

## RESEARCH ARTICLE

# Digital intrusions or distraction at work and work-Life conflict

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## Abstract

Internet usage for non-work activities during work hours is an increasingly common concern among management scholars and practitioners as well as for employees, particularly in relation to its impact on work-life conflict and individual well-being. Drawing on memory for goals theory, this study investigates the distinction between digital intrusions and digital interruptions during work and their concomitant impact on work-life conflict. Using a set-theoretic approach to analyse data gathered from information technology (IT) professionals in Germany and Australia, we explain how a 2\*2 matrix comprising non-work online messaging, or personal digital communication, during work and intrusion contributes to work-life conflict. A key finding is that employees reported work-life conflict only if they perceived private messaging as a source of intrusion rather than as a distraction. From a practical perspective, this finding suggests that employers may provide employees with micro-breaks to attend to perceived intrusions and thus reduce sources of work-life conflict. Contributions and suggestions for future studies are discussed.

## KEYWORDS

digital distraction, digital intrusion, IT professionals, online messaging, work-life conflict

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## INTRODUCTION

The digital transformation of work or work digitalisation has had a direct impact on how work is done, where it is done, and by whom (Farivar & Richardson, 2021). Work digitalisation can be loosely understood as a combination of systematic use of computing, constant connectivity, and cloud technology in the workplace (Venkatraman, 2017). Whereas it has allowed for more diversity in work practices, it has also blurred the boundaries between work and non-work activities (Sayah, 2013), which has, in turn, added to growing concerns about ‘digital distractions’ (Rosen & Samuel, 2015) and their impact on the quality of work and non-work lives. During work hours, for example, Rosen and Samuel (2015) argue that individuals are regularly ‘bombarded’ with work and non-work online messages on their desktops, laptops, and smartphones, which makes it virtually impossible to focus on a given task. Indeed, recent studies report increasing concerns among employers and managers about employees using information and communication technologies (ICT) for personal use and the concomitant impact on individual and organisational performance (Sheikh et al., 2019).

Organisational responses to employees using the internet for non-work activities during work hours can generally be located somewhere on a continuum between strict monitoring and/or complete prohibition and *laissez-faire*. In 2008, for example, the American Management Association reported that 75% of companies controlled and monitored employees’ use of the internet. However, more recent studies (Andel et al., 2019; Pindek et al., 2018) argue that while strict regulation and monitoring limit excessive and inappropriate use of the internet for personal activities, they can also limit opportunities for employees to take ‘mental breaks’ and to engage in impromptu learning (Kim, 2018). Expanding this perspective further, some scholars have also argued that using social media for personal use during work hours allows employees to manage workplace stress and/or boredom (Syrek et al., 2018). Proponents of this perspective also suggest that it can encourage creativity and impromptu learning, thus supporting both employee well-being and individual and organisational performance (Syrek et al., 2018). From this more perspective then, using the internet for non-work activities during work hours could conceivably enrich work performance by augmenting an individual’s ability to effectively manage work demands (Greenhaus & Powell, 2006). However, opponents argue that it also encourages time-wasting, reduces concentration and increases the risk of cybersecurity breaches (Kim, 2018).

The terminology for using the internet to engage in non-work activities during work hours varies with some authors referring to ‘cyberloafing’ (Lim, 2002), others to ‘cyber deviance’ (Al-Shuaibi et al., 2014), or ‘cyberslacking’ (Block, 2001), and ‘internet abuse’ (Griffiths, 2003). Inclusion of terms like ‘deviance’, ‘slacking’ and ‘abuse’ infers a pejorative view assuming an invariably detrimental impact on performance at the expense of the employer (Kidwell, 2010; Mercado et al., 2017). Yet, by the same token, digitalisation has also meant that work-related messages can interfere with individuals’ non-work lives thus limiting opportunities for work-life balance and running the risk of burnout through increased stress (Hunefeld et al., 2021). Therefore, drawing on a self-administered, web-based survey distributed to IT professionals in Australia and Germany, this paper will investigate the impact of digital intrusions on work-life conflict.

The novelty and contribution of this study are manifested in two important ways. First, we expand the current literature on digital distraction and related theoretical understandings of ICT use by drawing on memory of goal theory (Altmann & Trafton, 2002). Drawing on this theory enabled us to distinguish between workplace digital distractions and intrusions and

their putative impact on workplace activities. In doing so, we highlight the importance of individual choice and perception in shaping interactional relationships between users and technology. Relatedly, we also indicate that the extent to which digital non-work activities have negative outcomes (i.e., work-life conflict) depends on the extent to which they are perceived/experienced as a 'distraction' or 'intrusion'. Thus, for example, whereas previous studies suggest interruptions (intentional or non-intentional) are costly from a time management perspective (Altmann & Trafton, 2004; Katidioti et al., 2016) using memory of goal theory, we report that distractions are not. Second, extending contemporary work-life conflict literature by adopting a set-theoretic approach (fsQCA), we explain the role of perceived digital intrusion in the relationship between non-work-related online messaging and work-life conflict. Using this approach adds a further contribution to extant literature by allowing us to investigate the configurational impact of perceived digital intrusion and non-work online messaging as a 2 \* 2 matrix on work-life conflict.

## LITERATURE REVIEW

### Workplace distractions versus workplace intrusions

Drawing on Jett and George's (2003) conceptualisation of workplace distractions, we differentiate a 'digital distraction' from a 'digital intrusion'. In doing so, we understand a digital intrusion as a digital activity that draws an individual's attention away from the respective task entirely and unpredictably, thus inhibiting workflow. A digital distraction, on the other hand, draws an individual's attention away from the respective task, but (1) the person initiates the activity themselves or anticipates the activity and (2) the activity delays completion of the task but only momentarily (e.g., as might be the case when a child messages her father at work at the same time every day, where her father anticipates receiving the message and responds accordingly). From this perspective, the extent to which the use of social media for personal use during work hours is an intrusion or a distraction depends largely on individual circumstances and is, therefore, both individually defined and determined.

Reflecting a similar standpoint, González and Mark (2004) discuss two types of distractions: external and internal. Internal distractions, they argue, are self-initiated breaks from work tasks where, for example, an individual deliberately takes a break from writing a report to refresh their thinking. External distractions, however, are unexpected distractions such as receiving a non-work-related instant message or email that inhibits progress in writing (González & Mark, 2004). Adding further conceptual clarity, Sonnentag et al. (2017) argue that external distractions are best understood as intrusions precisely because they negatively impact task accomplishment. Therefore, in this study, we continue this line of thinking using the term 'distraction' to convey a situation where an individual takes a self-initiated break or responds to an expected demand and the term 'intrusion' as an unexpected and non-self-initiated event that inhibits work performance.

From a time management perspective, intrusions are likely to have a deleterious impact on individual work performance (Jett & George, 2003) because employees cease the original task to attend to the unexpected task. Additional time, known as the 'resumption lag' (Altmann & Trafton, 2004), is also required to resume the original task at the same level of concentration. It is also worth noting that increased frequency and duration of resumption lags can increase performance errors due to the related impact on attention and capacity to focus (Foroughi

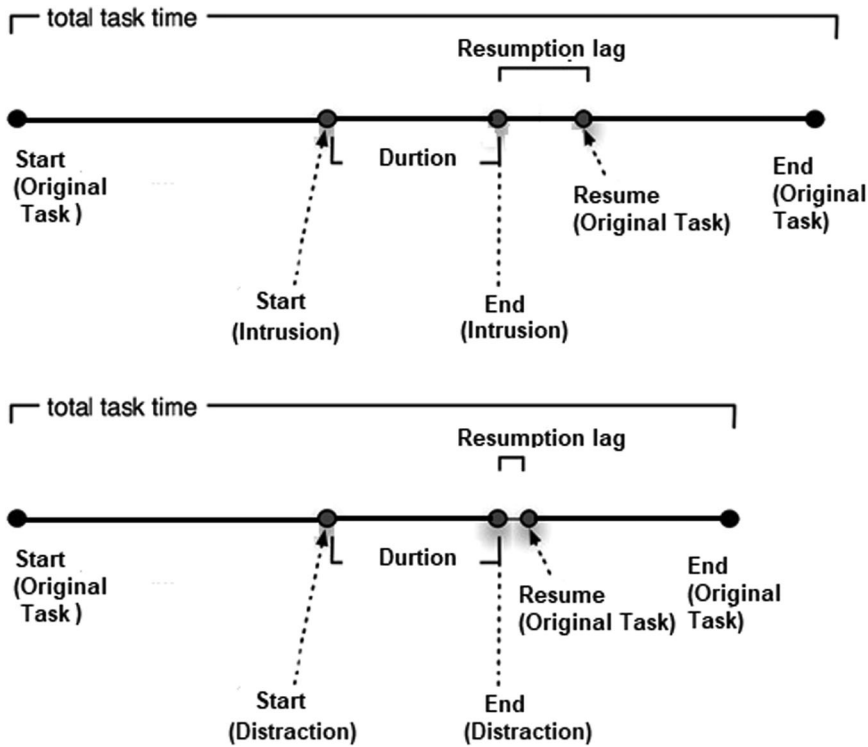


FIGURE 1 Resumption lag (intrusion vs. distraction)

et al., 2016). Furthermore, recent studies have reported that interruptions (either expected/self-initiated distractions or unexpected/non-initiated intrusions) increase time cost (Katidioti et al., 2016) because employees are likely to compensate for the pause in workflow by working faster, and then experiencing stress, pressure to perform, and higher levels of frustration (Mark et al., 2016). However, we use ‘memory of goals’ theory to clarify the difference between intrusion and distraction, as shown in Figure 1 and suggest that when employees intentionally pause their work-related activities, as would be the case in a self-initiated distraction, they can store relevant task-related information. Conversely, in the context of an intrusion, they are less likely to retain the respective information, which means more time is required to resume the task at the same concentration level.

## Memory of goal theory

Memory for goals theory (Altmann & Trafton, 2002) contends that intrusions negatively impact memory because they inhibit our capacity to remember our goals and strategies for achieving them. In other words, they inhibit our ability to remember what we were supposed to be doing and how we were supposed to be doing it (Brumby et al., 2013; Cades et al., 2011; Trafton et al., 2011). The underlying assumption of ‘memory for goals’ theory, then, is that when individuals are engaged in a particular work activity, they have a mental picture of their intentions to perform the respective activity, including task-related information (e.g., how long a report should be, the key aims of the report, the overall structure and intended audience)

(Altmann & Trafton, 2002). It also assumes that individuals can retrieve respective goal-relevant information after a distraction because they store that information as soon as the distraction occurs (Altmann & Trafton, 2002).

Empirical research confirms the validity of 'memory for goals' theory where the more time people spend exchanging online messages, the more likely they are to report that resuming the pending task is difficult (Monk et al., 2008). Indeed, Monk et al. (2008) report that intrusions as short as 3 s can reduce an individual's capacity to resume their original task by as much as 25%. Similarly, Mark et al. (2008) report that employees can spend between 15 s and 23 min trying to resume an original task once they have experienced an intrusion in their respective workflow. Focusing specifically on the impact of online notifications (i.e., when an online notification intrudes on individual work performance), Iqbal and Horvitz (2007) found that it can take up to ten minutes to resume a work activity after receiving an unexpected online message/notification (intrusion). These authors also found that depending on the type of notification (instant messaging or email), participants spent an additional 10 to 15 min refocusing on their original work task.

## Work-life conflict

There has been longstanding scholarly and practitioner interest in the relationship between work and nonwork roles and responsibilities, particularly concerning opportunities for work-life balance and broader individual well-being (Kelliher et al., 2018). However, this interest has increased dramatically in recent years, specifically with growing concerns about the impact of technological innovation on both work-to-life conflict and life-to-work conflict (van Zoonen et al., 2020). Work-to-life conflict suggests someone's work demands interfere with nonwork responsibilities while life-to-work conflict occurs due to the incompatibility of nonwork-related demands (i.e., entertainment, social life, childcare) with an employee's work demands (Germeys & De Gieter, 2017). Drawing on Greenhaus and Beutell's (1985) seminal work, we adopt the perspective that work-life conflict occurs when work activities delay personal activities or vice versa. In doing so we also acknowledge that work-life conflict is inherently bidirectional originating from the home environment and moving to the workplace (hereafter life-to-work conflict) or vice versa (hereafter work-to-life conflict) (Frone et al., 1997).

Extant scholarship has identified three types of conflict that can occur between work and nonwork roles and responsibilities: strain-based, time-based, and behaviour-based (Buonocore & Russo, 2013; Greenhaus & Beutell, 1985). Strain-based conflict occurs when pressures from participating in one role make it difficult to fulfil the requirements of another. Time-based conflict, on the other hand, occurs when spending time participating in a role in one domain makes it difficult to participate in other roles in other domains, as might be the case when time spent caring for young children limits an employee's capacity to fulfil their work role. Finally, behaviour-based conflict occurs when specific behaviours within a role in one domain are incompatible with behaviours in another (Greenhaus & Beutell, 1985).

A key concern for managers and employees is the widespread evidence that work-life conflict gives rise to problematic outcomes such as job dissatisfaction and lack of organisational commitment (Conte et al., 2019), voluntary turnover (Rubenstein et al., 2020); reduced productivity and performance (Buonocore & Russo, 2013); anxiety and depression (Jensen & Knudsen, 2017) and burnout (Wu et al., 2019). There is also widespread evidence that work-life conflict is negatively related to work engagement (Daderman & Basinska, 2016) and positively

associated with counterproductive behaviour (Germeys & De Gieter, 2017). In response to these findings, alongside growing pressure from professional bodies and public policymakers, an increasing number of employers are taking stringent steps to limit work-life conflict using worker-life friendly policies and Employee Assistance Programs (EAPs). Indeed, according to some authors, the business case for ensuring a reduction in work-life conflict is now incontrovertible (Obrenovic et al., 2020). Drawing on these findings and those of our study, in this paper, we test the following configurational hypothesis:

**Research Hypothesis:** *A configuration of nonwork-related online messaging (e.g., emailing, instant messaging, online social networking) at work and perceived intrusion contributes to work-life conflict.*

Reflecting on the above hypothesis and expressed in set language theory, we contend that respondents who report high work-life conflict levels will also report one of the following configurations.

- (1) A combination of nonwork online messaging and digital intrusion.
- (2) A combination of lack of participation in nonwork online messaging and digital intrusion.

The first configuration suggests that respondents will intentionally engage in nonwork online messaging and receive unexpected digital messages. By comparison, the second configuration suggests that although they will not initiate nonwork online messaging at work, a digital message (e.g., email, instant messages [SMS or MMS], etc.) will unexpectedly intrude on their respective workflow.

## RESEARCH METHOD

This study draws on a self-administered, 2018 web-based survey distributed to IT professionals in Australia and Germany. These two countries were selected for three primary reasons. First, they are located on different continents thus allowing for geographical dispersion and thus increasing the possibility of generalising from our findings. It also supports space data triangulation which, in turn, enhances the validity of findings (Podsakoff et al., 2003). Second, Germany is often seen as a leader in digitisation of work and technological advancement in Europe and worldwide. Following a similar trend, in recent years the Australian government and industry leaders have also adopted explicit policies and initiatives to achieve widespread work digitalisation. Australia and Germany were also selected due to their putative differences in having an indulgent versus a restrained culture, respectively (Hofstede et al., 2010). According to Hofstede et al. (2010), then, individuals living ‘indulgent’ societies are more willing to satisfy their impulses and desires, while individuals in ‘restrained’ countries are more likely to resist (Hofstede et al., 2010). Thus, we predict that Australian workers are more likely to engage in distracting digital behaviours (i.e., self-initiated nonwork online messaging) than their German counterparts.

We elected to investigate IT professionals, given recent research suggesting that digital distractions are especially prevalent in the IT industry (Brumby et al., 2019). Boundaries between work and nonwork domains are also more likely to be blurred in IT compared to other industries (Scholarios & Marks, 2004). Recent evidence also suggests that IT professionals are

especially prone to self-initiated distractions due to the widespread fragmentation of their work tasks and responsibilities (Brumby et al., 2019). We recruited an internationally recognised data management company to collect the initial survey data in each of the respective countries and then included three further screening conditions and two attention-check questions to augment data quality. The three conditions required that (i) respondents used a computer daily, (ii) had access to the internet at work, and (iii) had completed the survey within a minimum of 7 min. We included the time taken to complete the survey criteria to identify and then exclude surveys that might have been completed without due consideration to the integrity of respective responses. Seven minutes was established as the minimum amount of time required after conducting three pre-tests among a sub-sample of the research population.

Incorporating the distinction between intrusions and distractions discussed above, we focused specifically on respondents' use of 'online messaging', which comprises sending and receiving personal emails, personal instant messaging (IM), and nonwork-related online social networking during work hours.

## Sample

Two hundred and eight respondents completed the survey, of which one-third ( $n = 66$ ) were female, 83% ( $n = 172$ ) worked full-time, and 66% were married or lived with a partner ( $n = 137$ ). As Table 1 shows, on average, 37% of respondents ( $n = 76$ ) reported that they send nonwork-related instant messages during work hours, 43% ( $n = 90$ ) reported that they send nonwork-related emails during work hours, and 35% ( $n = 71$ ) reported that they participated in nonwork-related online social networking during work hours.

## Measures

We administered a previously tested Likert-based survey comprising established measures and self-administered items. The response options ranged from one (strongly disagree) to seven (strongly agree).

*Work-life conflict:* we tested both dimensions of work-life conflict using the work-family conflict scale: work-to-life conflict (five items) and life-to-work conflict (five items) (Haslam et al., 2015). Haslam et al. (2015) compared and refined two important work-life conflict measures developed by Carlson et al. (2000) and Frone et al. (1997) and used the term 'distraction' in their measure. The other work-life conflict measures test if respondent's participation in one domain reduces their participation in the other domain, while Haslam et al. (2015) investigate whether work activities distract from family activities or vice versa. We replaced the term 'family' with the term 'nonwork/personal' to expand the scope of our findings beyond family responsibilities as recommended by Kelliher et al. (2018). The following items are examples of this scale, 'My nonwork/personal concerns or responsibilities often distract me at work' and 'My work concerns or responsibilities often distract me after work.' The Cronbach alpha of the five-item work-to-life conflict scale was  $\alpha = 0.88$  in the Australian sample and  $\alpha = 0.86$  in the German sample. Analysis revealed a Cronbach's alpha of 0.95 and 0.92 for the life-to-work conflict in Australian and German samples, respectively. Furthermore, all items in the scales showed a high factor loading over 0.7 in both samples.

**TABLE 1** Descriptive analysis and demographic statistics

<b>Factors</b>	<b>Australia</b>	<b>Germany</b>
<i>Gender</i>		
Female	29 (27%)	37 (37%)
Male	80 (73)	62 (63)
<i>Employment status</i>		
Full time—ongoing	58 (53)	25 (25)
Full time—fixed contract	34 (31)	55 (56)
Part-time	12 (11)	13 (13)
Causal	5 (5)	6 (6)
<i>Marital status</i>		
Married	63 (58)	47 (48)
Living with a partner/de facto	13 (12)	14 (14)
Single or living alone	33 (30)	38 (38)
<i>Nonwork instant messaging during work</i>		
Agree	49 (45)	27 (29)
Neither agree/nor disagree	15 (14)	8 (8)
Disagree	45 (41)	60 (61)
<i>Nonwork emails during work</i>		
Agree	56 (51)	34 (33)
Neither agree/nor disagree	14 (13)	12 (12)
Disagree	39 (36)	53 (54)
<i>Nonwork social media activities during work</i>		
Agree	47 (43)	26 (26)
Neither agree/nor disagree	16 (15)	11 (11)
Disagree	46 (42)	62 (63)
Total	109	99

*Nonwork online messaging* was measured using three items: ‘During work, I send nonwork-related emails to my friends/family/relatives’, ‘During work, I exchange nonwork-related instant messages in instant messengers,’ and ‘During work, I use social media for nonwork-related purposes’. Although we did not expect these three items to form a scale, the analysis reported a Cronbach's alpha of 0.80 in the Australian sample and 0.81 in the German sample. This finding indicates many respondents responded to these three items in the same way, suggesting that they engaged in all three channels of nonwork online messaging or none of them.

*Intrusion* was measured by asking respondents to report their level of agreement with two statements: ‘Personal messages distract me from work’ and ‘Personal messages have frequently disrupted my workflow’.



## Analytical approach

We adopted a set-theoretic technique fuzzy-set Qualitative Comparative Analysis (fsQCA) to investigate the relationship between nonwork online messaging and work-life conflict. We selected this method for several reasons. First, fsQCA enables calculation of configurational conditions representing the  $2 \times 2$  matrix of nonwork online messaging and intrusion conditions. Second, unlike regression-based analyses, fsQCA is a set-theoretic technique using Boolean *algebra* to examine complexity, suggesting that intersections of two or more conditions can contribute to a desired outcome. The difference between Boolean algebra and regression-based techniques can be understood by using the following example of gender and age as conditions that can impact customer satisfaction of, in this instance, product A. Assuming researchers found that female respondents are more satisfied with product A than male respondents, they then want to test how 'age' can influence the relationship between 'gender' (independent variable) and 'satisfaction with product A' (dependent variable). In this logic, 'age' is a moderator. However, in Boolean algebra, both gender and age are conditions that create four configurations, including young male, young female, older male, and older female. For analysis, therefore, these four configurations are four independent variables.

Asymmetric logic is a key feature of fsQCA (Fiss et al., 2013; Ragin & Fiss, 2008), which means that the variables that result in the presence of an outcome could be different from those that contribute to the absence of the respective outcome (Ragin & Fiss, 2008; Woodside, 2013). In our example above, therefore, satisfaction with 'product A' and dissatisfaction with 'product A' are not opposing variables on the same continuum. Rather, in asymmetric logic, they are distinct outcomes (dependent variables) that can be driven by different conditions (independent variables). A fundamental underlying assumption here, therefore, is that human behaviour is likely to follow asymmetric patterns; thus, some scholars argue that using symmetric techniques [e.g., regression, analysis of variance (ANOVA), structural equation modelling, etc.] to investigate human behaviour is not compatible with reality (Woodside, 2013).

As an example of the above assumption, extant research suggests a direct positive relationship between performance payment and job satisfaction (e.g., Heywood & Wei, 2006). Using symmetric logic, a direct positive relationship between A and B means that when A increases, B will also increase. Conversely, when A decreases B will also decrease. This suggests that when performance payment decreases, employees will experience lower levels of job satisfaction. However, there is evidence to suggest that changing the amount of payment may not impact employees' job satisfaction (i.e., Pouliakas, 2010; Watson et al., 1996). While the rationale behind these conflicting results falls beyond the scope of this paper, they do suggest that the presence of equitable performance payment conditions may support job satisfaction while their absence may not.

The fsQCA approach also captures equifinality, suggesting that different configurations of the same conditions (independent variables) can contribute to the same outcome. Again, set-theoretic researchers argue that equifinality is closer to the reality of organisational life. Thus, for example, managers and other organisational decision-makers may solve organisational problems using different approaches. For instance, whereas reducing the number of employees on payroll may help some organisations during an economic downturn, for others different approaches may be required such as reducing production overheads, outsourcing, and decreasing or increasing the use of shift work. These alternatives, separately or combinations thereof, contribute to the same outcome, that is, addressing the need to reduce overall operating costs. Finally, fsQCA is a comparative method that works well with small samples.

Thus, we could test our hypothesis in both Germany and Australia unencumbered by a small sample bias that characterises regression-based techniques.

To decrease common method bias risk, we randomised the order of questions relating to different measures in the survey-development stage. This limited the risk of respondents identifying related items and producing a common method variance (CMV)-biased pattern of responses (Chang et al., 2010). Before testing the hypothesis, we also investigated common method bias by performing confirmatory factor analysis (CFA) using Mplus (7.4) software. Since our data are not normally distributed, we used the weighted least squares mean-variance adjusted (WLSMV) estimator. We then compared the postulated multi-factor measurement model with a single-factor model in which all items load on a single construct. The fit model indices indicated that the proposed measurement model [CFA = 0.98, Tucker-Lewis's index (TLI) = 0.98, the root mean square error of approximation (RMSEA) = 0.08, weighted root mean square residual (WRMR) = 0.81] fitted the data much better than the single-factor model (CFA:0.74, TLI:0.72, RMSEA:0.30, WRMR: 4.22). Furthermore, we calibrated the data and formed configurational conditions as independent variables and then used them in the analysis, which decreased the risk of common method bias. This approach also ensured that we avoided falling prey to common method bias.

The first step in testing the hypothesis was to calibrate the data. The fsQCA technique recognises variables as being calibrated between 0 and 1, where 0 represents the absence of variables while 1 indicates the presence of variables (Ragin & Fiss, 2008). To use the fsQCA technique, Likert-based data has to be calibrated between 0 and 1. Following prior studies (i.e., Farivar & Richardson, 2021; Farivar et al., 2021), we used the direct method of calibration to calibrate the Likert-based scale with fsQCA (3.0) software. This method uses three qualitative anchors namely, 'full non-membership', 'crossover point', and 'full membership'. To calibrate latent variables, we first formed composite variables. We then coded full non-membership in the set for the smallest value for each composite variable while the biggest value represented full membership. The crossover point is where there is maximum ambiguity (Ragin & Fiss, 2008). Therefore, the median was selected as the crossover point. The fsQCA reports two estimates (1) coverage value that designates what percentage of the desired outcome was covered by a specific configuration of conditions and (2) consistency value, which shows what portion of data is consistent with the configuration of predictors (Rauch et al., 2015).

Next, we used calibrated values to calculate configurational conditions representing the 2 \* 2 matrix of private messaging and intrusion conditions using 'AND' features of fsQCA (3.0) software. The configurational conditions include 'nonwork online messaging • intrusion' and 'nonwork online messaging • ~intrusion', '~nonwork online messaging • intrusion', '~nonwork online messaging • ~intrusion'. The symbol '~' indicates the negation or absence of the condition. The negation of a condition is equal to '1- the present of the condition' (Ragin and Fiss, 2008). Based on these configurational conditions, we were able to place our participants in four groups. 'Nonwork online messaging • intrusion' refers to participants who initiate exchanging nonwork online messages at work (digital distraction). Their workflow was also intruded by receiving uninitiated/expected nonwork online messages (digital intrusion). Conversely, 'nonwork online messaging • ~intrusion' refers to participants who intentionally participated in nonwork online messaging (digital distraction) but did not experience digital intrusion. The third group (~nonwork online messaging • intrusion) comprised participants who did not intentionally distract themselves using ICT but received unintended/unexpected

nonwork online messages (digital intrusion). Finally, the configuration of ‘~nonwork online messaging • ~intrusion’ suggests some participants experience neither digital intrusion nor digital distraction at work.

## RESULTS

We used four proposed configurational conditions and country as conditions and work-to-life conflict and life-to-work conflict as outcomes. Two truth tables were generated to investigate the hypothesis. We then revised the truth tables based on the acceptable threshold of raw consistency (0.8) and proportional reduction inconsistency (PRI) (Cooper & Glaesser, 2016). Raw consistency indicates the extent to which the conditions (predictors) are reliable and sufficient to explain the outcome (Cooper & Glaesser, 2016). The PRI score demonstrates the extent to which the data were skewed (Cooper & Glaesser, 2016). Finally, we used the revised truth tables to generate intermediate solution terms. In fsQCA language, solution terms are sets of predictors that contribute to an outcome (Ragin & Fiss, 2008). Intermediate solution terms refer to the most probable and reasonable configurations that contribute to an outcome of interest (Fiss et al., 2013).

As shown in Table 2, two solution terms contributed to work-to-life conflict (S1 and S2) and two solution terms contributed to life-to-work conflict (S3 and S4). S1 and S2 indicate no difference between the German and Australian samples as the ‘country’ condition was not present in the solution terms (white/blank circle). Solution 1 supports the research hypothesis indicating that participation in nonwork online messaging that is understood as an intrusion explains 31% of work-to-life conflict. Solution 2 also indicates that the configuration of ‘~nonwork online messaging \*intrusion’ is uniquely responsible for 25% of work-to-life conflict. This finding indicates that 21% of work-to-life conflict was explained by respondents who did not initially participate in nonwork online messaging but received nonwork online messages at work.

Turning to life-to-work conflict, again, fsQCA suggests two solution terms. Solution 3, like solution 1, indicates that if respondents initially participated in nonwork online messaging and perceived it to be an intrusion, respondents in both samples also experienced life-to-work conflict. Thus, perceived digital intrusion (unexpected/unscheduled online communication) results in work-life conflict regardless of participation in digital distraction as shown in Figure 2.

Solution 4 indicates a difference between the two samples as the ‘country’ condition appears in the configuration. Solution 4 indicates that Australian respondents who did not send nonwork online messages initially perceived it to be an intrusion and reported life-to-work conflict. This finding indicates that perceiving nonwork online messaging as an intrusion contributes to work-life conflict in the Australian sample, but only if they do not initially participate in nonwork online messaging. Finally, all four solution terms suggest that the lack of digital distraction, or intentionally participating in nonwork online messaging, contributes to work-life conflict as solution terms include the negation of ‘nonwork online messaging • ~intrusion’. Taking into account the two opposing perspectives on digital interruptions at work and their impact on work-life conflict, this finding indicates that digital distraction is a buffer for work-life conflict if it is not combined by digital intrusion (unexpected online messaging).

TABLE 2 Solution Terms to work-life conflict

N	Conditions	Outcomes			
		Work-to-life conflict		Life-to-work conflict	
		S1	S2	S3	S4
1	Nonwork online messaging • intrusion (Reported digital distraction and digital intrusion)	●	⊗	●	⊗
2	Nonwork online messaging • ~intrusion (Reported only digital distraction)	⊗	⊗	⊗	⊗
3	~Nonwork online messaging • intrusion (Reported only digital intrusion)	⊗	●	⊗	●
4	~Nonwork online messaging • ~intrusion (Reported none)	○	○	○	○
5	Country	○	○	○	●
	Unique coverage	0.31	0.25	0.37	0.10
	Raw coverage	0.57	0.50	0.58	0.30
	Consistency	0.90	0.80	0.87	0.80
	Overall coverage	0.72		0.67	
	Overall consistency	0.81		0.83	

## Symbol explanation

- The white circle ○ demonstrates 'the condition doesn't matter'.
- Country = the black circle represents Germany.
- The black circle ● shows that the presence of the condition contributes to the outcome.
- The crossed circle ⊗ shows that the absence of the condition contributes to the outcome.
- ~Intrusion = participants do not perceive nonwork messaging as an intrusion.
- Intrusion = participants perceive nonwork messaging as an intrusion.
- ~Nonwork online messaging = participants do not initially participate in nonwork messaging at work.
- Nonwork online messaging = participants actively participate in sending and receiving nonwork messages at work.

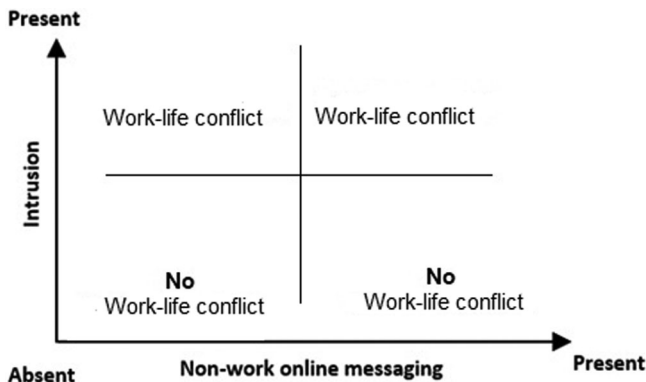


FIGURE 2 Paths to work-life conflict

## DISCUSSION AND CONCLUSION

This study has investigated how four different configurations of digital intrusion and nonwork online messaging contribute to work-life conflict. In doing so it addresses two opposing perspectives on digital interruptions at work and their impact on work-life conflict. The first suggests that digital interruptions give rise to deviant and counterproductive behaviours, which increase work-life conflict. The second indicates that digital interruptions can support coping and defensive mechanisms against boredom and work stress, which reduce work-life conflict. These opposing perspectives are directly informed by assumptions regarding the separation of nonwork/personal domains and professional domains. However, the digital transformation of work has created co-existing and overlapping personal and professional domains. Thus, conceptualising online communication purely along a work-related and nonwork-related continuum is problematic (Archer-Brown et al., 2018).

In this study, we extend contemporary thinking by distinguishing between workplace digital distractions and workplace digital intrusions. Specifically, we suggest that the impact of digital interruptions on work-life conflict depends on the extent to which they are perceived as an intrusion (uninitiated/unexpected) or a distraction (self-initiated/expected). Drawing on Jett and George's (2003) conceptualisation of workplace distractions and using 'memory of goal' theory, we hypothesised that nonwork messaging that results from digital intrusions, which are unexpected and involuntary, increases work-life conflict. On the other hand, the lack of intended and expected digital distraction is associated with work-life conflict.

To test our hypothesis, we adopted fsQCA as a set-theoretic approach, which allowed us to calculate four (4) configurational conditions comprised of the intersection between nonwork messaging and intrusion and their negations. Using this approach, we could treat the absence of nonwork online messaging and intrusion as two separate conditions from private messaging and intrusion. Thus, we investigated how four conditions generated by a 2 \* 2 matrix of nonwork online messaging (presence, absence) and perceived intrusion (presence, absence) positively contribute to work-life conflict.

Findings from both country samples showed respondents who saw nonwork online messaging as an intrusion (rather than a distraction) reported work-to-life conflict, regardless of whether they were initially involved in private messaging (S1 and S2). Rogers and Barber's (2019) argument can clarify our findings because these authors suggest that workplace intrusions contribute to decreased personal or environmental control perceptions, thus giving rise to negative work and life experiences. Indeed, they have also reported both objective and perceived (i.e., self-reported) intrusions are related to negative health outcomes, including anxiety, stress, burnout, and physical complaints.

Turning to the relationship between nonwork online messaging and life-to-work conflict, the third solution term (S3) indicates country is not an essential condition. In other words, this solution applies to both Australian and German samples. However, the fourth solution term (S4) only applies to the German sample. Based on these two solution terms, Australian respondents suffered from life-to-work conflict only if nonwork online messaging resulted from unexpected/uninitiated and hence intrusive nonwork-related messages. In a related, earlier study, Tennakoon et al. (2013) suggest that an "external imposition" or what we interpret as an external intrusion reduces the balance between work and life domains. By comparison, S3 and S4 indicate that German respondents reported nonwork online messaging increases life-to-work conflict, whether it is the result of a distraction or an intrusion. This finding is consistent with Tennakoon's (2018) finding that using ICT at work for personal purposes is positively

related to work-life conflict. This author also reported that respondents in her study felt a stronger relationship between work-related ICT use after working hours and work-to-life conflict.

Whereas this study contributes to existent theory in the ways described above, we acknowledge that it suffers from several limitations. First, it has been suggested that age plays an important role in the extent of digital distraction as younger workers have been assumed to engage in digital distraction more than their older counterparts. This assumption is based on recent reports that younger cohorts shift their attention between media such as laptops, smartphones 27 times on average per hour (Zwarun & Hall, 2014). Moreover, neuroscience indicates generation Y's brain functioning differs from older generations' such that there is a unique neurological pathway more conducive to parallel and multitask processing (Kim, 2018). However, the impact of age was beyond the scope of this study. Therefore, we suggest future studies should consider its impact. Second, whereas this study draws on data collected in two different national contexts, we acknowledge that larger sample sizes are required to substantiate broader generalisation claims. Third, we encourage future researchers to draw a distinction between what digital intrusions and distractions mean to IT professionals and those who manage them and examine whether these two cohorts face similar digital distractions and disruptions. Finally, our findings are based on perceived intrusion and self-report data, which limits our capacity to conclude causation. Future studies might also incorporate a mixed-methods design, including qualitative data to access an 'emic' understanding of the impact of both digital distraction and digital intrusion on work-life conflict.

This study has several implications for both research and practice. From a methodological standpoint, and echoing contemporary work-life balance scholars, we argued that work digitalisation has blurred the boundaries between work and life domains. This means that concepts such as 'after working hours' or 'at work' are losing their currency in both research and practice. Contemporary workers have access to their respective workplaces through online platforms regardless of temporal and physical boundaries. Thus, we suggest that future investigations focus on work performance regardless of location and time, that is, rather than focusing on work within specific periods or only in the formal workplace, that is, organisation.

To investigate the presence and absence of conditions as two distinct conditions, the study on which the paper draws adopted a set-theoretic research design (fsQCA). This design might be usefully implemented in future work, given that it allows researchers to create configurational phenomena and test the impact of multiple concepts as a unique set on a given outcome. It also engages directly with the complexity of human behaviour both within and outside of organisations (Woodside, 2013), facilitating theory that extends beyond correlational techniques (e.g., regression) by forming configurational phenomena using algebra. The specific value of this approach is that it enables clarification of how different factors work together as a unique set. By comparison, regression-based techniques (e.g., interaction) are limited to showing how one variable changes the influence of an independent variable on a dependent variable (Fiss, 2011; Woodside, 2013).

Contributing to contemporary theory, the paper problematises opposing arguments about whether nonwork messaging during work hours contributes to work-life conflict or allows employees to navigate their work and life responsibilities, thus enabling work-life balance. Drawing on 'memory for goals' theory, we argue for the need to distinguish between intrusions and interruptions before concluding the impact of nonwork messaging on work performance and work-life balance. We also signal the need to expand our understanding of workplace intrusions and interruptions beyond actual time spent on non-work activities to incorporate

required time for recommencing work. In other words, investigating how long it takes employees to resume the work they were performing before engaging in nonwork-related messaging. Exploring the concept of workplace intrusions further, we have also argued for the need to distinguish between expected and unexpected intrusions. Previous studies claim that a distractive activity will become an intrusion when it is unforeseen and non-initiated (Jett & George, 2003; Sonnentag et al., 2017). However, we used fsQCA to form configurational conditions comprising respondents' perceptions of private messaging as workplace intrusions and self-initiated versus unexpected private messaging. We found that nonwork online messaging contributes to work-life conflict if respondents perceived it as an intrusion regardless of whether they initiated it themselves. This finding suggests further investigation is required on individual perceptions and experiences of workplace intrusions.

From a practical point of view, this study is important because online messaging is a typical daily activity in the digital era, yet studies on digital intrusion are limited. Our findings show that nonwork online messaging contributes to work-life conflict regardless of different cultural and contextual factors. Thus, to limit the harmful impact of intrusions, employers may benefit from providing employees with designated opportunities to engage in nonwork-related messaging during work hours, that is, perhaps in the form of designed micro-breaks. The idea of designated micro-breaks and establishing specific periods for specific workplace activities is gaining increasing recognition in contemporary management scholarship and practitioners. Sonnentag et al. (2017) suggest that allocating designated periods to respond to emails—rather than responding throughout the day—can positively impact overall work performance. Indeed, in a large UK study, Griffey (2018) reported that responding to unexpected emails, texts, and phone calls had a more deleterious impact on concentration than smoking marijuana.

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## CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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