

E-MAIL AS A PREDICTOR OF SILENCE BEHAVIORS

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### **Abstract**

As e-mail became the number one communication channel within organizations, problems related to this fact started to arise. Employees no longer felt in control over their inbox and the term e-mail overload started to gain more relevance. Thus, the present study sought to investigate the impacts that e-mail overload and the quality of its content can have on employees, as well as what are its consequences to the individuals. As the outcomes can vary given different situations and individuals, the study was focused particularly on silence behaviors, that until to the moment have scarce empirical research.

The results of the study were obtained through an online questionnaire answered by 97 individuals. With the support of the Job Demands-Resources Model, it was possible to test mediations, moderations and moderated mediations, to verify the impact of e-mail on silence behaviors. While the results found that both work engagement and exhaustion mediate the previous relationship, it was also found that the quality of the e-mail content moderates the relation between e-mail overload and work engagement, contrary to what happens in the relationship between e-mail overload and exhaustion. Further, the moderated mediation was partially confirmed since it was verified that, e-mail quality moderates the mediation between e-mail overload and work engagement, but it does not moderate the mediation between e-mail overload and exhaustion.

The present study is particularly important to close one of the existent gaps regarding silence behaviors, as the subject does not have a large body of research nor it has been connected with e-mail. Further, it can be useful for managers to understand why some employees remain silent and what can be done to overcome such behaviors.

**Key-words:** E-mail, E-mail overload, E-mail quality, Silence behaviors

**JEL Classification System:** J290 Work Behavior, Y400 Dissertations (Unclassified)

## **Resumo**

Com o e-mail a tornar-se o canal de comunicação mais utilizado dentro das organizações, alguns problemas relacionados com este fato começaram a surgir. Os funcionários deixaram de sentir qualquer controle sobre a sua caixa de correio e o termo sobrecarga de e-mail passou a ter mais relevância.

O presente estudo tem como objetivo investigar quais os impactos que esta sobrecarga de e-mail bem como a qualidade do seu conteúdo podem ter nos funcionários, e quais são as consequências que poderão advir dos mesmos, afetando assim os indivíduos. Como as consequências podem variar consoante diferentes situações e diferentes indivíduos, o estudo foca-se particularmente em comportamentos de silêncio como possível consequência. Os resultados foram obtidos através de um questionário online, contando com a participação de 97 indivíduos. Com o apoio do modelo Job Demand-Resources, foi possível testar mediações, moderações e moderações mediadas, para verificar o impacto de e-mail nos comportamentos de silêncio. Os resultados mostraram que tanto o envolvimento no trabalho como a exaustão medeiam a relação anterior. Já a qualidade do conteúdo do e-mail modera a relação entre a sobrecarga de e-mail e o envolvimento no trabalho, ao contrário do que acontece na relação entre sobrecarga de e-mail e exaustão. Além disso, a mediação moderada foi parcialmente confirmada, uma vez que se verificou que a qualidade do e-mail modera a mediação entre a sobrecarga de e-mail e o envolvimento no trabalho, mas não modera a mediação entre a sobrecarga e a exaustão. Este estudo é particularmente importante para tentar fechar uma das lacunas existentes em relação aos comportamentos de silêncio, uma vez que a pesquisa sobre o mesmo é escassa e, a existente ainda não estudou a sua relação com o e-mail.

Assim, os resultados deste estudo podem ser bastante úteis para os gestores entenderem o porquê de alguns funcionários permanecerem em silêncio e o que pode ser feito para superar estes comportamentos.

**Palavra-chave:** E-mail, Sobrecarga de e-mail, Qualidade de E-mail, Comportamentos de Silêncio

**JEL Classification System:** J290 Work Behavior, Y400 Dissertations (Unclassified)

**Table of contents**

1 – Introduction ..... - 1 -

2 - Literature review ..... - 3 -

    2.1 - E-mail overview ..... - 3 -

        2.1.2 – The dark side of using e-mail ..... - 5 -

        2.1.3 E-mail overload and e-mail quality ..... - 7 -

    2.2 - Employee Silence..... - 9 -

        2.2.1 - Forms of silence behavior ..... - 10 -

    2.3 - Job Demands-Resources Model..... - 11 -

    2.5 - Conclusion ..... - 15 -

3 - Present study ..... - 16 -

    3.1 - Hypotheses ..... - 16 -

4 - Method ..... - 19 -

    4.1 - Participants..... - 19 -

    4.2 - Procedure and Instrument ..... - 19 -

    4.3 - Variables and Measures ..... - 20 -

        4.3.1 - Work engagement ..... - 20 -

        4.3.2 - Exhaustion..... - 20 -

        4.3.3 - E-mail overload..... - 20 -

        4.3.4 - E-mail quality..... - 21 -

        4.3.5 - Silence behaviors ..... - 21 -

    4.4 - Statistical Data Analysis Procedure ..... - 21 -

5 - Results..... - 22 -

    5.1 - Mediation analysis ..... - 23 -

    5.2 - Moderation analysis ..... - 25 -

    5.3 - Moderation Mediation analysis..... - 26 -

6 - Discussion ..... - 28 -

7 - Limitations and future research..... - 30 -

8 – Practical implications and recommendations ..... - 31 -

9 –Contributions and Conclusion..... - 32 -

10 - References..... - 33 -

**Index of Figures**

Figure 1 – The revised Job Demands-Resources Model..... - 15 -  
Figure 2 – Proposed model for hypotheses. .... - 18 -

**Index of Tables**

Table 1 - Bivariate Correlations..... - 23 -  
Table 2 - Mediation results of hypothesis 1a). .... - 24 -  
Table 3 - Mediation results of hypothesis 1b). .... - 24 -  
Table 4 - Moderation results of hypothesis 2a). .... - 25 -  
Table 5 - Moderations results of hypothesis 2b) ..... - 26 -  
Table 6 - Moderated mediation results of hypothesis 3a). .... - 27 -  
Table 7 - Moderated mediation results of hypothesis 3b). .... - 28 -

## **1 – Introduction**

Since its appearance, e-mail has slowly taken over other communication channels, with fax being long forgotten and face-to-face meetings being also less frequent, it is possible to affirm that e-mail is changing the way that business is accomplished (Cascio & Montealegre, 2016). It is common knowledge that an organization has to adapt to the rapidly developing environment, by implementing modern processes and technologies (Quaresma *et al.*, 2013) in order to allow the work pace to become faster and the workplace practices to become more efficient. But how do employees perceive the impact that e-mails have on their work?

If one goes to examine e-mail advantages, it is possible that the first reaction is to affirm that e-mail is a huge help tool, and it has a positive impact in the work context. Not only it is easy to use, inexpensive and available almost every time, its ubiquity features allow people to do their job at any time in any place (Wajcman & Rose, 2011), offering them a greater work flexibility.

However, many authors were concerned about the impact that e-mail disadvantages could have on employees, especially, when it is known that in average, people spend 29 minutes per day reading e-mails (Jackson *et al.*, 2006), and that 70% of people takes only 6 seconds to react to a new e-mail notification, while the average time to recover from this interruption lasted 64 seconds (Jackson *et al.*, 2003). Thus, it is possible to find several studies focused on the downside of e-mail, and while work-family conflict is one of the most noteworthy disadvantages of using e-mail (Webber & Howard, 1991; Webber, 2004; Barley *et al.*, 2011), the list of negative side of e-mail keeps on growing as people rely more and more on it each day. With e-mail being a complex topic that can be subjected to different study perspectives, the present study will focus particularly on two distinct e-mail characteristics, that is, e-mail overload and the quality of its content. As previously stated, e-mail features allow individuals to send e-mail at any time of the day, to any person and with the information that one might wish. If a person receives a great amount of e-mails per day, it is possible that the individual may start to display feelings of being overwhelmed, which can be a result of e-mail overload. Feelings of being overwhelmed by e-mail are positively related with the number of electronic messages that an individual receives (Brown *et al.*, 2014, Huang & Lin, 2009), which often are a consequence of using the forward feature, that enables individuals to send e-mails to multiple recipients, most of the times filling mailboxes with spam. (Thomas *et al.*, 2006). As for the quality of its content, Brown *et al.*, (2014) stated that, an e-mail is perceived to have quality if its content it is not written in an emotional or ambiguous way. While emotional e-mails may be



perceived as abrupt or insensitive, ambiguous e-mails makes the reader confused, for what they require further clarification in order to better understand the message.

Since e-mail is nowadays the preferred communication channel within organizations (Taylor *et al.*, 2013; Dawley & Anthony, 2003; D'Urso & Pierce, 2009), it is normal for workers to be frequently exposed to these aspects, for which it can affect their behaviors. Despite the fact that e-mail has an expanding literature, this fact has not been explored, more particularly with regards to silence behavior as an outcome, that is, “...*the withholding of any form of genuine expression about the individual's behavioral, cognitive and/or affective evaluations of his or her organizational circumstances to persons who are perceived to be capable of effecting changes or redress*” (Pinder & Harlos, 2001: 334). Thus, taking into account the result of previous studies that affirm that e-mail overload and the quality of its content can be treated as stressors (Brown *et al.*, 2014), it is legit to considerate both constructs as job demands. To support the study, it is applied the Job Demands-Resources Model (JD-R), since it is the only model described in the literature sustaining the fact that each work context has its own job demands and job resources (Demerouti *et al.*, 2001). The model also shows that while job demands will influence the health impairment process through stress, job resources can conduct a motivational process through engagement (Bakker *et al.*, 2003a), for which both engagement and exhaustion will also be studied. These two variables are particularly important because they will also be examined, not only as outcomes of e-mail overload but also as variables that can mediate the relationship between e-mail overload and silence behaviors. Thus, the present study pretends to contribute for the theoretical investigation about the role of e-mail in predicting silence behaviors, since no research has yet examined this relation, for which this study intends to feel this gap in the current research and literature.

Firstly, it will be presented the literature review, with the theoretical concepts and the main studies performed until now. The formulation of hypothesis, the method, the instruments, the measures, the procedures and the results obtained will follow the literature review. Finally, the results are discussed according to the existent literature, the limitations of the studies and its practical implications are analyzed and future investigation is proposed.

## **2 - Literature review**

The literature review covers three topics of this study: e-mail in the organizations, silence behaviors and the job demands-resources model. All of the three are complex, for which it was necessary to separate them into three different sections. Thus, this literature will start exploring e-mail followed by silence behaviors and will end with a review of the job demands-resources model, the supporting model that through its explanatory mechanisms helped to better understand the role of e-mail in predicting silence behaviors.

### **2.1 - E-mail overview**

The advances in technology have brought several changes to the organizations, especially in the way workers communicate within themselves, with the most notable change being the e-mail as a communication medium.

Originated in the 1970s, electronic mail (e-mail) was developed as an asynchronous communication tool, that allowed simple text messages to be transmitted within mainframe computer users. However, the constant technology developments, allowed e-mail to evolve from an internet application used only by technology specialists to a common communication used by the general public (Huang and Lin, 2014). In a study performed by Rogen International has shown that e-mail use has grown 600% from 1995 to 2001 (Thomas *et al.*, 2006) and it is expected that by year 2020 nearly half of the worldwide population will be using e-mail, topping 3.0 billion users (Radicati Group). Making its way through the organizations, e-mail is to date considered to be the preferred communication medium of the employees, and one of the most powerful business tools, supporting any type of business activity (Friedman & Currall, 2004; Dabbish & Kraut, 2006; Taylor *et al.*, 2008; McMurty, 2014), since “*employees are increasingly likely to use and prefer electronic mail (e-mail) to communicate with coworkers, customers, and other colleagues*” (Byron, 2008: 309). Its features, such as ubiquity, flexibility and availability to attach documents, seem to be the main “attractions” of this tool, which is why people view e-mail as crucial tool to perform their jobs (Tassabehji & Maria Vakola, 2005). Mackay (1988) distinguished three examples of e-mail users based on the actions that users chooses to take: (1) a classic “Prioritizer”, whose goal is to prioritize the incoming e-mails in order to read as much as possible; (2) an overwhelmed “Archiver”, whose strategy is to “...delete clearly unimportant messages, leaving the rest in his inbox as a reminder of what remains to be done” (Mackay, 1988: 384) and (3) a Manager-Secretary Team, composed by a manager, whose job is to flag messages for her secretary to handle. These strategies, can

ultimately lead to information management, time management and task management, relevant for everyone, but especially for those who have to deal with e-mail every day.

Through e-mail, organizational communication is now much more easier and faster than any other communication medium (Weber, 2004; Sarbaugh-Thompson & Feldman, 1998). Its inexpensive, readily available and easy-to-use features (Jung, 1997), made e-mail surpass other forms of communication and it is believed that e-mail combines elements of telephone, face-to-face, and letter-writing. Tassabehji & Maria Vakola, (2005: 68) affirmed that “...it has largely the same impact as the telephone in terms of conveying aggression, honesty, directness, offensiveness, formality, and as a medium that allows communication to be conclusive. E-mail incorporates similar qualities of honesty, expressiveness, and impersonality as letters, and has a similar level of formality as face-to-face communication.”. Some studies also stated that organizations’ productivity can be increased by using e-mail, since the time of face-to-face meetings is reduced and information can be shared ahead of time, which makes meeting more efficient and effective (Wills, 2004). Furthermore, the hierarchy of the organization has flattened, since it is possible for a CEO to communicate with employees from all levels through e-mail, just like it is easier for all employees to reach people in higher positions in the organization, through e-mail (Minsky & Marin, 2003, Tassabehji & Vakola, 2005, Turnage & Goodboy, 2016). Moreover, by adopting flexible work arrangements, organizations are allowing their employees to spend more time working outside of the workplace, (Gajendran & Harrison, 2007), which means that virtual teams are a rapidly growing concept, promoting once again, the necessity of e-mail as a form of communication (Thomas *et al.*, 2006). Ultimately, relationships are now more easily maintained, “when socializing, it appears we are more likely to win when using e-mail to maintain ongoing relationships, perhaps through such simple expedients as passing along Internet humor and initiating relationships in low-pressure contexts (such as seeking out and contacting others who clearly share our personal interests)” (Wilson, 2002: 124).

Reviewing all these arguments, it seems fair to affirm that the use of e-mail only brought positive effects, however there are some concerns about these effects turning into negative ones, for which the next section will discuss those concerns according to the study.

### **2.1.2 – The dark side of using e-mail**

As previously discussed, e-mail can be a highly effective communication channel, however, it is important to be aware of the negative side that this medium can hold, given the fact that e-mail is extremely valuable for organizations to obtain success.

Problematic behaviors among senders of e-mail messages are more common than one may think. Perhaps one of the most known negative aspects of using e-mail is cyber incivility (Giumetti & Hatfield, 2013). Individuals who lack interpersonal skills, are arrogant or aggressive, often use e-mail as a form to communicate with their colleagues, since e-mail provides a feeling of security compared with face-to-face meetings (Joinson, 2004; Turnage & Goodboy, 2016). By using e-mail, individuals can attack their colleagues by writing messages that “... *tend to be curt and aggressive, and at times they are downright abusive.*” (Weber, 2004: vii). This type of behaviors, can initiate “flame” wars (Weber, 2004; Ramsay & Renaud, 2012), that is, someone sends an abusive message, the receiver takes offense and responds the same way, which leads to the initial sender to respond in a more aggressive or abusive way. Even though, this so called “war” will dissipate, the damages done may be irreparable, and employees are likely to quit and engage in behaviors against their organizations (Weber, 2004).

The negative side of e-mail use can also encompass other forms. According to Weber (2004), senders of e-mail can suffer from Brain-finger disconnect (BFD), which means that often, individuals respond to e-mail without actually paying attention to what they are writing, resulting in messages with little relevance to the receiver. Incorrect language and form, can also pass feelings of uncertainty and ambiguity to the person reading the e-mails. Furthermore, e-mail can create additional work by allowing “buck passing”, that is, individuals pass more work to other employees by e-mail, since there is no need to face the person on whom the work is being sent to (Mackay, 1988; Watkins, 1998). “*The work is passed asynchronously, which means the person who is landed with the unexpected task and associated responsibility often has no way of correcting the situation.*” (Ramsay & Renaud, 2012: 589). It is also common for individuals to use e-mail for self-promotion and as a signaling mechanism, because they believe that the speed of their responses is an indicator of their good work (Weber, 2004), thus, normative response pressure is also considered to be a negative aspect of e-mail. Each individual has his or her own norms regarding the use of e-mail, however that does not mean that they follow their own rules. For example, pressure to respond quickly to the e-mails received (Jackson *et al.*, 2006; Barley *et al.*, 2011, Liang *et al.*, 2012, Pignata *et al.*, 2015), is one of the norms imposed by the society, to a point where Weber (2004) stated that, some

people may suffer from e-mail obsessive-compulsive disorder combined with e-mail attention-deficit disorder (“e-OCD-ADD), which happens “...when colleagues feel they must always deal with e-mail and act as though it is absolutely imperative they deal with it now.” Weber (2004: vi). Not only employees feel that, the rapid response to an e-mail demonstrates their good work as an employee and as a colleague, they also expect their colleagues to feel the same way, and thus, also respond promptly to their e-mails. Giving in to this type of pressure has several consequences, for example, the innumerable interruptions, that can be mitigated through time management, where according to Huang and Lin (2014), can be characterized by goal setting and scheduling. Combining e-mail features that prevent the constant sound alerts with specific time to only deal with e-mail, it is possible for the individuals to feel in control of their job, and start seeing e-mail as a helping tool (Jackson *et al.*, 2003; Vidgen & Powell, 2011). Yet, each job has different tasks, which is why the nature of the task shapes the strategies that each individual adopts to manage their e-mail (Bellotti *et al.*, 2005).

Regarding the information that an e-mail can contain, according to the Media Richness Theory (Daft & Lengel, 1986), information richness happens when there is ability to exchange information within a time interval. Channels that are able to overcome different frames and clarify issues that are perceived ambiguous in a timely manner, are considered rich channels. On the other hand, channels that require a long time to pass information and/or the information needs further clarification, are considered lower channels. Thus, the authors classified different communication channels, in order of decreasing richness, and while face-to-face communication is considered the richest, documents such as e-mail are considered a lean communication medium (Lee, 1994). This may happen because, being a written document, e-mail does not include important cues, like body language and tone of voice, which often can mislead the reader by interpreting the message in another way, other than what was intended to be perceived originally (Turnage & Goodboy, 2016). Comparing e-mail with face-to-face communication, researchers found that e-mail is more likely to produce more losses than gains (Wilson, 2002), one of which being e-mail overload.

### **2.1.3 E-mail overload and e-mail quality**

The term e-mail overload has been subject to many studies. Originally, the term was only referred to the task that an e-mail was able to perform, other than simply transmitting information, for example, reminders, calendar, to-do list and contact lists (Bellotti *et al.*, 2005; Mackay, 1988). However, as the use of e-mail in organizations grew, the term is now used to define the feeling that an individual is experiencing when he or she feels that the use of e-mail is out of control and is unable to handle, find or process e-mails, efficiently (Dabbish & Krautz, 2006). E-mail overload can cause serious damages to both organization and employee. An article written by Hemp (2009), affirms that many organizations are still denying the problem, however, the flood of information that an individual receives every day is more becoming negative and harmful. A large flow of information can also cause information overload, which is “...often used to convey the simple notion of receiving too much information” (Eppler & Mengis, 2004: 326). Yet, several studies found that performance and productivity are positively correlated with the amount of information that an individual receives up to a certain point. However, if the information received surpasses that point, it is likely that the individuals’ performance and productivity will decline, since a persons’ capacity to retain information is limited (Eppler & Mengis, 2004). Goldsborough (2009) stated that, most of the employees arrive to work early and leave later than they were supposed to, in order to compensate the large quantity of e-mails and thus information overload that they are exposed to. According to Evans & Wright (2008), e-mail overload may have its cause from multiple sources. For example, Thomas *et al.*, (2006) conducted a study where they observed that e-mail overload can have various numbers of causes, pointing out three main reasons for it: the first reason is due to unstable e-mail requests. What started with an e-mail asking for one information or task ended up with the e-mail going back and forth by adding requests into its content. The second reason for e-mail overload was the already addressed normative response pressure. According to Thomas *et al.*, (2006) the participants of the study provided comments about how they felt when they were subjected to respond promptly to e-mails. Many e-mails also contained deadlines for when the response was expected, implying an urgent need. The problem is concerned with the fact that almost every e-mail contains these type of pressure, even when a response is not that urgent, leading to feelings of stress from e-mail overload and from normative response pressure. The third reason is regarding the “buck-passing option”, also described by Mackay (1988). The participants of the study stated that they receive more work since it is easier to forward e-mails containing work tasks. However, when an individual forward an e-mail to another colleague, it

is likely that he or she will not provide the instructions needed to fulfill the task, which again, causes stress and overload to the receiver. Furthermore, several authors (Bellotti *et al.*, 2005; Thomas *et al.*, 2006), also pointed other reasons for e-mail overload, for example the simple fact that e-mail is easy to use, can be a cause for e-mail overloaded, since everyone can use it to transmit any information, regardless of being important or not; second the ubiquity nature of e-mail, means that workers can be reached almost anywhere, anytime. Through laptops or cellphones with internet access, a worker can respond to an e-mail 24-hours per day, not really having a moment to disconnect from their work. Further, the participants of the study conducted by Thomas *et al.*, (2006) also stated that the work volume has become so big that they use e-mail to multitask, increasing the number of electronic messages sent and received.

The quality of the content of each e-mail, more known as e-mail quality, also has impact on e-mail overload. Although not much has been studied about the subject till date, and thus, not having a single consensual definition, a study conducted by Brown *et al.*, (2014), verified two issues regarding e-mail quality, that are likely to be experienced by workers. More specifically, the emotionality and ambiguity that an e-mail could contain were subjected to study, and results found that e-mail quality could act as a work stressor. Not only were the participants affected by the insensitive or abrupt messages received, the ambiguous way that they were written, caused the reader to reread them (Friedman & Curral, 2003), and thus, spending more time in a single e-mail, while the work keeps accumulating. However, on a more positive note, e-mail quality can also work in the opposite way, that is, feelings of e-mail overload can be appeased through e-mail quality. More specifically, even though an individual may receive a great amount of e-mail, if the information that each e-mail contains is not perceived ambiguous and is helpful to complete any task, the individual may feel less overloaded, since the message is providing the necessary tools to complete the tasks (Brown *et al.*, 2014).

Taking into account that both e-mail overload and e-mail quality are mostly perceived as negative aspects of e-mail, organizations should start paying more attention to them, since it is likely that they will affect employee's behaviors.

## **2.2 - Employee Silence**

As human beings working in different organizational contexts, employees are also passive to display certain organizational behaviors triggered by different events. Whether positive behaviors or negative behaviors, managers should be aware of possible consequences, so they can be prepared, when confronted with them.

As previously mentioned, silence is one of the behaviors that employees may display, and having received little attention by the part of researches, it will be studied as the outcome of high e-mail demands. However, to understand silence, it is also important to comprehend the concept of voice – employees speak up their opinions in order to help organizations to innovate and succeed in the business environment (Liang *et al.*, 2012). With a well established body of research, voice is perceived as a positive organizational behavior that precedes positive organizational outcomes, and while one may think that silence is the polar opposite of voice, it is important to understand that neither silence nor voice behaviors can be defined simply by the act of remaining quiet or by the act of speaking up. (Van Dyne *et al.*, 2003).

Gambarotto *et al.*, (2012) defined employee silence as a behavioral choice, pervasive in organizations, that can improve or worsen the organizational performance and Knoll *et al.*, (2016) presented in his article, at least three reasons why silence is more than the absence of voice. Firstly, if an employee does not speak up, it does not mean that he or she is engaging in a silence behavior, since it is impossible to know if they are withholding any valued information or simply have nothing to say at all. Secondly, knowing that an employee is displaying silence behaviors, it is not enough information to understand its consequences or even to facilitate voice behavior. Thirdly, studying voice and silence as totally different constructs may not be the best choice, since employees can choose to remain silence on some issues and speak up about other issues, further both constructs may have the same motives, for which is necessary to study both sides (Van Dyne *et al.*, 2003; Knoll *et al.*, 2016).

If one wants to view silence as a distinct concept of voice, Knoll *et al.*, (2016), clarified this relationship by stating that it could have three forms. First, the relationship could be bipolar, that is when voice is present silence is absent and vice-versa, however Pinder & Harlos (2001) refuted this statement, by presenting a contradictory example. Second, when presented with challenges, employees may sometimes display voice and sometimes display silence, forming a continuum. Third, the authors state that both behaviors can form separate dimensions leading to four quadrants, with each quadrant presenting high or low severity.



### **2.2.1 - Forms of silence behavior**

In order to better understand how silence behaviors are manifested in organizations, several authors (Morrison & Milliken, 2000; Pinder & Harlos, 2001; Van Dyne *et al.*, 2003; Knoll & Van Dick, 2011) identified four forms of employee silence. For instance, Morrison & Milliken, (2000) argued that employees do not speak up because they believe that their opinion is not valued, resulting in a disengaged behavior. This form of silence is known as Acquiescent silence, and it shows that employee no longer tries to improve the organizational situation. Pinder and Harlos (2001) introduced Quiescent silence, that is, employees do not share important information because they fear that the consequences of speaking up could be unpleasant. Extending the research, Van Dyne (2003), suggested another form of silence, Prosocial silence. Usually, only altruistic and cooperative employees, engage in this form of silence, since they do not speak up due to the belief that they are helping other people or the organization by withholding information. Finally, Knoll and Van Dick, (2011) presented Opportunistic silence. Employees engaging in this form of silence believe that by holding work-related ideas and information, have an advantage over their peers. It is likely that engaging in these individual forms of silence behaviors will result in organizational silence.

Organizational silence can be defined as “*the possibility that the dominant choice within many organizations is for employees to withhold their opinions and concerns about organizational problems*” (Morrison & Milliken, 2000: 707), and it may have its origins in two causes. First, managers fear of negative feedback creates a climate of silence, especially from subordinates. Second, many managers still believe that employees are self-interested and untrustworthy, which makes the former act in ways to discourage upward communication. Besides managers also believe that they know best about most issues, which means that they create a climate of agreement and consensus, where disagreement should be avoided, encouraging once again silence behaviors (Morrison & Milliken, 2000).

It is also important to note that, Blackman and Sadler-Smith (2009) point out that, understanding silence forms is relevant for how education and training is planned, facilitated and managed, plus Van Dyne *et al.*, (2003) assumes that silence behaviors can have different consequences for the employees’ experience of training, well-being and turnover intention.

However, for the purpose of these study, no distinction will be made about silence forms as the subject will be studied as a whole.

### **2.3 - Job Demands-Resources Model**

The approach to understand the impact that e-mails can have in the individuals is focused on the Job Demands-Resources Model (Figure 1). Developed by Demerouti *et al.*, (2001), the JD-R is one of the leading job stress models in the literature that tries to explain why employees display negative (Burnout) or positive (Work Engagement) feelings towards the organization and the work itself.

The already ongoing investigation about burnout, described it as “*a psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment*” (Maslach *et al.*, 1997: 192). The exhaustion component of burnout happens when emotional and physical resources are depleted and it represents the stress dimension of burnout, although it does not capture the relationship that people have with their work. (Maslach *et al.*, 2001). As for depersonalization, it can be described has the interpersonal context of burnout and represents the feeling of disengagement of the job, whereas reduced personal accomplishment, is the self-evaluation dimension of burnout. This component refers to “*feelings of incompetence and a lack of achievement and productivity at work.*” (Maslach *et al.*, 2001: 399). While personal accomplishment develops largely independently of emotional exhaustion and depersonalization, the last two develop in parallel with each other, rather than following one another (Demerouti *et al.*, 2010), making them the core dimensions of burnout. Furthermore, burnout follows two processes: the first process is related with high job demands, that may lead to constant overtaxing and ultimately, exhaustion; the second process concerns the lack job resources, which implies that is more difficult to meet the job demands, and can further lead to withdrawal behavior. According to these processes, the model identifies two set of working conditions – job demands and job resources (Lee & Ashforth 1996), which means that, there is various types of demands and resources relevant for the health issues and motivational process. These conditions depend on several factors, for example, on the work itself, the work context or even the employee’s willingness to work (Bakker *et al.*, 2005, Xanthopoulou *et al.*, 2007b).

In the model, the first set of conditions (job demands) are defined as *those physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with physiological and psychological costs*” (Demerouti *et al.*, 2001: 501). Job demands can be the cause of stress when individuals are unable to recover adequately from the high effort previously made. Several studies point out that the most common job demands are workload, role ambiguity and cognitive and emotional demands (Bakker *et al.*,

2005; Bakker *et al.*, 2010), positively related to the exhaustion component of burnout (Bakker *et al.*, 2003a; Bakker *et al.*, 2004, Llorens *et al.*, 2006). The second set of conditions (job resources), are defined as “*those physical, psychological, social, or organizational aspects of the job that may do any of the following: (a) be functional in achieving work goals; (b) reduce job demands at the associated physiological and psychological cost; (c) stimulate personal growth and development*” (Demerouti *et al.*, 2001: 501). The most common job resources are social support, autonomy or feedback (Bakker *et al.*, 2010, Bakker *et al.*, 2003b). The interaction between them is determinant for the development of stress and health issues through high job demands, and motivation through high levels of job resources, capable of mitigate the demands resulting in excellent job performance and engagement. This assumption makes the model similar to other well-known models, Karasek’s Job Demand-Control-Support model (DCS model; Karasek, 1979) and Effort-Reward Imbalance (ERI model; Siegrist, 1996). While the DCS model states that the adverse effects of high job demands can be less if the workers feel supported and have control over their job, the ERI model states that the negative aspects of hard work can be alleviated with sufficient rewards. However, the JD-R model takes one step further by stating that “high effort” can be compensated by any resources, not only necessarily by control and support, broadening its scope and making it more flexible (Bakker & Demerouti, 2007). This statement falls in line with the buffering hypothesis (Karasek 1979; Bakker *et al.*, 2003a), that is, when the resources provided are enough, the impact of job demands can be diminish (Tadić *et al.*, 2014), no matter what type of resource. However, while some studies suggest that social support is probably the most well-known buffering variable against job demands (Johnson *et al.*, 1988; Bakker & Demerouti, 2007), other studies, had inconsistent findings with this assumption, which means that some resources may only have limited capability to buffer the impact that job demands can produce. (Bakker *et al.*, 2004)

The JD-R also encompasses the positive psychology, which means that, instead of focusing exclusively on negative outcomes (ill health, stress, burnout), the model also encompasses positive outcomes, such as job engagement. The latter varies according to the availability of the individual to perform the job (Khan, 1990) and is defined as positive state of mind. Just like burnout work engagement also encompasses three dimensions: (1) vigor, characterized by energy, effort and persistence in terms of a specific work goal, (2) dedication, reflecting the attitudes of an individual towards his or her work, “... *the individual wants to work well in his or her job in order to achieve personal satisfaction.*” (Salanova & Schaufeli, 2008: 118), and (3) absorption, that can be observed when an individual is so deeply involved

with the ongoing work, that he or she does not even notice the time passing by. Vigor and dedication are considered to be the core dimensions of engagement, while job demands are positively associated with burnout, job resources are positively associated with engagement (Schaufeli & Bakker, 2004).

In the literature, it is possible to find several studies that link engagement with positive outcomes. Employee well-being and health (Crawford *et al.*, 2010), positive job attitudes and higher levels of performance (Harter *et al.*, 2002), low turnover (Schaufeli & Bakker, 2004), positive financial results on a daily level (Xanthopoulou *et al.*, 2009), client satisfaction, loyalty, safety and profitability (Harter *et al.*, 2002) are just a few examples of these outcomes. As for burnout, various studies have managed to link the variable with negative outcomes, that can affect not only the individuals but also the organizations. The most worrisome outcomes are absenteeism (Bakker *et al.*, 2003a, Schaufeli *et al.*, 2009), performance decrease (Bakker *et al.*, 2004), and several physical and mental health issues (Bakker *et al.*, 2003a, Maslach *et al.*, 2001, Johnson & Hall, 1988).

Based on the fact that burnout and engagement produce different outcomes (Demerouti & Bakker, 2011), the JD-R Model also encompasses two distinct processes associated with job demands and job resources that can occur simultaneously in all work contexts: the health impairment process and the motivational process (Bakker *et al.*, 2003b). The health impairment process is related with high workload and high cognitive and emotional demands that may cause the reduction of worker's physical and emotional energy, which in turn can lead to burnout and health problems (Bakker *et al.*, 2003a). On the other hand, the motivational process is related with the job resources available, that stimulates personal growth and development, reduces job demands and helps workers to achieve their goals, leading to a greater dedication to one's work, improved performance and more engagement (Nahrgang *et al.*, 2011). When it comes to performance, both job resources and job demands can play a motivational role. While job demands are positively related with in-role performance, since the outcomes that derive from them directly serve the goals of the organization, job resources are positively related with extra-role performance, since the employee's behaviors directly promote the effective functioning of the organization (Bakker *et al.*, 2004).

Furthermore, it is also important to highlight the inclusion of personal resources in the model. Personal resources can help employees overcome some difficulties, since they are characteristics of the individual that are associated with resiliency and ability to control, having a positive impact in one's environment (Diener & Fujita, 1995; Brenninkmeijer *et al.*, 2010,

Schaufeli & Taris, 2014; Taris & Schaufeli, 2016; Bakker & Demerouti, 2016; Van den Broeck et al., 2011; Xanthopoulou *et al.*, 2007a).

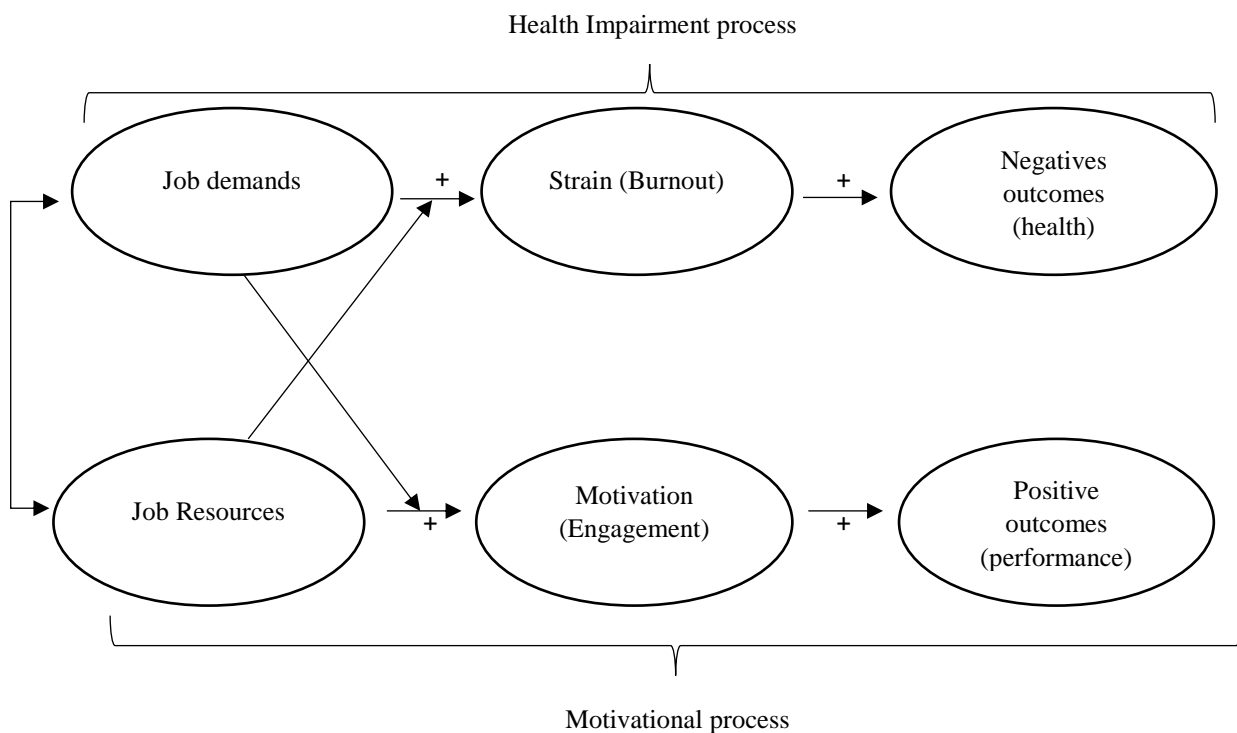
Similarly, job crafting is another concept that can help individuals, by changing their working condition on an individual level, enhancing motivation and performance at work (Wrzesniewski & Dutton, 2001). Contrarily, an individual may enter in a loss spiral if they are strain by their work and start to perceive and create more job demands, ending with a self-undermining behavior.

Over the years, the previously discussed assumptions have been tested in innumerable studies. For example, a cross-sectional study among call center employees (Bakker *et al.*, 2003a) demonstrated that higher job demands and lower resources were associated with higher burnout, at the individual level. As for longitudinal studies, in a one-year study it was possible to confirm that an increase in job demands and a decrease in job resources were associated with an increase of burnout complaints during the same year (Schaufeli *et al.*, 2009). However, there are other longitudinal studies where no evidence of the assumptions was found, presenting weak evidence for the casual assumptions.

Despite the several evidences that support the robustness of the model, just like any topic in the literature, the JD-R also presents some unresolved issues. Being a specific model, it only specifies the relation between job demands or job resources and its outcomes, which by definition the outcomes of job demands are related with the health impairment process while the outcomes of job resources are related with the motivational process, not providing the explanation underlying beneath these processes. Further, the health impairment and the motivational process may not be completely independent from one another, so they should be studied jointly, seen as when well-being decreases motivation also decreases, while the contrary also happens.

Even though job demands and job resources constitutes two different groups, their difference is not clear, that is some resources may be appraised negatively, while some demands may be appraised positively. That is one of the reasons, Crwaford *et al.*, 2010, distinguished job demands between challenges and hindrances. While the former can be appraised positively, the latter may be appraised negatively, depending on the nature of the demand. The inclusion of personal resources on the model also seems to pose an issue. The possibility of being study in such several different perspectives, makes it harder to figure out the place of these resources in the model, hence, they can be integrated in various ways.

While the model only proposed a one-way relationship between predictor and outcomes, several longitudinal studies showed that, there can also be a reciprocal relationship, especially in the motivation process (Schaufeli *et al.*, 2009). Lastly, although the model has mostly been applied in an individual-level approach, it can also be applied in other organizational levels, although one has to be careful when operationalizing the variables, making sure that they are all from the same level.



**Figure 1** – The revised Job Demands-Resources Model.  
Source: Taris & Schaufeli (2016: 161).

## 2.5 - Conclusion

In this review, the subjects concerning e-mail in organizations, silence behaviors and the Job Demands-Resources Model were covered.

While the introduction of e-mail in the organizations was initially perceived as a helpful tool in reaching the business goals, soon it was realized that the negative aspects of using e-mail surpassed the positive ones. Being the number one communication channels within organizations, new problems began to arise, while employees were drowning in the quantity of e-mails received. Thus, the terms of e-mail overload and e-mail quality were discussed in this

literature, and whereas the former can present serious negatives outcomes, be it for the individual (e.g. exhaustion) or for the organization (e.g. decrease in the productivity), the latter, can be able to diminish those problems, by transmitting the necessary information.

Silence behaviors were also discussed, since they can be a possible outcome of the heavily usage of e-mail. Having present different forms of silence behaviors, the interest in the present study, is to understand if both e-mail overload and e-mail quality can predict silence behaviors altogether, and not make any distinction between them.

To do so, the Job Demands-Resources Model was presented as a support for the study, due to its flexibility in being applied in several work contexts, in addition it also explores the variables of exhaustion and work engagement, present in the study.

### **3 - Present study**

Analyzing the literature review above presented, the objective of this study is to identify the role of the e-mail in predicting silence behaviors, that is, analyze how workers feel and behave, when presented with different e-mail challenges.

In order to reach the intended conclusions, this study will focus on two e-mail variables (e-mail overload working as a predictor and e-mail quality working as a moderator) and one behavior (silence behavior presented as an outcome). With the Job Demands-Resources model providing the theoretical foundation for hypotheses, variables of exhaustion and work engagement will also be tested.

#### **3.1 - Hypotheses**

According to the JD-R Model, high levels of job demands can lead to a strain path, decreasing work engagement and increasing exhaustion. Mostly, due to the fact that individuals are still not fully recovered from the energy spent in the previous tasks and are already performing new ones. Considering the fact that e-mail overload means that an individual is constantly receiving and sending e-mails, it is possible to state that e-mail overload is considered a job demand, that will exhaust individuals. If individuals are depleted from energy, the most natural reaction is to resort to strategies that will keep them from having to spend even

more energy. One of the strategies adopted could be silence behaviors, since remaining silent does not require any additional effort allowing energy saving. Thus, it is hypothesized that e-mail overload will lead to a decrease in work engagement and an increase in exhaustion which in turn will result in silence behaviors:

***Hypothesis 1a:*** *Work engagement mediates the effect that e-mail overload has on silence behaviors.*

***Hypothesis 1b:*** *Exhaustion mediates the effect that e-mail overload has on silence behaviors.*

As previously stated, according to the health impairment process, it is predictable that e-mail overload, often perceived as a stressor will lead to a strain path, decreasing work engagement and increasing exhaustion, However, e-mail overload may not be the only job demand triggering this process, for what e-mail quantity should also be account for, since the input of this demand can change the strength of the relationships between e-mail overload and the outcomes.

***Hypothesis 2a*** *E-mail quality moderates the relationship that e-mail overload has on work engagement, such that the relationship will be weaker for workers experiencing lower e-mail quality.*

***Hypothesis 2b:*** *E-mail quality moderates the relationship that e-mail overload has on exhaustion, such that the relationship will be stronger for workers experiencing higher e-mail quality.*

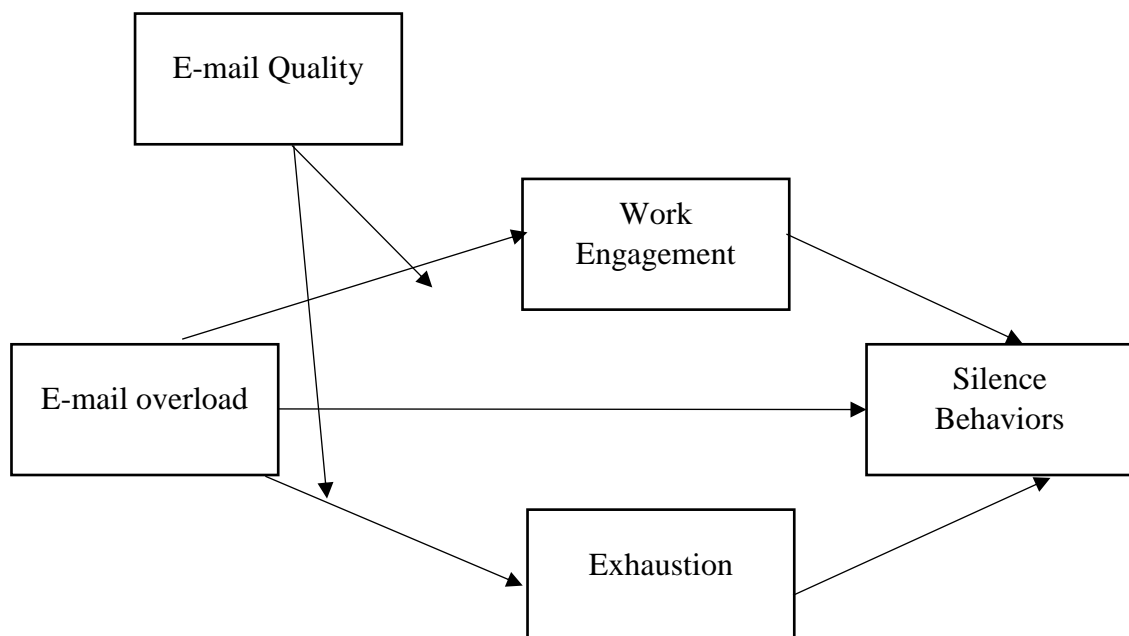
Taking in consideration the four previous hypotheses, it will be again tested if silence behaviors can be an outcome of e-mail overload, however, all the variables discussed will be present in the hypotheses. As stated before, it is expected a relation between e-mail overload and silence behaviors through work engagement/exhaustion, yet the strength of this relationship may be affected through e-mail quality, since it is believed that e-mail quality can directly impact the effects of e-mail overload and thus, influence silence behaviors, for which it is hypothesized that:



**Hypothesis 3a:** E-mail quality will strengthen the effect that work engagement has on the relationship between e-mail overload and silence behaviors, such that employees who receive a high quantity of e-mails with high quality will be more engaged and thus, display less silence behaviors.

**Hypothesis 3b:** E-mail quality will weaken the effect that exhaustion has on the relationship between e-mail overload and silence behaviors, such that employees who receive a high quantity of e-mails with low quality will be more exhausted and thus, display more silence behaviors.

From the hypotheses proposed was constituted the conceptual model presented in Figure 2. It is proposed a direct relationship between e-mail overload and silence behaviors, mediated by work engagement (H1a) and exhaustion (H1b) and moderated by e-mail quality (H2a and H2b). The overall model represents H3a) and H3b).



**Figure 2** – Representation of the model being tested.

## **4 - Method**

### **4.1 - Participants**

The group of participants of the present study was initially composed by 109 individuals, however, only 97 are considered valid for the analysis.

Of the 97 individuals, it is possible to verify that 69 (71%) are female and 27 (28%) are male, while 1 person did not answer the question. The majority (63.9%) of the individuals are between 18 and 38 years old. According to the data, 79.4% of the individuals have a higher level of education, with 45.4% having a degree, 29.9% having a master degree and 4.1% having a doctor degree.

The participants work in different districts, however, 51.5% work in the Lisbon district. Regarding the seniority, 56.7% of the participants have been in the organization between 1 to 9 years and 22% have a leadership role.

As for the organizations, 62% operate in the private sector mostly in Banking and Insurance (25.8%).

### **4.2 - Procedure and Instrument**

Before collecting the data, it was necessary to translate to Portuguese all scales regarding e-mail questions. The data collection was done through an electronic survey<sup>1</sup>, composed by 5 distinct sections: Section I – Work environment; Section II – E-mail at work; Section III – Feelings related with work; Section IV - Ways of behaving at work; Section V – Socio-demographic data.

Before being disclosed, the survey was subjected to a pre-test, in order to correct some errors and make a few adjustments, as well as estimate the necessary time to answer its final version. The survey was developed using the software Qualtrics, granting total confidentiality, and distributed by e-mail to personal contacts, that could find it directly by clicking on the link displayed in the e-mail. It was verbally asked to the participants if they could forward the survey to other people, thus, the snowball strategy was very important to reach more participants. To answer the survey, the participants were given approximately 2 months to complete the 20-minute survey, with the first two and last two weeks, being the ones where more answers were obtained.

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<sup>1</sup> The survey may be made available upon request.

### **4.3 - Variables and Measures**

The online survey incorporated more variables than the ones that were used in the study. Thereby, the variables used were: e-mail overload and e-mail quality as independent variables, work engagement and exhaustion, not only as mediators but also as dependent variables, and silence behaviors only as a dependent variable.

All the scales presented an internal consistency higher than .07.

#### **4.3.1 - Work engagement**

The measurement of work engagement was done through the short, nine version of Utrecht Work Engagement scale (UWES-9), developed by Schaufeli *et al.*, (2006). Examples of items include “At my work, I feel busting with energy” or “I am immersed in my work”. Measured through a 5-point Likert scale, ranging between 1 = Never and 5 = Always, the scale presented a high internal consistency ( $\alpha = 0,87$ ).

#### **4.3.2 - Exhaustion**

The present variable was measured thorough the exhaustion sub-scale of the MBI GS scale, developed by Schaufeli *et al.*, (1996).

The items were measured through a 7-point Likert scale ( $\alpha = 0,89$ ), ranging between 0 = Never and 6 = Everyday. Examples of items include “Working with people every day causes me stress” or “My work leaves me exhausted”.

#### **4.3.3 - E-mail overload**

E-mail overload was measured through a scale developed by Dabbish & Kraut (2006). The scale has 7 items, with statements about efficacy of e-mail use, and each statement is measured through a 5-point Likert scale ( $\alpha = 0,73$ ), ranging between 1 = Strongly Disagree and 5 = Strongly Agree. Examples of items are “I have trouble finding information in my email” or “I find dealing with my email overwhelming”.

#### **4.3.4 - E-mail quality**

E-mail quality was measured through a scale developed by Brown *et al.*, (2014). The scale contains 8 items, that measure the emotionality and ambiguity of e-mail messages. The items are measured through a 5-point Likert scale ( $\alpha = 0,84$ ), ranging between 1 = Never to 5 = Always. Some examples are “I deal with e-mails in my workplace that are... emotionally charged” or how often do employees receive e-mails that “...contain work-related content that is not easy to understand”.

#### **4.3.5 - Silence behaviors**

Silence behaviors were measured through the Scale to Assess Four Motives for Employee Silence from Knoll & Van Dick (2013). The participants had to answer why they remain silent at work, according to the 6 statements presented, that are measured through a 7-point Likert scale ( $\alpha = 0,77$ ), ranging between 1 = Never and 7 = Very frequently. Examples of these statements are “I remain silent at work... because of fear of negative consequences” or “I remain silent at work... because nothing will change, anyway”.

#### **4.4 - Statistical Data Analysis Procedure**

The data collected was introduced and analyzed through the Statistical Program for Social Sciences (SPSS) for Windows, version 23.

In a first stage, all the reversed tone questions were inverted, descriptive analyses and correlations were performed, and the internal consistency of the scales (Cronbach alpha) was validated. The analyses of the hypotheses were accomplished using the PROCESS Macro in SPSS. PROCESS was developed by Andrew Hayes, and is a program that determines the direct and indirect effects using an ordinary least squares method (Hayes, 2013). The analysis and tables regarding the hypothesis present in the study, followed the guidelines of Andrew Hayes (Hayes, 2013).

Within the PROCESS Macro, “Model 4” was selected to test the simple mediated hypotheses (1a and 1b). Whereas both hypotheses, tested in two separate analysis, had the same predictor (e-mail overload (X)) and outcome (silence behaviors (Y)), the mediation variable was different. While work engagement (M) was tested as mediator in hypothesis 1a), exhaustion (M) was the mediator tested for hypothesis 1b). The hypotheses were subjected to bootstrap analyses, with 10 000 bias corrected bootstrap samples and a confidence level of 95% for

confidence intervals. Furthermore, besides the ordinary least square method, it was also requested the effect size, the total effect model, the Sobel test and to compare indirect effects.

To test the moderated hypotheses (2a and 2b) Figure 2, it was selected “Model 1”, within the PROCESS Macro. While e-mail overload continues to be the predictor variable (X) in both hypotheses, the outcome variable is now work engagement (Y) in hypothesis 2a) and exhaustion (Y) in hypothesis 2b). E-mail quality is the moderator variable (M) in both hypotheses, tested in two separate analysis. Yet again, a bootstrap analysis was conducted with 10 000 bias corrected samples and a confidence level of 95% for confidence intervals. Besides the ordinary least square method, it was also requested the mean center for products, the heteroscedasticity-consistent and to generate data for plotting.

To address moderated mediation hypotheses (3a and 3b), it was used “Model 7”, within the PROCESS Macro. Tested in two separate analysis, e-mail quality was entered as the proposed moderator (W), to test the impact on the relationship between the predictor variable (e-mail overload (X)) and the mediator. Work engagement (M) was entered as the mediator in hypothesis 3a, while exhaustion was the mediator (M) of hypothesis 3b. In both hypotheses, silence behavior was the outcome variable (Y).

Bootstrapping with 10 000 bias corrected samples were requested with a confidence level of 95% for confidence intervals. Besides the ordinary least square method, it was also requested the mean center for products and the heteroscedasticity-consistent.

## **5 - Results**

The means, standard deviations and correlations between the study variables, are displayed in table 1. As it is possible to verify e-mail overload presents a mean of 2.06 (SD = .48), which considering the scale applied, the participants do not feel overload by the incoming e-mail messages. The same happens with e-mail quality, that presenting mean of 2.41 (SD = .57), it is possible to state that participants rarely receive e-mails that are ambiguous or emotionally charged. While work engagement presents a mean of 3.61 (SD = .56), signifying that the participants are frequently engaged with their jobs, the mean displayed by the exhaustion variable presents a value of 2.34 (SD = 1.61). Regarding silence behaviors, and taking into account the scale range, it is possible to state that the participants very rarely remained silenced at work, since the variable displays a mean of 2.91 (SD = .88).

As for the relationship between the variables, it is possible to verify that e-mail overload and e-mail quality are positively correlated with exhaustion, while the former is also positively

correlated with silence behaviors. As expected work engagement is negatively related not only with exhaustion, but silence behaviors as well.

While the highest positive score is between e-mail overload and e-mail quality, the highest negative score is between exhaustion and e-mail quality.

**Table 1** - Bivariate Correlations.

	Mean	SD	1	2	3	4	5
<b>1. E-mail overload</b>	2.06	.48	1				
<b>2. E-mail quality</b>	2.41	.57	.37**	1			
<b>3. Work engagement</b>	3.61	.56	-.22*	-.09	1		
<b>4. Exhaustion</b>	2.34	1.61	.28**	.29**	-.53**	1	
<b>5. Silence behaviors</b>	2.91	.88	.30**	.15	-.39**	.36**	1

**Note:** \*  $p < 0.05$ ; \*\* $p < 0.01$ ;

### **5.1 - Mediation analysis**

*Hypothesis 1a* – With the mediation analysis performed, it was possible to verify that e-mail overload indirectly influences silence behaviors through work engagement, confirming the hypothesis. Analyzing the results presented in table 2, it is possible to state that participants that suffer from e-mail overload will be less engaged in their jobs ( $a = -0.29$ ,  $SE = 0.11$ ,  $p < 0.05$ ) and participants more engaged in their work will display less silence behaviors ( $b = -0.52$ ,  $SE = 0.17$ ,  $p < 0.05$ ). The indirect effect ( $ab = 0.15$ ) was subject to a bootstrap analysis, with a bias-corrected bootstrap confidence interval based on 10 000 bootstrap samples. The confidence interval was entirely above zero with a lower value of 0.04 and an upper value of 0.37. Furthermore, there is evidence that e-mail overload influences silence behaviors independent of work engagement ( $c' = 0.38$ ,  $SE = 0.17$ ,  $p < 0.05$ ), indicating a partial mediation.

Table 2 - Mediation results of hypothesis 1a).

		Criterion						
		M (Work engagement)			Y (Silence behaviors)			
Predictor		Coeff.	SE	p	Coeff.	SE	p	
X (E-mail overload)	<i>a</i>	- 0.29	0.11	0.01	<i>c'</i>	0.38	0.17	0.03
M (Work engagement)		_____	_____	_____	<i>b</i>	- 0.52	0.17	< 0.05
Constant	<i>i<sub>1</sub></i>	4.21	0.23	<0.05	<i>i<sub>2</sub></i>	4.01	0.79	< 0.05
<b>R<sup>2</sup> = 0.08</b>				<b>R<sup>2</sup> = 0.20</b>				
<b>F (1.81) = 6.79, p &lt; 0.05</b>				<b>F (2.80) = 9.92, p &lt; 0.05</b>				

Hypothesis 1b – The present hypothesis was also confirmed, indicating that e-mail overload indirectly influences silence behaviors through exhaustion. The results presented in table 3 demonstrate that participants suffering from e-mail overload will be more exhausted ( $a = 0.93$ ,  $SE = 0.35$ ,  $p < 0.05$ ) and participants more exhausted will display more silence behaviors ( $b = 0.15$ ,  $SE = 0.06$ ,  $p < 0.05$ ). The indirect effect of e-mail overload on silence behaviors ( $ab = 0.14$ ) was subjected to a bootstrap analysis, with a bias-corrected bootstrap confidence interval based on 10 000 bootstrap samples. The confidence interval was entirely above zero with a lower value of 0.03 and an upper value of 0.32. Furthermore, there is evidence that e-mail overload influences silence behaviors independent of exhaustion ( $c' = 0.39$ ,  $SE = 0.18$ ,  $p < 0.05$ ), indicating a partial mediation.

Table 3 - Mediation results of hypothesis 1b).

		Criterion						
		M (Exhaustion)			Y (Silence behaviors)			
Predictor		Coef.	SE	p	Coef.	SE	p	
X (E-mail overload)	<i>a</i>	0.93	0.35	<0.05	<i>c'</i>	0.39	0,18	0.04
M (Exhaustion)		_____	_____	_____	<i>b</i>	0.15	0.06	< 0.05
Constant	<i>i<sub>1</sub></i>	0.42	0.72	0.56	<i>i<sub>2</sub></i>	1.76	0.36	< 0.05
<b>R<sup>2</sup> = 0.08</b>				<b>R<sup>2</sup> = 0.20</b>				
<b>F (1.80) = 7.25, p &gt; 0.05</b>				<b>F (2.79) = 8.38, p &lt; 0.05</b>				

## 5.2 - Moderation analysis

*Hypothesis 2a* – The results of the moderation analysis, show that the overall model is significant ( $F = 8.21, p = < 0.01$ ) accounting for 13% of variance in work engagement score ( $R^2 = 0.13$ ). Furthermore, the interaction between-mail overload and e-mail quality is also significant ( $b_3 = -0.52, SE = 0.13, t = -3.89, p < 0.05$ ). These results presented in table 4 indicate that e-mail quality is a moderator of the relation between e-mail overload and work engagement, supporting the present hypothesis.

**Table 4** - Moderation results of hypothesis 2a).

			<b>Coeff.</b>	<b>SE</b>	<b>t</b>	<b>p</b>
	<b>Intercept</b>	<b>i<sub>1</sub></b>	3.65	0.06	64.50	<0.05
<b>E-mail overload</b>	<b>(X)</b>	<b>b</b>	-0.10	0.13	-0.81	0.42
<b>E-mail quality</b>	<b>(M)</b>	<b>b<sub>2</sub></b>	0.00	0.16	0.01	0.99
<b>E.O x E.Q</b>	<b>(XM)</b>	<b>b<sub>3</sub></b>	-0.52	0.13	-3.89	<0.05

<b>R<sup>2</sup> = 0.13</b>	
<b>F (3.86) = 8.21, p &lt;0.05</b>	

*Hypothesis 2b* – Verifying the results presented in table 5, it is possible to state that, although the overall model is significant ( $F = 3.25, p < 0.05$ ) accounting for 13% of variance in exhaustion score ( $R^2 = 0.13$ ), the interaction between e-mail overload and e-mail quality is not significant ( $b_3 = 0.84, SE = 0.52, t = 1.61, p > 0.05$ ). This result indicates that e-mail quality it is not a moderator of the relation between e-mail overload and exhaustion, not supporting the hypothesis.



**Table 5** - Moderation results of hypothesis 2b)

			<b>Coeff.</b>	<b>SE</b>	<b>t</b>	<b>p</b>
	<b>Intercept</b>	<b>i<sub>1</sub></b>	2.27	0.17	13.56	<0.05
<b>E-mail overload</b>	<b>(X)</b>	<b>b<sub>1</sub></b>	0.38	0.34	1.12	0.27
<b>E-mail quality</b>	<b>(M)</b>	<b>b<sub>2</sub></b>	0.58	0.34	1.67	0.10
<b>E.O x E.Q</b>	<b>(XM)</b>	<b>b<sub>3</sub></b>	0.84	0.52	1.61	0.11

**R<sup>2</sup> = 0.13**  
**F (3.84) = 3.25, p < 0.05**

### **5.3 - Moderation Mediation analysis**

*Hypothesis 3a* – The goal of the present hypothesis, was to analyze the moderated mediation, that is, to verify if e-mail quality moderated the mediational impact of e-mail overload on silence behaviors, through work engagement. Analyzing table 6, it is possible to verify that the direct effect (*c'*) of e-mail overload on silence behaviors is not significant ( $a_1 = 0.36$ ,  $SE = 0.18$ ,  $p > 0.05$ ), however, the interaction between e-mail overload and e-mail quality is significant ( $a_3 = -0.48$ ,  $SE = 0.15$ ,  $p < 0.01$ ).

Furthermore, the bootstrapping analysis, also revealed a significant moderated mediation effect with an index value of 0.24 and a 95% confidence interval [0.07,0.50], thus, these results support the present hypothesis.

**Table 6** - Moderated mediation results of hypothesis 3a).

		Outcome					
		<b>M (Work engagement)</b>			<b>Y (Silence behaviors)</b>		
		Coef	SE	p	Coef	SE	p
Constant		3.68	0.05	0.00	4.71	0.58	0.00
<b>X:</b> E-mail overload	<b>a<sub>1</sub></b>	-0.10	0.12	0.43	<b>c'</b>	0.36	0.18
<b>W:</b> E-mail quality	<b>a<sub>2</sub></b>	-0.14	0.13	0.29			—
<b>X*W:</b> E.O x E.Q	<b>a<sub>3</sub></b>	-0.48	0.15	<0.01			—
<b>M:</b> Work engagement				—	<b>b</b>	-0.50	0.16
		R <sup>2</sup> = 0.18			R <sup>2</sup> = 0.17		
<b>Mediator</b>		<b>Index of moderated mediation</b>			<b>95% bootstrap confidence interval*</b>		
<b>M:</b> Work Engagement		0.24			0.07 to 0.50		

\*Percentile bootstrap confidence interval based on 10 000 bootstrap samples

Hypothesis 3b – While analyzing the table 7 it is possible to state that the direct effect ( $c'$ ) of e-mail overload on silence behaviors is not significant ( $a_1 = 0.37, SE = 0.19, p > 0.05$ ). The same happens with the interaction between e-mail overload and e-mail quality ( $a_3 = 0.58, SE = 0.47, p > 0.05$ ). Furthermore, the bootstrapping analysis, also revealed a non-significant moderated mediation effect with an index value of 0.09 and a 95% confidence interval [-0.01,0.34], not supporting the present hypothesis

Table 7 - Moderated mediation results of hypothesis 3b).

	<i>M</i> (Exhaustion)			Outcome				
	Coef	<i>SE</i>	<i>p</i>	Coef	<i>SE</i>	<i>p</i>		
Constant	2.23	0.17	0.00	2.51	0.17	0.00		
<i>X</i> : E-mail overload	<i>a</i> <sub>1</sub>	0.36	0.34	0.29	<i>c</i> '	0.37	0.19	>0.05
<i>W</i> : E-mail quality	<i>a</i> <sub>2</sub>	0.77	0.37	0.04				————
<i>X*W</i> : E.O x E.Q	<i>a</i> <sub>3</sub>	0.58	0.47	0.22				————
<i>M</i> : Exhaustion			————	<i>b</i>	0.15	0.37	0.01	
<i>R</i> <sup>2</sup> = 0.14			<i>R</i> <sup>2</sup> = 0.17					
Mediator	Index of moderated mediation		95% bootstrap confidence interval*					
<i>M</i> : Exhaustion	0.09		-0.01 to 0.34					

\*Percentile bootstrap confidence interval based on 10 000 bootstrap samples

## 6 - Discussion

The present study sought to investigate the role of e-mail in the work context, and its effects on individual’s silence behavior. Supported by the Job Demands-Resources model, the main objective was to study to what extent two e-mail dimensions – e-mail overload and e-mail quality - contributed to employee’s silence behaviors.

First and foremost, it is important to note that, the results of the correlation analysis previously presented (table1), showed that e-mail overload is significantly related to silence behaviors. Combining these results with the mediation analysis, where both hypothesis were supported, it is possible to state that both, work engagement and exhaustion, acted purely as mediators. In other words, it means that, even if both concepts were not in the equation (e-mail overload leads to work engagement/exhaustion, which in turn leads to silence behaviors), there would still be a part of the outcome (silence behaviors) explained by the predictor (e-mail overload). While in hypothesis 1a) e-mail overload is negatively related with work engagement, which in turn is negatively related with silence behaviors, in hypothesis 1b) e-mail overload is positively related with work exhaustion, which in turn is positively related with silence behaviors. These results, support the motivational process and the health impairment process,

described by Bakker *et al.*, (2003a), where work engagement and exhaustion are considered mediators of the link between job demands/resources and organizational behaviors.

According to Brown *et al.*, (2014), individuals who handled more e-mail with lower quality reported more e-mail overload, however, if accounting for the relationship between e-mail overload and work engagement (H2a), e-mail quality was found to moderate the strength of this link, meaning that even if an individual that is experiencing e-mail overload, receives e-mails that do not need further clarification nor are ambiguous, can perceive e-mails as a helpful tool instead of a problem, and thus can be more engaged in the work. On the other hand, e-mail quality was not found to influence in any way, the relation between e-mail overload and exhaustion, which could mean that if an employee is exhausted, e-mail quality will not change that state in any way.

With e-mail quality working as a significant moderator between e-mail overload and work engagement, it was also tested if e-mail quality could also affect the indirect effects of the first two hypotheses. That is, if e-mail quality presented as a proposed moderator influences the strength of the relationship between the predictor (e-mail overload) and the mediators (work engagement and exhaustion), and consequently the outcome (silence behaviors).

The results of the moderated mediation analysis showed that while the relationship between e-mail overload and work engagement is affected by e-mail quality (H3a), the same does not happens when the mediator is exhaustion (H3b). In other words, the variance in silence behaviors can be explained by e-mail overload and exhaustion but not by e-mail quality.

Several studies reported that employee silence can have several causes. Be it because they fear the consequences of talking or simply because they do not identify with the organization (Morrison & Milliken, 2000; Knoll & Van Dick, 2011), the results of the present study also helped to identify to what extent dealing with e-mail at work can cause such behaviors.

## **7 - Limitations and future research**

The present study has some limitations that should be addressed. An important limitation is the fact that the information was gathered through a cross-sectional study, which constrains the relationships found. That is, one cannot be certain that e-mail overload predicts exhaustion, since it is possible that employee suffering from exhaustion are exposed to many other job demands. To note also, that the data gathering was done through a self-report questionnaire (Podsakoff *et al.*, 2003), which can produce a degree of variance in the variables studies (Spector, 2006), as well as influence the participants to answer in a certain way, without thinking much about the situation presented. Further, and although data was collected from different regions of the country and different organizations, the number of participants was not big enough nor representative of specific work contexts, to be able to made generalizations about the effects of e-mail on employees.

By making a number of assumptions, the scope of the study was limited. Including only two e-mail dimensions and one behavior it is not possible to have a complete overview about the impacts of e-mail on employees, for which in the future, not only more e-mail variables should be added to the studies, but also demographic variables, since age may play an important role when dealing with technologies. Further, it is possible that employees have different perceptions of e-mail quality, or even that the uncertainties were resolved through another communication medium, influencing once again, the answers provided (Brown *et al.*, 2014).

Just like it is recognized that silence behaviors might not be the only outcome of e-mail predictors, it is also recognized that the two e-mail dimensions might not be the only ones predicting silence behaviors.

Moreover, the different forms of silence were not addressed, thus, it is not possible to assess the consequences of such behaviors, for what it should not be perceived only as a negative behavior.

Lastly, it is important to note that the number of studies regarding e-mail consequences are very low, so it is not possible to make any comparisons regarding the results.

In order to deepen the knowledge about e-mail it is important that future research is made in form of longitudinal studies with a bigger sample.

Relationships between several others e-mail characteristics and different behaviors should be established. It is important to note that, just like discussed in the literature review, e-mail dimensions such as normative response pressure or e-mail management control of time,

can also predict or influence different outcomes. Employees behaviors such as voice behaviors, should also be subject of discussion, since, being the antagonist of silence behaviors, can also affect the good functioning of the organizations.

When links between e-mail dimensions and negative outcomes are verified, it is important to present practical solutions, in order to help not employees but also the organization, thus, it should be studied the effect that social support from supervisors can have on people not dealing well with e-mail, just like the positive impact that training can provide.

Likewise, personal resources should be added to the studies since it can change the relationships proposed.

## **8 – Practical implications and recommendations**

The results of this study are important to establish a link between e-mail and silence behaviors. Although, both have been studied, the latter is still lacking research, for which this link has not been yet made.

A review in the literature showed a strong connection between job demands and negative outcomes, and since the constructs of e-mail overload and silence behaviors are perceived as negative for organizations, both in the literature review and in the results sections, the practical implications of the present study are especially important for managers. They should be able to understand when a worker is displaying feelings of being overwhelmed by e-mail, while the same should happen when a worker is displaying silence behaviors. In fact, if managers are able to tackle these feelings and behaviors, it will benefit not only the individual but also the organization, since both can compromise its good functioning. With that being said, managers should also promote voice behaviors, the opposite of silence behaviors, whose objective is to help organizations to reach its goals while empowering workers, by allowing them to voice their opinions. Training about how to deal with e-mail and what type of information should an e-mail contain or not, should be provided by organizations. Therefore, leaders play an essential role on this issue by providing the needed support. Moreover, it would also benefit both the organization and workers, if the communication would also be made face-to-face, since it provides more cues than a written message. However, the responsibility can not only fall back on managers, as employees are the ones who are most affected by the issue, but most of the times they are also the ones who trigger such problems. If an employee feels in control over their work it is likely that the outcome will be positive. Well established in the

literature, the relation between work engagement and positive outcomes is now one of the main organizational goals. Yet, and even though most organizations are already working in having an open culture where employees feel totally connected with, it is never too much to reinforce that communication is the key for success, for which it should always be improved no matter how is done.

## **9 –Contributions and Conclusion**

The present study was able to contribute not only for the role of e-mail has a job demand in the organization but also for the insights of the predictors of silence behaviors in a work context. More precisely, it was possible to establish a link between e-mail variables – e-mail overload and e-mail quality – and silence behaviors, highlighting that this is the first reading about the subject that we have knowledge about, thus deepening our knowledge about silence behaviors and contributing to the research that already exists although its body of research is not large (e.g: Morrison & Milliken, 2000 Pinder & Harlos, 2001; Van Dyne *et al*, 2003; Knoll *et al.*, 2016).

Further, by being supported by the JD-R Model and taking into account the results, it was also possible to confirm some of the assumptions of the model, more precisely, that it can be applied in different work contexts, since the sample came from different organizations in different sectors, and that exists a dual process (health impairment and motivational process) Baker et al., (2003a), mediated by exhaustion and work engagement, as it was possible to state from the assumptions.

Since the main conclusion of this study is the fact that, e-mail can act as a predictor of silence behaviors and not forgetting all the limitations that the study presented, we recognize that this study can contribute to the gaps existing in the literature, more so in terms of silence behaviors. Further, but it can also be a starting point for future investigations, due to the importance of the subjects in maintaining a “healthy” organization capable of facing all the business demands.

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