

**E-Mail as a Source of Stress and Burnout Symptoms: The  
Mediating Role of Work-Family Conflict**

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## **Abstract**

Despite being one of the most used communication tools for work purposes, e-mail use may lead its users to experience unwanted symptoms for their mental health. This cross-sectional study (N = 389) aims to shed light on how e-mail as a source of stress will impact both work-family conflict and burnout symptoms. We hypothesized that e-mail as a source of stress would be positively associated with both work-family conflict and burnout symptoms. Plus, we predicted work-family conflict to mediate the relationship between e-mail as a source of stress and burnout symptoms. Our results pointed out to the existence of a partial mediation, in which work-family conflict explains the relationship between e-mail as a source of stress and burnout symptoms, thus supporting those three hypotheses. We have also hypothesized that segmentation preference would moderate the relationship between e-mail as a source of stress and work-family conflict. However, the results we obtained do not support this hypothesis, after accounting for seniority. Our findings provide evidence to consider that e-mail as a source of stress is likely to cause a conflict between work and family lives among its users, which by its turn will lead to the experience of burnout symptoms. Further, we discuss the practical implications of these findings and suggest directions for future research.

*Keywords:* e-mail as a source of stress, work-family conflict, segmentation preference, burnout symptoms.

*JEL Classification System:* O15 (Economic Development: Human Resources; Human Development; Income Distribution; Migration) and Y4 (Dissertations)

## **Resumo**

Apesar de ser uma das ferramentas de comunicação mais utilizadas para fins de trabalho, o e-mail pode levar os seus utilizadores a experienciarem sintomas indesejados para a sua saúde mental. Este estudo transversal ( $N = 389$ ) pretende clarear a forma como o e-mail como fonte de stress irá impactar o conflito trabalho-família e sintomas de *burnout*. Formularam-se as hipóteses de que o e-mail como fonte de stress estaria positivamente associado a conflito trabalho-família e a sintomas de *burnout*. Mais, prevemos que o conflito trabalho-família iria mediar a relação entre o e-mail como fonte de stress e sintomas de *burnout*. Os nossos resultados apontam para a existência de uma mediação parcial, em que o conflito trabalho-família explica a relação entre o e-mail como fonte de stress e sintomas de *burnout*, suportando assim as três hipóteses formuladas. Também formulámos a hipótese de que a preferência por segmentação iria moderar a relação entre o e-mail como fonte de stress e o conflito trabalho-família. No entanto, os resultados obtidos não suportam a hipótese formulada, após controlar a antiguidade. As nossas descobertas fornecem evidência para considerar que o e-mail como fonte de stress pode causar um conflito entre a vida profissional e familiar dos seus utilizadores, o que, por sua vez, pode conduzir ao aparecimento de sintomas de *burnout*. Para além disso, discutimos as implicações práticas relativas às nossas descobertas e sugerimos direções para pesquisas futuras.

*Palavras-chave:* e-mail como fonte de stress, conflito trabalho-família, preferência por segmentação, sintomas de *burnout*.

*JEL Classification System:* O15 (Economic Development: Human Resources; Human Development; Income Distribution; Migration) and Y4 (Dissertations)

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## **I. Introduction**

Nowadays, communication technologies are a vital part of people lives, whether in their works or in their personal issues (Valcour and Hunter, 2005). Therefore, it is important to study the impact that communication technologies are having on those two domains. For instance, those technologies provide individuals the possibility to blur the existing boundaries between home and work domains, something that has been widely reported in the existing literature (e.g. Derks, Bakker, Peters and Wingerden, 2016; Peeters, Montgomery, Bakker and Schaufeli, 2005). Those boundaries get blurred because of some characteristics of these communication technologies, such as: flexibility (Mellner, Aronsson and Kecklund, 2015; Derks and Bakker, 2010) and availability (Valcour and Hunter, 2005), i.e., to be connected to both family and work at any time (Boswell and Olson-Buchanan, 2007) and anywhere (Kalleberg and Epstein, 2001). Despite the flexibility and availability given by communication technologies, those devices are associated with overload and intrusions of work into family, which is likely to enhance a conflict between those two domains (Boswell and Olson-Buchanan, 2007; Chesley, 2005). Therefore, we consider relevant to study in depth the consequences of communication technologies use for its users' work-life balance.

In terms of communication technologies, smartphones have been one of the most widely studied recently (e.g. Derks and Baker, 2014; Derks *et al.*, 2016; Derks, Duin, Tims and Bakker, 2015). Those studies examined how smartphone use for work purposes are impacting the employees' work-life balance, by allowing work issues to intrude into their family lives. For instance, both Derks and Bakker (2014) and Derks *et al.* (2015) found a positive association between smartphone use and work interfering with home issues. Smartphones are a communication technology with a vast range of features, in which e-mail is included (Derks *et al.*, 2016). Therefore, in this present study, we will focus on the impact that e-mail use for work purposes has on employees' stress levels. In fact, e-mail has been one of the most used communication tools by individuals, in such extent that 269 billion e-mails were estimated to be daily sent/received worldwide in 2017 (The Radicati Group, 2017). Also, it was reported in 2014 that each employee has to deal on average with 121 e-mails daily, whether by receiving or by sending them (The Radicati Group, 2014). And even though some studies have examined the relationship between e-mail and the work-family interface (e.g. Barley, Meyerson and Grodal, 2011; Derks and Bakker, 2010), there is still a

need for new research. This gap for new studies might be mainly focused on the impact of e-mail stress on work-family conflict.

Sometimes, the performance expectations regarding work and home lives are incompatible, leading to a conflict between those two domains (Netemeyer, Boles and McMurrian, 1996). In fact, a lot of research has examined work-life balance (e.g. Valcour and Hunter, 2005). Studies have focused on that theme because an increasing number of workers have been searching for an optimal balance between their work and home lives (Peeters *et al.*, 2005). Plus, it has also been said that balancing both aspects of life is a society concern nowadays (Westman, Etzion and Gattenio, 2008).

Communication technologies are likely to increase the permeability of boundaries between work and family fields (Peters, Dulk and Lippe, 2009; Valcour and Hunter, 2005). Therefore, the inadequate use of technologies for work purposes may be one catalyst of work-family conflict, mainly because it leads to fewer time spent on family issues (Derks and Bakker, 2010; Turel, Serenko and Bontis, 2011). However, there is also evidence that the growth in the use of communication technologies might give employees an opportunity to balance both work and family aspects, not necessarily incurring in conflict between them (Valcour and Hunter, 2005). In sum, we can agree with the idea that the extent to which people will experience work-family conflict will vary from worker to worker (Higgins and Duxbury, 2005; Houliort, Philippe, Bourdeau and Leduc, 2017).

The way that boundaries between home and work lives are managed depends on each employees' segmentation preference, which may vary from keeping those two domains separate or to integrate both of them (Ashforth, Kreiner and Fugate, 2000). In fact, segmentation preference has been suggested to be associated with work-family conflict as a variable that will influence the experiences of spillover between work and family lives (e.g. Derks *et al.*, 2014; Kreiner, 2006). However, few studies have examined the role of segmentation preference on the relationship between communication technologies and work-family conflict. Additionally, the existing research on that relationship has focused on smartphones (e.g. Derks *et al.*, 2014; Derks *et al.*, 2016), rather than e-mail, which "opens up" a gap for us to investigate it.

Some research has examined the consequences of work-family conflict, and there is evidence that job burnout is one of those (e.g. Netemeyer *et al.*, 1996; Peeters *et al.*, 2005).



On a smaller extent some studies have approached the relationship between e-mail use and job burnout, in which was found that employees who feel stronger e-mail overload are more likely to experience higher levels of job burnout (Reinke and Chamorro-Premuzic, 2014). However, to the best of author's knowledge, no studies have analyzed the relationship between e-mail as source of stress and burnout symptoms, being an opportunity for the present study to work on an innovative relationship.

E-mail has been conceptualized as a source of stress feelings among its users (e.g. Barley *et al.*, 2011; Jerejian, Reid and Rees, 2013). However, to the best of our knowledge, no studies have examined the relationship between feelings of stress caused by e-mail use and burnout symptoms. Then, studying whether e-mail as a source of stress is more likely (or not) to make its users experience feelings of burnout is an important contribution to the existing knowledge. Therefore, to help explain the effects of stress symptoms caused by e-mail use on employees' burnout feelings, work-family will be tested as a mediator of this relationship. Adding to this, as to the best of our knowledge the relationship between e-mail as a source of stress and work-family conflict has never been approached, we will also focus on it. To understand the conditions that may lead stress symptoms caused by e-mail to different levels of work-family conflict, we will test each individual's segmentation preference as a moderator of this relationship. In fact, our proposals for mediation and moderation models have never been tested before, which constitutes our study as innovative and a contribution to the existing literature.

In sum, this study aims to explore the consequences of stress caused by e-mail use for both work and family domains of each employee. First, we will analyze the effects of e-mail as a source of stress on burnout symptoms through work-family conflict (mediator). Then, we will focus on the extent to which e-mail as a source of stress will affect work-family conflict based on employees' levels of segmentation preference (moderator).

In the next chapter, we will present the literature review covering the concepts and the theoretical reasoning to sustain our proposed hypothesis. Then, we will present the used methodology in this study, followed by the analysis of the obtained results. Finally, we will discuss those results, present our conclusions and give insights for future research.

## **II. Literature Review**

Communication technologies brought up a new way of being more connected to the workplace (Boswell and Olson-Buchanan, 2007), which by its turn promoted the idea that employees must be always available to engage in work issues whether the time and their location (Middleton, 2007). This expectation of availability by the employers, usually leads to a greater pressure for their subordinates to answer work-related messages and extends their working schedule throughout leisure times (Davis, 2002), which might be an enabler for stress symptoms (Barley *et al.*, 2011). In fact, e-mail is said to be a communication tool that contributes to workers' stress levels (Jerejian *et al.*, 2013). E-mail has evolved throughout the last decades, becoming an accessible and generalized communication tool for everyone (Huang and Lin, 2014), and being the main way through which information is shared inside of organizations (Dabbish and Kraut, 2006).

Despite the advantage for speed up communications, allowing workers to be more connected and, therefore, promote an increase on their productivity (Turel *et al.*, 2011), several negative consequences arise from the daily use of e-mail (Derks and Bakker, 2010). When using e-mail for communications, employees are likely to perceive an increase on time pressure, mainly because of the expectations by their employers and pairs (Huang and Lin, 2014). Those expectations by the others may lead employees to permanently monitor and answer e-mails, which encompasses an evidence of social pressure regarding e-mail use, i.e., others will judge them based on the time they took to answer (Ramsay and Renaud, 2012; Hair, Renaud and Ramsay, 2007). In fact, in a study regarding academic teaching staff, it was found that e-mail stress was predicted by the volume of e-mails that employees have to deal with (Jerejian *et al.*, 2013). Feelings of overwhelming are also reported due to excessive use of e-mail, as employees argue that they are no longer in control of their works, mainly because of the huge amount of e-mails they have to deal with and to the need of being responsive to them (Ramsay and Renaud, 2012). In line with these findings, Barley *et al.* (2011) concluded that: the more people handle e-mail and the longer they work, the higher will be their feelings of being (e-mail) overloaded. Also, it was found that when people are not using their e-mails, their stress levels tend to be lower than when they are emailing (Kushlev and Dunn, 2015; Mark, Volda and Cardello, 2012). In short, it is plausible to consider e-mail as source of stress for those using it on a daily basis.

## **E-Mail and Burnout Symptoms**

From those consequences that may arise due to the use of e-mail, one of them is symptoms of burnout. Job burnout was defined as disorder represented by three main psychological dimensions: an augment of emotional exhaustion feelings, depersonalization regarding interactions with other people and dissatisfaction about own performance which translates in feelings of decreased personal accomplishments (Maslach and Jackson, 1981). Originally, it was suggested that it was a disorder mainly related to occupations in which employees had to interact continuously with other individuals (Maslach and Jackson, 1981). However, in the 90s, burnout started being expanded to other occupations, as the concept of job burnout had been generalized in empirical researches (Demerouti, Bakker, Nachreiner and Schaufeli, 2001; Maslach, Schaufeli and Leiter, 2001).

Job burnout was also conceptualized as a result of the misfit between job demands and job resources of an individual (Demerouti *et al.*, 2001). In fact, job demands were found to be positively associated with exhaustion, which is one dimension of job burnout (Demerouti *et al.*, 2001). Still according to Demerouti *et al.* (2001), when job demands are high and job resources are limited simultaneously, workers will be likely to experience feelings of job burnout. Also, more recently, a study by Derks and Bakker (2010) suggests that the use of technologies at work (in which e-mail is included) might be a catalyst of job demands.

In fact, the excessive and continuous use of e-mail might lead to job burnout, according to Camargo (2008). Additionally, Derks and Bakker (2010) suggested that an inadequate and overuse of e-mail might turn it into a job demand itself. Also, Barley *et al.* (2011) found a positive relationship between the amount of time spent emailing and feelings of being overloaded, which by its turn was measured by one of the three dimensions of job burnout – exhaustion. Plus, Reinke and Chamorro-Premuzic (2014) found a positive relationship between feelings of e-mail overload and job burnout, in which the first one is a strong predictor of the latter. Taking these findings in consideration, we think it is important to understand in depth how and when the relationship between e-mail as a source of stress and burnout symptoms occurs. Therefore, we hypothesize the following:

H1: E-mail as a source of stress is positively related to the experience of burnout symptoms.

## **E-Mail and Work-Family Conflict**

As a portable communication technology that might be used anywhere and anytime, e-mail can pressure individuals' lives, by intruding into them and blurring the boundaries between their home and work domains (Barley *et al.*, 2011). According to Chesley (2005), when boundaries are blurred and, therefore, more permeable, the transfer of negative spillover experiences from one domain to another are more likely to happen, which means that negative consequences from work might be spillover to the home domain, originating work-family conflict.

Work-family conflict was defined by Greenhaus and Beutell (1985: 77) as: *"a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect."* This definition of work-family conflict came out based on the notion of "interrole conflict", presented by Kahn, Wolfe, Quinn, Snoek and Rosenthal (1964), in which was stated that individuals experience it – interrole conflict – when the expectations set in one role of their lives are incompatible with the expectations of another role. The same authors gave an example that might be applied to the work-family conflict domain, in which is said that: *"demands from role-senders on the job for overtime or take-home work may conflict with pressures from one's wife to give undivided attention to family affairs during evening hours."* (Kahn *et al.*, 1964: 20). According to Greenhaus and Beutell (1985), three different types of work-family conflict may appear: time-based, strain-based and behavior-based conflict. The concept of work-family conflict also underlies on the idea of resources scarcity, because as personal resources are finite, when they are needed to meet the expectations of one role, that might leave the other domain with insufficient resources to be fulfilled (Edwards and Rothbard, 2000). This resources scarcity is precisely what happens when the resources needed to perform work tasks are depleted and, therefore, not enough to complete the home duties (or vice-versa), which leads to work-family conflict.

As the way that individuals balance both their job and family demands are getting more attention (Westman, Etzion and Gortler, 2004), more research has been done in this field, which brings us another particularity regarding work-family conflict: its bidirectionality. In fact, a bidirectional relationship between work and family domains was associated to work-family conflict (Frone, Russell and Cooper, 1992a). According to this, work-family conflict needs to be unfolded in two: work-to-family conflict (when work

interferes with the family domain) and family-to-work conflict (when family issues interfere with the work domain) (Gutek, Searle and Klepa, 1991; Frone, Yardley and Markel, 1997). It is important to note that a positive reciprocal relationship between both forms of work-family conflict was found, which implies that if problems from work interfere in the home domain, those family duties that were unable to be performed at home, might start to interfere in the work domain, therefore, leading to a vicious cycle (Frone *et al.*, 1992a). Also, it was found that work-to-family conflict is more prevalent than family-to-work conflict, which might suggest that it is easier for work demands to interfere in the family domain, than the opposite (Frone, Russell and Cooper, 1992b; Eagle, Miles and Icenogle, 1997).

In this study, the focus will be exclusively on work-to-family conflict, defined as: “*a form of interrole conflict in which the general demands of, time devoted to, and strain created by the job interfere with performing family-related responsibilities*” (Netemeyer *et al.*, 1996: 401). Throughout this study, work-to-family conflict will be further referred as simply “work-family conflict”.

As stated before, the technological changes that have been occurred in the last decades have impacted the way that work and family lives interact with each other (Valcour and Hunter, 2005). The main proposition behind those (technological) changes is that technologies allow work to be done in different places and at any time (Kalleberg and Epstein, 2001). However, the use of communication technologies for work purposes at home has been associated with negative spillover from work to family, which means that work-related problems are likely to increase their influence at home and impact in a negative way the family lives of individuals (Watt and White, 1999; Chesley, 2005; Turel *et al.*, 2011). One reason for this spillover may be related to the fact that communication technologies promote an intensification of work processes (Valcour and Hunter, 2005). Another reason for this spillover might be the fact that technologies have been creating an addiction among its users lately, such that mobile e-mail addiction has been related to negative consequences regarding the balance of work and home lives (Turel *et al.*, 2011). Plus, communication technologies facilitate working longer hours and overtime, which in turn has been associated to work-family conflict (Boswell and Olson-Buchanan, 2007).

In fact, when it comes to overtime and working beyond the work schedule, e-mail has been one of the most studied communication technologies (e.g., Ramsay and Renaud, 2012).

According with Barley *et al.* (2011) and Boswell and Olson-Buchanan (2007), individuals are bringing work home, by answering e-mails early in the morning, after work during the evening and/or night and in the weekends. Researchers have tried to understand the reasons behind this overtime emailing and found that some individuals believe that e-mail is a mechanism that will support them organizing their work day prior to its start and help them being in control of their job demands (Barley *et al.*, 2011; Estévez-Mujica and Quintane, 2018). Also, it was found that this overtime emailing might be related to each employee's ambitions and career aspirations, suggesting that people may work overtime using communication technologies in order to progress in their careers (Boswell and Olson-Buchanan, 2007). Whether the intentions to stay connected to work after hours are good or not, the fact is that - people who usually do it through communication technologies, tend to report high levels of work-family conflict (Boswell and Olson-Buchanan, 2007).

Interestingly, and grounded on the findings that the higher the use of communication technologies, the higher the levels of work-family conflict (Valcour and Batt, 2003; Murray and Rostis, 2007), Turel *et al.* (2011: 90) defined technology-family conflict as: *"irreconcilable demands for time from both the family and the pervasive organizational technology"*. Taking these findings in consideration, we consider relevant to analyze in depth how and when the relationship between e-mail as a source stress and work-family conflict occurs. Therefore, we hypothesize the following:

H2: E-mail as a source of stress is positively related to work-family conflict.

## **Work-Family Conflict and Burnout Symptoms**

Regarding the relationship between work-family conflict and job burnout, some conclusions might be taken based on previous researches. First, Kinnunen and Mauno (1998) found that when an individual experiences work-family conflict, a reduction in the quality of his/her working life will be more likely to occur. Moreover, some studies have found a positive relationship between work-family conflict and job burnout (Allen, Herst, Bruck and Sutton, 2000; Westman *et al.*, 2008; Amstad, Meier, Fasel, Elfering and Semmer, 2011). Plus, some researchers tried to understand which form of work-family conflict is more related to job burnout and found that work-to-family conflict is more significantly connected to job burnout than family-to-work conflict (Netemeyer *et al.*, 1996). Additionally, findings

reported that job burnout is an outcome of work-family conflict (Bacharach, Bamberger and Conley, 1991; Peeters *et al.*, 2005). Taking these findings into consideration, we expect a positive relationship between work-family conflict and burnout symptoms.

In fact, when an individual brings work home or is e-mailing a colleague in the evening, the psychological detachment related to this individual is less likely to happen and, in some cases, it might not even occur at all (Derks *et al.*, 2014). This psychological detachment was defined by Etzion, Eden and Lapidot (1998: 579) as a: “*sense of being away from the work situation*”. Additionally, Sonnentag and Bayer (2005) stated that just being physically away from work is not enough to detach from it, which brings a redoubled importance for the concept of psychological detachment, because it promotes a distance between work and the individual in a mental sense. In fact, psychological detachment was found to moderate the relationship between work-family conflict and psychological strain, (job burnout was considered a strain related to the work environment – Allen *et al.*, 2000), in such way that, when work issues are interfering with the family life of an individual, mentally detaching from work will reduce the levels of psychological strain (Moreno-Jiménez, Mayo, Sanz-Vergel, Geurts, Rodríguez-Muñoz and Garrosa, 2009).

## **Work-Family Conflict as a Mediator**

Work-family conflict has already been used to mediate the relationship between stressors and psychological strains in previous studies. For instance, a study by Peeters *et al.* (2005) found that work-family conflict<sup>1</sup> mediated the relationship between job demands and burnout, in such extent that when job demands are high, a negative spillover between work and family lives will occur, which by its turn promote the experience of burnout feelings. Moreover, findings from Derks and Bakker (2014) reported that work-family conflict<sup>2</sup> mediated the relationship between recovery experiences and job burnout, in such extent that when employees recover and detach from their works, they will be less likely to experience feelings of job burnout, through reduced levels of work-family conflict.

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<sup>1</sup> Referred in the study as “work-home interference” (Peeters *et al.*, 2005).

<sup>2</sup> Referred in the study as “work-home interference” (Derks and Bakker, 2014).

When e-mail is overused in a way that does not allow employees to “turn off” from work and provokes distractions, it will be likely to be a catalyst of stress symptoms among its users. In fact, when e-mail is used in an inadequate and excessive way for work purposes, it is expected that labor issues intrude into people’s familiar lives causing an interrole conflict. Thus, we expect e-mail as a source of stress to promote a conflict between work and home lives among its users. By its turn and taking previous studies in consideration (e.g. Peeters *et al.*, 2005), when an individual experiences work-family conflict, feelings of job burnout will be likely to be enhanced and felt by that individual. Hence, we assume that work-family conflict is as mechanism that can explain the negative effects of e-mail as a source of stress on burnout symptoms. Therefore, the following is hypothesized:

H3: The relationship between e-mail as a source of stress and burnout symptoms will be mediated by work-family conflict.

### **Segmentation Preference as a Moderator**

As seen previously, some studies indicate that there is a relationship between communication technologies use and higher levels of work-family conflict (e.g. Murray and Rostis, 2007). This conflict is likely to rise since communication technologies allow workers to bring work to home and maintain contact with their colleagues when they were supposed to be with their family (Valcour and Batt, 2003). Therefore, there is not surprising that we predict a positive relationship between e-mail and work-family conflict. However, the extent to which e-mail interferes with family issues will depend upon individual’s segmentation preference.

Prior to define the concept of segmentation preference, it is important to approach the boundary theory, as it states that each person has to set his/her own boundaries between his/her multiple life domains, which, in the case of work-life literature, refers to the home and family spheres (Ashforth *et al.*, 2000; Clark, 2000). Thus, segmentation preference is the extent to which someone prefers to keep his/her work and home domains separate, through the creation of boundaries between them (Kreiner, 2006). Those boundaries may vary in terms of permeability, which was defined by Allen, Cho and Meier (2014: 102) as: “*the extent to which a person physically located in one domain may be psychologically or behaviorally involved with another domain*”. Therefore, when someone has a high



preference for segmentation, he/she is more likely to keep his/her work and family domains separate, which can be done through more impermeable boundaries, because those boundaries will prevent work from interfering with family issues (Park, Fritz and Jex, 2011). In the other hand, there are the integrators, who prefer low levels of segmentation, and thus are more likely to promote a merge between home and work domains, raising more permeable boundaries between those two fields (Allen *et al.*, 2014; Kreiner, 2006).

Given these findings, some considerations regarding segmentation preference need to be done. Firstly, and according with Kreiner (2006), none of those two preferences, either for segmentation or integration, are better than the other. In fact, preferring a certain the degree of segmentation will depend on the willingness and the extent to which an individual wants to keep his/her home and work domains separate or not (Kreiner, 2006). For people high on segmentation, work concerns and thoughts are less likely to intrude into their family lives and the boundaries between home and work domains will not be easily blurred (Liu, Kwan, Lee and Hui, 2013). However, a high segmentation preference makes transitions and shifts between roles harder to perform (Carlson, Ferguson and Kacmar, 2015).

In fact, and as approached previously, since communication technologies allow individuals to bring work home and to stay connected to the office no matter the place and time (Chesley, 2005), the boundaries built between home and work domains are likely to get blurred (Valcour and Hunter, 2005). Plus, it was found that the use of communication technologies is associated with a greater permeability of boundaries between home and work domains (Chesley, 2005). Since individuals with a preference for high segmentation are known for appealing to more impermeable boundaries between work and family lives (Allen *et al.*, 2014), it is not surprising that a high segmentation preference was found to be related to a lesser use of communication technologies at home (Park *et al.*, 2011). However, sometimes it is not possible for each individual to segment work and family lives to the extent he/she prefers to, due to pressures and expectations from supervisors and colleagues to answer work-related messages while at home (Derks *et al.*, 2016).

In line with the previous findings and as a communication tool, e-mail was found to increase the permeability of boundaries between work and home domains (Barley *et al.*, 2011). This increase on boundaries' permeability might be explained by the interruptions and distractions caused by e-mail (e.g. Derks and Bakker, 2010; Kushlev and Dunn, 2015). In

fact, those interruptions provoked by e-mail may happen anywhere and at any time (Boswell and Olson-Buchanan, 2007). According with Chen, Powell and Greenhaus (2009), the number of work interruptions a worker has while at home needs to be congruent with his/her segmentation preference, in such extent that someone who prefers to segment his/her home and work domains, is more likely to intend having fewer interruptions, than someone who desires to integrate those two domains. Additionally, findings report that if an individual has intentions to segment his/her work and home domains but does not have conditions to do it (due to e-mail interruptions, for example), the work-family conflict levels associated with that individual are likely to increase (Kreiner, Hollensbe and Sheep, 2009; Michel and Clark, 2012).

We have hypothesized e-mail as a source of stress to be positively associated with work-family conflict (H1). In fact, e-mail has the potential to cause work-family conflict among its users, as it may intrude into employees' familiar lives by provoking distractions and interruptions and not allowing them to "turn off" from their jobs (Boswell and Olson-Buchanan, 2007). However, we consider relevant to understand if the relationship between those two variables is always positive and if it gets stronger (or weaker) with the inclusion of another variable as a moderator. In our study, we expect individuals' segmentation preference to condition the relationship between e-mail as a source of stress and work-family, in a way that those who prefer to segment their work and home lives will experience work-family conflict to a different extent than those who prefer to integrate those two domains.

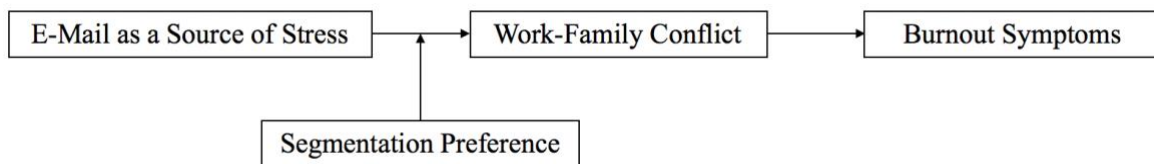
Segmentation preference was used as a moderator in a similar study to ours, in which Derks *et al.* (2016) found that individuals with a low segmentation preference ("integrators") experience less work-family conflict when using their smartphones for work purposes during off-job time. Considering this finding, we expect that e-mail as a source of stress will have a stronger effect on work-family conflict for employees who prefer to segment their work and family lives as much as possible (high segmentation preference), than for those who prefer to integrate those two domains (low segmentation preference). The main reason behind this assumption is that individuals with a high segmentation preference will be less willing to be interrupted by e-mail when performing their family tasks and will have less tendency to bring work to home. On the other hand, individuals with a low segmentation preference will be

more willing to conjugate their work and family obligations at the same time and will be less bothered by e-mail distractions while at home. Therefore, the following is hypothesized:

H4: Segmentation preference will moderate the positive relationship between e-mail as a source of stress and work-family conflict, such that this positive relationship will be stronger for individuals who prefer high segmentation levels.

In sum, this study suggests a mediated moderation research model. In this model, work-family conflict will mediate the relationship between e-mail as a source of stress and burnout symptoms. Also, the relationship between e-mail as a source of stress and work-family conflict will be moderated by segmentation preference. A graphic representation of this model can be seen on Figure 1.

*Figure 1.* Research model



### III. Method

#### Participants

In total, 714 employees from a multinational Portuguese company were invited to participate in this study. A response rate of approximately 55% were obtained ( $N = 389$ ), which according to Leedy (1997) goes in line with the required sample size to properly represent the given population. The process of selecting this sample was totally random, as the probability of response was the same for every inquired (Lavrakas, 2008).

From those who answered the survey, the majority were women (54%), almost two thirds work in Portugal (66%) and most of them have an academic education (90%). Almost three quarters of the respondents are aged between 30 and 49 years (71%) and the majority have been in this company for more than 10 years (56%). In terms of contracts, almost three quarters of the employees are working in the company under a permanent contract (73%) and a large majority work on a full-time basis (98%). Since a part of this study focuses on the interactions between home and work domains, it is important to highlight the fact that most of the respondents live with one or more children (59%). A more detailed characterization of the sample can be found on Figure 2.

We considered this sample as representative of the target population from both qualitative and quantitative points of view. This representativeness was considered due to the fact that in our sample, all sociodemographic groups are represented in a similar percentage to the the way they are spread in the original population (Lavrakas, 2008).

*Table 1.* Sociodemographic characterization of the sample

Variables	Answer	Frequency
1. Sex	Male	46%
	Female	54%
2. Workplace Country	Portugal	66%
	Other European Countries	34%
3. Education Level	Less than University	10%
	Bachelor	7%
	Degree	34%
	Post-Graduation	18%

	Master/Doctorate	31%
4. Age Groups	Less than 29 Years Old	12%
	30-39 Years Old	27%
	40-49 Years Old	44%
	50-59 Years Old	14%
	More than 60 Years Old	3%
5. Seniority	Less than 2 Years	16%
	2-5 Years	16%
	6-10 Years	12%
	More than 10 Years	56%
6. Contract Term	Fixed Term	13%
	Permanent Term	73%
	Uncertain Term	12%
	Other Type	2%
7. Contract Type	Full-Time	98%
	Part-Time	2%
8. Number of Children Living With	Don't Have Children	41%
	1 Children	23%
	2 Children	25%
	More than 2 Children	11%

## Measures

**E-mail as a source of stress.** This variable was measured with a reduced and adapted three-item scale based on the scale developed by Mano and Mesch (2010), in which is intended to measure the impact that using e-mail for work-related tasks has on work stress. The original scale has four items, but we only used three of them. From those three items we used, two were adapted from the original source to more accurately fit the information we got from the participants. The third item was used just like proposed by the authors. All items were rated on a five-point Likert scale ranging from 1 = *never* to 5 = *always*. An example of an item is: “(Using the e-mail in the last month) made it impossible to get away from work”. The Cronbach’s alpha of the scale was 0,83.

**Work-family conflict.** This variable was measured with the three-item subscale for work-to-family conflict of Abbreviated Work-Family Conflict Measures (Matthews, Kath and Barnes-Farrell, 2010). This subscale for work-to-family conflict has one item for each work-family conflict form: time-based, strain-based and behavior-based conflict. By its turn,

this subscale is an abbreviated version from the original one developed by Carlson, Kacmar and Williams (2000). All items were rated on a five-point Likert scale which varies between 1 = *strongly disagree* and 5 = *strongly agree*. An example of an item is: “I have to miss family activities due to the amount of time I must spend on work responsibilities”. For the used subscale, the alpha of Cronbach was of 0,74.

**Burnout symptoms.** This variable was measured with a four-item scale based on the Burnout Assessment Tool (Schaufeli, 2018). This scale is currently being tested, which means that it was not validated yet. All items were rated on a five-point Likert scale ranging from 1 = *never* to 5 = *always*. An example of an item is: “At work, I feel mentally exhausted”. The Cronbach’s alpha of the scale was 0,71.

**Segmentation preference.** This variable was measured with a reduced three-item scale based on the Segmentation Preferences (Kreiner, 2006). The original scale has four items, which means we take one of them off and three others remain. All items were rated on a five-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. An example of an item is: “I don’t like to have to think about work while I’m at home”. The Cronbach’s alpha for this scale was 0,82. The higher the Cronbach’s alpha value, the higher the preference for segmentation between work and home domains.

**Control Variables.** In this present study, we will control the effect that some variables might have on work-family conflict and burnout symptoms. The chosen control variables were: sex (1 = *female*, 2 = *male*), education level (1 = *less than university*, 2 = *bachelor*, 3 = *degree*, 4 = *post-graduation*, 5 = *master/doctorate*), age groups (1 = *less than 29 years old*, 2 = *30-39 years old*, 3 = *40-49 years old*, 4 = *50-59 years old*, 5 = *more than 60 years old*) and seniority (1 = *less than 2 years*, 2 = *2-5 years*, 3 = *6-10 years*, 4 = *more than 10 years*). Sex, education level and age were found to be related to work-family conflict in previous research (Allen and Finkelstein, 2014; Schieman, Whitestone and Gundy, 2006). However, none of these three variables (sex, education level and age) were found to be significantly correlated to work-family conflict in this study. Also, some studies reported sex, education level and age to be related to job burnout (Brewer and Shapard, 2004; Hill, Jacob, Shannon, Brennan, Blanchard and Martinengo, 2008; Rashkovits and Livne, 2013). Nevertheless, none of these variables (sex, education level and age) were found to be significantly correlated to job burnout in our study. Despite the fact that we did not find any

studies regarding a possible relationship between seniority and both work-family conflict and job burnout, seniority was found to be significantly correlated to both of these variables in our research. Therefore, we decided to use seniority as a control variable in this study.

## **Procedure**

The data from this study is a part of a project coordinated by Professor Sílvia Silva in a Portuguese multinational company. The project scope is health and wellness at work. Since the study was made in a multinational company, the data collection had to be made through an online questionnaire. This questionnaire was held in English, as it is the company's official language.

Prior to the application of the questionnaire, an agreement with the company and informed consent requirements were included in the first page of the survey. Then, the respective questionnaire was analyzed by an internal team of the company to validate the items understanding and the appropriate answering time. Also, some limitations were raised by the company, mainly regarding the number of items for each variable scale, which conditioned us on the number of questions made in the questionnaire. Therefore, we had to reduce the number of items in some scales of variables.

The questionnaire was distributed *Qualtrics*. The data was collected within a period of twenty days.

It should be also noted that throughout the whole process of information collection, all respondents were assured the confidentiality and anonymity of the data they provided. Plus, no rewards were given to the respondents, as this was a questionnaire of voluntary participation.

Finally, the results were analyzed with *IBM SPSS Statistics (Version 23)*.

## IV. Results

Means, standard deviations and zero-order correlations for all the studied variables are shown in Figure 3. As we can see, e-mail as a source of stress was found to be positively associated with work-family conflict ( $r = .43, p < .01$ ) and burnout symptoms ( $r = .39, p < .01$ ). Among the control variables, only seniority was significantly correlated to work-family conflict ( $r = .18, p < .01$ ) and burnout symptoms ( $r = .17, p < .01$ ). Therefore, except for seniority, no control variables (age, education level and sex<sup>3</sup>) were included in our two regression models.

*Table 2.* Means, standard deviations and correlations between the variables

Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8
1. E-mail as a Source of Stress	3.03	.94	-							
2. Work-Family Conflict	2.77	.89	.43**	-						
3. Segmentation Preference	3.95	.83	.08	.16**	-					
4. Burnout Symptoms	2.47	.66	.39**	.39**	.17**	-				
5. Age <sup>a</sup>	2.68	.95	.15**	.09	-.04	.02	-			
6. Seniority <sup>b</sup>	3.09	1.16	.24**	.18**	-.07	.17**	.56**	-		
7. Education Level <sup>c</sup>	3.55	1.26	.08	.01	-.03	-.03	-.19**	-.12**	-	

Notes: N = 389. <sup>a</sup>1 = Less Than 29 Years Old, 2 = 30-39 Years Old, 3 = 40-49 Years Old, 4 = 50-59 Years Old, 5 = More Than 60 Years Old. <sup>b</sup>1 = Less Than 2 Years, 2 = 2-5 Years, 3 = 6-10 Years, 4 = More Than 10 Years. <sup>c</sup>1 = Less Than University, 2 = Bachelor, 3 = Degree, 4 = Post-Graduation, 5 = Master/Doctorate.

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ .

## Test of Hypothesis

Then, to test our hypotheses, we conducted hierarchical regression analysis, following the recommendations of Baron and Kenny (1986). The results of the hierarchical regression predicting burnout symptoms are presented on Figure 4, as we reported the standardized coefficients ( $\beta$ ) and the t-statistics value ( $t$ ). In Step 1, we inserted seniority into the model, as the control variable; then, in Step 2, we entered e-mail as a source of stress, as the predictor; finally, in Step 3, work-family conflict was entered as the mediator. Hypothesis

<sup>3</sup> The t-test for equal means regarding the variable “sex” can be seen on Annex 1.



1 posited that e-mail as a source of stress would be positively related to burnout symptoms. As we can see on Figure 4, e-mail as a source of stress was positively associated with burnout symptoms after controlling for seniority ( $\beta = .26, p < .001$ ). Therefore, our H1 was supported.

*Table 3.* Results of the hierarchical regression analysis on burnout symptoms (mediation)

	Burnout Symptoms					
	Step 1		Step 2		Step 3	
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
Seniority	.09**	3.16	.05	1.60	.03	1.17
E-mail as a Source of Stress			.26***	7.21	.18***	4.69
Work-Family Conflict					.20***	5.12
$\Delta R^2$	.03**		.13***		.06***	

Notes: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ;

Then, the results of the hierarchical regression predicting work-family conflict are presented on Figure 5. In Step 1, we entered seniority as the control variable and, in Step 2, we inserted e-mail as a source of stress as the predictor. As seen on Figure 5, e-mail as a source of stress was positively associated with work-family conflict after controlling for seniority ( $\beta = .40, p < .001$ ). Thus, our H2 was supported.

*Table 4.* Results of the hierarchical regression analysis on work-family conflict (mediation)

	Work-Family Conflict			
	Step 1		Step 2	
	$\beta$	$t$	$\beta$	$t$
Seniority	.14**	3.41	.06	1.65
E-mail as a Source of Stress			.40***	8.42
$\Delta R^2$	.03**		.20***	

Notes: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ;

Regarding our H3, we predicted that work-family conflict would mediate the relationship between e-mail as a source of stress and burnout symptoms. First, we tested if the predictor (e-mail as a source of stress) affects the mediator (work-family conflict), as it is the first condition for the establishment of a mediation (Baron and Kenny, 1986). This

condition constitutes our H2, which was found to be supported by the results presented on Figure 5. Therefore, the first condition for the existence of a mediation model was met.

Then, we tested whether the predictor (e-mail as a source of stress) affects the criterion variable (burnout symptoms) and if the latter is affected by the mediator (work-family conflict), which are the second and third conditions for having a mediation, respectively (Baron and Kenny, 1986). In fact, and as shown on Figure 4, e-mail as a source of stress was positively associated with burnout symptoms, which constituted our H1. Also, work-family conflict was found to be positively associated with burnout symptoms (Figure 4), after accounting for both seniority and e-mail as a source of stress and pressure ( $\beta = .20$ ,  $p < .001$ ). Therefore, the three conditions given by Baron and Kenny (1986) for having a mediation were all fulfilled.

As seen on Figure 4, the results for this regression analysis support a partial mediation model (Baron and Kenny, 1986). In fact, the positive relationship between e-mail as a source of stress and burnout symptoms was still significant after introducing work-family conflict in the regression model ( $\beta = .18$ ,  $p < .001$ ). The tested regression model explained 21% of the employees' burnout symptoms variance ( $R^2_{\text{Adjusted}} = .21$ ;  $F(3, 349) = 31.42$ ;  $p < .001$ ).

Additionally, besides confirming that all the conditions for having a mediation were assured (Baron and Kenny, 1986), we performed the Sobel test (Sobel, 1982) to check if our predictor (e-mail as a source of stress) has a significant indirect effect on the criterion variable (burnout symptoms) through the mediator (work-family conflict). According with the results from the Sobel test, a significant indirect relationship was found between e-mail as a source of stress and burnout symptoms via work-family conflict ( $z = -4.35$ ,  $p < .001$ ). Therefore, our H3 was supported.

The third hierarchical regression analysis concerns to our H4, in which we proposed that segmentation preference would moderate the relationship between e-mail as a source of stress and work-family conflict. The results for this regression analysis can be seen on Figure 6, as we reported the unstandardized coefficients (B).

In Step 1, we inserted seniority as the control variable into the model; then, on Step 2, e-mail as a source of stress was placed as the predictor of our model; in Step 3, segmentation preference was inserted as the moderator variable; finally, on Step 4, the interaction term between e-mail as a source of stress and segmentation preference was

introduced into our regression model. Before calculating the interaction term, we centered our control (seniority), independent (e-mail as a source of stress) and moderator (segmentation preference) variables, as indicated by Aiken and West (1991). Therefore, the results provided on Figure 6 for both variables were obtained after centering them.

*Table 5.* Results of the hierarchical regression analysis on work-family conflict (moderation)

	Work-Family Conflict			
	Step 1	Step 2	Step 3	Step 4
	B	B	B	B
Seniority	.14***	.06	.07	.08*
E-Mail as a Source of Stress (EM)		.40***	.39***	.38***
Segmentation Preference (SP)			.14**	.13*
EM x SP				.10
$\Delta R^2$	.03***	.16***	.02**	.01
$R^2_{\text{Adjusted}}$				.21
F-Test	11.64***	42.39***	31.03***	24.36***

Notes: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ;

According with the results presented on Figure 6, it is possible to see that after controlling for seniority, the interaction term between e-mail as a source of stress and segmentation preference is not significantly predicting work-family conflict ( $B = .10$ ,  $p = .057$ ). Contrary to these findings, the results of this moderation were significant when we did not inserted seniority into the model<sup>4</sup> ( $B = .10$ ,  $p = .049$ ). After testing the results with *Process Macro for SPSS*, we thus confirmed that the interaction term between e-mail as a source of stress and segmentation preference is indeed not significantly predicting work-family conflict. Regarding the model, it explains approximately 21% of the employees' work-family conflict variance ( $R^2_{\text{Adjusted}} = .21$ ) and it was considered significant when predicting work-family conflict ( $F(4, 349) = 24.36$ ;  $p < .001$ ).

Considering that the interaction term between e-mail as a source of stress and segmentation preference is not significantly predicting work-family conflict and following the recommendations of Aiken and West (1991), we decided not to run the simple slopes test,

<sup>4</sup> This regression analysis (moderation without controlling for "seniority") can be seen on Annex 2.

as the p-value of this interaction term falls slightly above the significance level ( $p < .05$ ). Therefore, our H4 was not supported.

## **V. Discussion and Conclusions**

In this research, we analyzed how e-mail as a source of stress could affect employees' burnout symptoms. Further, we examined the role that work-family conflict could have on explaining this relationship, by playing the role of a mediator. This constitutes one of our hypotheses, in which was posited that work-family conflict would mediate the relationship between e-mail as a source of stress and burnout symptoms. Plus, we examined how segmentation preference would condition the relationship between e-mail as a source of stress for its users and their work-family conflict levels. This last premise constitutes another hypothesis, in which we stated that segmentation preference would moderate the relationship between e-mail as a source of stress and work-family conflict, in such extent that individuals who prefer to segment their work and home lives, would be more willing to experience such form of interrole conflict. And despite the fact that some of these variables have already been studied, to the best of author's knowledge, no studies have examined these mediation and moderation proposals.

First, we found a positive and significant relationship between e-mail as a source of stress and burnout symptoms. Therefore, it is plausible to say that when e-mail produces harmful effects on employees, they will be more likely to experience feelings of burnout, even after accounting for employees' seniority. In fact, given the evidence that the inadequate use of communication technologies for work purposes might be a catalyst of job demands (Derks and Bakker, 2010), it is not surprising the results pointing out to a positive relationship between e-mail as a source of stress and burnout symptoms. These results are in line with the previous studies suggesting a positive association between e-mail use and job burnout (e.g. Barley *et al.*, 2011; Reinke and Chamorro-Premuzic, 2014). However, none of these studies have pointed out to a possible mechanism that could explain how and why e-mail use affects burnout symptoms.

In fact, one purpose of this study was to find out a mechanism that would explain why employees who cannot control the harmful effects of e-mail's inadequate overuse are more likely to suffer from burnout symptoms. Our results provide support for the given hypothesis, in which was stated that e-mail as a source of stress would lead to work-family conflict, which by its turn, is likely to promote feelings of burnout symptoms. In fact, our findings suggest that when employees cannot control the flow of their e-mails and are unable

to concentrate on things other than their jobs, they are more vulnerable to suffer from work-family conflict. As employees cannot “turn off” from their jobs and bring work home through e-mail use, the time they would spend with their families is compromised and vulnerable to interruptions provoked by work issues. Hence, this interrole conflict between employees’ work and home lives is likely to augment when e-mail turns out into a source of stress. In turn, and in line with the findings from Allen *et al.* (2000), Amstad *et al.* (2011) and Westman *et al.*, (2008), work-family conflict was found to have a positive and significant relationship with burnout symptoms. This means that, when employees are struggling with a role conflict between their work and family lives, they are more likely to experience feelings of job burnout. In sum, these findings shed light on how the stress exhorted by e-mail use relates to burnout symptoms, through work-family conflict.

Additionally, e-mail as a source of stress was conceptualized as the predictor of our mediation model. As far as the author knows, no studies have analyzed the relationship between e-mail as a source of stress and work-family conflict. In this study, we found a positive and significant association between those two variables, which suggests that e-mail as a catalyst of stress affects the work-family conflict levels felt by its users. These results are in line with the studies that suggested the use of communication technologies for work purposes to be associated with work-family conflict (e.g. Turel *et al.*, 2011; Watt and White, 1999). The rationale behind this was that since communication technologies allow employees to bring work home and to solve labor issues beyond their schedule, those technologies are likely to interfere with employees’ family lives in a negative way (Boswell and Olson-Buchanan, 2007; Valcour and Batt, 2003).

The other purpose of this study was to examine the impact that e-mail as a source of stress would have on work-family conflict, with segmentation preference playing the role of moderator. Indeed, we wanted to go further and to delimit the context of this association between e-mail as a source of stress and work-family, to find out if employees’ segmentation preference would condition the way in which this relationship occurs.

In fact, people with a high segmentation preference, i.e. who desire to separate work and family issues as more as possible (Kreiner, 2006), usually build boundaries around those two spheres, given how much they want them to be permeable or not (Ashforth *et al.*, 2000). According to Park *et al.* (2011), having a high segmentation preference is related to a lower

use of technologies at home for work purposes. For these employees with a high segmentation preference, the use of communication technologies for job purposes might be seen as a threat, because those technologies are likely to blur the existing boundaries and increase permeability between their home and work lives (Valcour and Hunter, 2005). We argue that when e-mail constitutes a source of interruptions and does not allow its users to “turn off” from it, employees with a high segmentation preference will be the ones struggling the most to balance their work and home lives. In fact, if someone wants to keep his/her work and family lives separate, by having e-mail intruding into his/her life while at home causing distractions, interruptions and pressure to answer, he/she will be more likely to experience a negative spillover from work to family. For the employees who prefer a low segmentation between work and home spheres, the use of e-mail beyond the job schedule and the stress caused by it while at home are likely to have a weaker impact on work-family conflict, as those employees will have more openness to bring work home. Therefore, we hypothesized that for employees who prefer a higher segmentation between their work and home lives, the impact of e-mail’s associated stress on work-family conflict will be greater, than for those who prefer to integrate those two domains (low segmentation preference).

However, based on the results we obtained, it is possible to see that segmentation preference does not moderate the relationship between e-mail as a source of stress and work-family conflict, after accounting for seniority. These results are not in line with the idea that if work e-mail causes cross-role distractions and interruptions while individuals are at home, it would be likely to intensify the experience of work-family conflict for those employees who prefer to separate both dimensions of their lives. Nevertheless, we found that segmentation preference would moderate the relationship between e-mail as a source of stress and work-family when not controlling for seniority. Therefore, we can assume that the inclusion of seniority as the control variable into this moderation model is the main reason why segmentation preference was not found to be moderating the relationship between e-mail as a source of stress and work-family conflict.

In sum, the results of this study suggest that only the hypotheses regarding our mediation are suitable and confirmed on the given sample. In fact, there is evidence to support a partial mediation model, in which work-family conflict is the mediator of the relationship between e-mail as a source of stress and burnout symptoms. Indeed, e-mail as a source of

stress was found to foster the experience of work-family conflict by the employees, which by its turn was positively related to burnout symptoms. Additionally, e-mail as a source of stress was also found to be positively associated with burnout symptoms. However, and contrary to our expectations, it was found that segmentation preference did not moderate the relationship between e-mail as a source of stress and work-family conflict. We expected that for those employees who prefer to segment their family and work lives (high segmentation preference), the effects of e-mail as a source of stress would be stronger on work-family conflict than for those who rather integrate those two domains (low segmentation preference), but our results did not support this idea.

## **Theoretical Contributions**

Firstly, and although e-mail has already been associated to stress feelings among its users (e.g. Barley *et al.*, 2011; Kushlev and Dunn, 2015), the conceptualization of e-mail as a source of stress as the predictor of our model was a disruptive contribution from this study to the framework of e-mail overuse consequences. In fact, some studies examined the outcomes associated with e-mail use on organizations for the well-being of employees (e.g. Jerejian *et al.*, 2013; Turel *et al.*, 2011), however none of those have explored the relationship between e-mail as a catalyst of stress feelings and both work-family conflict and burnout symptoms. Therefore, our first theoretical contribution was to find out a positive significant relationship between e-mail as a source of stress and burnout symptoms. Then, we also found that e-mail as a source of stress does in fact affect the levels of work-family conflict experienced by its users. Through these findings, it was possible to see the impact that an inadequate and ostensible use of e-mail may cause on employees, mainly to their work-life balance and to their own mental health. These results are in line with the findings pointing out to a positive relationship between communication technologies use at home for job purposes and work-family conflict (e.g. Chesley, 2005) and between feelings of e-mail overload and job burnout (Reinke and Chamorro-Premuzic, 2014).

Adding to this, stress caused by e-mail use was analyzed on previous studies, but mainly as an outcome of the frequency and volume of e-mails an employee has to deal with (e.g. Jerejian *et al.*, 2013; Kushlev and Dunn, 2015). In this research, we focused on e-mail being a catalyst of stress and pressure feelings but rather as an antecedent of severe



consequences for employees' mental well-being and work-life balance. Therefore, this might be an impeller to start looking at e-mail as a source of stress as an antecedent of multiple negative consequences for its users, rather than just an outcome of e-mail use.

Plus, we have analyzed the relationship between work-family conflict and burnout symptoms, and it was found a positive and significant relationship between both variables. And besides these results are in line with the majority of findings that point out to a positive relationship (e.g. Allen *et al.*, 2000; Westman *et al.*, 2008), we have also confirmed that burnout symptoms can be considered an outcome of work-family conflict (Bacharach *et al.*, 1991; Peeters *et al.*, 2005).

Summing up the studied relationships, we came up with a mediation proposal, in which e-mail as a source of stress would augment the levels of work-family conflict felt by employees, which, by its turns will increase the experience of burnout symptoms. In fact, this mediation model has never been studied before, and based on our results of being significant and adequate, we can consider it as a contribute to the framework of work-life balance.

Finally, we have also proposed a moderation model, in which segmentation preference would moderate the relationship between e-mail as a source of stress and work-family conflict. In here, we wanted to shed some light on how this relationship would be affected by the inclusion of a variable that concerns to employees' preferences on how they want to keep home and work lives separate or not. The results from this moderation did not confirm our expectations that employees who have a high segmentation preference would feel the effects of e-mail as a catalyst of stress symptoms on work-family in a stronger way than the ones who prefer to integrate home and work lives (low segmentation preference). In fact, after accounting for seniority, segmentation preference was found not to moderate the relationship between e-mail as a source of stress and work-family conflict anymore. In here, it is important to mention the impact that seniority had on this moderation, especially considering that without controlling for it, segmentation preference was significantly moderating the relationship between e-mail as a source of stress and work-family conflict.

## **Limitations and Future Research**

Although the contributions given by this study, some limitations occurred while conducting it that we need to be aware of.

First, some common method variance problems may be risen. Given the fact that the respondents for all variables were always the same in this study, we can stand before a self-reported bias (Podsakoff, MacKenzie, Lee and Podsakoff, 2003). According to the same authors (Podsakoff *et al.*, 2003), when the source who provided the measure for both predictor and criterion variables is the same, this may result in a “artifactual covariance” between those two variables. To help control this common method bias, Podsakoff *et al.* (2003) recommend collecting the study data from different sources, i.e. to have different respondents providing measures for both predictor and criterion variable, in which is suggested that within an organization, employees can rate their hierarchical superiors’ behaviors and attitudes, while the latter can provide measures regarding their subordinates. However, having different sources providing measures for the studied variables can also carry some common method variance concerns too, as it can lead to “leniency biases”, in which respondents tend to rate the people they like the most in a more favorable way (Podsakoff *et al.*, 2003). In our study, all variables were related to personal experiences (e.g. burnout symptoms) and preferences of individuals (e.g. segmentation preference), which makes it difficult to be measured by different sources. Despite this, we suggest that in future studies the impact of these variables can be also tested on employees’ relatives, following the idea of Boswell and Olson-Buchanan (2007) in which they measured how employees’ significant others felt the impact of communication technologies use during nonwork time on work-family conflict. Despite this recommendation, we are aware that it might not be that easy to collect data regarding work-family issues near employees’ relatives, due to the sensitivity of this theme (Aryee, Srinivas and Tan, 2005).

Another potential source of common method bias is social desirability, in which respondents tend to answer the questions in a way that goes according to which they consider as socially accepted, rather than in line with their true feelings regarding the theme (Podsakoff *et al.*, 2003). A possible way to attenuate the effect of social desirability on biasing our results, is to assure participants the confidentiality and anonymity of the data they provide, as it will promote sincere answers from them on sensitive themes (Jong, Pieters and Fox, 2010). Therefore, when applying the questionnaire, we assured all the participants the confidentiality of the answers they gave, which we believe reduced the probability of incurring in socially desirable behaviors.

Other common method variance concern that can be highlighted is the fact that all variables from this study were measured at the same point in time (Podsakoff *et al.*, 2003). The fact that data from both predictor and criterion variables were collected simultaneously turns this research into a cross-sectional study, in which the inference of causal relationships between variables is limited (Michel & Hargis, 2008; Park *et al.*, 2011). Another problem about measuring constructs at the same point in time is that the responses given by participants to both predictor and criterion variables will remain in their short-term memories (Podsakoff *et al.*, 2003). Therefore, we suggest that a longitudinal study should be conducted with these variables, in which a time lag is implemented between the measurement of those constructs, so that causal relationships between variables can be established and inferred (Podsakoff *et al.*, 2003; Podsakoff, MacKenzie and Podsakoff, 2012; Reinke and Chamorro-Premuzic, 2014).

Adding to this, there is another possible source of common method bias in this study, that is related to the used scales format, as we measured all variables with similar Likert scales and number of points, which may have made respondents incur in similar answers for different variables (Podsakoff *et al.*, 2003). Therefore, we suggest in future studies analyzing similar variables to ours, that researchers could use different format scales, mainly in terms of number of points.

Then, e-mail as a source of stress needs to be carefully examined, as it is not just related to the use of e-mail for work purposes, but it rather represents an inadequate and excessive overuse of that type of communication tool, in such extent that produces feelings of stress and intrudes in employees' family lives, not allowing them to "turn off" from their jobs. Still regarding this variable, as e-mail use over the day may fluctuate according to each employee's workflow and workload, it would be interesting to study how e-mail as a source of stress levels oscillate on a daily basis.

Also, some concerns about work-family conflict and burnout need to be risen, as a study conducted by Westman *et al.* (2008) found that these two constructs are not constant over the time, which reinforces the need to conduct a study in which these variables are measured at different points in time, to analyze how they change and which factors may be associated with their fluctuations. Besides this, the fact that the used scale for measuring burnout symptoms (Schaufeli, 2018) is still being tested and was not validated yet in Portugal

is another limitation of this study. Therefore, we reinforce the idea to use that scale in a similar study to ours, to check if the results are consistent with ones we obtained.

Plus, as our study was conducted in a single multinational company, we need to be careful when generalizing the obtained results, as it may not be representative of the reality of other companies or industries. Also, the company limited us in the number questions on the questionnaire, which made us reduce and adapt the number of items in some variables.

One of the points of our research was to examine the impact that segmentation preference would have as a moderator on the relationship between e-mail as a source of stress and work-family conflict. According to our results, segmentation preference is not significantly moderating this relationship, after accounting for seniority. However, and as suggested in some studies (Kreiner *et al.*, 2009; Michel and Clark, 2012), if employees' preferences for segmenting their work and home lives do not meet the companies' policies regarding this theme, they are likely to suffer from work-family conflict. Taking this into account, we believe that perceived segmentation norms should be included in a similar model to ours, to help explain how colleagues and supervisors influence one's segmentation preference and the work-family conflict levels felt by employees in a more detailed way.

Adding to this and taking into consideration the importance of recovery from both work and home lives to alleviate possible negative mental health outcomes (Sonnentag and Bayer, 2005), we suggest the inclusion of psychological detachment as a moderator in the relationship between technology-family conflict (Turel *et al.*, 2011) and burnout symptoms. In fact, psychological detachment was found to moderate the relationship between work-family conflict and psychological strain (Allen *et al.*, 2000), in such extent that the more people detach mentally from work, the less feelings of burnout they are likely to experience. Therefore, we would expect psychological detachment to moderate the relationship between technology-family conflict and burnout symptoms, in a way that proves how important it is to detach and "turn off" from work to avoid burnout feelings, even when communication technologies intrude into our family lives.

Then, it would be interesting to investigate the impact of work-family conflict on other psychological strains, such as depression or anxiety (Allen *et al.*, 2000). We believe that by looking forward to other consequences (other than burnout symptoms) for employees' mental health, that some light will be shed on the consequences of work-family conflict and

on the need from companies to intervene and help their human resources coping with it to avoid drastic consequences for their mental well-being.

Finally, regarding control variables, some suggestions might be made for future studies. First, seniority was found to be associated with burnout symptoms, although it did not affect our mediation model after controlling for it. On the other hand, seniority was found to influence the moderation role of segmentation preference in the relationship between e-mail as a source of stress and work-family conflict. In fact, after accounting for seniority, segmentation preference did not moderate this relationship anymore. Taking these findings into accounting, it would be interesting to test the influence of seniority in other studies regarding work-life balance, considering the lack of research on this particular variable.

## **Practical Implications**

Our study focuses on e-mail as a source of stress as the starting point. In fact, we analyzed how this type of communication tool may leverage its users to experience feelings of stress and be a catalyst of work intruding into employees' family lives. This means that, by itself, e-mail has been used in an inadequate and abusive way by its users, which explains why they are feeling those symptoms. Therefore, and in first place, companies need to be aware of this and propose solutions to attenuate the experienced feelings of stress when using e-mail for work purposes. For example, Huang and Lin (2014) suggest that companies need to make sure that their employees are not overwhelmed or time pressured when e-mailing, and that they feel in control of time when using e-mail. Some studies highlight the importance of constantly checking e-mail to feel in control of it (Dabbish and Kraut, 2006), while others defend that employees should monitor their e-mails less often to help alleviate stress symptoms (Kushlev and Dunn, 2015). These literature contradictory findings may suggest that how to reduce stress symptoms associated with e-mail use will depend on each user, but both reinforce the importance of adopting strategies that help them cope with e-mail overload, as a way of improving their performance and psychological well-being.

Then, we found that e-mail as a source of stress will lead to an increase on work-family conflict levels. This type of interrole conflict may produce severe consequences for those who are experiencing it, firstly in a more personal level by affecting employees' well-being and health (Adams, King and King, 1996; Allen *et al.*, 2000) and then by reducing the

quality of life of employees' relatives through negative social interactions (Bakker, Demerouti and Dollard, 2008). Adding to this, work-family conflict will also bring negative outcomes for companies, as employees' work productivity will be likely to decrease and their intentions to leave the company to rise, which may result in financial costs for organizations (Cascio, 1991; Peeters *et al.*, 2005). Taking this in consideration, companies should provide specific training and resources to help employees balance both work and family domains and alleviate the feelings of conflict between those two dimensions, such as: flexible work schedules, offer them the possibility to work remotely from home, personal leave possibilities, child care facilities and training on parental issues and role orientation for employees and their partners (Boswell and Olson-Buchanan, 2007; Kinnunen and Mauno, 1998; Peeters *et al.*, 2005).

Our results also show that work-family conflict felt by individuals will lead them to experience feelings of burnout. In fact, burnout will have an effect not just on employees' well-being, but also on the people that interact directly with those employees (Brewer and Shapard, 2004). Similarly to work-family conflict, companies will also incur in financial costs when their employees are experiencing burnout symptoms, as a result of the deterioration of their work performance (Wright and Bonett, 1997). Some researchers have examined the consequences of burnout for both individuals and companies, and suggested that some measures need to be taken to target this psychological strain: supervisors should receive training on how to identify possible signals of burnout on their subordinates and to help them tackle those feelings; also, cross-company-wide burnout prevention programs are recommended to avoid it from being experienced in the company (Brewer and Shapard, 2004). Adding to this, there is also evidence that companies should look forward to reduce feelings of e-mail overload among their employees, as it is likely to decrease the probability of experiencing job burnout (Reinke and Chamorro-Premuzic, 2014).

In sum, the results from this study suggest that when e-mail is used in a way that lead to stress symptoms among its users, it will be likely to increase the levels of work-family conflict of those individuals. Hence, burnout symptoms are likely to be felt as a consequence of work-family conflict and have the potential to bring severe consequences not just for the individual's mental well-being, but also for the company. Therefore, a mediation was found

to be significant, as e-mail as a source of stress leads to work-family, which by its turn is likely to augment the feelings of burnout among employees. Contrary to our expectations, segmentation preference was not found to moderate the relationship between e-mail as a source of stress and work-family after accounting for seniority.

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## **Annexes**

*Annex 1.* T-test for equality of means for sex (and both work-family conflict and burnout symptoms)

	Sex
	t
Work-Family Conflict	1.62
Burnout Symptoms	2.03*

Notes: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ;

*Annex 2.* Results of the hierarchical regression analysis on work-family conflict without controlling for seniority (moderation)

	Work-Family Conflict		
	Step 1	Step 2	Step 3
	B	B	B
E-Mail as a Source of Stress (EM)	.41***	.40***	.40***
Segmentation Preference (SP)		.13**	.13*
EM x SP			.10*
$\Delta R^2$	.19***	.02**	.01*
$R^2_{\text{Adjusted}}$			.21*
F-Test	85.39***	46.89***	32.80***

Notes: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ;