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The role of perceived organisational support on technostress and work–family conflict

Authors:
Chenè E. Ward[1]
Martha Harunavamwe[2]

Affiliations:
[1]Department of Industrial Psychology, Faculty of Economic and Management Sciences, University of the Free State, Bloemfontein, South Africa

[2]Department of Human Resource Management, Faculty of Economic and Management Sciences, University of Pretoria, Pretoria, South Africa

Corresponding author:
Chenè Ward,
wardce@ufs.ac.za

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Orientation: The role of workplace support has been well established; however, with tech-driven hybrid work settings, technostress makes managing work-family conflict daunting for employees.

Research purpose: This study investigates the role of perceived organisational support (POS) in the relationship between technostress and work–family conflict.

Motivation for the study: Constant connectivity and escalating technological demands, contribute to work–family conflict, with employees struggling to manage responsibilities across personal and professional lives. Organisational support can help mitigate technostress by aiding in managing work-home boundaries. By examining the mediating role of organisational support, this study seeks to provide actionable insights for reducing technostress-related conflicts, ultimately supporting a healthier work–life balance.

Research approach/design and method: The study utilised a cross-sectional quantitative survey using self-administered questionnaires. The sample comprised 302 higher education employees in South Africa. The SmartPLS programme was used to analyse the data.

Main findings: Both technostress and POS have a strong direct effect on work–family conflict, and POS mediates the relationship between technostress and work–family conflict.

Practical/managerial implications: Leaders must rethink the way technology is implemented and used to avoid work–family conflict. It remains important that supportive work environments are created to enhance POS as a job resource to buffer the negative impact of job demands such as technostress and work–family conflict on employees.

Contribution/value-add: The study deepens our understanding of the role perceived organisational support plays in the relationship between technostress and work–family conflict.

Keywords: technostress; perceived organisational support; work–family conflict; work-home boundaries; job demands; job resources; higher education.

Introduction

Organisations should become cognisant to view their employees also as parents, dog-parents, spouses, friends and confidants. Employees occupy various roles that result in demands different from their work and family life, which may be an avenue for conflict. Work–family conflict may be described as how job demands clash with non-work roles (Shabaniebahar et al., 2012). Thus, the more time spent within your work role, the more conflict may arise from your family role.

Within the higher education context, university employees may be pressured to spend more time on their work because of a higher demand on attracting grants, publishing in high-impact journals, contributing to society through community engagement and discharging demanding teaching responsibilities. Most of the research and publishing activities are finalised at home (Winefield et al., 2014), resulting in increased work–family conflict. To achieve the objectives mentioned above, universities require psychologically and emotionally well-nourished employees. Winefield et al. (2014) found that work–family conflict adds to the physical and psychological strain on university employees' job demands. Furthermore, work–family conflict negatively impacts psychological safety and well-being (Obrenovic et al., 2020).

Technostress (Ragu-Nathan et al., 2008) can exacerbate the work–family conflict. Techno-invasion, a dimension of technostress, may result in blurring working and non-working hours among

employees (Ragu-Nathan et al., 2008), consequently adding to work–family conflict. The more technostress invades family time, the less time will be devoted to family roles assigned, resulting in feelings of resentment and incompetence (Salo et al., 2019). The expectation of the 'always on' culture with perceived urgency of responding to emails and other information and communications technology (ICT) tools can lead to increased workload and time pressures, thus complicating the separation of work and family roles.

While some studies researched the impact of technology on work–family conflict, they neither focused on technostress as a whole construct nor were conducted within the higher education sector (Butts et al., 2015; Fenner & Renn, 2010). As the studies that do address the relationship between technostress and work–family conflict remain limited and directed to a non-South African population (e.g. Harris et al., 2022; Pranoto & Nuzulia, 2023; Sommovigo et al., 2023), their applicability to the South African context remains questionable. In hybrid work settings, there has been limited research performed on how technology is altering work systems or the interactions that families have. Technology has created a constant working culture of working 24/7 and impacting people's work–life balance. This is because of the constant connectedness provided by ICT (De Wet et al., 2016). Hence, more empirical research is needed to determine the relationship between technostress and work–family conflict from a South African perspective in the higher education sector (Harunavamwe & Kanengoni, 2023; Harunavamwe & Ward, 2022).

Without proper support from the organisation, in this context of higher education, to accompany ICT implementation, the use of technology may be more of a burden and a strain (Harunavamwe & Ward, 2022). It is proposed that such support may be facilitated through perceived organisational support (POS). Perceived organisational support is employees' perception that the organisation looks after their well-being and values their contribution (Eisenberger et al., 1986). Employees who feel supported will most likely be obligated to their organisation and perform optimally.

Although an association between POS and work–family conflict has been established (e.g. Casper et al., 2002; Dixon & Sagas, 2007; Foley et al., 2005; Gurbuz et al., 2013), these studies are dated. However, it confirms that such support may lessen the burden derived from competing role demands established through work–family conflict. Higher levels of POS have been found to decrease technostress (Solís et al., 2023; Xu & Yang, 2021).

In the higher education environment, the increasing reliance on digital tools for teaching, research and administration has led to a rise in technostress, as academics, professional staff and students experience the pressures of constant connectivity and technology management (Tarafdar et al., 2019). This stress often leads to work–family conflict, where work-related digital demands intrude on personal and family time, negatively affecting employees' well-being and productivity (Ayyagari et al., 2011). Perceived organisational support can possibly play a role by providing employees with the resources and support they need to manage these pressures. High POS can potentially mitigate some of the effects of technostress through favourable policies as well as the presence of information technology (IT) and supervisory support to reduce the negative impact of digital stress on work–family conflict (Rhoades & Eisenberger, 2002; Tziner & Sharoni, 2014). Although research has explored the effects of technostress on work–family conflict, there is limited focus on how POS mediates this relationship, particularly within higher education environments. Previous studies have shown the role of POS in buffering stress in general (Eisenberger et al., 1986; Rhoades & Eisenberger, 2002), but there is a lack of empirical evidence on how it mitigates the specific impacts of technostress and work–family conflict in academic settings (Ayyagari et al., 2011; Tarafdar et al., 2019). With institutions increasingly relying on digital technologies, understanding how to support faculty and staff in managing technostress is essential to maintain performance. This study thus aims to provide new insights into how universities can deal with the adverse effects of technostress on work–life balance.

Research purpose and objectives

The study aimed to determine the relationship between technostress and work–family conflict and the mediating role of POS in the relationship between technostress and work–family conflict. The objectives were to:

- Determine the relationship between technostress and POS on work–family conflict.
- Establish the mediating role of POS in the relationship between technostress and work–family conflict.

Literature review and theoretical background

Work–family conflict

Work–family conflict may arise in an individual if there is a concurrent activity in two different life domains, namely work and family, through performing various roles such as that of a partner, professional worker or parent; this is known as work–family conflict (Shabaniebahar et al., 2012). Because of the pull in different directions owing to the various roles, it may be cumbersome to create a balance as one or the other domain may need to be addressed. The work–family conflict is made up of three dimensions, which include time-based, strain-based and behaviour-based conflicts (Kossek & Lee, 2017). Behaviour-based conflict occurs when behavioural expectations are attached to one role, which could be contrary to the other and may be seen as incompatible (Loscalzo et al., 2019). The time-based conflict refers to the time spent on either one of the two domains (i.e. work–family or family–work), which prohibits the possibility of fulfilling the other role's responsibilities (Loscalzo et al., 2019). The strain-based

conflict occurs when strain, fatigue, tension, anxiety or dissatisfaction in one domain affects the performance in the other (Loscalzo et al., 2019). Work–family conflict has been found to increase levels of stress and turnover intentions (Kusumanegara et al., 2018).

While international scholars have extensively examined work–family conflict, exploring its causes, effects and moderating factors (e.g. Allen et al., 2020; Chen et al., 2021), few studies have investigated this conflict within the specific framework of technostress. The advent of digital communication technologies has intensified demands on employees to remain connected, yet limited research has focused on how these technological pressures exacerbate work–family conflict. In the South African context, research on work–family conflict remains somewhat outdated and typically lacks attention to how modern technology impacts these dynamics, particularly in sectors like higher education that face unique demands (e.g. Bazana & Dodd, 2013; Jaga & Begraim, 2017; Opie & Henn, 2013). The higher education sector, with its reliance on digital platforms for communication, instruction and administrative tasks, creates specific challenges that can amplify the strain on employees managing both work and family roles.

Technostress

The term 'technostress' describes the strain, anxiety or unfavourable effects on one's emotions and mental health that could result from using technology or ICT services. It is a form of stress that is mainly linked to the challenges and expectations of using technology in various aspects of life, such as job, education, communication and social relationships (Ayyagari et al., 2011). Ragu-Nathan et al. (2008) assert that it is experienced by the end-users of ICTs. Technostress is caused by the speed of technological change, the ongoing need to learn new technologies, information overload, excessive screen time, digital distractions and the technology-induced blurring of the lines between work and personal life (Tarafdar et al., 2007).

Technostress has five dimensions: technological overload, invasion, complexity, uncertainty and insecurity (Ragu-Nathan et al., 2008). Techno-overload refers to a situation when employees feel coerced to take on additional work quicker because of technology (Ragu-Nathan et al., 2008; Tarafdar et al., 2007). Techno-invasion is the intrusion of technology into personal life, blurring boundaries between work and home. Employees feel they must remain constantly connected and responsive, even outside of working hours (Ragu-Nathan et al., 2008; Tarafdar et al., 2007). An example of techno-invasion is receiving work emails or messages on a smartphone afterhours, which can prevent employees from fully disconnecting. They may always expect to be available, known as techno-invasion. Techno-complexity is experienced when an individual feels that a substantial amount of strain is required to grasp new technologies (Ragu-Nathan et al., 2008; Tarafdar et al., 2007). Employees may struggle to understand or use certain tools effectively, leading to stress and reduced confidence. Techno-uncertainty occurs when users fail to develop a solid foundation of experience with technology because of persistent modifications and upgrades (Ragu-Nathan et al., 2008; Tarafdar et al., 2007). The last technostress creator is the techno-insecurity, which is experienced due to constant updates on new technology. Users may feel insecure concerning how technology may replace them because of a lack of expertise with new technology (Ragu-Nathan et al., 2008).

Perceived organisational support

Employees are influenced by an organisation's appreciation of their value to the organisation. The organisation can show value and support through adequate supervisory support, fair treatment, taking care of employee well-being, rewarding their contributions, presenting opportunities for organisational rewards and supportive working conditions (Ahmed et al., 2012). This type of support is perceived as organisational support (POS). Eisenberger et al. (1986) defined POS as the general belief that the organisation cares for the welfare and contributions of its employees. It, therefore, may be asserted that the central aspects of POS is the level of generosity organisations exhibit in respecting the needs of their employees.

Perceived organisational support is derived from the organisational support theory, which posits that workers increase their energy to ensure an organisation achieves its objectives if there is a perception that the organisation of its freewill provides heightened levels of support to its employees (Aselage & Eisenberger, 2003). Thus, when employees feel cared for, higher levels of POS may be exhibited. Within the ambit of this study, POS will be considered a job resource that may provide an avenue for employees to overcome the work–family conflict that may arise from the excessive use of ICT tools through technostress.

Perceived organisational support consists of three dimensions. The first dimension of POS is fairness in organisational procedures. The allocation of resources needs to be performed by using fair procedures, as posited by the theory of organisational justice. For workers, such procedures are essential for their long-term interests and welfare (Jabagi et al., 2020). The second dimension is the support from supervisors. This element bridges the gap between employees and management, as supervisors are seen as agents of the organisation (Jabagi et al., 2020) who identify their goals, push them to achieve the goals and suggest rewards for the goals achieved (Ahmed et al., 2012). Lastly, the third dimension refers to the rewards and working conditions incorporated into the human resources strategy and implementation, which considers the working environment and elements of an employee's job (Jabagi et al., 2020).

Job demands-resources model

The Job Demands-Resources (JD-R) model is based on the premise that certain aspects of a job or specific field are deemed too demanding by the individual, which causes them excessive stress and overtaxing, which results in exhaustion and poor work engagement (Demerouti & Bakker, 2011). The JD-R model maintains that every job and work set comprises factors that can be categorised into two components: job resources and job demand. According to Demerouti and Bakker (2011), job demands require physical and mental strength as they consist of the job's physical, social and administrative parts, which is why they are linked with physiological and psychological costs. These include unusually high work pressure, irregular working hours or a poor work environment (Demerouti & Bakker, 2011).

Job resources refer to individuals functioning in attaining goals, reducing job demands and stimulating personal growth and development (Demerouti & Bakker, 2011). Job resources refer to physical, social or organisational aspects of the job that assist the individual in achieving work-related goals, reduce job demands and stress and stimulate growth and development (Llorens et al., 2006). Separate from the job, specific individuals have more personal resources, allowing them to tolerate higher job demands before leading to adverse health effects (Demerouti & Bakker, 2011). The model has been tested in various occupational settings in various countries, and its premise remained the same, demonstrating its robustness (Llorens et al., 2006).

The model suggests that excessive job demands deplete employees' energy and resources and could lead to burnout and deterioration of health (Demerouti & Bakker, 2011). The motivation process starts when job resources stimulate employees' motivation and subsequently increase work engagement and organisational outcomes (Demerouti & Bakker, 2011).

Looking at the JD-R model in the context of this study, technostress is understood as a job demand, requiring sustained mental and emotional effort from employees. This demand, stemming from pressures such as constant connectivity, complex technology use and frequent updates, can drain employees' resources and lead to work–family conflict as work intrudes into personal life (Bakker & Demerouti, 2007). Perceived organisational support, defined as employees' belief that their organisation values their contributions and well-being, functions as a crucial job resource that can mediate this relationship (Rhoades & Eisenberger, 2002). High POS can provide employees with resources such as training, tech support and flexibility, enabling them to cope better with the demands of technostress and reducing the risk of work spilling over into family life (Allen et al., 2020).

When employees feel strongly supported by their organisation, they are more likely to have the confidence, resilience and practical support needed to manage technological pressures, preventing technostress from escalating into work–family conflict (Riglea et al., 2021). Conversely, in low-POS environments, employees facing high technostress are more susceptible to work–family conflict as they lack the necessary support to manage both roles effectively (Harris et al., 2022). Therefore, POS plays a critical role in buffering the effects of technology-related demands, helping to sustain employees' work–life balance by preventing the negative spillover effects associated with technostress. This mediating role of POS emphasises its importance in creating resilient work environments that protect employees from the adverse impacts of technology demands. According to the organisational support theory, Kurtessis's (2015) idealogue on POS is that it can positively impact employees' attitudes and behaviour as it creates a form of obligation in individuals to return to the organisation. When employees feel there needs to be a better match between their professional role and their roles at home, support from the organisation, such as flexible working arrangements and fairness in their decisions and procedures, may increase their POS (Harris et al., 2022). Perceived organisational support may aid employees in challenging, demanding circumstances (Eisenberg et al., 1986), which could result from work–family conflict or technostress. Supervisors and IT technicians within organisations should provide accessible technical support to help employees manage technostress effectively, ensuring that they possess the necessary skills to use technology confidently. Additional support can involve maintaining regular, transparent and consistent communication to ensure that employees feel equipped and have the resources needed to handle technology demands (Tarafdar et al., 2011).

Technostress and work–family conflict

A positive association between technostress and work–family conflict was discovered in a study among four universities in Pakistan (Shaukat et al., 2022). Several studies have explored constructs similar to technostress across various contexts. For example, digital stress has been examined among university students in the United States (Harris et al., 2022), and technostress has been studied in working professionals (Ayyagari et al., 2011; Harris et al., 2022; Fenner & Renn, 2010). One study on digital fatigue by Bennet et al. (2021) reported that employees experiencing prolonged screen time and frequent virtual meetings reported exhaustion and fatigue after working hours, highlighting digital fatigue's impact on work–life balance. Additionally, Riglea et al. (2021) found that, among employees, work–family conflict mediated the relationship between the technostress dimension of techno-overload and psychological well-being, emphasising the broader impact of technostress on personal outcomes.

In a South African study among academics, Kotecha et al. (2014) confirmed a significant relationship between technology-assisted extra work and work–life conflict. In addition, technology-assisted extra work was revealed to be a significant predictor of work–life conflict, although the

study did not specifically focus on technostress and word–family conflict. In the same vein, the investigation by Ma and Turel (2019) among Chinese workers shows that using IT for work enhances work–family conflict. This result is supported by a South African study among employees in the higher education sector, which found that technostress predicts work–family conflict (Harunavamwe & Ward, 2022). It is relevant to consider how working beyond the designated work hours impacts work–life balance causing work–family conflict. A Chinese study illustrates that when an employee is at home outside working hours, the use of communication technology for work is positively related to work–family conflict, including the two dimensions of work–family conflict, time-based and strain-based conflicts (Wang et al., 2017). It can thus be posited that when employees use ICT tools to complete tasks during personal or family time, it reduces the time available for family engagement, which may increase work–family conflict. This stress, arising from using ICT tools to work during personal time, has the potential to spill over into the family domain, further exacerbating work–family conflict. This suggests that organisations should encourage employees to disconnect after working hours and offer flexible work arrangements. By acknowledging and addressing the negative consequences of ICT-related stress on family life, organisations can reduce work–family conflict and support work–life balance.

Accustoming oneself to the latest technology applications and resources can increase lecturers' workload as it may burden work performance and efficiency (Shaukat et al., 2020). Such a burden results in an increase in working hours, spilling over into family time. Furthermore, restructuring teaching and learning processes to accommodate technology may lead to unclear roles at work and obstruct work patterns (Ayyagari et al., 2011; Tarafdar et al., 2007). Unclear roles and obstructed work patterns, in turn, can lead to increased work–family conflict as technology often interrupts family activities outside working hours (Sarbu, 2018). The struggle to familiarise oneself with learning and technology applications and the latest resources for teaching has significantly increased workloads for lecturers. Individuals are, therefore, motivated through technostress to complete big workloads within less time, leading to experiencing pressure and anxiety (Harunavamwe & Kanengoni, 2023):

H1: There is a positive significant relationship between technostress and work–family conflict

Perceived Organisational Support as a mediator in the relationship between technostress and work–family conflict

Based on the JD-R model (Bakker & Demerouti, 2007), technostress is conceptualised as a job demand that arises from various technology-related stressors in the workplace. These stressors, such as techno-overload, techno-invasion and techno-uncertainty, place significant cognitive, emotional and behavioural demands on employees, leading to stress and reduced well-being. These technology-related demands increase employees' stress levels by creating competing pressures between professional responsibilities and family obligations. The cumulative effect of these stressors can lead to higher levels of work–family conflict, where employees struggle to meet the expectations of both their work and family roles. In this context, employees may feel torn between the demands of their job, which are amplified by technology, and their personal life, which suffers as a result of the increased time and effort needed to manage work-related technological demands. However, from the social exchange theory (Blau, 1964), even if employees experience these challenges, if they perceive high levels of support from their organisation, they feel more valued and are better equipped to manage these stressors (Riglea et al., 2021). Perceived organisational support, in the form of resources such as flexible work arrangements, technical support and emotional assistance, can help employees cope with the demands of technostress, thus preventing it from negatively affecting their personal time. Allen et al. (2020) highlight that organisational support in managing technology-related stress reduces work–family conflict by helping employees manage the pressures of technology in both professional and personal spheres. In contrast, low POS exacerbates the impact of technostress, as employees lack the resources to manage these challenges, ultimately leading to higher levels of work–family conflict. Similarly, Giao et al. (2020) also found that POS may decrease levels of work–family conflict and mediate the relationship between emotional intelligence and work–family conflict. While evidence exists that POS mediates the relationships of other variables (Wang & Xu, 2019). it serves as an important mediator, enabling employees to navigate the challenges posed by technostress and maintain a balance between their work and family roles:

H2: Perceived organisational support mediates the relationship between technostress and work–family conflict

Research design

Research approach

The study investigated the indirect and direct effects between the independent variables (technostress creators, the mediator [POS]) and the dependent variable (work–family conflict). Therefore, to test the hypothesis, the quantitative approach was found to be the most appropriate. Specifically, a cross-sectional survey was used on a sample of higher education employees.

Research method

Research participants

The target population was employees in the higher education sector. The study targeted both academics and support staff from a resident university with an estimated population of around 6300 employees. Online surveys were distributed to all employees, and three repeated follow-ups were performed. Only 302 employees responded with their completed responses and were included in the study. Among the participants, in terms of gender, the majority were female,

61%, then 39% were males; for age, the majority were between the age of 31 years and 40 years (39%), followed by those who were 41–50 years (22%). The minority age group comprised those above 60 years, constituting 17% of the participants. In addition, most participants were academics, which constituted 57%, and 41% were those working as support staff.

Measuring instrument

Work–family conflict scale: The Work–Family Conflict Scale (WFC) developed by Chen et al. (2021) was used to measure the work–family conflict. This is a three-dimensional scale consisting of strain-based conflict, behaviour-based conflict and the time-based conflict. Items are measured in a seven-point Likert scale that ranges from strongly disagree to strongly agree. Examples include 'My work keeps me from my family activities more than I would like' and 'The time I must devote to my job keeps me from participating equally in household responsibilities and activities'. The internal reliability estimates for the Work–Family Conflict Scale measure were acceptable in previous studies ranging from 0.84 to 0.94. The Work–Family Conflict Scale has discriminant validity (Chen et al., 2021), and it has proven to be an accurate measure to assess the level of work–family conflict. Consistent with the above, the current study observed an acceptable internal consistency at $\alpha = 0.942$.

Technostress questionnaire: To measure technostress, the Technostress Questionnaire was used. It consists of five dimensions known as techno-stressors (Tarafdar et al., 2007). The scale consists of 23 items that are assessed on a 5-point Likert scale. 5 indicates 'strongly agree', and 1 indicates 'strongly disagree'. Examples of the items include 'I am forced by this technology to do more work than I can handle' and 'I am forced by this technology to work with very tight time schedules'. The scale is reliable with the Cronbach's alpha for all the dimensions ranging from above 0.80, that is, techno-invasion (0.81), techno-overload (0.89), techno-complexity (0.84), techno-uncertainty (0.82) and techno-insecurity (0.84) (Tarafdar & Stich 2021). The scale is also proven to have content and convergent validity across factors. (Tarafdar et al., 2019). The current study obtained an acceptable internal consistency for the technostress questionnaire ($\alpha = 0.927$), the techno-overload dimension ($\alpha = 0.867$), techno-complexity ($\alpha = 0.835$), techno-insecurity ($\alpha = 0.786$) and techno-invasion ($\alpha = 0.827$).

Perceived organisational support scale: Perceived organisational support was measured using the POS scale developed by Eisenberger et al. (1986). The original 36-item scale measures POS and its sub-dimensions. However, the current study used the shortened version, which is made up of eight items. The scale is a 5-point Likert scale, where 1 represents – strongly disagree and 5 represents – strongly agree. Example items include 'My organisation strongly considers my goals and values', 'My organisation really cares about my well-being' and 'My organisation shows very little concern for me'. According to Worley et al. (2009), the questionnaire has an internal consistency of 0.952. Hinschberger (2009) observed a Cronbach alpha of 0.88. The current study observed an acceptable internal consistency for the POS scale ($\alpha = 0.801$).

Research procedure and ethical considerations: After applying for and being granted ethical clearance by the Faculty of Economic and Management Sciences at the University of the Free State (HSD2021/1827/21), data were gathered through the online platforms using Evasys, and the sample was made up of academic and support staff from a selected university in South Africa. The procedure followed involved sending an email with an informed consent form requesting the target population to participate. The email included a detailed explanation of the study's objectives and a consent form. After seeking their willingness to participate, the online questionnaire was shared with them through Evasys. Three repeated follow-ups were performed. Only 302 employees responded with their completed responses and were included in the study.

Data analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 24 and Smart PLS version 4. SPSS was used for data cleaning, descriptive statistics and initial analysis (e.g. checking for normality, outliers and reliability). It is user-friendly and enables quick analysis of the dataset's basic characteristics. Descriptive and inferential statistics were used to summarise the collected data and test the study's hypotheses. Cronbach's alpha was used to assess the internal consistency reliability of the measuring instruments. SmartPLS was used to test the proposed hypothesis. It is well-suited for complex mediation models within the structural equation modelling (SEM) framework. It allows for advanced analysis of multiple mediation paths and latent variables. SmartPLS is particularly valuable when the study's model includes multiple constructs or indirect paths as is the case for the current study. It facilitates a more flexible, comprehensive assessment of relationships among constructs, including the mediating effects.

To test the study hypotheses, variance-based SEM was applied. A two-stage analysis was conducted. Firstly, the outer model, which handles unobserved measurements, was evaluated in terms of relevant quality criteria. The outer model determines whether the constructs are reliable and valid. The quality criteria associated with an acceptable outer model are: (1) average variance extracted (AVE) of 0.5 and higher, (2) composite reliability estimates of 0.7 and higher and (3) indicators (i.e. dimensions of constructs) with significant loadings on their respective constructs. In addition to significant loadings, the latter should also be 0.7 and above.

Secondly, the inner model (i.e. structural model) was evaluated using the following guidelines: (1) the size of the path coefficients (beta values), (2) the significance of the path coefficients and (3) the amount of variance explained in the dependent variable by the proposed model.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of the Free State Human Research Ethics Committee (GHREC). (No. UFS-HSD2021/1827/21/23).

Results

The results (Table 1) indicate that the variables under study met the quality criteria for an excellent outer model (validity and reliability). The variables observed satisfactory composite reliability scores as the scores were above the cut-off score of 0.6: work–family conflict (0.847) and technostress (0.840). The measuring instruments were also valid, as convergent validity values, assessed through the AVE score, were above 0.5. The AVE scores were as follows: work–family conflict (0.867) and technostress (0.688).

Table 2 indicates that each indicator loaded significantly on the respective latent construct ($t > 1.96$, p-value less than 0.05). More specifically, factor loadings ranged between 0.935 and 0.972 for work–family conflict and between 0.786 and 0.867 for technostress. The original sample indicates the internal consistency for the sub-dimensions of technostress and work–family conflict. For technostress: techno-insecurity $\alpha = 0.786$, techno-complexity $\alpha = 0.835$, techno-invasion $\alpha = 0.827$ and techno-overload $\alpha = 0.867$. Unfortunately, for these data, the techno-uncertainty did not load significantly on the model, so it was deleted from the outer model. The work–family conflict dimension of strain-based conflict reported $\alpha = 0.927$, and the time-based conflict reported $\alpha = 0.935$. Note that the third dimension, which is the behaviour-based conflict, did not load significantly in the outer model; therefore, it was removed from the outer model as instructed by Henseler et al. (2012). The following section reports the results associated with the structural model.

Of the three direct proposed paths in the conceptual model, the two are direct paths to the dependent variable, work–family conflict. These two direct paths are significant, indicating $p < 0.05$, both showing 0.000. The strongest significant positive pathway is noted from technostress to work–family conflict ($\beta = 0.564$, $t = 13.485$, $p = 0.000$) providing support for hypothesis 1: There is a positive statistically significant relationship between technostress and work–family conflict. This implies that technostress is a strong positive predictor and influencer of work–family conflict.

Furthermore, the pathway from technostress to POS is noted as negative but statistically significant ($\beta = -0.340$, $t = 6.444$, $p = 0.000$). This implies that technostress has moderate negative influence on POS. This indicates the presence of an inverse relationship between the two variables, showing technostress as a strong negative determining factor for POS. The weakest path was observed between POS and work–family conflict ($\beta = -0.213$, $t = 4.257$, $p = 0.000$). There is a negative statistically significant relationship between technostress and technology self-efficacy, indicating that when POS increases, the work–family conflict decreases. As noted in Table 3, all the two hypothesised direct paths to the dependent variable in the conceptual model are significant. As such, both technostress and POS demonstrate direct effects on work–family conflict.

Table 3 presents the results associated with the size and significance of the proposed paths (i.e. quality criteria associated with the inner model). It is observed that all three paths are statistically significant, with the strongest path observed from technostress to work–family conflict ($\beta = 0.564$, $t = 13.485$, $p = 0.000$), followed by technostress to POS ($\beta = -0.340$, $t = 6.444$, $p = 0.000$). The weakest paths were observed between POS and work–family conflict ($\beta = -0.213$, $t = 4.257$ $p = 0.000$). The results support hypothesis 1. Pertaining to the dependent variable, the strongest path is from technostress to work–family conflict.

Table 4 reports results associated with the influence of the independent variables on work–family conflict. It is evident that the proposed model explains 44.5% of the variance in work–family conflict, which can be explained as moderate. It should be noted that, among the independent variables, technostress has the largest positive significant relationship (i.e. paths) with work–family conflict.

TABLE 1: Quality criteria.

Constructs	Cronbach's alpha	rho_A	Composite reliability	AVE
Work–family conflict	0.847	0.848	0.929	0.867
Technostress	0.840	0.854	0.898	0.688
POS	1.00	-	-	-

AVE, Average variance extracted; POS, perceived organisational support.

TABLE 2: Outer loadings.

Constructs	Original sample (O)	Sample mean (*M*)	SD	*T* statistics (|O/SD|)	*p*
POS	1.00	1.000	0.000	0.000	0.000
SBC <- Work–family Conflict	0.972	0.926	0.011	81.091	0.000
TBC <- Work–family Conflict	0.935	0.935	0.008	117.451	0.000
TechInsec <- Technostress	0.786	0.784	0.030	26.242	0.000
TechComple <- Technostress	0.835	0.834	0.025	32.843	0.000
TechInva <- Technostress	0.827	0.827	0.019	43.815	0.000
TechOver <- Technostress	0.867	0.867	0.016	54.855	0.000

SBC, strain-based conflict; TBC, time-based conflict; POS, perceived organisational support; SD, standard deviation.

TABLE 3: Path coefficients (inner model).

Constructs	Original sample (O)	Sample mean (*M*)	SD	*T* statistics (|O/SD|)	*p*
Technostress -> work–family conflict	0.564	0.566	0.042	13.485	0.000
Technostress -> POS	-0.340	-0.339	0.053	6.444	0.000
Technostress -> POS -> work–family conflict	-0.213	-0.213	0.050	4.257	0.000

POS, perceived organisational support; SD, Standard deviation.
*, $p < 0.05$; **, $p \leq 0.001$.

TABLE 4: *R* square.

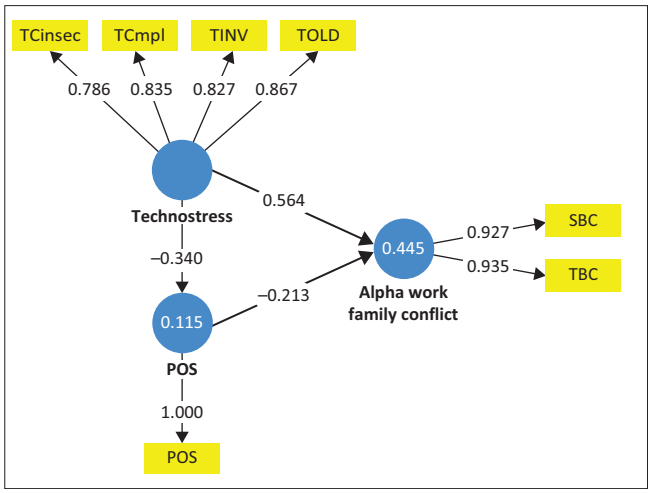
Constructs	*R* square	*R* square adjusted
POS	0.115	0.113
Work–family conflict	0.445	0.442

POS, perceived organisational support.

TABLE 5: Specific indirect effects.

Constructs	Original sample (O)	Sample mean (M)	SD	T statistics (|O/SD|)	p
Technostress -> POS -> work–family conflict	0.072	0.072	0.020	3.585	0.000

POS, perceived organisational support; SD, Standard deviation.



TCinsec, Techno-insecurity; TCmpl, Techno-complexity; TINV, Techno-invasion; TOLD, Techno-overload; SBC, Strain-based conflict; TBC, Time-based Conflict; POS, Perceived organisational support.

FIGURE 1: The full specification of the path diagram: Model (Ringle et al., 2022) 'SmartPLS 4'.

To determine whether POS mediates the relationship between technostress and work–family conflict, the specific indirect effects table should be consulted (Table 5).

Memona et al. (2018) recommend that a statistically significant indirect effect or evidence for mediation should be shown by a $t > 1.96$ and $p < 0.05$. Based on this recommendation, the results indicate that the effect of technostress on work–family conflict via POS is statistically significant ($t = 3.585$; p-value 0.000). The results support hypothesis 2. The results indicate that the indirect effect of technostress on work–family conflict through POS is statistically significant ($t = 3.585$; p-value 0.000).

Discussion

The study sought to determine the relationship between technostress and work–family conflict. In addition, it aimed to determine the role of POS in the relationship between technostress and work–family conflict. For the first hypothesis (technostress positively influences work–family conflict), the current study's findings supported the first hypothesis. This finding aligns with previous findings (Ayyagari et al., 2011; Harunavamwe & Ward, 2022; Shaukat et al., 2022). Li et al. (2021) and Sarker et al. (2018) have determined that workers are experiencing higher levels of work–life conflict because of technology-induced stress. This suggests that constant connectivity through digital devices makes employees feel obligated to respond to work-related messages outside of regular hours, making it challenging to fully disengage from work (Ayyagari et al., 2011). This digital intrusion reduces quality family time and creates tension, as family members may feel neglected when work continuously interrupts personal interactions (Derks & Bakker, 2014). Technostress also contributes to role overload, as employees struggle to balance the demands of technology with family roles, leading to exhaustion and emotional strain that further intensifies work–family conflict (Tarafdar et al., 2019). Social overload from increased digital interactions can exacerbate this issue, as employees experience heightened stress from constant connectivity, impacting their ability to maintain healthy boundaries between work and family (Maier et al., 2015). Therefore, organisations need to recognise the disruptive role of technostress in employees' personal lives, prompting the development of policies that clearly define work boundaries and limit after-hours communication. There is need for proactive approaches to assist employees to better manage technology demands. Considering the JD-R model, technology job demands such as constant connectivity, information overload and rapid adaptability required in the academic environments consume significant mental and emotional resources, which can increase stress and make it difficult for employees to recover effectively (Bakker & Demerouti, 2007).

It has been noted that technostress may increase generic occupational stress levels (Tarafdar et al., 2007). Such stress, in turn, might affect work–family conflict. As the levels of technostress increase, so do the overall stress levels, which leave critical relationships within and outside the workplace vulnerable to experiencing the wrath of an overly stressed employee and family partner. Lee et al. (2016) confirmed that stress caused by using instant messages on your mobile device after-hours negatively impacts an employee's efficiency and quality of life. By pushing users to complete more work quicker, it may require a form of multitasking that could ultimately surpass their healthy capacity to multitask and lead to resentment and stress (Nastjuk et al., 2023).

The findings also observed a negative direct relationship between POS and work–family conflict. These findings are consistent with Gurbuz et al. (2013), who reported that POS was negatively associated with work–family conflict among employees from small and medium-sized enterprises in Turkey. Older studies have found POS to positively impact work–family conflict, such as Casper et al. (2002), Dixon and Sagas (2007) and Foley et al. (2005). It, therefore, may be argued that if employees were to feel seen and supported by their organisation, it might assist in combatting the adverse effects of work–family conflict. When there is a higher level of perception of the support provided to employees, they might feel supported and understood by their managers and co-workers regarding their family responsibilities, which, in turn, can assist them in managing their work and family demands more efficiently, in turn lowering work–family conflict and its possible adverse impact.

As POS is based on the social exchange theory and the norm of reciprocity, it may be argued that when employees feel supported by the organisation, they give back to the organisation in the form of positive attitudes (e.g. towards

technostress) and favourable work behaviours (e.g. countering work–family conflict) (Eisenberger et al., 1986). Therefore, if employees feel cared about, they may perceive the organisation as understanding and acknowledging their challenges, which can alleviate the strain brought on by work–family conflict and technostress (Wu et al., 2017).

A study among employees in Asia found that the perceived organisational IT support for working from home was positively associated with strain-based work–family conflict. However, although the organisations provided IT support for the employees to increase their efficiency, the authors emphasised that this could lead to higher work–family conflict (Shi et al., 2023). Nonetheless, a study among employees in China's manufacturing and IT industries found that POS substantially weakened the relationship between techno-invasion and job anxiety (Wu et al., 2017).

The second hypothesis, which noted that *POS mediates the relationship between technostress and work–family conflict*, was confirmed, meaning the level of support employees feel from their organisation could help explain or reduce the impact of technostress on work–family conflict. In this case, *POS* acts as an intermediary factor that can either weaken or help buffer the negative effects of technostress on employees' work–life balance. These findings are consistent with some previous studies. For example, Chen and Kao (2012) reported that POS helps employees better cope with job-related stressors, thus reducing spillover effects into their family life. Similarly, in an old study by Rhoades and Eisenberger (2002), it was discovered that when employees feel supported by their organisation, they experience lower levels of strain and conflict between work and personal life, even under high job demands. Similarly, Tziner and Sharoni (2014) highlighted that POS enhances employee resilience against stress, reducing the likelihood of work–family conflict. These studies confirm that the negative impact of technostress on work–family conflict may be less severe when employees feel strongly supported by their organisation (Marchiori et al., 2019). Thus, organisational support may mitigate the negative pathway from technostress to work–family conflict by providing employees with coping resources, reducing the direct adverse effects of technostress (Figure 1) (Harris et al., 2022).

Contrary to our findings, some studies suggest that POS does not always have an effect on work–family conflict. For example, a study by Haar and Brougham (2011) indicated that despite high levels of POS, technostress still led to significant work–family conflict, possibly because of the pervasive and unavoidable nature of technological demands. Similarly, research by Molino et al. (2020) also reported that while POS could mitigate general work stress, it was less effective in reducing the specific strains caused by constant connectivity and digital interruptions, which directly interfere with family time. Technostress may be too overwhelming for organisational support alone to alleviate, indicating the need for more direct interventions, such as limiting after-hours communication, creating more flexible work arrangements and providing digital detoxing programmes to address the root causes of technostress-related work–family conflict. This suggests that interventions should address not only general support but also specific strategies for handling technostress. This might include establishing clear boundaries around work communication after-hours, promoting training on effective technology use and supporting employees in managing digital overload.

Previous studies have indicated that two dimensions of technostress, techno-overload and techno-invasion, have consistently been associated with increased work–family conflict (Harris et al., 2022; Wu et al., 2017). Techno-overload may lead to an information overload that triggers anxiety and affects quality sleep (Ragu-Nathan et al., 2008). Techno-invasion can also diminish the effectiveness of organisational support in mediating the relationship between technostress and work–family conflict. When employees experience constant digital intrusion, even strong POS may not fully buffer the negative effects of technostress, leading to increased work–family conflict (Derks & Bakker, 2014). However, if organisations establish clear boundaries, such as limiting after-hours communication and promoting work–life balance, they can help employees manage techno-invasion and reduce work–family conflict (Ayyagari et al., 2011). The more technostress invades family time through techno-invasion, the less time will be devoted to family roles assigned, which may lead to feelings of resentment and incompetence (Salo et al., 2019). Consistent with that, in a study among Chinese participants, Wu et al. (2017) found that techno-invasion can substantially predict job anxiety, which could lead to feelings of distress regarding employment status (Probst et al., 2020). In turn, job anxiety may impact behaviour while surrounded by loved ones.

The relationships within an employee's household may be adversely impacted by intrusive technology experienced in the work domain. Thus, it may be suggested that work–family conflict is a common consequence of technostress (Benlian et al., 2020). The more time employees devote to the virtual world created by technology, the less time and effort they may exert on an employee's immediate family. When we consider the definition of techno-invasion, technology users may feel obligated to entertain communications through technological tools at any time and respond to such requests urgently. Such requests often intrude private time and family time. A recent study used a broader definition of technostress, divided into two main types, and its impact on two types of work–family conflict (time-based and strain-based) (Shi et al., 2023). It was found that challenge technostressors have a negative relationship with time-based and strain-based work–family conflict. In comparison, hindrance technostressors had a positive relationship with time-based and strain-based work–family conflict (Shi et al., 2023). While previous studies have found a clear relationship between technostress and work–family conflict, the current study is the first of its kind to consider

this relationship within the higher education sector in South Africa.

Limitations of the study and recommendations for future research

Limitations for the current study need to be acknowledged. A cross-sectional survey design with self-reported measurements was utilised for the study, which has drawbacks. Future studies could consider a longitudinal approach.

Data collection occurred only at one university, which has residential university employees. The impact of technostress and the context in which other university employees receive support may differ. Technology in open distance e-learning (ODeL) is often integrated as a foundational element in their service offering. Therefore, the impact of technostress might be lessened, and have established support structures to combat any negative impact. It is recommended that ODeL institutions replicate this study within their context to determine this. Future studies should consider larger samples among different universities to determine the generalisability of the results.

Furthermore, the current study was conducted within a public higher education institution that may utilise a limited number of technological interventions in their teaching and learning services compared to their private counterparts. Therefore, future research studies may replicate this study within the private higher education sector. Future studies could consider which technostress dimensions impact work–family conflict (and its dimensions) more. In addition, it may be interesting to determine which dimensions of POS mediate the relationship between technostress and work–family conflict more. The current study sample comprises employees within a higher education institution and should not be generalised to other samples.

Managerial implications

Practitioners within organisations should consider how the impact of technology can be lessened to avoid work–family conflict – recommendations of comprehensive training and retraining that are simple, user-friendly and enjoyable. Furthermore, using only official work devices for work communication, clear policy and guidelines on the use of technological devices after-hours may be meant to combat the behaviours that create technostress. Flexible work arrangements that allow the integration of family responsibilities may be an aid in reducing the level of work–family conflict experienced by employees.

Human resources managers should cultivate a supportive environment for employees to combat the negative impact of technostress and work–family conflict. When employees know they can rely on their organisation's ICT support functions, it may reduce the conflict they would have experienced within their work or family lives. Furthermore, when employees perceive support from organisations regarding their family obligations, a sense of duty towards the organisation may arise, lowering work–family conflict.

Conclusion

The study's main aim was to investigate the role of POS in the relationship between technostress and work–family conflict. As hypothesised, the study found that technostress has a direct and strong relationship with work–family conflict. This suggests that organisations should have comprehensive interventions to target technostress in a bid to avoid work–family conflict. Furthermore, the study observed that POS mediates the relationship between technostress and work–family conflict. Therefore, it becomes pertinent that organisations cultivate a supportive and positive work environment to lessen the impact of these job demands.

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Authors' contributions

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Data availability

The data supporting this study's findings are not openly available because of ethical requirements for only the researchers to have access to the data.

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