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After-hours work-related technology use and individuals' deviance: the role of interruption overload, psychological transition and task closure

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Abstract

Purpose – The information and communication technologies have made it progressively practical for employees to remain associated with work, even when they are not in the workplace. However, prior studies have provided very little understanding of the implications for the deviant behavior aspect. The current study aims to investigate the association between after-hours work-related technology usage and interpersonal, organizational and nonwork deviance through psychological transition, interruption overload and task closure. The authors draw upon the theory of conservation of resource (COR) to examine the research model.

Design/methodology/approach – The primary data for the study has been collected in two waves from the sample of 318 employees who were working in diverse organizations in the Anhui province of the People's Republic of China for empirical testing of the authors' research model.

Findings – This study's findings have revealed the positive association of after-hour work-related technology use with individuals' deviance in its entire three forms through psychological transition and interruption overload and have negative associations with all forms of deviance through task closure.

Originality/value – The significant contribution of this study is in the literature on technology use and employee outcomes, by identifying the consequences of technology use in both work (interpersonal deviance and organizational deviance) and outside work domain (nonwork deviance) and exploring the underlying mechanisms for these relationships in detail. To the best of the authors' knowledge, this study is the first of its kind that investigates a relationship between after-hours technology use and all three kinds of deviance while exploring both the positive and negative perspectives in one study.

Keywords After-hours technology use, Interpersonal deviance, Organizational deviance, Nonwork deviance, Psychological transition, Interruption overload, Task closure

Paper type Research paper

Introduction

Information and communication technology (ICT) usage after work such as emails, text messages and phone calls is ubiquitous in the current era (Williams, 2019). Researchers have argued that the proliferation of ICTs has provoked two-way arguments. On one side, the use

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of technology increases the work time of individuals with place flexibility (Cousins and Robey, 2015; Diaz *et al.*, 2012; Jarvenpaa and Lang, 2005). While on the other hand, technology often results in constant interruptions into individuals off-time that causes stress and strain (Galluch *et al.*, 2015) and produce negative outcomes such as underperformance (Chen and Karahanna, 2018), increased turnover intentions (Ferguson *et al.*, 2016) and disturbed work-life balance (Adela and Casterella, 2019). The changing landscape of work-life interface due to the global connectivity with technology has made it important to explore that how after-hours work-related technology use (hereafter it refers as AHWTU) induces interruption and deviant behavior at the workplace (Ferguson *et al.*, 2016).

Despite the increasing scholarship of technology usage and its consequences such as innovation, agility and creativity, ample space still remains to be explored in AHWTU, psychological and behavioral dynamics, and its outcome such as deviant behavior (Park *et al.*, 2019; Pletzer *et al.*, 2019). Deviant behavior is considered as the varying attitude or belief when compared to conventional standards. Lucas and Friedrich (2005) have perceived it in negative terms. When this deviant behavior is practiced at the workplace, it is regarded as workplace deviance such as reduced work commitment, absenteeism and employee turnover (Huiras *et al.*, 2000). Researchers have argued that the proliferation of technology induces deviant behavior in the workplace which influences employees' productivity (Mallmann, 2020). For example, Wang *et al.* (2020) suggested that employees in western countries engage in deviant behavior causing more loss to organizations. There are various social and psychological benefits of technology use, but it also leads to deviant behavior that results in declining work productivity (Karr-Wisniewski and Lu, 2010). Due to this reason, when the employees are continuously engaged with technology, they experience work overload (Boswell and Olson-Buchanan, 2007; Barley *et al.*, 2011). Yet, existing literature in this area is inconclusive that requires an in-depth investigation of the underlying mechanism and consequences of after-work hour technology use.

We have identified several gaps and curbs in prior literature. First, extant literature has over-emphasized the positive aspects of technology use while overlooking its adverse consequences, as AHWTU tempts social and informational burden that reduces productivity (Chen and Wei, 2019) and results in creating the emotional exhaustion that hinders creativity (Xie *et al.*, 2018). The current study is an attempt to bridge this gap by investigating the dark side of AHWTU, that is, deviant behavior. Second, prior studies were mainly focusing the performance measures as innovative behavior and agility performance (Cai *et al.*, 2018; Schuetz and Venkatesh, 2020). However, quite rare empirical studies have discussed after-hour work-related technology use and deviant behavior. The working environment is changing due to the rapid development of technology. Thus, there is a dire need to better understand and develop strategies to reduce deviant behavior in the workplace. Current study has considered three types of deviant behaviors such as (1) nonwork deviance (NWD) that is the individual's deviant behavior outside the organization, (2) interpersonal deviance (ID) refers to the deviant behavior targeted towards other individuals (e.g. violence, gossips and theft of others such as coworkers and valuables) and (3) organizational deviance (OD) alludes to the negatives conduct toward the organization. Due to this, the current study is timely and pertinent to assist the managers in minimizing deviant behavior in the workplace.

Third, previous studies mainly investigated the underlying processes, such as absorptive knowledge creation capability (e.g. Cao *et al.*, 2018) and psychological conditions (e.g. Cai *et al.*, 2018). The variables representing the negative side of after-work hour technology use are rarely studied. In this context, we considered the negative aspects such as psychological transition (PT) and interruption overload (IO), while task closure (TC) as a positive aspect. PT is described as a psychological movement between different roles (work and nonwork), for example, disengagement from one role (work) and engagement in another role (nonwork)

(Ashforth *et al.*, 2000). IO is a state in which the rate of technologically mediated work interruptions in the nonwork domain exceeds the human capacity to deal with such interruptions adequately (Chen and Karahanna, 2018). In addition, based on flexibility and enrichment perspectives, we explore TC as a mediating mechanism that is positively related to AHWTU but has a negative association with three forms of deviance. To address this lacuna, this study has examined the mediating effect of these three variables, thereby providing timely and relevant inputs to help managers in minimizing interruptions. Finally, recent literature has suggested that AHWTU predicts an increased level of interruptions (Chen and Karahanna, 2018). Such moment-to-moment transition due to AHWTU from work to nonwork domains consumes psychological resources. This juggling across the domains might exceed one's capacity to handle, therefore, might induce feelings of exhaustion (Cao *et al.*, 2018; Luqman *et al.*, 2017; Maier *et al.*, 2015). Practically, rarely any theoretical model has identified the drivers of deviant behavior at the workplace along with the underlying mechanisms. This study examined the theoretical model through the lens of conservation of resource (COR) theory to better understand the proposed associations.

The current study addresses these visible research lacunas in ICT literature, guided by two research questions (RQs). RQ1. What is the association between AHWTU, interruption overload, PT and TC and deviant behavior? RQ2. Do IO, PT and TC mediate the association between AHWTU and deviant behavior? We assume that AHWTU creates a stressful situation through PT, IO and TC that subsequently leads to three kinds of deviance including organizational, nonwork and interpersonal. The study proposes a research model drawing upon conservation of resource theory (Hobfoll, 1989) with the cross-sectional research design to investigate if AHWTU induces IO, PT and TC and in turn deviant behavior. A total of 318 respondents from the Anhui province of China participated in this study (see Figure 1).

Theoretical background

After-hour work-related technology use

Organizations are increasingly using communication technologies to yield various benefits in the form of employee engagement, perceptions of effectiveness and autonomy (Claartje *et al.*, 2016; Mazmanian *et al.*, 2013). Employees find technology to use effectively when they feel autonomy and flexibility in accomplishing the nonwork and work-related tasks (Valcour and

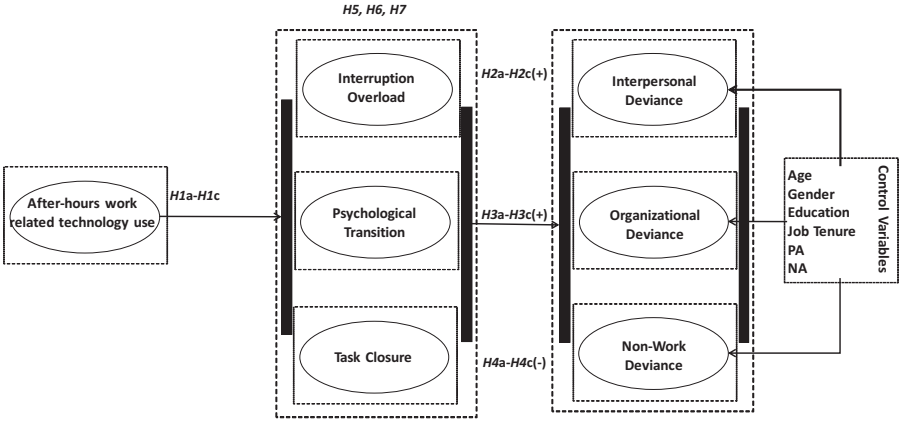

Figure 1.
Proposed research model

Note(s): H1 to H7 = Hypothesis 1 to Hypothesis 7, PA = Positive Affect, NA = negative Affect

Hunter, 2005). After-hour technology use facilitates employees to work from everywhere and at any time (Xie *et al.*, 2018). It further facilitates in meeting the work demands conveniently leading to job satisfaction (Diaz *et al.*, 2012). Other than the benefits of after-hour technology use, several studies have reported the negative impact of this usage (Xie *et al.*, 2018; Derks *et al.*, 2014). AHWTU ensures the availability of employees and provides them access to work-related tasks after working time leading to excessive consumption of resources such as energy and time utilized in thinking about and completing job tasks resulting in emotional exhaustion (Demerouti, 2001; Ragsdale and Hoover, 2016). When employees are emotionally exhausted, they may go for deviant behavior (Golparvar, 2016).

Workplace deviance is referred to as "voluntary behavior that violates significant organizational norms and in so doing, threatens the well-being of an organization, its members, or both" (Robinson and Bennett, 1995, p. 556). Scholars have regarded this prevalent negative behavior of employees as dysfunctional behavior, employee misconduct, service dysfunction, counterproductive behavior and antisocial employee behaviors (Griffin *et al.*, 1998; Kolz, 1999; Giacalone and Greenberg, 1997; kidder, 2005; Harris and Ogbonna, 2006). Robinson and Bennett (1995) and Aquino *et al.* (1999) proposed another form of deviance that is ID. ID is any negative behavior targeted towards other persons, such as coworkers. NWD, a third form of deviance, is getting popular in modern literature as it is referred to the deviant behavior targeted towards the people outside the organization (Yam *et al.*, 2017). Given our interest in all AHWTU and individual deviance, this study enriches deviance literature by broadening the horizon of deviant behavior by incorporating three kinds of deviance. Neuman and Baron (2005) suggested that deviance could be a reason for stressful events. Whereas, Krischer *et al.* (2010) argued that individuals may be involved in deviant behavior as they may take it instrumental in reducing stress. For example, working slowly, taking longer breaks, leaving the office early, uninformed absenteeism, fighting with others in and outside the organization and cheating and lying in and outside the organization may allow people to gain control, avoid further resource loss and replenish the lost resources.

Prior literature has considered AHWTU as work-related technologically mediated interruptions that cause suspension or delays by breaking the steadiness of ongoing activities in the nonwork domain (Chen and Karahanna, 2018). Researchers view this interruption as a productivity challenge in the workplace. For instance, McFarlane and Latorella (2002) suggested that interruptions adversely affect the ability to engage in sustained attention and have a negative relationship with decision making, work-life balance and nonwork performance (Chen and Karahanna, 2018). In addition to these nonwork consequences, numerous work-related outcomes have been reported previously including work exhaustion, job burnout, work satisfaction, work performance, turnover intentions and work engagement (e.g. Rasheed *et al.*, 2020; Chen and Karahanna, 2018; Derks *et al.*, 2014; Ragsdale and Hoover, 2016; Ferguson *et al.*, 2016; Diaz *et al.*, 2012). Surprisingly, the third side of performance is deviant behavior that has not been studied previously, which is the commonly observed outcome in interruption studies. Hence, this presents the lacuna in prior literature that the relationship between AHWTU and all forms of individual deviant behavior, both in the work (interpersonal and organizational) and nonwork (nonwork deviance) domain has not been explored yet.

The present study leverages the COR theory to understand the resource dynamics induced by after-hours technology-mediated work interruptions. It further explores the mediating mechanism such as PT and IO to understand how such interruptions exert negative consequences such as deviant behavior. Work-related interruptions during off-job time may cause a shift of resources from personal domain to encounter work call, and frequently doing so may ultimately reduce individual's resource-reserves and thus cause stress. The basic premise of COR theory is the role of resources to create and prevent strain outcomes. AHWTU poses a threat to an individual's resources such as energy and time, thus individuals are left with fewer resources available to address nonwork obligations and this

creates negative consequences such as stress. Stress is the resulting outcome of work environment characteristic that poses a threat to individuals (Caplan *et al.*, 1975). Similarly, our conceptualization of after-hours work-related interruptions is the environmental work factor that poses a threat to an individual's resources that leads to adverse effects.

After-hours work-related technology-mediated interruptions may create the strain based on time and conflict. Strain-based conflicts arise when work formed strain makes it challenging to meet nonwork demands (Steiber, 2009) by decreasing one's physical and psychological resources (Edwards and Rothbard, 2000). Time-based conflict arises when time devoted to work ingests time that is needed to accomplish nonwork responsibilities (Steiber, 2009). Both types of conflicts are based on the transferal of resources, and how this transition obstructs psychological and behavioral outcomes, motivate us to conceptualize the harmful effects of AHWTU through IO. Moreover, individuals' psychological preoccupation with work while they are in the nonwork domain, motivate us to conceptualize the adverse effects of AHWTU through PT.

On the other hand, based on COR's resource acquisition tenet and enrichment principle, we conceptualize the positive effects of AHWTU. For instance, mobile technologies enable workers with temporal and geographical flexibility. Such flexibility allows individuals to effectively deal with work-related tasks at their opportune time and place. Work-related use of technology is embedded with the opportunity to allocate resources in a way that fits their preferences and enhance their chances for resource gain. Therefore, addressing AHWTU may reflect an individual's resource investment strategies to acquire resources by completing work goals. We posit that AHWTU provides the opportunity to complete unfinished work tasks while being in the nonwork domain. When an individual cannot complete a certain task in the office he does completes it after coming back home. Such a TC facilitates workers gaining more resources to do their job well and to nullify the factor of loss of resources associated with IO and PT. Therefore, we assume that this TC factor which is associated with technology use at home is negatively associated with individuals' deviant behavior.

Hypothesis development

After-hours work-related technology use

The use of technology after working hours has become a common practice in organizations. As mentioned earlier, prior literature has discussed its favorable as well as adverse consequences. After-hour work-related technology use has resulted in improved performance of employees and reduced work exhaustion by allowing them to close the major work-related tasks (Chen and Karahanna, 2018). Moreover, it also increases work satisfaction and nonwork accomplishments that lead to decreased work-life conflict (Diaz *et al.*, 2012; Derks *et al.*, 2016). Prior studies have presented adverse outcomes such as psychological detachment, turnover intentions, increased stress and job burnout (Khizar *et al.*, 2020; Ferguson *et al.*, 2016; Butts *et al.*, 2015; Mazmanian *et al.*, 2013; Derks *et al.*, 2014; Zhou and Wang, 2019; Zhou *et al.*, 2019). Moreover, communication technologies are considered a constant interruption in today's working environment with an expectation that employees are continuously accessible (O'Leary *et al.*, 2011). Previously, interruptions have been studied from the perspective of an individual's personal life and work performance. For example, Karr-Wisniewski and Lu (2010) reported that excess of interruptions can contribute to increased levels of stress and inefficiencies. However, AHWTU is similar to the interruptions discussed above. AHWTU is negatively related to work exhaustion and performance (Chen and Karahanna, 2018). Similarly, Ferguson *et al.* (2016) concluded the frequency of using a smartphone for work purposes during nonwork hours is associated with increased levels of work-family conflict, burnout and decreased organizational commitment which leads to turnover intentions.

After-hours work-related technology-mediated interruptions create a trade-off situation, and consume one's resources (time and energy), which would lead to the state of IO by creating a time-based and strain-based pressure and causing activities (e.g. family dinner and watching movies) to be canceled or rescheduled. Individuals feel stressed when work-related interruptions surpass the resources available to adequately deal with them. Adverse reactions to such IO are expected in the form of aggression, retaliation or counterproductive work behaviors. The adverse outcomes of AHWTU are not limited to interruption overload but beyond this, such as the frequent use of AHWTU can be harmful to the interactive relationship demands with clients and colleagues (Bakker and Demerouti, 2007). The free time then becomes critical for employees to regain from the load created from work in the free time that results in poor health and greater stress (McEwen, 1998; Geurts and Sonnentag, 2006). Similarly, Kompier *et al.* (2012) presented the outcomes of the previous mechanism in the form of anxiety and psychological detachment. This makes it difficult for employees to switch their roles from one domain (work) to another (nonwork) and thus would lead to psychological transition.

Psychological transition is described as a psychological movement between different roles (nonwork and work) (Ashforth *et al.*, 2000). Prior studies reported elevated levels of negative feelings in response to a frequency of cognitive switching between multiple tasks, such as stress or frustration (Prakash *et al.*, 2015). Moreover, PT is linked with psychological conflicts through preoccupation with work-related thoughts while in the family domain (Carlson and Frone, 2003; Greenhaus, 1988).

TC is referred to as "the extent to which after-hours work-related interruptions allow one to bring to completion of unfinished work-related communications or tasks" (Chen and Karahanna, 2018). Unfinished work may be related to the elevated levels of psychological preoccupation with work when individuals physically leave the work domain. Incomplete tasks may serve as prolonged thoughts as to when people physically move from work to nonwork, their mind may remain to call for closure. These prolonged thoughts would be related to increased work exhaustion as they are adversely contributing to disengaging from work. Empirical evidence has shown that the lack of closure is related to anxiety (Colbert *et al.*, 2006; Freeman *et al.*, 2006) and psychological intrusion (Rennecker and Godwin, 2005). Therefore, based on the above rationale, we proposed the following hypotheses;

H1. There is a positive relationship between AHWTU and (1a) Interruption overload, (1b) psychological transition, (1c) task closure.

Interruption overload, psychological transition, task closure and deviant behavior

Interruptions occur in form of messages, phone calls, emails and task reminders. Afifi *et al.* (2018) have disclosed that the technology-based interruption literature is still in the developing stage despite the popularity of these interruptions. When the employees receive greater interruptions in their off time that they can't effectively handle is interruption overload (Chen and Karahanna, 2018). Prior studies have shown the adverse consequences of interruption as reduced productivity of employees and increased stress that leads to deviant behavior (Riemer and Frobler, 2007; Stephens, 2008).

In this age of digital transformation, the physical transition from nonwork to work is less critical. Previous results demonstrate that technologically tethered employees have potentially troubling implications, particularly when they experience difficulties in disengaging from work and feel heightened stress (Madden and Jones, 2008). AHWTU requires a psychological transition that allows individuals to actuate appropriate work-related mindset and behaviors. These cognitive efforts not only consume personal resources, but it generates feelings that one's personal time is invaded and fragmented (Ragu-Nathan

et al., 2008). The strain produced from cognitive efforts may lead to adverse employee reactions, such as retaliation, aggression or deviance from set rules and regulations.

A recent study on work-related interruptions has concluded that completion of unfinished work during the nonwork domain has mitigated the negative effects of interruptions on work exhaustion and consequently increase work performance (Chen and Karahanna, 2018). Moreover, work-related interruptions allow individuals with a prospect of investing their resources at their will that can ultimately enhance their chances of resource gain in the form of TC and thus creates a positive impact in the form of negatively affecting deviant behaviors inside and outside the organization. Based on the discussed pieces of evidence it is hypothesized:

H2. There is a positive relationship between Interruption overload and (2a) interpersonal deviance, (2b) organizational deviance and (2c) nonwork deviance.

H3. There is a positive relationship between psychological transition and (3a) interpersonal deviance, (3b) organizational deviance and (3c) nonwork deviance.

H4. There is a negative relationship between task closure and (4a) interpersonal deviance, (4b) organizational deviance and (4c) nonwork deviance.

After-hour work-related technology use and deviant behavior

Workplace deviance is seen as a sign of frustration at work (Fox and Spector, 1999; Neuman and Baron, 2005). Moreover, workplace deviance is increased in a situation when stress is caused by an external actor and seems uncontrollable (Martinko *et al.*, 2002). Prior studies have provided evidence in which individuals view acts of harmful behaviors "to feel better in response to provocation" (Bushman *et al.*, 2001). Similarly, multiple sources suggested the emotional benefits derived from counterproductive work behaviors (i.e. these behaviors will make them feel better; Bies and Tripp, 1996; Krischer *et al.*, 2010; Spector and Fox, 2002). The preceding discussion is also in line with the foundation COR theory, which states that people struggle to acquire, preserve, protect and build those resources that they value (Hobfoll, 2001). We, therefore, have sound theoretical and empirical support for our proposed relationship amongst AHWTU and workplace deviance through IO. Resource loss due to AHWTU can increase IO (a psychological outcome), which in turn leads to workplace deviance (a behavioral outcome). Past shreds of evidence are consistent with the notion that counterproductive workplace behavior is a volitional choice of an individual in reaction to a negative experience at the workplace (Shoss *et al.*, 2016). CWB theorists have likewise proposed that an employee's response with CWB is a function of emotional benefits derived from these retaliatory acts.

AHWTU is a cognitively effortful behavior in conjunction with limited personal resources. A cognitive shift is required while blinking attention between work and nonwork roles. Thus, it creates a strain produced from these frequent cognitive transitions due to technologically mediated work interruptions while in the nonwork domain, which in turn would lead to deviant behavior in response to this stressful situation and this is in line with COR theory.

The enrichment viewpoint says that involvement in numerous roles can increase individuals' resources, such that the benefits offset the cost (Rothbard, 2001). An individual's involvement in one domain can benefit from what is generated from that domain, for example, flexibility, skills and income (Jeffrey Hill *et al.*, 2008). Therefore, we expect that AHWTU may create positive results to the extent to which it can bring closure to an individual's unfinished work tasks and would negatively affect all forms of deviance (interpersonal, organizational and nonwork) by mitigating the negative effects of psychological preoccupation with work during nonwork domain.

COR theory (Hobfoll, 1989) states "individuals strive to obtain, retain, protect, and foster those things they value" (i.e. resources). Individuals experience stress when they lose

resources, leading to adverse psychological and behavioral consequences such as overload, transition, burnout, absenteeism and working slowly (Chiu *et al.*, 2015). Supporting these arguments, we posit that after-hours work-related interruptions ingest personal resources required to fulfill nonwork demands. This situation of resource loss results in PT and IO, which in turn leads to deviant behavior both inside and outside the organizations. Based on the above rationale, we proposed the following hypotheses;

H5. There is an indirect relationship between after-hour work-related technology use and deviant behavior i.e. interpersonal deviance through (5a) interruption overload, (5b) psychological transition and (5c) task closure respectively.

H6. There is an indirect relationship between after-hour work-related technology use and deviant behavior i.e. organizational deviance through (6a) interruption overload, (6b) psychological transition and (6c) task closure respectively.

H7. There is an indirect relationship between after-hour work-related technology use and deviant behavior i.e. nonwork deviance through (6a) interruption overload, (6b) psychological transition and (6c) task closure respectively.

Method

Procedure and participants

A survey approach has been utilized to collect the primary data in two phases in the People's Republic of China (PRC). An online survey was created and distributed through emails and WeChat groups, among employees who were employed in diverse organizations in PRC province Anhui. In the first phase of the survey, which was conducted in May 2019, a total of 650 questionnaires was delivered and received 419 responses (64.4% response rate). In this survey, we requested the participants to rate the measures of after-hours technology usage, PT, IO and their demographic information (e.g. age, gender, education and work experience). Six weeks after the completion of the first phase of the survey, further data was collected in the second phase in which 419 people contacted and responded to our first phase and here 318 responses were received. In the second phase, participants were requested to rate the measures of TC, OD, ID and NWD. Participants' email IDs were utilized as a code to match the two-time surveys. At the beginning of the data collection, it was ensured that the participants about the confidentiality of their identity and information provided by them. To enhance the response rate, we announced a reward of 10RMB cash prize in the form of a WeChat red envelop for each participant each time responding to our survey questionnaire and 2000RMB cash reward for one lucky participant selected through balloting at the end of the three phases of data collection. This reward announcement was resulted in receiving a good response rate in this online survey. Table 1 represents the demographics information of our sample.

Measures

The original scales used for collecting data for this study were in the English language. Therefore, English language questionnaire measures were translated into the Chinese language following back translation method recommended by Brislin (1980).

After-hours technology use

We used six items scale taken from the studies of Boswell and Olson-Buchanan (2007) and Batt and Valcour (2003) to assess our participants' after-hours work-related use of technology. We requested the individuals to rate the different king of technology usage frequency (e.g. Smartphone or landline phone, laptop, computer, tablet, iPad and any other device) at home for their work purpose. The questions were designed on the five-point Likert

Category		Frequency	Percentage (%)
Gender	Male	166	52.2
	Female	152	47.8
Age (years)	18–25	135	42.5
	26–30	97	30.5
	31–35	63	19.8
	36–40	23	7.2
Education	High School or Below	41	12.9
	College	118	37.1
	University	159	50.0
Designation	Nonmanagerial Employees	157	49.4
	Manager	127	39.9
	Senior/ Executive Manager	34	10.7
Job Tenure/Experience	Less than 1 year	39	12.3
	1–2 years	138	43.4
	2–3 years	75	23.6
	3–4 years	50	15.7
	4–6 years	16	5.0
Smartphone using Experience	Less than 1 year	122	38.4
	1–2 years	151	47.5
	2–3 years	42	13.2
	3–4 years	3	0.90

Table 1.
Demographics of respondents

scale, where 1 = *never* and 5 = *very often*. Cronbach's alpha reliability of the scale in our study was 0.88 which is well above the acceptable threshold value of 0.70 (Nunnally, 1978).

Psychological transition

PT was measured with the scales from the studies of Ashforth *et al.* (2000) and Chen and Karahanna (2018). A sample item is "After a work-related interruption during my time off, typically takes me some time to stop thinking about work." The questions were designed on the five-point Likert scale where 1 = strongly disagree, and 5 = strongly agree. The internal reliability of the scale in this study was 0.92 which is well above the acceptable threshold value of 0.70 (Nunnally, 1978).

Interruption overload

We used six items scale used in the studies of Roberts and O'Reilly (1974) and Chen and Karahanna (2018). A sample item is "During my time off, I have more work-related interruptions than I have energy to deal with." The questions were designed on the five-point Likert scale where 1 = strongly disagree, and 5 = strongly agree. The internal reliability of the scale in this study was 0.81 which is well above the acceptable threshold value of 0.70 (Nunnally, 1978).

Task closure

We assessed TC of our respondents with the scale used in the studies by Straub and Karahanna (1998) and Chen and Karahanna (2018). A sample item is "Work-related interruptions during my time off allow me to bring closure to unfinished work-related tasks." The questions were designed on the five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. Alpha reliability for this scale found in our study was 0.87 which is well above the acceptable threshold value of 0.70 (Nunnally, 1978).

Deviance

Deviance was measured with the scales from the studies of Yam *et al.* (2017) and Bennett and Robinson (2000). Seven items scale was used to measure ID. A sample item was "made fun of someone at work." 12-item scale was used to measure OD. A sample item was "come in late to work without permission". Seven items scale was used to measure NWD. A sample item for this scale was "made fun of someone outside work." All questions were designed on the five-point Likert scale where 1 = *strongly disagree,* and 5 = *strongly agree.* The internal consistencies of the scales were 0.89, 0.84, and 0.85, respectively which is well above the acceptable threshold value of 0.70 (Nunnally, 1978).

Analysis and results

We utilized the structural equation model (SEM) by using the AMOS (V21) which is viewed as appropriate for examining the hypothetical connections given its higher factual force (Sarstedt and Mooi, 2019). SEM is the most appropriate technique to analyze different variables to comprehend scientific analysis. SEM effectively recognizes the reliability and validity of observed scores obtained from measurement instruments. Moreover, SEM model also considers the inclusion of interaction terms to test the main effects as well as interaction effects.

This study adopted the constructs utilized in prior investigations; therefore, we assessed the constructs' validity as follows; convergent validity was assessed by testing the value of the factor loadings, Cronbach's alpha (CA), composite reliability (CR) and average variance extracted (AVE) (Karaiskos *et al.*, 2010). The values of CFA (all are above 0.70) CA = 0.81, CR = 0.76 and AVE (all are above 0.57) (shown in Table 2) all are well within the acceptable range. Next, we calculated the discriminant validity of the measurement model and the results show that the square root of AVE for every construct is greater than the correlations of all related inter-construct (shown in Table 3).

Multicollinearity among the constructs are examined through the variance inflation factor (VIF). Our results show VIF score range from 1.01 to 1.79 (shown in Table 3) which is well within the acceptable limit (Hair *et al.*, 2010). In addition, we have calculated the common method variance using Harman's single-factor test (Podsakoff *et al.*, 2003). The results show the most influential factor accounts for 28.87% of the variance (see Table 4). Thus, there is no issue of multicollinearity and common method bias in this study.

In addition, overall fit indices for the proposed model were also calculated. The resulting values are within the commonly acceptable range (RMSEA is 0.056, CMIN/DF is 2.187, IFI is

Constructs	Items	Factor loadings	Cronbach's alpha	Composite reliability	Average variance extracted
After work hour technology use	06	0.876–0.760	0.88	0.93	0.67
Interruption overload	05	0.845–0.767	0.81	0.92	0.66
Psychological Transition	02	0.846–0.845	0.92	0.83	0.71
Task Closure	02	0.791–0.776	0.87	0.76	0.61
Organizational Deviance	12	0.836–0.671	0.84	0.91	0.57
Interpersonal Deviance	07	0.875–0.786	0.89	0.94	0.68
Nonwork Deviance	07	0.889–0.778	0.85	0.94	0.71

Table 2. results of confirmatory factor analysis

Table 3.
correlations matrix and descriptive statistics

	X	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. After work hour technology use	3.60	1.07	*0.818*											
2. Interruption overload	4.73	1.31	0.352**	*0.812*										
3. Psychological transition	4.73	1.40	0.285**	0.613**	*0.842*									
4. Task closure	3.55	1.02	0.486**	0.335**	0.112*	*0.781*								
5. Organizational deviance	3.95	1.24	0.018	0.191**	0.192**	−0.390**	*0.754*							
6. Interpersonal deviance	4.30	1.47	0.179**	0.286**	0.269**	−0.251**	−0.021	*0.824*						
7. Nonwork deviance	5.17	1.26	0.291**	0.522**	0.449**	−0.138*	0.274**	0.172**	*0.842*					
8. Positive effect	3.84	1.00	0.177**	0.368**	0.359**	0.160**	0.071	0.046	0.232**	*NA*				
9. Negative effect	3.73	1.03	0.167**	0.244**	0.171**	0.148**	0.013	0.106	0.150**	0.121*	*NA*			
10. Gender	1.48	0.500	0.122*	0.107	0.124*	0.127*	0.105	0.088	0.121*	0.005	−0.062	*NA*		
11. Age	1.92	0.953	0.179**	0.153**	0.032	0.121*	0.039	0.077	0.130*	0.070	0.138*	0.043	*NA*	
12. Education level	2.37	0.702	0.120*	0.142*	0.168**	0.013	0.110*	0.108	0.081	0.057	0.112*	−0.075	0.012	*NA*
13. Job tenure/ experience	2.58	1.05	−0.217**	0.020	0.036	−0.142*	0.014	−0.073	−0.087	−0.014	0.000	−0.018	−0.160**	0.127*

Note(s): **$p < 0.01$, *$p < 0.05$ (2 and 1-tailed respectively), X = Mean, SD = Standard Deviation. Italic diagonal elements are the square root of the average variance extracted of each construct; Pearson correlations are shown below the diagonal

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	10.901	*28.687*	28.687	10.901	28.687	28.687	5.669	14.919	14.919
2	5.144	13.537	42.223	5.144	13.537	42.223	4.990	13.132	28.051
3	4.163	10.954	53.177	4.163	10.954	53.177	4.935	12.987	41.038
4	3.255	8.566	61.743	3.255	8.566	61.743	4.786	12.595	53.633
5	2.450	6.448	68.191	2.450	6.448	68.191	4.634	12.194	65.827
6	1.248	3.285	71.476	1.248	3.285	71.476	1.689	4.444	70.271
7	1.060	2.791	74.266	1.060	2.791	74.266	1.518	3.996	*74.266*

Table 4.
Harman's single factor (variance explained)

Table 5.
Summary of alternate model fit indices

Model test	CMIN/DF < 5	GFI > 0.9	AGFI > 0.9	NFI > 0.9	IFI > 0.9	CFI > 0.9	RMSEA < 0.1
Measurement model	χ^2 (1428.146), df = 798, χ^2/df = 1.78	0.932	0.912	0.909	0.913	0.934	0.061
Hypothesized model	χ^2 (13.122), df = 6, χ^2/df = 2.187	0.988	0.944	0.974	0.985	0.985	0.056
Alternate Model-1 Direct path from after work hour technology use to organizational deviance ($\beta = -0.034$, $p > 0.05$)	χ^2 (14.21), df = 6, χ^2/df = 2.36	0.901	0.834	0.834	0.776	0.756	0.126
Alternate Model-2 Direct path from after work hour technology use to interpersonal deviance ($\beta = 0.013$, $p > 0.05$)	χ^2 (15.56), df = 6, χ^2/df = 2.59	0.714	0.788	0.730	0.878	0.758	0.145
Alternate Model-3 Direct path from after work hour technology use to nonwork deviance ($\beta = 0.131$, $p < 0.05$)	χ^2 (18.89), df = 6, χ^2/df = 3.14	0.713	0.837	0.598	0.706	0.792	0.121

0.985, TLI is 0.914 and CFI is 0.985) (Hair *et al.*, 2010). Thus, the results have shown a valid model fit (see Table 5).

Hypotheses testing

We made use of the coefficient of determination (R^2) as well as the significance levels of each path coefficient to evaluate the structural model. Figure 2 indicates that AHWTU was positively related with IO ($\beta = 0.431$, $p = 0.001$) PT ($\beta = 0.372$, $p = 0.001$) and TC ($\beta = 0.462$, $p = 0.001$) supporting our hypothesis H1a, H2a and H3a. Moreover, IO has a significant positive association with ID ($\beta = 0.271$, $p = 0.001$), OD ($\beta = 0.121$, $p = 0.05$) and NWD ($\beta = 0.342$, $p = 0.001$), thereby supporting H2a, H2b, and H2c. The association between PT and ID ($\beta = 0.140$, $p = 0.05$), OD ($\beta = 0.103$, $p = 0.01$) and NWD ($\beta = 0.199$, $p = 0.001$) was found significant. Thus, supporting H3a, H3b and H3c. TC has shown a significant negative relationship with all three forms of deviance, namely, ID ($\beta = -0.160$, $p = 0.01$), OD ($\beta = -0.087$, $p = 0.05$) and NWD ($\beta = -0.116$, $p = 0.05$) is negatively significant. Thus providing support for H4a, H4b and H4b.

The mediation results have been shown in Table 6. This table reveals that IO (effect = 0.109, se = 0.001, LLCI: 0.044, ULCI: 0.135), PT (effect = 0.041, se = 0.02, LLCI: 0.004, ULCI: 0.109) and TC (effect = 0.119, se = 0.00, LLCI: −0.119, ULCI: −0.118) mediate the relationship between after-hours technology use and ID. Thereby supporting our hypotheses H5a, H5b and H5c.

Table 6 further reveals that IO (effect = 0.055, se = 0.001, LLCI: 0.005, ULCI: 0.125), PT (effect = 0.042, se = 0.22, LLCI: 0.004, ULCI: 0.095) and TC (effect = 0.011, se = 0.033, LLCI: −0.626, ULCI: −0.006) mediate the relationship between after-hours technology use and OD. These results have supported our H6a, H6b and H6c.

In addition, results reported in Table 6 reveal that IO (effect = 0.143, se = 0.052, LLCI: 0.083, ULCI: 0.222), PT (effect = 0.069, se = 0.027, LLCI: 0.024, ULCI:0.135) and TC (effect = 0.033, se = 0.035, LLCI: −0.053, ULCI: −0.104) mediate the relationship between after-hours technology use and NWD. These results have supported our hypotheses H7a, H7b and H7c.

Thus, our hypothesized model is acceptable. The model illustrates that 24.5% of variance exists in IO, 18.1% variance is related to PT, 23.6% variance exists in TC and 42.1% variance is related to ID, 34.5% is for OD and 32.9% variance exists in NWD. None of the control variables revealed a significant effect on interpersonal deviance, OD and NWD. Thus, we conclude that the hypothesized model is acceptable (Figure 2).

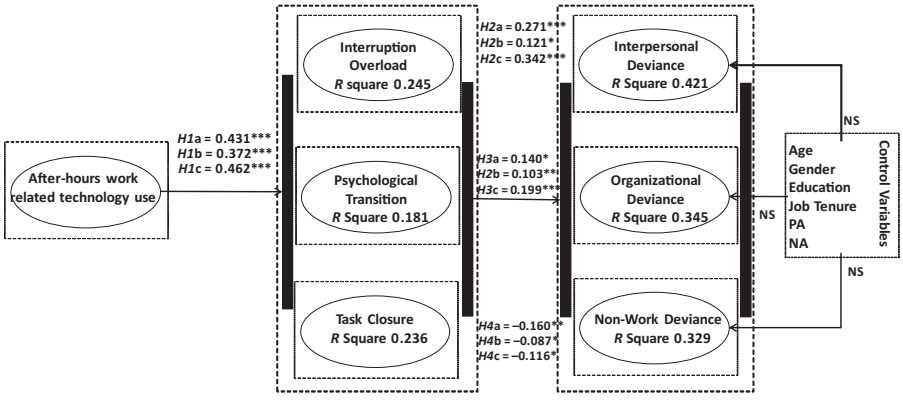

Figure 2.
Results of proposed model

Note(s): H1 to H7 = Hypothesis 1 to Hypothesis 7, PA = Positive Affect, NA = negative Affect

Independent variables	Mediators	Dependent variable	Indirect effect (standard error)	Bootstrapping results Lower	Upper	Bias-corrected confidence interval
After-hours work related technology use	Interruption Overload	Interpersonal Deviance	0.109 (0.001)**	0.044	0.135	Supported
	Psychological Transition		0.041 (0.02)***	0.004	0.109	Supported
	Task Closure		0.119 (0.00)***	−0.119	−0.118	Supported
After-hours work related technology use	Interruption Overload	Organizational Deviance	0.055 (0.001)***	0.005	0.125	Supported
	Psychological Transition		0.042 (0.022)***	0.004	0.095	Supported
	Task Closure		0.011 (0.033)***	−0.626	−0.006	Supported
After-hours work related technology use	Interruption Overload	Nonwork Deviance	0.143 (0.052)**	0.083	0.222	Supported
	Psychological Transition		0.069 (0.027)***	0.024	0.135	Supported
	Task Closure		0.033 (0.035)**	−0.053	−0.104	Supported

Table 6.
Mediation analysis

Note(s): Bootstrapping method for mediation. Significant at: **$p < 0.01$, ***$p < 0.01$

Discussion

The present study was designed to address two research questions that were investigated through an empirical approach. In answering RQ1, we have conducted the coefficient of determination (R^2) and the significance level of each path coefficient to evaluate the structural model to understand the association between AHWTU, IO, PT, TC and deviant behavior in its entire form (interpersonal, organizational and nonwork) and four hypotheses were developed to test the direct association between after-hours work-related technology use, IO, PT, TC and deviant behavior. While answering RQ2, we develop three hypotheses to understand the mediating role of IO, PT and TC between after-hours work-related technology use and deviant behavior. To test our proposed hypotheses, we analyzed data collected from 318 employees from China using SEM.

Finding of the study reveals that AHWTU is positively associated with PT, IO and TC and provide support for our hypothesis (H1a, H2a, and H3a) these findings are consistent with the previous studies (Karr-Wisniewski and Lu, 2010; Ferguson *et al.*, 2016; Carlson and Frone, 2003; Greenhaus, 1988). The IO and PT are positively associated with all forms of deviant behavior and thus confirming collectively hypothesis (H2 and H3). These findings are consistent with the findings of (Bushman *et al.*, 2001; Shoss *et al.*, 2016). Moreover, TC is negatively associated with all forms of deviant behavior and providing support for our hypothesis H3 and this finding is aligned with the study of (Jeffrey Hill *et al.*, 2008), which implies that task completion due to work connectivity after-working hours is linked with less deviant behavior. Moreover, our results indicate AHWTU is positively associated with TC which in turn negatively affects deviant behaviors and thus confirming our hypotheses H4. This finding implies that AHWTU facilitates the closure of the unfinished work. In other word, it reduces frustration and anxiety related with unfinished tasks and thus contributing in reduced negative employee behaviors (Jeffrey Hill *et al.*, 2008; Rothbard, 2001).

In mediating analysis, our findings confirmed that IO, PT, and TC mediate the effect of AHWTU on employee deviant behaviors thus confirming our hypotheses (H5, H6 and H7) collectively. These findings are also consistent with the past studies that have shown the use of ICT after working hours results in negative psychological and behavioral outcomes (Chen and Karahanna, 2018; Ferguson *et al.*, 2016; Madden and Jones, 2008). However, on the other

hand, technology facilitates the employees to connect with work even after working hour and enable them to complete their unfinished task thought (e.g. H7). Furthermore, COR theory postulates that individuals strive to maintain or gain the resources that are lost or threatened to be lost. IO and PT impair the resource of employees and thereby induce deviant behavior. Deviant behavior in its different forms could be a way to regain psychological resources lost or threatened to be lost due to after-hour work-related technology usage through PT and IO.

Theoretical implications

This study contributes in several ways to the prior literature on after-hours work-related technology usage. First, previous studies dominantly focused on the positive side of technology usages such as technological advancement in the organization having a positive association with agility performance of an employee, social capital, innovative behavior, and creativity (Cai *et al.*, 2018). Moreover, there is a research call for the negative side of technologies to explore the paradoxes of the positive and negative impact of technology at the workplace (Tarafdar *et al.*, 2015). We responded to the call and empirically explored how after-hours work-related technology usage use positively associated with interruptions and thereby employee deviance. The negative connotation of AHWTU due to its affordance such as socialization, and the negative effect examined in this study yield desirable outcomes such as alleviated employee deviance. The prior literature is silent on the dark side of AHWTU; therefore, the current study contributes to the ongoing discussion with a new perspective on the favorable and adverse outcomes of AHWTU.

Second, the study identifies and tests a novel relationship between AHWTU and deviant behavior. Three unique outcome variables namely ID, OD and NWD have not been studied in the context of AHWTU before, yet prior literature has recognized them as important constructs (yam *et al.*, 2017). Thus, it provides researchers and organizations to develop better strategies to reduce such negative employee behavior in response to after-hours work connectivity.

Third, this study does not only explore an important relationship between AHWTU and employee deviance in its three forms, but it also answers the question of how AHWTU at home is related to deviance by identifying important mediating mechanisms namely PT, IO and TC. Recent literature suggested that such moment to moment transition between work and family roles consumes psychological resources and thus may lead to negative psychological and behavioral consequences (Chen and Karahanna, 2018). Thus, understanding these mediating mechanisms informs individuals and organizations to allocate their resources appropriately and preferentially so that such harmful behaviors could be reduced.

Fourth, the present research has extended the range of COR theory to explain the phenomenon of deviant behavior. Prior studies have extensively used the COR theory, but little research has applied this perspective to explicate deviant behavior. The current study contextualizes AHWTU as an interruption that ingests personal resources to fulfill nonwork demands and creates a situation of resource loss through PT and IO, that results in deviant behavior inside and outside the organization. Moreover, the variables considered for current research model provide predictive power to elucidate the phenomenon of employee's deviant behavior. Our study deepens literature on COR theory into a novel context (deviant behavior) which will encourage future scholars to utilize this research framework.

Practical implications

This study has important practical implications for managers, organizations and individuals in the context of AHWTU. Mangers, organizations and employees should understand the adverse consequences of AHWTU on their employees. In today's age, employees must know how to scrutinize the multiple technologically mediated work interruptions that occur in their

family domain. Organizations can offer some counseling and training programs to their employees aimed at dealing better with after-hours work-related technology interruptions. Such training and counseling sessions may help the employees to better deal with potential problems associated with their usage of technology at home.

This study found that employee's use of work-related technology at home has negative consequences in the form of PT and IO which leads to employee's deviant behavior both inside and outside the organization. Hence, we recommend that managers consider limiting or placing restrictions around interruptions after work hours. Employees often struggle to fulfill the expectations of persistent accessibility (Derks *et al.*, 2015). Therefore, managers should be consciously indulging in the expectations formation process that the subordinates do not feel being compelled to be available at every work-related communication after working hours. Besides this, managers should educate their subordinates about the downsides of AHWTU and should understand that subordinates will model the manager's behavior. Thus, it would behoove managers to set an example not to blur the boundaries between work and life by excessively addressing work-related interruptions. As the objective of employees is to be at organizational expectations, this approach would be fruitful to transform the expectations of constant availability in the minds of employees and to prevent PT, IO and deviant behaviors inside and outside the organizations.

Present study suggests organizational norms about AHWTU should be deliberately developed. A study on physically dispersed teams has documented the importance of team operating norms in facilitating collaboration and communication via technology (Cramton, 2001). Shared understandings about appropriate and inappropriate behaviors also shape the expectation and behavior of people in the work and life interface. The organizational norms have been shaped by the ubiquitous nature of communication technologies with decreased tolerance of communication delays. As such, employees are inclined to give privileged importance to work-related communication and assume similar behavior from their coworkers. Consequently, organizations have to carefully observe their prevailing norms about work-related interruption after working hours and should develop such norms that stimulate a healthy work-life interface to mitigate the negative consequences of such interruptions.

Developers of technology should consider making a more powerful interruption management tool. For example, the "Do Not Disturb" feature of the iPhone can block all incoming communications, users can also differentiate between important and less important communication through "Repeated Calls" and "Allow Calls From" settings. As we are living in a technologically tethered world, an evolving avenue in current time is to design an interruption management system that can facilitate the mobile user, in how to handle incoming communications based on location, schedule of the user, daytime, while driving, and relationship status with the caller. Therefore, technological solutions had significant potential in interruption management to facilitate individuals with effective and efficient use of their limited psychological resources. In the current time, the usage of technology is increasing in individuals' lives, the problems associated with technology usage are expected to even increase (Anderson and Rainie, 2018; Lee *et al.*, 2014; Tarafdar *et al.*, 2015). Our research findings are, therefore, very relevant to the current problems individuals, managers and organizations are facing.

Limitations and directions for future research. Although this study has a research design with time-lagged data enhances the strength of the study. So, the limitations of the study should be considered while interpreting the findings. First, we tested the model with small data from 318 employees working in a single collectivistic country. Therefore, the generalization of our results is limited, future studies with a large sample and participants from other countries and cultures such as countries with an individualistic culture merits consideration by future researchers. Second, we investigated PT, IO and TC conflict as an underlying mechanism in the relationship of after-hours technology use with deviance. But

we believe that there are other alternative explanations, for instance, work-life balance and life satisfaction can be investigated as the potential mediators in this relationship. Similarly, we comprehensively investigated the three kinds of deviance as the outcome in our model. Certainly, AHWTU may cause other consequences such as low performance, less engagement, and high turnover intentions. In addition, our focus in this study is on the identification of mediating mechanisms, but we have not incorporated boundary conditions into this study. Future researchers are encouraged to answer when after-hours work-related interruptions lead to deviant behaviors. Moreover, developing and investigating some important boundary conditions on the relationship between after-hour work technology use and its adverse outcomes will be valuable.

Conclusion. Interruptions from work have made significant contributions to the nonwork area of employees due to the omnipresent nature of most of the communication technologies that result in blurring the boundaries between work and family life. The current study highlighted some important negative consequences of AHWTU at home in the form of PT, IO, and deviance in its three forms (work, nonwork and interpersonal), besides these negative consequences, this study also shed a light on the positive consequences of this phenomenon by demonstrating positive consequences of AHWTU at home in the form of TC at work. Specifically, this study helps to comprehend the work-related interruptions in depth by juxtaposing favorable and adverse consequences in both nonwork and work domains, and thus, enrich our understanding of this most prevalent phenomenon of this digital era and enables us to mitigate the negative consequences of such after-hour technology use and enhance the positive effects for both organizations and employees.

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Appendix

Constructs		1	2	3	4	5	6	7
1. After work hour technology use	AT1	*0.876*	0.071	0.062	0.041	0.108	0.138	0.027
	AT2	*0.854*	−0.013	0.014	0.130	0.054	0.108	0.057
	AT3	*0.842*	0.084	−0.051	0.151	0.079	0.175	−0.037
	AT4	*0.811*	0.124	0.083	0.073	0.079	0.054	0.062
	AT5	*0.780*	0.143	−0.060	0.115	0.063	0.091	−0.101
	AT6	*0.760*	0.204	0.056	0.142	0.046	0.175	0.023
2. Interruption overload	IO1	0.133	*0.845*	0.085	0.142	0.048	0.067	0.845
	IO2	0.104	*0.836*	0.069	0.199	0.083	0.164	0.836
	IO3	0.098	*0.820*	0.092	0.060	0.141	0.167	0.820
	IO4	0.174	*0.810*	0.061	0.204	0.090	0.135	0.810
	IO5	0.129	*0.803*	0.085	0.138	0.087	0.100	0.803
	IO6	0.151	*0.767*	0.076	0.138	0.008	0.019	0.767
3. Psychological Transition	PT1	−0.006	−0.003	*0.846*	−0.006	0.098	−0.047	0.190
	PT2	0.031	0.031	*0.845*	0.031	0.119	−0.067	0.178
4. Task Closure	TC1	0.103	0.045	0.011	*0.791*	0.289	0.099	0.395
	TC2	0.114	0.059	0.016	*0.776*	0.261	0.103	0.420
*5. Organizational Deviance	OD1	0.060	−0.064	0.099	−0.018	*0.836*	0.048	0.016
	OD2	0.113	0.079	0.103	0.045	*0.827*	−0.010	0.093
	OD3	0.111	0.137	0.059	0.006	*0.792*	0.006	0.093
	OD4	0.083	0.001	0.049	−0.007	*0.790*	0.013	−0.130
	OD5	0.123	−0.123	0.136	−0.026	*0.727*	−0.073	−0.078
	OD6	0.111	−0.105	0.128	0.039	*0.715*	0.063	−0.004
	OD7	0.035	0.110	−0.044	0.007	*0.673*	−0.028	−0.024
	OD8	0.129	0.181	−0.086	−0.018	*0.671*	0.024	0.085
4. Interpersonal Deviance	ID1	0.138	−0.003	−0.021	0.054	0.009	*0.875*	0.090
	ID2	0.135	0.002	−0.043	0.086	0.033	*0.863*	0.106
	ID3	0.061	−0.010	0.132	−0.035	−0.132	*0.832*	0.065
	ID4	0.150	−0.029	0.000	−0.046	0.102	*0.806*	−0.043
	ID5	0.111	−0.091	0.083	−0.063	0.032	*0.800*	0.127
	ID6	−0.007	0.001	0.143	−0.049	0.062	*0.796*	0.031
	ID7	0.101	−0.002	0.123	−0.028	0.050	*0.786*	0.029
5. Non work Deviance	ND1	0.062	0.208	0.143	0.064	0.106	0.091	*0.889*
	ND2	0.066	0.202	0.113	0.083	0.124	0.052	*0.866*
	ND3	0.024	0.186	0.107	0.192	−0.015	0.128	*0.848*
	ND4	0.090	0.166	0.108	0.190	−0.009	0.090	*0.845*
	ND5	0.045	0.189	0.108	0.003	0.151	0.049	*0.834*
	ND6	0.067	0.197	0.152	0.179	−0.062	0.080	*0.823*
	ND7	0.102	0.281	0.160	0.078	−0.016	0.022	*0.778*

Note(s): *4 items removed due to cross-loading, Item loadings are provided in italics

Table A1. Items loading and cross loading

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