity, significance, and feedback that will help to engage teachers more fully with their job, lead to a reduction in cyberloafing behavior. The university management should find the ways to build and sustain passion and energy in teachers during the job. Teachers must be given independence to design their courses, assignments, projects, article writing, and presentation, etc. There should be frequent assessment of teachers regarding several aspects of the job, including the adoption of new technological tools such as online lectures, presentations, and checking assignments. The more teachers are engaged in their job, the less will they be involved in cyberloafing, a positive step for universities. Finally, this study suggests the employee motivation can play a significant role in the management of universities. If the teachers are motivated by their jobs, this can reduce the impact of job stress and lead to a decrease in cyberloafing behavior. Motivation is optimal when teachers have rights like independence in conducting extra classes or leaving the class. This is because teachers feel their worth is appreciated, motivating them and in turn reducing cyberloafing behavior.

## 5.3 Limitations and future research

Our study has some limitations that can be rectified in future work. First, data on job demands, job resources, job stress, work engagement, employee motivation, and cyberloafing behavior was self-reported and collected through a single source. The study did make every effort to reduce CMB issues through procedural remedies (see Section 3.3). Second, this study is cross-sectional in nature, and the authors are not confident that job demands, job resources, job stress, work engagement, and employee motivation in public and private universities provide similar results in the

long run. Thus, future researchers could adopt the same research model to check whether the findings remain identical in the long term. Third, this study collected data from public and private universities in Pakistan, but future researchers could gather data from the ICT sector, manufacturing, banking, and construction industries to identify any variations in outcomes. Fourth, future studies can extend this research model by concentrating on other predictors, such as work-family conflicts, workplace ostracism, consideration of future consequences, and job satisfaction with cyberloafing behavior. Fifth, cyberloafing behavior can be test on the students as they addicted to the technology and because of online classes may this behavior affects the efficiency and productivity of learning and teaching activities. Finally, this study was held in Pakistan; future researchers could test the same research model in other countries to look for any variations in the results.

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