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# Techno-overload and well-being of French small business owners: identifying the flipside of digital technologies

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## ABSTRACT

Technostress is an important by-product of information and communication technologies (ICT). The technostress literature suggests focusing on specific dimensions of technostress, such as techno-overload, which describes when ICT usage demands to work faster and longer. However, only a few studies have dealt with the technostress of small business owners, let alone techno-overload. This is surprising since work overload in general has been identified as an important dimension of job stress for small business owners, and technostress has been identified as an important impediment for workers in general. The aim of the current study is to investigate the effect of techno-overload on well-being outcomes (as a composite measure consisting of physical well-being, mental well-being, sleep quality, burnout, and loneliness) using three data sets of French small business owners. Our results indicate a strong negative correlation between techno-overload and our composite measure of well-being for all three data sets. We interpret our findings for several different disciplines: information systems, small business owners and entrepreneurship, health and well-being, psychology and organization studies. Our data also allow for the identification of contextual effects – the COVID-19 pandemic – since one survey was conducted before, one at the start of, and one during the pandemic.

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Techno-overload; technostress; small business owners; entrepreneurs; well-being outcomes; COVID-19 pandemic; France

## Introduction

For more than 200 years, information and communications technologies (ICT) have evolved in several major phases. They gave us telegraphy, telephone, radio, television, space technologies such as satellite-based communications, and digital technologies (DT) such as computerized devices, methods, and systems (Hoonakker 2014). DT appeared in the 1990s and represent the latest phase of the ICT evolution. DT have become an indispensable and ubiquitous part of everyday life and the business environment in particular (Audretsch and Belitski 2017)<sup>1</sup> This phenomenon is identified as 'digital transformation' (Elia, Margherita, and Passiante 2020). ICT and/or DT<sup>2</sup> have invaded humans' personal and working environments worldwide. Even if they have radically and positively changed the economy, society, and companies (OECD 2019), there exists a negative flipside.

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This dual nature of ICT (both positive and negative) is referred to as the 'paradox of ICT' (Tarafdar et al. 2007, 302; Ragu-Nathan et al. 2008, 431; Carayon and Smith 2014, 112). On the one hand, ICT can lead to benefits by improving economy-wide productivity (Kim, Park, and Komarek 2021), productivity of companies, especially small ones (Bi, Davison, and Smyrniotis 2017; Audretsch and Belitski 2021), and individual well-being (Joseph-Shehu et al. 2019). On the other hand, ICT can have negative consequences, especially for individuals at work by diminishing their performance and impacting their well-being due to stress (Karimikia, Singh, and Joseph 2021).

The stress induced by ICT use is usually referred to as technostress, a term originally proposed by the psychotherapist Craig Brod (Brod 1984). Brod identified this form of stress during his psychotherapy sessions with individuals using computers, in various industries (such as banking, health care, manufacturing), and in various occupations (such as nurses, IT programmers, researchers, journalists, managers, students). In the current literature, technostress refers to the stress induced by ICT in general (Ragu-Nathan et al. 2008). The recent literature also refers to it as digital stress (Fischer, Reuter, and Riedl 2021).

International institutions, such as the International Labour Organization, have identified technostress as a crucial issue for work and well-being (ILO 2019). Despite its far-reaching impact, technostress is an emerging and underdeveloped topic of research (Tarafdar, Cooper, and Stich 2019). This has taken a positive turn recently, as scholarly interest in technostress is on the rise (La Torre et al. 2019; Salazar-Concha et al. 2021).

In the present study, we focus on techno-overload, a dimension of technostress, and study its effect on the well-being of French small business owners. Techno-overload refers to situations when ICT usage increases the time and speed for individuals to accomplish their tasks and work (Tarafdar et al. 2007). Techno-overload<sup>3</sup> (also referred to as technology overload) is the operationalized measure of work overload induced by ICT (Borle et al. 2021). Techno-overload can thus be considered as the overlap between work-overload and technostress, both of which have been shown to have detrimental effects on the well-being of small business owners (Park, Han, and Kim 2020) and employees (Pfaffinger, Reif, and Spieß 2020). Techno-overload is one of the most studied dimensions of technostress (other dimensions being techno-invasion, techno-complexity, techno-uncertainty, and techno-insecurity (Tarafdar et al. 2007) and has been found to have negative effects on health (Borle et al. 2021).

In our current study, we measure the link between techno-overload and a composite measure of well-being consisting of five dimensions (physical well-being, mental well-being, sleep, burnout, and loneliness). The separate links with the five underlying dimensions can be downloaded as Supplementary Material (SM). We use a dataset of French small business owners (2020,  $n = 1,900$ ). We replicate the results using two more data sets of French small business owners (2020,  $n = 346$  and 2019,  $n = 340$ ). Given the novel nature of our endeavour, we don't make theoretical assumption initially; instead we test the link between techno-overload and the composite measure of well-being in three datasets along with several controls. In our conclusion, we emphasize what the results mean for the literature of small business owners and entrepreneurship. Additionally, we try to make sense of our results for the fields of information systems, health and well-being, psychology and organization studies. In our view, it is a token of richness of our finding that it speaks to several disciplines and bodies of knowledge.

There are several reasons why the effect of techno-stress on small medium business owners warrant attention. SMEs play a crucial role in the modern economy (OECD 2017) for which knowledge about factors that may or may not affect their well-being is important. Small business owners run high personal risk of failure and have a strong commitment to their business. This is even more acute for solo business owners or for those who have very few employees. Hence, it is no surprise that small business owners experience higher stress levels than salaried workers and managers (Tetrick et al. 2000) which may affect the odds of survival and growth of their businesses. Moreover, just like in any other work environment, digital technologies have also permeated into small

businesses, for which it is important to know how techno-overload affects the well-being of small business owners.

The results of our study show a strong negative correlation between techno-overload and the composite measure of well-being for all three data sets. The signs of the coefficients of the controls are largely in accordance with what is expected. They are also similar across the three data sets, underlying the robustness of the results. Taking out techno-overload from the model leads to a considerable drop in the explanatory power of the OLS regressions with the well-being outcome as the dependent variable.

The present paper is organized as follows. First, we deal with the presentation of concepts, a concise justification of our hypothesis, and a justification of the controls. Then materials including data, variables, and measurements are discussed. The method and results for both the main data set ( $n = 1,900$ ) and the two smaller replication sets ( $n = 340$  and  $n = 346$ , respectively) are presented in the following section. The final sections deal with discussion and conclusion (including limitations, future research avenues and recommendations) respectively. We also discuss the meaning of our results with respect to different theories from various disciplines. Empirical details and a discussion of the five underlying dimensions of well-being can be downloaded from the SM.

## Concepts, literature, hypothesis and controls

Techno-overload, a concept that lies at the cross-roads of technostress and work-overload, is one of the most studied dimensions of technostress (Borle et al. 2021). Prior research shows that work overload in general is an important dimension of job stress for small business owners (Lechat and Torrès 2016, 2017) and that technostress is an important negative factor in the context of work (La Torre et al. 2019). Below, after explaining the links between technostress and techno-overload, and those between work-overload and techno-overload, we present our main hypothesis which is loosely based on relevant literature on technostress, work-overload and health outcomes for both employees, managers and small business owners. Finally, we present an overview of the expected influence of the nine controls including some literature.

### *Technostress and techno-overload*

The ICT literature deals with the negative effects or the dark side of ICT, and in particular technostress (Tarafdar, Cooper, and Stich 2019). Technostress – stress induced by ICT usage (Ragu-Nathan et al. 2008) - has mostly been studied in the context of work (La Torre et al. 2019). Research on this topic has grown, especially after the publications of key research articles on technostress and its dimensions, sometimes also referred to as technostress creators (Tarafdar et al. 2007; Ragu-Nathan et al. 2008), technostressors (Ayyagari, Grover, and Purvis 2011) and the technostress RED/TIC (Salanova, Llorens, and Cifre 2013).<sup>4</sup> The principal conceptualization and measure of technostress is that of the technostress creators (Tarafdar et al. 2007; Ragu-Nathan et al. 2008).

Techno-overload occurs when ICT use exceeds an optimum level (Karr-Wisniewski and Lu 2010). There are some studies on the relationship between techno-overload and well-being outcomes. For instance, Choi and Lim (2016) documented a negative indirect relationship between techno-overload and psychological well-being through social networks sites. Similarly, Hang et al. (2022) found that techno-overload is negatively associated with employees' well-being. Finally, Srivastava, Chandra, and Shirish (2015) found that technostress creators including techno-overload were positively associated with job burnout of managers, another negative well-being outcome.

### *Work-overload and techno-overload*

Work overload occurs 'when job demands exceed an individual's ability to deal with them, i.e. exceed the time and resources available' (Kirch 2008, 1466). Work overload may be quantitative overload (i.e.

excessive work demand on the employee in the time that is available) or qualitative overload (i.e. demanding excessive skill levels or resources of the employee). Work overload may lead to harmful emotional and physical consequences for the individual when the requirements of a job do not match the individual characteristics and resources. Therefore, work overload can be considered as a dimension of job stress. Techno-overload, a dimension of technostress, is also a form of work overload induced by ICT at work.

### ***Our composite measure of well-being***

Our composite measure of well-being (overall well-being) consists of five dimensions: physical well-being, mental well-being, sleep quality, loneliness, and burnout. We developed our composite measure based on the definition of health by the World Health Organization: '*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*' (WHO 1948).<sup>5</sup> We also based our composite measure on the literature on small business owners and entrepreneurs' health. In fact, we used loneliness as a marker of social well-being (Fernet et al. 2016) and burnout because it can impact physical, mental, and social well-being (Torrès and Kinowski-Moysan 2019).

### ***Techno-overload and its effect on well-being in small business owners***

Given the novel nature of our study we abstained from using a theoretical framework borrowed from one of its underlying fields such as information systems, small business owners and entrepreneurship, health and well-being, psychology and organization studies. In this section, we first provide some justification for our hypothesis dealing with each of the five dimensions underlying our composite measure of well-being. Due to the lack of existing empirical work, we often use parallel reasonings: using employees instead of small business owners, technostress instead of techno-overload, work-overload instead of techno-overload and health outcomes instead of well-being outcomes. Finally, we point at some characteristics of small business (owners).

The association between stress and *physical well-being* among entrepreneurs and small business owners has been investigated (Buttner 1992; Cardon and Patel 2015; Lechat and Torrès 2017). Self-employed individuals experience a higher level of stress compared to salaried employees, which is detrimental to their physical health (Cardon and Patel 2015). Several studies taking one dimension of stress induced by ICT, such as information overload, have shown that it may negatively impact physical well-being (Lewis 1996; Edmunds and Morris 2000). For example, Laspinas (2015) reported that technology overload could lead to physical issues such as eye strain, backaches, headaches, neck pain, muscle tension, keyboard related injuries and rapid heart rate.

Techno-overload can have serious negative effects on *mental well-being*. These include cognitive overload, attention problems and memory issues (Scott, Valley, and Simecka 2017; Rutkowski and Saunders 2018), anxiety (Bawden and Robinson 2020) and negative affect (LaRose et al. 2014). Techno-overload is also an important predictor of negative emotions (Edmunds and Morris 2000). Matthes et al. (2020) found that techno-overload was a strong but lagged predictor of depressive symptoms and well-being. While small business owners' and entrepreneurs' mental health remains a pre-occupation due to their exposure to recurrent stress, a lot has been done in terms of research in this area (Stephan 2018; Visentin, Cleary, and Minutillo 2020; Torrès and Thuriik 2019). However, as said above, no study has looked into the role of techno-overload on small business owners' mental health.<sup>6</sup>

In the entrepreneurship literature, entrepreneurs' stress and *sleep quality* have been studied (Guiliani and Torrès 2018; Kollmann, Stöckmann, and Kensbock 2019; Wach et al. 2021). In this regard, work overload has been identified as a strong predictor of decreased sleep quality for small business owners (Guiliani and Torrès 2018). In fact, entrepreneurs who experience high workload fail to recover from a stressful day in the evening, and hence have poor sleep quality (Wach et al. 2021).

Techno-overload can lead to emotional exhaustion and *burnout* if it becomes chronic (Tarafdar et al. 2007). Various studies have shown the positive associations between techno-overload and burnout in different populations: individual users (Reinecke et al. 2017), teachers (Califf and Brooks 2020), employees (Kim et al. 2015; Maier et al. 2019) and managers (Srivastava, Chandra, and Shirish 2015; Khedhaouria and Cucchi 2019).

In a qualitative study of young adults, Thomée et al. (2010) found that higher use of ICT may lead to higher *loneliness*. Recently, Taser et al. (2022) found that a high level of technostress amongst employees induces a high level of loneliness. Both in the entrepreneurship and psychology literature, studies have identified associations between job stressors and loneliness (viz, occupational loneliness) (Fernet et al. 2016). For example, the literature review of Shepherd et al. (2010) suggests that a high level of stress is linked to loneliness. Similarly, Fernet et al. (2016) found a positive association between job stressors and occupational loneliness.

Finally, some characteristics of small businesses make their owners particularly liable to suffering from techno-overload. The crucial characteristic is that management is often 'concentrated in the person of the owner' (Julien 2018, 15). Small business owners have many responsibilities and play different roles which lead them to take multiple decisions and actions including the management of activities, management of employees, relationships with customers, partners, suppliers, and local and other authorities (Fernet et al. 2016).

Another characteristic is linked to the design of small businesses. In fact, small businesses are designed as 'transaction space', which implies the need of communication, especially for their owners with the environment and its actors (Marchesnay and Julien 1990).

Due to these characteristics, small business owners work long hours, often in tight schedules and under high intensity, especially when they work with their employees (Block et al. 2022).

Thus, while small business owners' activities can be a source of satisfaction, they are also a source of stress, especially due to work overload (Lechat and Torrès 2017) which may be detrimental to their health and well-being (Torrès and Thurik 2019). Moreover, their use of ICT increased during the recent COVID pandemic, not only for the purpose of allowing them to develop and modify their skills as well as their business (Audretsch and Belitski 2021), but also for maintaining their business (Belitski et al. 2022). This increased ICT use could be an additional source of stress, viz., technostress, due to the technology overload that adds to their existing sources of stress.

Taken together, we advance the following hypothesis:

Techno-overload is negatively associated with small business owner's (overall) well-being.

### ***Expected influence of the controls***

For our analysis of the relation between techno-overload and well-being outcomes, we use nine controls. Below, we present some justification for their use, based on the entrepreneurship literature. Alternatively, we draw parallels from the general literature when the relationship remains uninvestigated in the entrepreneurship literature. We provide our expectation of the sign in the heading of the control.

#### ***Age (no expected sign)***

Recent studies have found links between age and *physical health* of small business owners and entrepreneurs (Gielnik, Zacher, and Frese 2012). Older age in entrepreneurs has been shown to negatively associate with entrepreneurial activity, opportunities, and skills' perception; such a relation could be due to declining physical health (Bohlmann, Rauch, and Zacher 2017).

In the European general population, older age has been associated with *mental health* problems like depression, dementia and anxiety (Riedel-Heller, Busse, and Angermeyer 2006). However, the entrepreneurship literature indicates that older entrepreneurs are less impacted by stress compared to their younger counterparts as they may have developed better coping capabilities (Baron, Franklin, and Hmieleski 2016).

The relationship between entrepreneurs' age and *sleep quality* received some interest recently (Weinberger et al. 2018). A study by Guiliani and Torrès (2018) shows that small business owners over 45 years of age, sleep less than their younger counterparts.

Associations between age and *burnout* have been found in the literature, under different contexts and among people with different individual characteristics. For example, Carod-Artal and Vázquez-Cabrera (2013) found that younger adults in general have a higher risk of burnout. Maslach, Jackson, and Leiter (1996) found that younger teachers are more affected by burnout. A recent study indicates a negative association between older male employers with high job autonomy and high job satisfaction, and burnout (Lin et al. 2020). In a similar vein, the entrepreneurship literature indicates that younger small business owners have a high risk of burnout compared to older small business owners (Fernet et al. 2016; Torrès et al. 2022a).

A recent large global study on the general population found that *loneliness* decreases with age (Barreto et al. 2021). Some studies point to the importance of loneliness for entrepreneurs (Gumpert and Boyd 1984; Akande 1994; Patzelt and Shepherd 2011) and entrepreneurs have often been called 'lone wolfs'. However, as far as we know, empirical research has not delved into the relationship between age and loneliness in entrepreneurs.

### **Gender (expected sign is negative for female = 1)**

A global study on the general population investigating the effect of gender on *self-reported health* showed that women reported poorer health (largely due to chronic health conditions) compared to men (Boerma et al. 2016). A study on entrepreneurial mental health showed that women reported lower mental health quality compared to men (Gielnik, Zacher, and Frese 2012). However, in a recent study, women entrepreneurs reported higher subjective well-being (mental health and physical health) compared to their male counterparts (Hatak and Zhou 2021)

A recent study of the general population found that younger men have better *sleep quality* compared to younger women (Fatima et al. 2016). The same results were found in a sample of young small business owners' (Guiliani and Torrès 2018).

Recent research has found a relationship between gender and *burnout*. Several reviews (of the general population) show that women have more burnout compared to men (Purvanova and Muros 2010; Artz, Kaya, and Kaya 2022) and score higher in emotional and physical exhaustion symptoms (Canazei et al. 2018). In the entrepreneurship literature, several studies have found the same results concerning higher levels of burnout for women compared to men (Lechat et al. 2016; Manzano-García, Ayala-Calvo, and Desrumaux 2021; Torrès et al. 2022a).

A large research including many countries shows that men are *lonelier* than women (Barreto et al. 2021). However, to our knowledge, the relationship between loneliness and gender differences has not been investigated among small business owners.

### **Education (expected sign is positive)**

A recent study using longitudinal data from the OECD and the World Bank shows that adults with higher educational levels have better *health* and lifespans (Raghupathi and Raghupathi 2020). In a similar vein, in the entrepreneurship literature, tertiary education has been shown to be positively associated with better mental and physical health, and to entrepreneurial success (Hatak and Zhou 2021).

While the entrepreneurship literature has not directly investigated the relationship between entrepreneurs' education and their *sleep quality*, in the general population, individuals with lower educational achievement report more sleep complaints (Grandner et al. 2010). Research shows that a lower level of education increases the risk of psychological and social frailty, and decreases sleep duration (Yanguas, Pinazo-Henandis, and Tarazona-Santabalbina 2018).

A review article identified education as a protective factor against *burnout* (Milićević-Kalašić and Bährer-Kohler 2013). Lower education and low economic status are important contributors of



burnout, especially for women (Norlund et al. 2010). Research also indicates that a lower level of education is associated with emotional exhaustion (Nuallaong 2013).

In a rural living context (compared to an urban one), a low level of education has been shown to be positively associated with *loneliness* (Savikko et al. 2005). A cross-national study also found that a high level of education is negatively associated with loneliness (Fokkema, De Jong Gierveld, and Dykstra 2012).

### ***Entrepreneurship experience (no expected sign)***

Studies looking at the relationship between entrepreneurial experience and entrepreneurs' *physical and mental health* show mixed results. For example, Xu and Jin (2022) found that for nascent entrepreneurs, there is an indirect negative significant effect of stress reactivity on their psychological and general well-being. On the other hand, Torrès et al. (2022a) found positive associations between entrepreneurial experience and burnout which may affect other forms of well-being.

A recent study that looked at *insomnia* among novice and experienced entrepreneurs indicates no differences between the two groups (Kollmann, Stöckmann, and Kensbock 2019). However, what this study found was that for experienced entrepreneurs, there is a direct effect between stressors (dimensions of stress) and insomnia, while, for novice entrepreneurs, the effect is through work-home interference (Kollmann, Stöckmann, and Kensbock 2019).

In the general population, the number of years in a profession and the number of years of work experience has been shown to associate with the risk factor of *burnout* (Carod-Artal and Vázquez-Cabrera 2013). However, studies that look into the relation between entrepreneurial experience and the risk of burnout show mixed results. A study on entrepreneurial burnout showed that novice entrepreneurs may face high levels of stress and in some cases burnout (Omrane, Kammoun, and Seaman 2019). However, a recent study found that longer entrepreneurial experience is positively associated with burnout (Torrès et al. 2022a).

While, to our knowledge, the relationship between entrepreneurship experience and *loneliness* has not been investigated, we could conjecture that more experience of small business owners could lead to more networks and support activities, which could lead to reduced loneliness (in comparison to less experience).

### ***Workload (expected sign is negative)***

Both theoretical and empirical work in the extant literature points towards a negative association between high workload and *health outcomes*. For example, a meta-analysis of the general population indicates that long working hours are positively linked to workaholism, and negatively related to physical health (Clark et al. 2016). In the entrepreneurship literature, various reviews have pointed to a negative relationship between workload and mental health for entrepreneurs (Stephan 2018; Cubbon et al. 2021). In a recent study, Park, Han, and Kim (2020) found that self-employed people with long working hours reported worse physical and mental well-being in comparison to salaried employees.

While, to our knowledge, no specific study has looked into the relationship between workload and *sleep quality* of entrepreneurs, in the general population, workload has been shown to have a negative association with both sleep quality and quantity (Sonnentag 2018).

Various studies have pointed out a positive association between workload and *burnout* of entrepreneurs (Wei, Cang, and Hisrich 2015; Manzano-García, Ayala-Calvo, and Desrumaux 2021; Torrès et al. 2022a). For example, Wei, Cang, and Hisrich (2015) found a positive relationship between workload and emotional exhaustion. A recent study also found a significant and positive association between hours of work and emotional exhaustion in entrepreneurs (Manzano-García, Ayala-Calvo, and Desrumaux 2021).

A recent review article indicates that there is a positive association between workload and *isolation* among entrepreneurs (Cubbon et al. 2021).



### **Financial involvement (no expected sign)**

To our knowledge, the relationship between financial involvement and *physical and mental health* of small business owners have not been studied empirically. However, we conjecture that a higher financial stake would lead to higher risk and uncertainty (Boyd and Gumpert 1983) which could lower entrepreneurs' perception of physical and mental well-being.

While the relationship between entrepreneurs' financial involvement and *sleep quality* has not been empirically investigated, we assume that when the financial involvement is more, entrepreneurs are subject to higher level of risk and uncertainty; the latter could negatively impact their sleep quality.

To our knowledge, there is hardly empirical work that looks at the association between financial involvement and *burnout* for entrepreneurs, one notable exception being a study by Torrès et al. (2022a) which shows an association between high level of burnout and high ownership stakes (financial involvement).

While entrepreneurs can select who they work with (Forbes et al. 2006) and often develop close relationships (and friendships) with the venture founding teams, to our knowledge, no study has looked into financial involvement and *loneliness* of business owners.

### **Opportunity (no expected sign) and necessity (expected sign is negative)**

The relationship between opportunity-driven/necessity-driven entrepreneurship and entrepreneurs' *health* has been studied in the past (Binder and Coad 2013; Van der Zwan et al. 2016). Research has found that opportunity-driven entrepreneurs have a better perceived health compared to necessity-driven entrepreneurs (Binder and Coad 2013). Recently, Nikolova (2019) found that opportunity-driven entrepreneurship has positive effects on both mental and physical health. Zbierowski, Brzozowska, and Gojny-Zbierowska (2019) found that opportunity-driven immigrant entrepreneurs' have a higher level of well-being and life satisfaction compared to necessity-driven immigrant entrepreneurs.

To our knowledge, the relationship between opportunity-driven/necessity-driven entrepreneurship and entrepreneur's *sleep quality* has not been studied, with recent research calling for empirical investigation in this area (Gunia 2018).

Recently, research on opportunity-driven entrepreneurs and necessity-driven entrepreneurs found that both groups suffer from *burnout* but that opportunity-driven entrepreneurs are less impacted (Torrès et al. 2022a).

To our knowledge, there are no studies that investigated the relationship between opportunity-driven/necessity-driven entrepreneurs and their sense of *loneliness*. However, in her review article on entrepreneurship and mental health, Stephan (2018) reported that opportunity-driven entrepreneurship experience higher autonomy compared to necessity-driven entrepreneurship. Thus, we could conjecture that opportunity-driven entrepreneurs may suffer from higher isolation and loneliness as compared to necessity-driven entrepreneurs.

### **Number of employees (expected sign is negative)**

Studies on the relationship between the number of employees of entrepreneurs and their *mental and physical health* indicate mixed results. Nikolova (2019) found no significant differences in physical or mental health outcomes between solo entrepreneurs and entrepreneurs with employees. On the other hand, Fors Connolly, Johansson Sevä, and Gärling (2021) found that business size has a negative relationship with subjective well-being.

Research indicates that small business owners report more *sleep disorders* compared to entrepreneurs working alone (Godin, Desmarez, and Mahieu 2017).

To our knowledge, there are no studies that investigate the association between the number of employees (size of the company) and entrepreneurial *burnout*. An exception is Torrès et al. (2022a) which found a positive association in their main analysis but failed to replicate it in a second analysis. However, some studies show the link between the size of the company and stress. For example, it has

been found that entrepreneurs with employees need to respond to higher job demands which lead to increased stress (Hessels, Rietveld, and Van der Zwan 2017).

Small business owners report feeling *lonelier* than those who work with larger teams, or alone (i.e., solo entrepreneurs) (Godin, Desmarez, and Mahieu 2017).

## Data

### Data and surveys

In this section, we present the data collection and the surveys. The surveys and their characteristics are summarized in Table SM1 (Supplementary Material).

### Data design and collection

The survey design and the data collection were produced and conducted by the Observatoire Amarok, a French research institute dedicated to the study of small business owners and their mental and physical health created in 2010. Between 2016 and 2020, five surveys that included technostress measures were conducted. For the current study, we use three of these surveys (i.e. *Enquête CPME 2019*, *Enquête Garance 2020*, *Enquête Nationale COVID-19 2020*) because these surveys contain the same measure for techno-overload (Tarafdar et al. 2007; Ragu-Nathan et al. 2008) and for the well-being outcome variables: physical well-being, mental well-being, sleep quality, burnout, and loneliness. The three surveys were in French, and the data collection was conducted online.

### Surveys and samples

The first and main sample of this study is based on the *Enquête Nationale COVID -19 2020* survey which comprises French small business owners. This sample was collected during the worldwide COVID-19 pandemic and the French general lockdown period (from March 17 to 11 May 2020). The data was collected between April 15 and 21 April 2020. The online survey invitation was sent to 46,220 small business owners who are members of the Chambers of Commerce and Industry (CCI) and the Chamber of Commerce and Handicraft (CMA). The total population behind this survey is about 230,000 companies. 2,899 small business owners responded and participated in the survey ( $n = 2,899$ ). After removing incomplete responses and duplicates, we ended up with 1,900 responses. The survey is mostly composed of business owner-managers, crafts persons, shopkeepers, and sole traders. The main industries represented in this sample are trade, construction, hospitality (including catering) and business services. Most of this sample is composed of small business owners having employees instead of small business owners working alone.

The second data sample is based on the *Enquête Garance 2020* survey. The sample is also composed of French small business owners. The data was collected during the premise of the worldwide COVID-19 pandemic and the start of the French general lockdown. Specifically, the data was collected between February 14 and 27 March 2020. The online survey invitation was sent to nearly 52,000 small business owners. The total population behind this survey is about 270,000 companies. 673 small business owners responded and participated in this survey. We applied the same method as with the *Enquête Nationale COVID-19 2020* and removed incomplete responses and duplicates. Finally, we ended up with 340 responses. This number represents the second sample used in this study ( $n = 340$ ). The sample is mostly composed of crafts persons, business owner-managers and a small proportion of sole traders. The industries represented in this sample are diverse and are mostly clustered around crafts (e.g. hairdressing, plumbing, taxi services, decoration activities). Most of this sample is composed of small business owners working alone but a fair part of the sample is composed of small business owners having employees.

The third and last data sample is based on the *Enquête CPME 2019* survey which also comprises French small business owners. The data was collected before the COVID-19 pandemic between October 17 and 29 November 2019. The online survey invitation was sent to 45,000 companies out of

**Table 1.** Descriptive statistics, correlations and variance inflation factor (VIF) (*Enquête Nationale COVID-19 2020, N = 1,900*).

Variables	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	VIF
(1) Overall well-being	3.19	0.8	1.00	5.40	1.00										1.06
(2) Age	3.57	0.98	1	5	0.06	1.00									1.27
(3) Gender (female)	0.37	0.48	0	1	-0.06	-0.12	1.00								1.10
(4) Education	3.52	1.18	1	5	0.05	-0.04	0.07	1.00							1.06
(5) Entrepreneurship experience	3.36	1.35	1	5	0.00	0.44	-0.15	-0.07	1.00						1.38
(6) Workload	1.57	1.01	1	5	-0.05	0.05	-0.18	0.12	0.11	1.00					1.15
(7) Financial involvement	4.14	1.26	1	5	0.02	0.00	-0.05	-0.04	-0.04	-0.01	1.00				1.07
(8) Opportunity (dummy)	0.77	0.42	0	1	-0.01	-0.13	0.01	0.01	-0.08	-0.01	-0.01	1.00			1.05
(9) Necessity (dummy)	0.33	0.47	0	1	-0.13	0.08	0.02	-0.03	0.03	0.01	0.01	-0.17	1.00		1.06
(10) Number of employees	2.14	1.19	1	6	0.00	0.10	-0.22	0.12	0.31	0.32	-0.22	0.03	-0.06	1.00	1.37
(11) Techno-overload	3.79	1.45	1	7	-0.16	0.05	-0.03	0.07	0.12	0.11	-0.04	0.01	0.04	0.19	1.08

a population of some 250,000. 405 small business owners responded and participated in this survey. We applied the same method as the *Enquête Nationale COVID-19 2020* and the *Enquête Garantie 2020* surveys to remove incomplete responses and duplicates, yielding a final sample of 346 responses. This number represents the third and last sample used in this study ( $n = 346$ ). The sample is mostly composed of business owner-managers, professionals, and executives. The industries represented in this sample are business services, trade, manufacturing, and construction. Most of this sample is composed of small business owners with employees.

We compared five characteristics such as professional status, industries, size (in terms of number of employees), gender and location, among the three samples. They are different in terms of professional status, industries, and size. Gender and location are comparable. All three samples are composed of 30% women and 70% men. Concerning the location, the small business owners of the three samples are in France with some overrepresentation of some departments: five departments for the *Enquête Nationale COVID-19 2020* and thirteen for the *Enquête CPME 2019*. Difference in characteristics broadens the scope of our investigation (Zahra 2007).

## Variables and measurements

In this section, we present the variables, their measurement, and their source.<sup>7</sup> The variables are summarized in Table SM2 (Supplementary Material). Table 1 displays descriptive statistics, correlations, and variance inflation factors (VIFs). The VIFs indicate that multicollinearity does not seem to bias our estimates.

### Dependent variables

Our main dependent variable is a composite well-being index that considers five dimensions of well-being. The five dimensions are:

**Physical well-being:** Physical well-being was adapted from Heyman and Jeffers (1963) and measured based on one item: 'During the last month, would you say that your physical was ...'. A five-point Likert scale was used: 1 'bad', 2 'average', 3 'good', 4 'very good' to 5 'excellent'.

**Mental well-being:** Mental well-being was adapted from Friedsam and Martin (1963) and measured based on one item: 'During the last month, would you say that your mental health was ...'. A 5-point Likert scale was used: 1 'bad', 2 'average', 3 'good', 4 'very good' to 5 'excellent'.

**Sleep quality:** Sleep quality was adapted based on the Pittsburgh Sleep Quality Index (PSQI) from Buysse et al. (1989) and was composed of one item: 'During the last month, would you say that your sleep quality was ...'. A five-point Likert scale was used: 1 'bad', 2 'average', 3 'good', 4 'very good' to 5 'excellent'.

**Burnout:** Burnout was adapted based on the Burnout measure short version (BMS-10) from Malach-Pines (2005) and Lourel, Gueguen, and Mouda (2007). This measure is composed of ten items: 'When you think about your work overall, how often do you feel the following?', 'Tired', 'Disappointed with people', 'Hopeless', 'Trapped', 'Helpless', 'Depressed', 'Physically weak/sickly', 'Worthless/like a failure', 'Difficulties sleeping' and 'I've had it'. A seven-point Likert scale was used for the ten items measure of burnout from 1 'always', 2 'very often', 3 'often', 4 'sometimes', 5 'rarely', 6 'almost never' to 7 'never'.

**Loneliness:** Loneliness was adapted based on Fernet et al. (2016) and was composed of one item 'In the past month, in your job position as a business owner, did you feel ...' with a five-point Likert scale from 1 'very lonely', 2 'somewhat lonely', 3 'neither lonely nor surrounded', 4 'somewhat surrounded' to 5 'very surrounded'.

First, we calculate the mean value of our five well-being measures as an equally-weighted average of the five well-being measures. We reverse the scales of burnout and loneliness so that lower values of the variable always indicate the worst value of well-being. In a second analysis, we use factor analysis to obtain a well-being measure across the five dimensions.

### ***Independent variable***

**Techno-overload:** Techno-overload was captured with the techno-overload measure adapted from the technostress creators by Tarafdar et al. (2007) and Ragu-Nathan et al. (2008). This variable is measured with five items: 'I am forced by this technology to work much faster', 'I am forced by this technology to do more work than I can handle', 'I am forced by this technology to work with very tight time schedules', 'I am forced to change my work habits to adapt to new technologies' and 'I have higher workload because of increased technology complexity'. A seven-point Likert scale was used to measure techno-overload, from 1 'strongly disagree' to 7 'strongly agree'. Our techno-overload variable is calculated as the equally-weighted average of the five items.

### ***Control variables***

We included nine control variables that referred to the small business owners' individual characteristics and the company characteristics of their venture. We did so to mitigate omitted variable bias and to check the credibility of our results by comparing the signs of the effects of the variables with what can be expected based upon the literature.

#### ***Individual characteristics***

**Age:** We captured the age of small business owners with the item 'What is your age?' and the following categorical scale: 1 '30 years old and less', 2 '30 to 39 years old', 3 '40 to 49 years old', 4 '50 to 59 years old' to 5 '60 years old or more'.

**Gender:** We captured the gender of the small business owners with the item 'Are you female or male?' and the following categorical scale: 1 'female' and 0 'male'.

**Education:** We captured the education level of the small business owners with the item 'What is your highest level of education?' and the following categorical scale: 1 'none/self-taught', 2 'professional studies certificate', 3 'baccalaureate', 4 'undergraduate degrees' and 5 'postgraduate degree or higher'.

**Entrepreneurship experience:** We captured the entrepreneurship experience of the small business owners via the business ownership duration in terms of years and with the item 'How long have you been an entrepreneur and/or business owner?' and the following categorical scale from 1 '< 3 years', 2 '3 < 5 years', 3 '5 < 10 years', 4 '10 < 20 years' to 5 '≥ 20 years'.

**Workload:** We captured the workload of the small business owners in terms of hours per week with the item 'How many hours did you work in the previous week?' and the following categorical scale from 1 '< 40 h', 2 '40 < 50 h', 3 '50 < 60 h', 4 '60 < 70 h' to 5 '≥ 70 h'.

**Financial involvement:** We captured the financial involvement of the small business owners in the current company in terms of the company's capital percentage with the item 'What percentage of the company's capital do you own?' Possible responses ranged from 0% to 100%.

**Opportunity and Necessity:** We captured the small business owner's company's starting point and if he/she is an entrepreneur by opportunity or by necessity with the items 'Did you found your business because you wanted to seize an opportunity or because you had no other choice?'. This item is adapted from the Global Entrepreneurship Monitor (Reynolds et al. 2002). We developed two scales: the following categorical scale for opportunity: 1 'seize an opportunity' and 0 'otherwise'. For necessity the following categorical scale was: 1 'no choice without' and 0 'otherwise'.

#### ***Company characteristics***

**Employees:** We captured the number of employees in the small business owners' company with the item 'What is your company's workforce, including yourself?' and the following categorical scale from 1 '0 employees', 2 '1 < 5 employees', 3 '5 < 10 employees', 4 '10 < 20 employees', 5 '20 < 50 employees', 6 '≥ 50 employees'.

## Methods and results

To quantitatively analyse the effect of techno-overload on well-being outcomes, we perform multiple OLS regressions. The well-being outcomes serve as our dependent variables. We employ techno-overload as our main independent variable and a variety of control variables which we include to account for confounding factors that could be associated with well-being outcomes.

Our first set of regressions uses the mean value of our five well-being measures; (1) physical well-being, (2) mental well-being, (3) sleep quality, (4) burnout, and (5) loneliness. The results are displayed in Model (2) of Table 2. Consistent with our main analysis, the results show a pronounced negative association between techno-overload and overall well-being (coefficient  $-0.085$ ,  $p < .01$ ).

Second, we perform a factor analysis on the five well-being measures to obtain a composite well-being measure as an alternative, more sophisticated way of building a composite well-being measure. Factor analysis is useful to identify internally consistent factors that underlie the individual well-being items. We perform a factor analysis using Stata's factor command in combination with varimax rotation. The Kaiser – Meyer–Olkin measure (KMO = 0.75) and the Bartlett test of sphericity (Chi-square 2,639.45,  $p < .01$ ) indicate that the dataset is appropriate for factor analysis. The results indicate a one-factor solution according to the Eigenvalue criterion (e.g. Block et al. 2015) with an internal consistency (Cronbach's alpha) of 0.74. This indicates that the five measures are based on a single dimension that represents overall well-being. We then use Stata's predict command to obtain the factor scores for each individual. These factor scores serve as the dependent variable in an additional analysis, which is displayed in Model (4) of Table 2. The results are similar to Model (2) and highlight the profound negative effect of techno-overload on small-business owners' overall health.

Moreover, comparing Model (1) and (2), and Model (3) and (4) we note that the coefficients of the controls remain similar when techno-overload is taken out of the regression and that adding techno-overload substantially increases the R2. Finally, we note that the signs of the coefficients of the controls are never at odds with what is expected.<sup>8</sup>

**Table 2.** Effect of techno-overload on a composite measure of overall well-being (*Enquête nationale COVID-19 2020*).

Model	(1)		(2)		(3)		(4)	
Dependent variable	Well-being (mean)		Well-being (mean)		Well-being (factor)		Well-being (factor)	
<i>Individual characteristics</i>								
Age	0.063	[0.021]***	0.064	[0.020]***	0.077	[0.023]***	0.078	[0.023]***
Gender (female)	-0.107	[0.039]***	-0.102	[0.039]***	-0.178	[0.043]***	-0.172	[0.043]***
Education	0.039	[0.016]**	0.044	[0.015]***	0.051	[0.017]***	0.057	[0.017]***
Entrepreneurship experience	-0.013	[0.016]	-0.006	[0.015]	-0.018	[0.017]	-0.012	[0.017]
Workload	-0.051	[0.019]***	-0.044	[0.019]**	-0.062	[0.021]***	-0.056	[0.021]***
Financial involvement	0.008	[0.015]	0.008	[0.015]	0.008	[0.016]	0.008	[0.016]
Opportunity (dummy)	-0.044	[0.044]	-0.039	[0.043]	-0.066	[0.049]	-0.061	[0.048]
Necessity (dummy)	-0.235	[0.039]***	-0.221	[0.039]***	-0.208	[0.043]***	-0.193	[0.043]***
<i>Company characteristics</i>								
Number of employees	-0.007	[0.018]	0.009	[0.017]	-0.045	[0.019]**	-0.029	[0.019]
<i>Independent variable</i>								
Techno-overload			-0.085	[0.013]***			-0.087	[0.014]***
Obs.	1,900		1,900		1,900		1,900	
R2	0.033		0.056		0.036		0.056	
R2 (adj.)	0.028		0.051		0.032		0.051	

Notes: Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

We replicate our main results displayed in Table 2 using data from the *Enquête Garance 2020* and from the *Enquête CPME 2019*. The results are displayed in Tables 3 and 4, respectively. The results confirm the results of our main analysis regarding the effect of techno-overload on composite well-being. That is, techno-overload is negatively associated with well-being (coefficient  $-.168/-.175$ ,  $p < .01$ ) for the *Enquête Garance 2020* and (coefficient  $-.149/-.187$ ,  $p < .01$ ) for the *Enquête CPME 2019*. And again, we note that the coefficients remain similar when techno-overload is taken out of the regression and that adding techno-overload substantially increases the R2. Finally, we note that the signs of the coefficients of the controls are never at odds with what is expected (see section Expected influence of the controls).

## Discussion

The development and implementation of Information and Communication Technologies (ICT), including Digital Technologies (DT), are beneficial to the productivity, efficiency and innovation of both organizations and individuals. However, ICT and DT may also produce harmful effects on

**Table 3.** Effect of techno-overload on a composite measure of overall well-being (*Enquête Garance 2020*).

Model	(1)		(2)		(3)		(4)	
Dependent variable	Well-being (mean)		Well-being (mean)		Well-being (factor)		Well-being (factor)	
<i>Individual characteristics</i>								
Age	0.096	[0.067]	0.093	[0.063]	0.090	[0.070]	0.087	[0.066]
Gender (female)	-0.215	[0.114]*	-0.184	[0.107]*	-0.244	[0.119]**	-0.212	[0.112]*
Education	0.047	[0.047]	0.080	[0.045]*	0.062	[0.049]	0.096	[0.047]**
Entrepreneurship experience	0.068	[0.059]	0.080	[0.056]	0.082	[0.062]	0.095	[0.058]
Workload	-0.125	[0.042]***	-0.061	[0.040]	-0.118	[0.043]***	-0.052	[0.042]
Financial involvement	-0.011	[0.035]	-0.014	[0.033]	-0.004	[0.037]	-0.008	[0.034]
Opportunity (dummy)	0.183	[0.113]	0.155	[0.106]	0.178	[0.117]	0.149	[0.110]
Necessity (dummy)	-0.328	[0.101]***	-0.299	[0.095]***	-0.356	[0.105]***	-0.325	[0.099]***
<i>Company characteristics</i>								
Number of employees	-0.022	[0.044]	0.048	[0.043]	-0.033	[0.046]	0.039	[0.045]
<i>Independent variable</i>								
Techno-overload			-0.168	[0.025]***			-0.175	[0.026]***
Obs.	340		340		340		340	
R2	0.091		0.198		0.091		0.198	
R2 (adj.)	0.066		0.173		0.066		0.174	

Notes: Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 4.** Effect of techno-overload on a composite measure of overall well-being (*Enquête CPME 2019*).

Model	(1)		(2)		(3)		(4)	
Dependent variable	Well-being (mean)		Well-being (mean)		Well-being (factor)		Well-being (factor)	
<i>Individual characteristics</i>								
Age	0.081	[0.049]*	0.067	[0.047]	0.113	[0.059]*	0.096	[0.056]*
Gender (female)	-0.155	[0.084]*	-0.136	[0.081]*	-0.198	[0.102]*	-0.175	[0.097]*
Education	0.058	[0.039]	0.050	[0.038]	0.069	[0.048]	0.059	[0.045]
Entrepreneurship experience	0.032	[0.034]	0.055	[0.033]	0.036	[0.042]	0.065	[0.040]
Workload	-0.149	[0.036]***	-0.101	[0.036]***	-0.183	[0.044]***	-0.122	[0.043]***
Financial involvement	0.017	[0.029]	0.003	[0.028]	0.024	[0.035]	0.007	[0.034]
Opportunity (dummy)	0.052	[0.111]	0.117	[0.107]	0.081	[0.134]	0.162	[0.129]
Necessity (dummy)	-0.274	[0.084]***	-0.233	[0.081]***	-0.335	[0.102]***	-0.284	[0.097]***
<i>Company characteristics</i>								
Number of employees	-0.022	[0.028]	-0.018	[0.027]	-0.036	[0.034]	-0.031	[0.032]
<i>Independent variable</i>								
Techno-overload			-0.149	[0.026]***			-0.187	[0.032]***
Obs.	346		346		346		346	
R2	0.110		0.188		0.119		0.201	
R2 (adj.)	0.087		0.164		0.095		0.177	

Notes: Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



individuals, such as technostress or digital stress. Below we simply refer to ICT and technostress as much as possible.

While recent literature has started to investigate the consequences of excessive ICT usage on work, well-being and health of employees and managers, small business owners as a population have been left out from such investigation. This is an obvious shortcoming given the important role of owners for their small businesses and the role of small businesses in the economy.

Knowledge about the virtues of ICT in the world of small businesses – for example, easier interaction between actors and the speeding up of innovative activities – remains incomplete unless its negative effects on the well-being of business owners are also investigated and well understood. Since techno-overload is a prime dimension of technostress, the current study aims to investigate the effect of this techno-overload dimension on a composite (overall) measure of well-being (consisting of five dimensions: physical well-being, mental well-being, sleep quality, burnout, and loneliness) using three surveys of French small business owners.

Mindful of the recent call in the literature to adopt an inter-disciplinary approach for investigating the consequences of ICT usage (Tarafdar and Davison 2018; Tarafdar, Cooper, and Stich 2019), we do not anchor our study on one literature; instead, we discuss what our findings mean in the fields of information systems, small business owners and entrepreneurship, health and well-being, psychology and organization.

Our results show that there is a strong negative correlation between techno-overload and well-being for the three data sets (see the Supplementary Material for similar results for all five underlying dimensions). The negative correlation is established in an analysis using nine controls for which the coefficients are largely in line with the expectations based upon the literature. Lastly, we find that the coefficients of the controls are hardly influenced by the inclusion of techno-stress (see Tables 2 through 4) and that this inclusion contributes to a sizable increase of the R2.

Taken together, we have strong evidence that, indeed, techno-stress is detrimental to the well-being of small business owners. Below we discuss our findings with respect to several literatures in the fields of information systems, small business owners and entrepreneurship, health and well-being, psychology and organization; additionally, we discuss our findings with respect to the role of context. Given the subject of the present paper, links with the small business and entrepreneurship literature are also central in our discussion of the other fields.

*First*, in the information systems field, technology use – after reaching a certain level (over-usage) - can create an overload and hence has negative consequences for individuals (Karr-Wisniewski and Lu 2010; Lee, Son, and Kim 2016). The Transactional model of stress and coping (Lazarus and Folkman 1984) is the dominant framework to understand techno-overload and its outcomes in the technostress studies of the information systems field. In fact, this model was adapted to the technostress literature and allows researchers to study the phenomenon of stress and the outcome on individuals (Ragu-Nathan et al. 2008). It is originally composed of four elements: stressors (events or demands), the strain (outcomes of stress), the situational factors (mechanisms which reduce stress) and other organizational outcomes (Ragu-Nathan et al. 2008). In our study, we focus on two elements: stressors (events or demands) and strain (outcomes of stress). Our results demonstrate that techno-overload (demands) represents an excess challenge (outcomes of stress) from ICT and DT ‘over-usage’ which can be detrimental to the well-being of small business owners. This finding is entirely in line with the Transactional model of stress and coping. Based on this model, recent studies have suggested to use situational factors or individual factors (mechanisms which reduce stress) such as technostress inhibitors, coping strategies (Salazar-Concha et al. 2021) and personality traits (Khedhaouria and Cucchi 2019) to diminish the impacts of technostress. However, because small business owners have a limited number of employees and/or departments, we suggest that researchers who study the relationships between technostress and well-being, focus on the individual factors such as the personality traits or the coping strategies such as problem-focused or proactive coping styles, specifically when studying mental well-being (Stephan 2018). Our study infers that the level of technology overload may have been lower during the COVID-19 pandemic. Therefore, small business

owners must have applied coping strategies to reduce the effect of technology overload and its impacts on their well-being. With the lockdown measures, ICT may have allowed small business owners to communicate with their employees in remote work configurations. Also, ICT may have reduced uncertainty and may have presented a solution against the negative effects of the 'impediment exhaustion' of entrepreneurs induced by the lockdown measures (Torrès et al. 2021a).

*Second*, research on health and well-being has been an important research issue in the small business and entrepreneurship literature in recent years (Stephan 2018; Torrès and Thurik 2019). Knowledge of what increases and hinders entrepreneurs' sense of well-being is crucial since entrepreneurs 'energize positive change in the society' (Wiklund et al. 2019, 580) by providing innovation (both social and commercial) that may also lead to social well-being. In fact, entrepreneurship scholars suggest that the definition of entrepreneurial success should be broadened to include entrepreneur's well-being (along with financial output) (Baron, Franklin, and Hmieleski 2016). Well-being in entrepreneurs can also boost their psychological resources like optimism and resilience, which allows them to persist with challenging tasks, thus creating positive change at an individual, business and societal level (Stephan 2018; Wiklund et al. 2019). The role of entrepreneurs in economic diversity and in fostering resilience of macro-level entities like cities and regions is also immense (Korber and McNaughton 2018). Our study contributes to the small business and entrepreneurship literature by showing how technostress due to excessive ICT usage can negatively affect small business owners' well-being. Hence, our results are important in the context of the digital transformation and the increased use of ICT in small business by small business owners (Audretsch and Belitski 2021; Belitski et al. 2022). This knowledge has implications for planning pre-emptive interventions for small business owners, as well as for policy makers.

*Third*, in terms of the health and well-being literature, we interpret our results through the lens of the distinction between salutogenic and pathogenic views (Torrès and Thurik 2019). The pathogenic view focuses on negative effects of work on health such as work family conflict, financial issues and work overload created by ICT and DT 'over-usage'. The salutogenic view of health or salutogenesis has been advanced by Antonovsky (1979, 1987). This theory is an invitation to move away from the negative factors of health and well-being such as stress and to focus on its positive factors such as job satisfaction, sense of coherence, happiness. Salutogenic factors focus on the resources and capabilities of individuals which allow them to stay in good health (Antonovsky 1987). The paradigm of salutogenesis is oriented towards the health gains in opposition to the risks due to illness (Becker, Glascoff, and Felts 2010). This new conception of health is based on the intersections of psychology of health and positive psychology. It also contributes to the new orientation of public health policies which focused on the promotion of good health and less on the prevention of illness' risks (Becker, Glascoff, and Felts 2010). ICT and DT can be a source of well-being for individuals and their business if they are used in the right way. They allow small business owners to resolve issues and could be essential resources for their business. But in our paper, we clearly show that there is also pathogenic side. However, one of the salutogenic resources which could balance the pathogenic effect of technostress, in particular technology overload, could be through the so-called daily recovery experiences (Torrès, Soenen, and Thurik 2022c). Recovery is a way to avoid the negative effect of work overload on the well-being of small business owners (Wach et al. 2021; Torrès, Guilian, and Thurik 2022b). Of the four dimensions of daily recovery experiences, such as detachment, mastery, relaxation and control (Sonnetag and Fritz 2007), relaxation leads to enhanced well-being while control reduces burnout risk of small business owners (Torrès, Soenen, and Thurik 2022c). Although our study focused on the pathogenic side, salutogenic resources like daily recovery experiences should be included as moderators in future research.

*Fourth*, our findings speak to the self-determination theory in psychology by confirming the link between the sense of agency and individual well-being (Ryan, Curren, and Deci 2013). Our results show a negative association between necessity entrepreneurship and well-being. This finding is in line with the self-determination theory according to which a lack of self-directedness (viz., not being able to choose) has a negative effect on one's psychological wellbeing (Ryan, Curren, and Deci 2013).

In the entrepreneurship literature, necessity entrepreneurship has been referred to as precarious entrepreneurship (Fayolle and Nakara 2012), a more constrained type of entrepreneurship resulting from the danger of unemployment, which is potentially pathogenic for the entrepreneur. A recent empirical study (Torrès et al. 2021b) found a negative association between necessity entrepreneurship and well-being outcomes, but no link between opportunity entrepreneurship and well-being outcomes of entrepreneurs. Our results validate the findings of this recent study.

*Fifth*, our work fits the framework of the Jobs Demand Resources (JD-R) model which plays a considerable role in the organization studies literature. Recent recommendation in the ICT literature claims that the JD-R model is an effective model to make sense of the dark side of digital technologies (Marsh, Vallejos, and Spence 2022). While the JD-R approach started with burnout as the focal 'dependent' phenomenon (Demerouti et al. 2001), we extend it to with our composite (overall) measure of well-being and show the similarities between them in their link with techno-stress. Also, we show that workload and company size (in terms of the number of employees) can play the role of job demand, while age and education can play the role of job resource. We identify a new job demand phenomenon: to have started a company out of necessity. This phenomenon is specific for business owners but can easily be extended to employees.

*Finally*, our work also contributes to knowledge about the effect of specific contexts on the relationship between ICT and well-being. By doing so, we believe our work may achieve greater rigour and relevance (Zahra 2007).<sup>9</sup> For instance, we show that the size of the negative relation between techno-overload and well-being is bigger using the *Enquête Garantie* and the *CPME* surveys than the *Enquête Nationale COVID-19 2020*. It is tempting to conclude that the effect of techno-overload went down during the pandemic (compared to before the pandemic). We speculate that this could be because during the pandemic, ICT allowed many small business owners to continue their business activities and avoid the risk of potential bankruptcy (Torrès et al. 2022a). Thus, during this crisis, more and more small business owners may have embraced the path of digital entrepreneurship by adopting and using ICT in their business activities (Elia, Margherita, and Passiante 2020), which allowed them to cope with this crisis and its consequences (Eggers 2020). This effect may have compensated the negative effect of dependence and excessive usage of ICT and hence more techno-overload. Moreover, we observed that our set of controls which include both individual as well as company characteristics, have similar links to the well-being outcomes among the three data sets. This finding would lead to the observation that a business profile does not mediate the above contextual effect.

France was the first country in the world to identify the negative effects of ICT (in particular technostress) and has passed the El Khomri Law which recognizes employees' 'right to disconnect' (Légifrance 2016). According to French Labour Code, companies with more than 50 employees must adopt a collective agreement for this right to disconnect (Légifrance 2020). The right to disconnect allows an employee (including managers) not to be connected to work through the digital tools related to her work (emails, mobile phone, etc.) outside of working hours. This right to disconnect has now been adopted by other countries such as Belgium, Italy and Spain.

The right to disconnect is relevant in work contexts with hierarchy, i.e. traditional work organizations. However, that is not the case for small business owners. Unlike regular salaried workers in traditional work organizations, they have no ties of subordination and enjoy the liberty to autonomously set their own limits on work time, its duration, its intensity, etc.

In a context where a worker enjoys a high degree of autonomy (such as small business owner), creating a right to disconnect is not relevant and effective. A better path would be to develop a 'disconnection awareness' for small business owners through training. Moreover, training courses could make (prospective) small business owners aware of the potential negative repercussions of excessive ICT usage and the need to take breaks in their daily work, to promote digital empowerment and to restrict email reading periods. It is useful to encourage public authorities, employer associations and other professional organizations to pay more attention to the dangers created by ICT for the well-being and health of small business owners.

## Conclusion: limitations, future research dimensions and recommendations

### Limitations

Techno-overload is an important dimension of the technostress creators' scale and our results have confirmed its negative associations with well-being of small business owners before and during the COVID-19 pandemic. However, our choice of one specific technostress dimension (La Torre et al. 2019; Borle et al. 2021) can be seen as a limitation. Other dimensions of technostress are conflicts (e.g. work/home conflicts), invasion of privacy, complexity of ICT, usefulness, technical support, insecurity, social environment (including overload) (Fischer, Reuter, and Riedl 2021). Such dimensions regrouped in the digital stress scale (Fischer, Reuter, and Riedl. 2021) could be useful for future studies, especially on small business owners and their potential associations with health and well-being. Yet another limitation of our study is that we did not measure the level of technology usage. Considering the ongoing digital transformation of companies, it could be useful to measure the level of digital technologies' usage of small business owners, their level of digital stress and its consequences on their health during the different phases of the digital transformation.

In the current study, we used a main and two additional samples to check for the robustness of our main results. However, because our samples were based on cross-sectional design studies, we could not check for the evolution of techno-overload of small business owners over time (Salazar-Concha et al. 2021). Such a design could help to better investigate the coping strategies of small business owners while experiencing various dimensions of technostress over time.

Finally, based on the aim of our study, we performed multiple OLS regressions. However, in the technostress literature, recent studies have adopted the fuzzy-set qualitative comparative analysis (fsQCA) to develop and create specific personality profiles towards technostress perceptions (Khedhaouria and Cucchi 2019; Maier et al. 2021). Also, in the entrepreneurship literature, this type of analysis has been adopted to understand entrepreneurial behaviours (Douglas, Shepherd, and Prentice 2020). Therefore, this specific type of analysis could help identify the role of personality profiles of small business owners on their technostress perceptions, and its consequences on well-being. Other methodologies could also be adopted in future studies, such as the biologically founded and experimental methodologies developed in the technostress studies (Riedl et al. 2012; Hill and Tams 2018) and entrepreneurship well-being studies (Nicolaou, Phan, and Stephan 2021).

### Future research directions and recommendations

The present study has extended our understanding of stress and its consequences for entrepreneurs' health and well-being (Stephan 2018; Torrès and Thurik 2019; Wiklund et al. 2019; Lévesque and Stephan 2020). By investigating new potential sources of stress at work, we have contributed to the literature on stress of entrepreneurs (Newlin 2020; White and Gupta 2020). Future studies could further these investigations considering the limitations and suggestions we provided in the previous section.

Different forms of technostress dimensions have been recently identified in the literature (Tarafdar, Cooper, and Stich 2019; Maier et al. 2021). In fact, two categories have been considered: the challenge technostress dimensions, and the hindrance technostress dimensions (Tarafdar, Cooper, and Stich 2019). First, challenge technostress dimensions represent positive demands which could help individuals to improve their experience and the use of ICT. Second, hindrance technostress dimensions represent negative demands which are detrimental when using ICT (Tarafdar, Cooper, and Stich 2019).

Maier et al. (2021) has identified various challenge technostress dimensions: high workload, complexity of tasks, ICT use to meet deadlines under time pressure, and ICT skills and abilities. It also identifies various hindrance technostress dimensions: ICT breakdowns, ICT use of unclear instructions or inadequate ICT to accomplish work tasks. Since the challenge stress dimensions can help entrepreneurs improve their performance, while the hindrance stress dimensions can

decrease their well-being (Wach et al. 2021), future research could investigate this Challenge-hindrancer stressor framework (LePine, Podsakoff, and LePine 2005).

Even though we did not find significant results for our control variable 'entrepreneurship experience', future research could compare technostress levels among experienced and non-experienced business owners of different age groups (Berg-Beckhoff, Nielsen, and Ladekjær Larsen 2018; Riedl and VanMeter 2020; le Roux and Botha 2021), and try to link it with the literature on difference in stress perception between experienced and nascent entrepreneurs (Xu and Jin 2022).

Recent studies have focused on the recovery (rebuilding mental and physiological resources) of entrepreneurs and small business owners as a way to protect and improve their health and well-being (Wach et al. 2021; Williamson, Gish, and Stephan 2021). Studies in the technostress literature have also pointed to the importance of recovery from technostress experiences (Pfaffinger, Reif, and Spieß 2020). Therefore, future studies could use these recent insights to study technostress and the strategies of recovery among entrepreneurs and small business owners.

Finally, even though small business owners can develop behaviours in favour of ICT security (Barlette and Jaouen 2019), they need more 'cyber awareness' (Renaud and Ophoff 2021) which could help avoiding security issues during their digital transformation. Future studies could focus on the stress induced by ICT security issues.

At the individual level, awareness should be created among small business owners of the pathogenic effects of ICT in combination with recommended practices such as not looking at cell-phones in the evening, not checking emails before going to bed or avoiding working late using ICT. It is also important for them to learn how to disconnect during weekends and holidays. Recovery periods (weekend sleeping hours, holidays) are essential (Wach et al. 2021) and must be protected from digital intrusions. Boundaries between work and personal life must be respected as well. ICT must not interfere between these two domains as it can become an intrusive source of technostress (Tarafdar et al. 2007). Finally, at the organizational level, small business owners may want to set up rules for proper ICT usage for and with their employees. Charters such the 'right to disconnect' are good practices. Small business owners usually tend to respect the rules enforced for their employees. In fact, establishing rules of healthy ICT use at work for employees will naturally create healthy ICT use and self-discipline among small business owners. Moreover, given that ICT induced stress is probably not different from generic stress, mindset training and intervention may prove helpful (Yeager et al. 2022).

## Contributions

RT: setup and coordination, design and writing; AB: literature, data, and writing; ChF: design, calculations, and writing; JM: design and writing; OT: data and writing

## Notes

1. Access to and use of ICT has been growing relentlessly since the start of the 21st century (Feng 2021). In 2021, 63% of the worldwide population had access to the internet and 95% had access to a mobile broadband network (ITU 2021).
2. The terms 'information and communication technologies' and 'digital technologies' are used as synonyms both in the entrepreneurship literature (Autio et al. 2018, 8) as well as in the information systems literature (Fischer, Reuter, and Riedl 2021, 2). We use the term ICT because it is largely used in the literature on technostress even when authors talk about digital technologies.
3. We use the term techno-overload as a synonym for technology overload in the remainder of the current paper.
4. RED refers to resources-experiences-demand model and TIC refers to Tecnologías de la información y comunicación (Salanova, Llorens, and Cifre 2013).
5. We consider health and well-being as a continuum as Stephan (2018) did with mental health and well-being in her review and based on the definition of health of the World Health Organization.
6. An exception may be a recent study on the link between technostress and small business owners' burnout. This study showed that technostress was positively associated with strain (emotional exhaustion) but not with

burnout (Benzari et al. 2022). It may be that results depend largely on the inclusion of ‘negative affectivity’ as a control.

7. The variables and measures used in the three surveys are perceived measures mostly.
8. To investigate whether individual characteristics moderate the effect of techno-overload on well-being, we perform a range of further analysis in which we interact techno-overload with individual characteristics (i.e. whether the individual is a lone founder, age, gender (female), and necessity (dummy)). The results are displayed in Table SM3 (Supplementary Material). The moderation effects are insignificant.
9. Studying various contexts enhances our understanding of the phenomena by delineating boundaries and ‘recognizing contingencies that influences relationships within a given context’ (Zahra 2007, 444).

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## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Document

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## Data sources

available at <https://osf.io/7aqt4/>

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## References

- Akande, A. 1994. “Coping with Entrepreneurial Stress: Evidence from Nigeria.” *Journal of Small Business Management* 32 (1): 83–87.
- Antonovsky, A. 1979. *Health, Stress and Coping, the Jossey-Bass Social and Behavioural Science Series*. San Francisco: Jossey-Bass.
- Antonovsky, A. 1987. *Unraveling the Mystery of Health –How People Manage Stress and Stay Well, the Jossey-Bass Social and Behavioural Science Series*. San Francisco: Jossey-Bass.
- Artz, B., I. Kaya, and O. Kaya. 2022. “Gender Role Perspectives and Job Burnout.” *Review of Economics of the Household* 20 (2): 447–470. doi:10.1007/s11150-021-09579-2.
- Audretsch, D. B., and M. Belitski. 2017. “Entrepreneurial Ecosystems in Cities: Establishing the Framework Conditions.” *The Journal of Technology Transfer* 42 (5): 1030–1051. doi:10.1007/s10961-016-9473-8.
- Audretsch, D. B., and M. Belitski. 2021. “Knowledge Complexity and Firm Performance: Evidence from the European SMEs.” *Journal of Knowledge Management* 25 (4): 693–713. doi:10.1108/JKM-03-2020-0178.
- Autio, E., S. Nambisan, L. D. Thomas, and M. Wright. 2018. “Digital Affordances, Spatial Affordances, and the Genesis of Entrepreneurial Ecosystems.” *Strategic Entrepreneurship Journal* 12 (1): 72–95. doi:10.1002/sej.1266.



- Ayyagari, R., V. Grover, and R. Purvis. 2011. "Technostress: Technological Antecedents and Implications." *MIS Quarterly* 35 (4): 831–858. doi:10.2307/41409963.
- Barlette, Y., and A. Jaouen. 2019. "Information Security in SMEs: Determinants of CEOs' Protective and Supportive Behaviors." *Systèmes d'information & management* 24 (3): 7–40. doi:10.3917/sim.193.0007.
- Baron, R. A., R. J. Franklin, and K. M. Hmieleski. 2016. "Why Entrepreneurs Often Experience Low, Not High, Levels of Stress: The Joint Effects of Selection and Psychological Capital." *Journal of Management* 42 (3): 742–768. doi:10.1177/0149206313495411.
- Barreto, M., C. Victor, C. Hammond, A. Eccles, M. T. Richins, and P. Qualter. 2021. "Loneliness Around the World: Age, Gender, and Cultural Differences in Loneliness." *Personality and Individual Differences* 169: 110066. doi:10.1016/j.paid.2020.110066.
- Bawden, D., and L. Robinson. 2020. "Information Overload: An Overview." In *Oxford Encyclopedia of Political Decision Making*, edited by D. P. Redlawsk, 1–49. Oxford: Oxford University Press. doi:10.1093/acrefore/9780190228637.013.1360.
- Becker, C. M., M. A. Glascoff, and W. M. Felts. 2010. "Salutogenesis 30 Years Later: Where Do We Go from Here?" *The International Electronic Journal of Health Education* 13: 25–32.
- Belitski, M., C. Guenther, A. S. Kritikos, and R. Thurik. 2022. "Economic Effects of the COVID-19 Pandemic on Entrepreneurship and Small Businesses." *Small Business Economics* 58 (2): 593–609. doi:10.1007/s11187-021-00544-y.
- Benzari, A., A. Khedhaouria, O. Torrès, and A. Cucchi. 2022. "The Impact of Technostress on Small Business Owners' Burnout: The Mediating Role of Strain." *International Journal of Entrepreneurship and Small Business*. Forthcoming.
- Berg-Beckhoff, G., G. Nielsen, and E. Ladekjær Larsen. 2018. "Use of Information Communication Technology and Stress, Burnout, and Mental Health in Older, Middle-Aged, and Younger Workers – Results from a Systematic Review." *International Journal of Occupational and Environmental Health* 23 (2): 1–12. doi:10.1080/10773525.2018.1436015.
- Bi, R., R. M. Davison, and K. X. Smyrniotis. 2017. "E-Business and Fast Growth SMEs." *Small Business Economics* 48 (3): 559–576. doi:10.1007/s11187-016-9788-8.
- Binder, M., and A. Coad. 2013. "Life Satisfaction and Self-Employment: A Matching Approach." *Small Business Economics* 40 (4): 1009–1033. doi:10.1007/s11187-011-9413-9.
- Block, J. H., C. O. Fisch, A. Hahn, and P. G. Sandner. 2015. "Why Do SMEs File Trademarks? Insights from Firms in Innovative Industries." *Research Policy* 44 (10): 1915–1930. doi:10.1016/j.respol.2015.06.007.
- Block, J. H., J. M. Millan, A. Moritz, and J. D. Ramos-Poyatos. 2022. "Working Hours, Working Time Flexibility and Stress at Work of Different Types of Entrepreneurs." *Revue de l'Entrepreneuriat* Vol. 21 (HS2): 59–100. Forthcoming. doi:10.3917/entre.hs2.0059.
- Boerma, T., A. R. Hosseinpoor, E. Verdes, and S. Chatterji. 2016. "A Global Assessment of the Gender Gap in Self-Reported Health with Survey Data from 59 Countries." *BMC Public Health* 16 (1): 1–9. doi:10.1186/s12889-016-3352-y.
- Bohlmann, C., A. Rauch, and H. Zacher. 2017. "A Lifespan Perspective on Entrepreneurship: Perceived Opportunities and Skills Explain the Negative Association Between Age and Entrepreneurial Activity." *Frontiers in Psychology* 8: 2015. doi:10.3389/fpsyg.2017.02015.
- Borle, P., K. Reichel, F. Niebuhr, and S. Voelter-Mahlknecht. 2021. "How are Techno-Stressors Associated with Mental Health and Work Outcomes? A Systematic Review of Occupational Exposure to Information and Communication Technologies Within the Technostress Model." *International Journal of Environmental Research and Public Health* 18 (16): 8673. doi:10.3390/ijerph18168673.
- Boyd, D. P., and D. E. Gumpert. 1983. "Coping with Entrepreneurial Stress." *Harvard Business Review* 61 (2): 44–64.
- Brod, C. 1984. *Technostress: The Human Cost of the Computer Revolution*. Reading, Mass: Addison-Wesley.
- Buttner, E. H. 1992. "Entrepreneurial Stress: Is It Hazardous to Your Health?" *Journal of Managerial Issues* 4 (2): 223–240.
- Buysse, D. J., T. H. M. CF Reynolds III, S. R. BermanMonk, and D. J. Kupfer. 1989. "The Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research." *Psychiatry Research* 28 (2): 193–213. doi:10.1016/0165-1781(89)90047-4.
- Califf, C. B., and S. Brooks. 2020. "An Empirical Study of Techno-Stressors, Literacy Facilitation, Burnout, and Turnover Intention as Experienced by K-12 Teachers." *Computers & Education* 157: 103971. doi:10.1016/j.compedu.2020.103971.
- Canazei, M. D., D. Bassa, P. Jimenez, M. Bühner, A. Fink, K. Bauernhofer, S. Luttenberger, et al. 2018. "Gender Differences in Different Dimensions of Common Burnout Symptoms in a Group of Clinical Burnout Patients." *Neuropsychiatry* 8 (6): 1967–1976. doi:10.4172/Neuropsychiatry.1000539.
- Carayon, P., and M. J. Smith. 2014. "The Balance Concept Revisited: Finding Balance to Reduce Stress in a Frantic World of IT." In *The Impact of ICT on Quality of Working Life*, edited by C. Korunka and P. Hoonakker, 105–121. Dordrecht: Springer.
- Cardon, M. S., and P. C. Patel. 2015. "Is Stress Worth It? Stress-related Health and Wealth Trade-offs for Entrepreneurs." *Applied Psychology* 64 (2): 379–420. doi:10.1111/apps.12021.
- Carod-Artal, F. J., and C. Vázquez-Cabrera. 2013. "Burnout Syndrome in an International Setting." In *Burnout for Experts*, edited by S. Bährer-Kohler, 15–35. Boston: Springer.
- Choi, S. B., and M. S. Lim. 2016. "Effects of Social and Technology Overload on Psychological Well-Being in Young South Korean Adults: The Mediator Role of Social Network Service Addiction." *Computers in Human Behavior* 61: 245–254. doi:10.1016/j.chb.2016.03.032.



- Clark, M. A., J. S. Michel, L. Zhdanova, S. Y. Pui, and B. B. Baltes. 2016. "All Work and No Play? A Meta-Analytic Examination of the Correlates and Outcomes of Workaholism." *Journal of Management* 42 (7): 1836–1873. doi:10.1177/0149206314522301.
- Cubbon, L., K. Darga, U. D. Wisnesky, L. Dennett, and C. Guptill. 2021. "Depression Among Entrepreneurs: A Scoping Review." *Small Business Economics* 57 (2): 781–805. doi:10.1007/s11187-020-00382-4.
- Demerouti, E., A. B. Bakker, F. Nachreiner, and W. B. Schaufeli. 2001. "The Job Demands-Resources Model of Burnout." *The Journal of Applied Psychology* 86 (3): 499–512. doi:10.1037/0021-9010.86.3.499.
- Douglas, E. J., D. A. Shepherd, and C. Prentice. 2020. "Using Fuzzy-Set Qualitative Comparative Analysis for a Finer-Grained Understanding of Entrepreneurship." *Journal of Business Venturing* 35 (1): 105970. doi:10.1016/j.jbusvent.2019.105970.
- Edmunds, A., and A. Morris. 2000. "The Problem of Information Overload in Business Organisations: A Review of the Literature." *International Journal of Information Management* 20 (1): 17–28. doi:10.1016/S0268-4012(99)00051-1.
- Eggers, F. 2020. "Masters of Disasters? Challenges and Opportunities for SMEs in Times of Crisis." *Journal of Business Research* 116: 199–208. doi:10.1016/j.jbusres.2020.05.025.
- Elia, G., A. Margherita, and G. Passiante. 2020. "Digital Entrepreneurship Ecosystem: How Digital Technologies and Collective Intelligence are Reshaping the Entrepreneurial Process." *Technological Forecasting and Social Change* 150: 119791. doi:10.1016/j.techfore.2019.119791.
- Fatima, Y., S. A. Doi, J. M. Najman, and A. Al Mamun. 2016. "Exploring Gender Difference in Sleep Quality of Young Adults: Findings from a Large Population Study." *Clinical Medicine & Research* 14 (3–4): 138–144. doi:10.3121/cm.2016.1338.
- Fayolle, A., and W. Nakara. 2012. "Création par nécessité et précarité: la face pathogène de l'entrepreneuriat." In *La santé du Dirigeant*, edited by O. Torrès, 15–27. Louvain-la-Neuve: De Boeck.
- Feng, M. 2021. "The Effects of Techno-Stress in the Role Stress Context Applied on the Proximity Manager Performance: Conceptual Development and Empirical Validation." *Journal of Organizational and End User Computing (JOEUC)* 33 (1): 1–18. doi:10.4018/JOEUC.2021010101.
- Fernet, C., O. Torrès, S. Austin, and J. St-Pierre. 2016. "The Psychological Costs of Owning and Managing an SME: Linking Job Stressors, Occupational Loneliness, Entrepreneurial Orientation, and Burnout." *Burnout Research* 3 (2): 45–53. doi:10.1016/j.burn.2016.03.002.
- Fischer, T., M. Reuter, and R. Riedl. 2021. "The Digital Stressors Scale: Development and Validation of a New Survey Instrument to Measure Digital Stress Perceptions in the Workplace Context." *Frontiers in Psychology* 12: 607598. doi:10.3389/fpsyg.2021.607598.
- Fokkema, T., J. De Jong Gierveld, and P. A. Dykstra. 2012. "Cross-National Differences in Older Adult Loneliness." *The Journal of Psychology* 146 (1–2): 201–228. doi:10.1080/00223980.2011.631612.
- Forbes, D. P., P. S. Borchert, M. E. Zellmer-bruhn, and H. J. Sapienza. 2006. "Entrepreneurial Team Formation: An Exploration of New Member Addition." *Entrepreneurship Theory & Practice* 30 (2): 225–248. doi:10.1111/j.1540-6520.2006.00119.x.
- Fors Connolly, F., I. Johansson Sevä, and T. Gärling. 2021. "The Bigger the Better? Business Size and Small-Business Owners' Subjective Well-Being." *Journal of Happiness Studies* 22 (3): 1071–1088. doi:10.1007/s10902-020-00264-2.
- Friedsam, H. J., and H. W. Martin. 1963. "A Comparison of Self and Physicians' Health Ratings in an Older Population." *Journal of Health and Human Behavior* 4 (3): 179–183. doi:10.2307/2948660.
- Gielnik, M. M., H. Zacher, and M. Frese. 2012. "Journal of Health and Human Behavior." *Journal of Business Venturing* 27 (1): 127–142. doi:10.1016/j.jbusvent.2010.05.002.
- Godin, I., P. Desmarez, and C. Mahieu. 2017. "Company Size, Work-Home Interference, and Well-Being of Self-Employed Entrepreneurs." *Archives of Public Health* 75 (1): 1–9. doi:10.1186/s13690-017-0243-3.
- Grandner, M. A., N. P. Patel, P. R. Gehrman, D. Xie, D. Sha, T. Weaver, and N. Gooneratne. 2010. "Who Gets the Best Sleep? Ethnic and Socioeconomic Factors Related to Sleep Complaints." *Sleep medicine* 11 (5): 470–478. doi:10.1016/j.sleep.2009.10.006.
- Guiliani, F., and O. Torrès. 2018. "Entrepreneurship: An Insomniac Discipline? An Empirical Study on SME Owners/Directors." *International Journal of Entrepreneurship and Small Business* 35 (1): 81–101. doi:10.1504/IJESB.2018.094273.
- Gumpert, D. E., and D. P. Boyd. 1984. "The Loneliness of the Small-Business Owner." *Harvard Business Review* 62 (6): 18–24.
- Gunia, B. C. 2018. "The Sleep Trap: Do Sleep Problems Prompt Entrepreneurial Motives but Undermine Entrepreneurial Means?" *Academy of Management Perspectives* 32 (2): 228–242. doi:10.5465/amp.2016.0159.
- Hang, Y., G. Hussain, A. Amin, and M. I. Abdullah. 2022. "The Moderating Effects of Technostress Inhibitors on Techno-Stressors and Employee's Well-Being." *Frontiers in Psychology* 12: 821446. doi:10.3389/fpsyg.2021.821446.
- Hatak, I., and H. Zhou. 2021. "Health as Human Capital in Entrepreneurship: Individual, Extension, and Substitution Effects on Entrepreneurial Success." *Entrepreneurship Theory & Practice* 45 (1): 18–42. doi:10.1177/1042258719867559.
- Hessels, J., C. A. Rietveld, and P. Van der Zwan. 2017. "Self-Employment and Work-Related Stress: The Mediating Role of Job Control and Job Demand." *Journal of Business Venturing* 32 (2): 178–196. doi:10.1016/j.jbusvent.2016.10.007.
- Heyman, D. K., and F. C. Jeffers. 1963. "Effect of Time Lapse on Consistency of Self-Health and Medical Evaluations of Elderly Persons." *Journal of Gerontology* 18 (2): 160–164. doi:10.1093/geronj/18.2.160.

- Hill, K., and S. Tams. 2018. "Physiological, Psychological, and Behavioral Measures in the Study of is Phenomena: A Theoretical Analysis of Triangulation Strategies." In *Information Systems and Neuroscience*, edited by F. D. Davis, R. Riedl, J. vom Brocke, P. M. Léger, and A. B. Randolph, 101–107. Cham: Springer.
- Hoonakker, P. 2014. "Information and Communication Technology and Quality of Working Life: Backgrounds, Facts, and Figures." In *The Impact of ICT on Quality of Working Life*, edited by C. Korunka and P. Hoonakker, 9–23. Dordrecht: Springer.
- International Labour Organization (ILO). 2019. Safety and Health at the Heart of the Future of Work: Building on 100 Years of Experience. [https://www.ilo.org/global/topics/safety-and-health-at-work/events-training/events-meetings/world-day-for-safety/WCMS\\_686645/lang-en/index.htm](https://www.ilo.org/global/topics/safety-and-health-at-work/events-training/events-meetings/world-day-for-safety/WCMS_686645/lang-en/index.htm)
- International Telecommunication Union (ITU). 2021. Measuring Digital Development: Facts and Figures 2021. <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>
- Joseph-Shehu, E. M., B. P. Ncama, N. Mooi, and T. P. Mashamba-Thompson. 2019. "The Use of Information and Communication Technologies to Promote Healthy Lifestyle Behaviour: A Systematic Scoping Review." *BMJ Open* 9 (10): e029872. doi:10.1136/bmjopen-2019-029872.
- Julien, P. A. 2018. *The State of the Art in Small Business and Entrepreneurship*. London: Routledge.
- Karimikia, H., H. Singh, and D. Joseph. 2021. "Negative Outcomes of ICT Use at Work: Meta-Analytic Evidence and the Role of Job Autonomy." *Internet Research* 31 (1): 159–190. doi:10.1108/INTR-09-2019-0385.
- Karr-Wisniewski, P., and Y. Lu. 2010. "When More is Too Much: Operationalizing Technology Overload and Exploring Its Impact on Knowledge Worker Productivity." *Computers in Human Behavior* 26 (5): 1061–1072. doi:10.1016/j.chb.2010.03.008.
- Khedhaouria, A., and A. Cucchi. 2019. "Technostress Creators, Personality Traits, and Job Burnout: A Fuzzy-Set Configurational Analysis." *Journal of Business Research* 101: 349–361. doi:10.1016/j.jbusres.2019.04.029.
- Kim, H. J., C. C. Lee, H. Yun, and K. S. Im. 2015. "An Examination of Work Exhaustion in the Mobile Enterprise Environment." *Technological Forecasting and Social Change* 100: 255–266. doi:10.1016/j.techfore.2015.07.009.
- Kim, J., J. C. Park, and T. Komarek. 2021. "The Impact of Mobile ICT on National Productivity in Developed and Developing Countries." *Information & Management* 58 (3): 103442. doi:10.1016/j.im.2021.103442.
- Kirch, W. 2008. *Encyclopedia of Public Health: Volume 1: A-H volume 2: I-Z*. Berlin: Springer Science + Business Media.
- Kollmann, T., C. Stöckmann, and J. M. Kensbock. 2019. "I Can't Get No Sleep—the Differential Impact of Entrepreneurial Stressors on Work-Home Interference and Insomnia Among Experienced versus Novice Entrepreneurs." *Journal of Business Venturing* 34 (4): 692–708. doi:10.1016/j.jbusvent.2018.08.001.
- Korber, S. and R. B. McNaughton. 2018. "Resilience and Entrepreneurship: A Systematic Literature Review." *International Journal of Entrepreneurial Behavior & Research* 24 (7): 1129–1154. doi:10.1108/IJEBR-10-2016-0356.
- LaRose, R., R. Connolly, H. Lee, K. Li, and K. D. Hales. 2014. "Connection Overload? A Cross Cultural Study of the Consequences of Social Media Connection." *Information Systems Management* 31 (1): 59–73. doi:10.1080/10580530.2014.854097.
- Laspinas, M. L. 2015. "Technostress: Trends and Challenges in the 21<sup>st</sup> Century Knowledge Management." *European Scientific Journal* 11 (2): 1857–7881. <https://eujournal.org/index.php/esj/article/view/4970>.
- La Torre, G., A. Esposito, I. Sciarra, and M. Chiappetta. 2019. "Definition, Symptoms and Risk of Techno-Stress: A Systematic Review." *International Archives of Occupational and Environmental Health* 92 (1): 13–35. doi:10.1007/s00420-018-1352-1.
- Lazarus, R. S., and S. Folkman. 1984. *Stress, Appraisal, and Coping*. New York: Springer publishing company.
- Lechat, T., and O. Torrès. 2016. "Exploring Negative Affect in Entrepreneurial Activity: Effects on Emotional Stress and Contribution to Burnout." In *Emotions and Organizational Governance*, edited by N. M. Ashkanasy, C. E. J. Härtel, and W. J. Zerbe, 69–99. Bingley: Emerald Group Publishing Limited.
- Lechat, T., and O. Torrès. 2017. "Stressors and Satisfactors in Entrepreneurial Activity: An Event-Based, Mixed Methods Study Predicting Small Business Owners' Health." *International Journal of Entrepreneurship and Small Business* 32 (4): 537–569. doi:10.1504/IJESB.2017.087838.
- Lee, A. R., S. M. Son, and K. K. Kim. 2016. "Information and Communication Technology Overload and Social Networking Service Fatigue: A Stress Perspective." *Computers in Human Behavior* 55: 51–61. doi:10.1016/j.chb.2015.08.011.
- Légifrance. 2016. LOI N° 2016-1088 du 8 Août 2016 Relative au Travail, à la Modernisation du Dialogue Social et à La Sécurisation des Parcours Professionnels. [Law n° 2016-1088 of 8 August 2016 on Work, on the Modernization of Social Dialogue and on the Securing of Career Paths]. <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000032983213/>
- Légifrance. 2020. Article L2242-17 of the Labour Code. [https://www.legifrance.gouv.fr/codes/article\\_lc/LEGIARTI000039785096/](https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000039785096/)
- LePine, J. A., N. P. Podsakoff, and M. A. LePine. 2005. "A Meta-Analytic Test of the Challenge Stressor–Hindrance Stressor Framework: An Explanation for Inconsistent Relationships Among Stressors and Performance." *Academy of Management Journal* 48 (5): 764–775. doi:10.5465/amj.2005.18803921.
- le Roux, D. J., and P. A. Botha. 2021. "Investigating the Impact of Technostress on Productivity and Overall Life Satisfaction of Managers Working at a South African Ferrochrome Smelting Company." *SA Journal of Human Resource Management* 19: a1649. doi:10.4102/sajhrm.v19i0.1649.

- Lévesque, M., and U. Stephan. 2020. "It's Time We Talk About Time in Entrepreneurship." *Entrepreneurship Theory & Practice* 44 (2): 163–184. doi:10.1177/1042258719839711.
- Lewis, D. 1996. *Dying for Information?*. London: Reuters Business Information.
- Lin, K. H., C. C. Wu, T. S. Chu, T. S. Huang, and Y. Y. Chen. 2020. "Employer or Employee: Who is More Likely to Suffer from Burnout?" *Journal of Occupational and Environmental Medicine* 62 (4): e154–159. doi:10.1097/JOM.0000000000001825.
- Lourel, M., N. Gueguen, and F. Mouda. 2007. "L'évaluation du Burnout de Pines: Adaptation Et Validation En Version Française de L'instrument Burnout Measure Short Version (BMS-10) [The Burnout Assessment of Pines: A French Adaptation and Validation of the "Burnout Measure Short Version" (BMS-10)]." *Pratiques Psychologiques* 13 (3): 353–364. doi:10.1016/j.prps.2007.06.001.
- Maier, C., S. Laumer, M. Tarafdar, J. Mattke, L. Reis, and T. Weitzel. 2021. "Challenge and Hindrance is Use Stressors and Appraisals: Explaining Contrarian Associations in Post-Acceptance is Use Behavior." *Journal of the Association for Information Systems* 22 (6): 1590–1624. doi:10.17705/1jais.00709.
- Maier, C., S. Laumer, J. Wirth, and T. Weitzel. 2019. "Technostress and the Hierarchical Levels of Personality: A Two-Wave Study with Multiple Data Samples." *European Journal of Information Systems* 28 (5): 496–522. doi:10.1080/0960085X.2019.1614739.
- Malach-Pines, A. 2005. "The Burnout Measure, Short Version." *International Journal of Stress Management* 12 (1): 78–88. doi:10.1037/1072-5245.12.1.78.
- Manzano-García, G., J. C. Ayala-Calvo, and P. Desrumaux. 2021. "Entrepreneurs' Capacity for Mentalizing: Its Influence on Burnout Syndrome." *International Journal of Environmental Research and Public Health* 18 (1): 3. doi:10.3390/ijerph18010003.
- Marchesnay, M., and P. A. Julien. 1990. "The Small Business: As a Transaction Space." *Entrepreneurship & Regional Development* 2 (3): 267–278. doi:10.1080/08985629000000017.
- Marsh, E., E. P. Vallejos, and A. Spence. 2022. "The Digital Workplace and Its Dark Side: An Integrative Review." *Computers in Human Behavior* 128: 107118. doi:10.1016/j.chb.2021.107118.
- Maslach, C., S. E. Jackson, and M. P. Leiter. 1996. *MBI: Maslach Burnout Inventory*. Palo Alto: Consulting Psychologists Press.
- Matthes, J., K. Karsay, D. Schmuck, and A. Stevic. 2020. "'Too Much to Handle': Impact of Mobile Social Networking Sites on Information Overload, Depressive Symptoms, and Well-Being." *Computers in Human Behavior* 105: 106217. doi:10.1016/j.chb.2019.106217.
- Miličević-Kalašić, A. 2013. "Burnout Examination." In *Burnout for Experts*, edited by S. Bährer-Kohler, 169–183. Boston: Springer.
- Newlin, A. M. B. 2020. "More Specific Than "Small": Identifying Key Factors to Account for the Heterogeneity in Stress Findings Among Small Businesses." In *Entrepreneurial and Small Business Stressors, Experienced Stress, and Well-Being*, edited by P. L. Perrewé, P. D. Harms, and C. H. Chang, 95–122. Bingley: Emerald Publishing Limited.
- Nicolaou, N., P. H. Phan, and U. Stephan. 2021. "The Biological Perspective in Entrepreneurship Research." *Entrepreneurship Theory & Practice* 45 (1): 3–17. doi:10.1177/1042258720967314.
- Nikolova, M. 2019. "Switching to Self-Employment Can Be Good for Your Health." *Journal of Business Venturing* 34 (4): 664–691. doi:10.1016/j.jbusvent.2018.09.001.
- Norlund, S., C. Reuterwall, J. Höög, B. Lindahl, U. Janlert, and L. S. Birgander. 2010. "Burnout, Working Conditions and Gender-Results from the Northern Sweden MONICA Study." *BMC Public Health* 10 (1): 1–9. doi:10.1186/1471-2458-10-326.
- Nuallaong, W. 2013. "Burnout Symptoms and Cycles of Burnout: The Comparison with Psychiatric Disorders and Aspects of Approaches." In *Burnout for Experts*, edited by S. Bährer-Kohler, 47–72. Boston: Springer.
- Omrane, A., A. Kammoun, and C. Seaman. 2019. "Entrepreneurial Burnout: Causes, Consequences and Way Out." *FIB Business Review* 7 (1): 28–42. doi:10.1177/2319714518767805.
- Organisation for Economic Co-operation and Development (OECD). 2017. Enhancing the contributions of SMEs in a global and digitalised economy. <https://www.oecd.org/industry/C-MIN-2017-8-EN.pdf>
- Organisation for Economic Co-operation and Development (OECD). 2019. Going Digital Shaping Policies, Improving Lives. [https://www.oecd-ilibrary.org/science-and-technology/going-digital-shaping-policies-improving-lives\\_9789264312012-en](https://www.oecd-ilibrary.org/science-and-technology/going-digital-shaping-policies-improving-lives_9789264312012-en)
- Park, J., B. Han, and Y. Kim. 2020. "Comparison of Occupational Health Problems of Employees and Self-Employed Individuals Who Work in Different Fields." *Archives of Environmental & Occupational Health* 75 (2): 98–111. doi:10.1080/19338244.2019.1577209.
- Patzelt, H., and D. A. Shepherd. 2011. "Negative Emotions of an Entrepreneurial Career: Self-Employment and Regulatory Coping Behaviors." *Journal of Business Venturing* 26 (2): 226–238. doi:10.1016/j.jbusvent.2009.08.002.
- Pfaffinger, K. F., J. A. Reif, and E. Spieß. 2020. "When and Why Telepressure and Technostress Creators Impair Employee Well-Being." *International Journal of Occupational Safety and Ergonomics* 28 (2): 1–16. doi:10.1080/10803548.2020.1846376.
- Purvanova, R. K., and J. P. Muros. 2010. "Gender Differences in Burnout: A Meta-Analysis." *Journal of Vocational Behavior* 77 (2): 168–185. doi:10.1016/j.jvb.2010.04.006.

- Raghupathi, V., and W. Raghupathi. 2020. "The Influence of Education on Health: An Empirical Assessment of OECD Countries for the Period 1995–2015." *Archives of Public Health* 78 (1): 1–18. doi:10.1186/s13690-020-00402-5.
- Ragu-Nathan, T. S., M. Tarafdar, B. S. Ragu-Nathan, and Q. Tu. 2008. "The Consequences of Technostress for End Users in Organizations: Conceptual Development and Empirical Validation." *Information Systems Research* 19 (4): 417–433. doi:10.1287/isre.1070.0165.
- Reinecke, L., S. Aufenanger, M. E. Beutel, M. Dreier, O. Quiring, B. Stark, K. Wöfling, and K. W. Müller. 2017. "Digital Stress Over the Life Span: The Effects of Communication Load and Internet Multitasking on Perceived Stress and Psychological Health Impairments in a German Probability Sample." *Media psychology* 20 (1): 90–115. doi:10.1080/15213269.2015.1121832.
- Renaud, K., and J. Ophoff. 2021. "A Cyber Situational Awareness Model to Predict the Implementation of Cyber Security Controls and Precautions by SMEs." *Organizational Cybersecurity Journal: Practice, Process and People* 1 (1): 24–46. doi:10.1108/OJ-03-2021-0004.
- Reynolds, P. D., S. M. Camp, W. D. Bygrave, E. Autio, and M. Hay. 2002. *Global Entrepreneurship Monitor GEM 2001 Summary Report*. London: London Business School and Babson College.
- Riedel-Heller, S. G., A. Busse, and M. C. Angermeyer. 2006. "The State of Mental Health in Old-Age Across the 'Old' European Union - a Systematic Review." *Acta psychiatrica Scandinavica* 113 (5): 388–401. doi:10.1111/j.1600-0447.2005.00632.x.
- Riedl, R., H. Kindermann, A. Auinger, and A. Javor. 2012. "Technostress from a Neurobiological Perspective." *Business and Information Systems Engineering* 4 (2): 61–69. doi:10.1007/s12599-012-0207-7.
- Riedl, R., and K. VanMeter. 2020. "Explaining Inconsistent Research Findings on the Relationship Between Age and Technostress Perceptions: Insights from the Neuroscience Literature." In *Neurols 2020: Information Systems and Neuroscience*, edited by F. D. Davis, R. Riedl, J. vom Brocke, P. M. Léger, A. B. Randolph, and T. Fischer, 307–320. Cham: Springer.
- Rutkowski, A. F., and C. S. Saunders. 2018. *Emotional and Cognitive Overload: The Dark Side of Information Technology*. London: Routledge.
- Ryan, R. M., R. R. Curren, and E. L. Deci. 2013. "What Humans Need: Flourishing in Aristotelian Philosophy and Self-Determination Theory." In *The Best Within Us: Positive Psychology Perspectives on Eudaimonia*, edited by A. S. Waterman, 57–75. Washington D.C: American Psychological Association. doi:10.1037/14092-004.
- Salanova, M., S. Llorens, and E. Cifre. 2013. "The Dark Side of Technologies: Technostress Among Users of Information and Communication Technologies." *International Journal of Psychology* 48 (3): 422–436. doi:10.1080/00207594.2012.680460.
- Salazar-Concha, C., P. Ficapal-Cusi, J. Boada-Grau, and L. J. Camacho. 2021. "Analyzing the Evolution of Technostress: A Science Mapping Approach." *Heliyon* 7 (4): e06726. doi:10.1016/j.heliyon.2021.e06726.
- Savikko, N., P. Routasalo, R. S. Tilvis, T. E. Strandberg, and K. H. Pitkälä. 2005. "Predictors and Subjective Causes of Loneliness in an Aged Population." *Archives of Gerontology and Geriatrics* 41 (3): 223–233. doi:10.1016/j.archger.2005.03.002.
- Scott, D. A., B. Valley, and B. A. Simecka. 2017. "Mental Health Concerns in the Digital Age." *International Journal of Mental Health and Addiction* 15 (3): 604–613. doi:10.1007/s11469-016-9684-0.
- Shepherd, C. D., G. Marchisio, S. C. Morrish, J. H. Deacon, and M. P. Miles. 2010. "Entrepreneurial Burnout: Exploring Antecedents, Dimensions and Outcomes." *Journal of Research in Marketing and Entrepreneurship* 12 (1): 71–79. doi:10.1108/14715201011060894.
- Sonnentag, S. 2018. "The Recovery Paradox: Portraying the Complex Interplay Between Job Stressors, Lack of Recovery, Poor Well-Being." *Research in Organizational Behavior* 38: 169–185. doi:10.1016/j.riob.2018.11.002.
- Sonnentag, S., and C. Fritz. 2007. "The Recovery Experience Questionnaire: Development and Validation of a Measure for Assessing Recuperation and Unwinding from Work." *Journal of Occupational Health Psychology* 12 (3): 204–221. doi:10.1037/1076-8998.12.3.204.
- Srivastava, S. C., S. Chandra, and A. Shirish. 2015. "Technostress Creators and Job Outcomes: Theorising the Moderating Influence of Personality Traits." *Information Systems Journal* 25 (4): 355–401. doi:10.1111/isj.12067.
- Stephan, U. 2018. "Entrepreneurs' Mental Health and Well-Being: A Review and Research Agenda." *Academy of Management Perspectives* 32 (3): 290–322. doi:10.5465/amp.2017.0001.
- Tarafdar, M., C. L. Cooper, and J. F. Stich. 2019. "The Technostress Trifecta - Techno Eustress, Techno Distress and Design: Theoretical Directions and an Agenda for Research." *Information Systems Journal* 29 (1): 6–42. doi:10.1111/isj.12169.
- Tarafdar, M., and R. M. Davison. 2018. "Research in Information Systems: Intra-Disciplinary and Inter-Disciplinary Approaches." *Journal of the Association for Information Systems* 19 (6): 523–551. doi:10.17705/1jais.00500.
- Tarafdar, M., Q. Tu, B. S. Ragu-Nathan, and T. S. Ragu-Nathan. 2007. "The Impact of Technostress on Role Stress and Productivity." *Journal of Management Information Systems* 24 (1): 301–328. doi:10.2753/MIS0742-1222240109.
- Taser, D., E. Aydin, A. O. Torgaloz, and Y. Rofcanin. 2022. "An Examination of Remote E-Working and Flow Experience: The Role of Technostress and Loneliness." *Computers in Human Behavior* 127: 107020. doi:10.1016/j.chb.2021.107020.
- Tetrick, L. E., K. J. Slack, N. Da Silva, and R. R. Sinclair. 2000. "A Comparison of the Stress–Strain Process for Business Owners and Nonowners: Differences in Job Demands, Emotional Exhaustion, Satisfaction, and Social Support." *Journal of Occupational Health Psychology* 5 (4): 464–476. doi:10.1037/1076-8998.5.4.464.

- Thomé, S., L. Dellve, A. Härenstam, and M. Hagberg. 2010. "Perceived Connections Between Information and Communication Technology Use and Mental Symptoms Among Young Adults-A Qualitative Study." *BMC Public Health* 10 (1): 1–14. doi:10.1186/1471-2458-10-66.
- Torrès, O., A. Benzari, C. Fisch, J. Mukerjee, A. Swalhi, and R. Thurik. 2022a. "Risk of Burnout in French Entrepreneurs During the COVID-19 Crisis." *Small Business Economics* 58 (2): 717–739. doi:10.1007/s11187-021-00516-2.
- Torrès, O., A. Benzari, A. Swalhi, and R. Thurik. 2021a. "Confinement et Risque de Burnout des Dirigeants Propriétaires de PME: Le Syndrome d'Épuisement d'Empêchement." *Revue Internationale PME* 34 (2): 62–80. doi:10.7202/1079188ar.
- Torrès, O., C. Fisch, J. Mukerjee, F. Lasch, and R. Thurik. 2021b. "Health Perception of French SME Owners During the 2020 COVID-19 Pandemic." *International Review of Entrepreneurship* 19 (2): 151–168.
- Torrès, O., F. Guilian, and R. Thurik. 2022b. "Entrepreneurship and Health: An Existential Perspective." *Revue de l'Entrepreneuriat* 21 (HS2): 11–32. Forthcoming. doi:10.3917/entre.hs2.0011.
- Torrès, O., and C. Kinowski-Moysan. 2019. "Dépistage de l'épuisement et Prévention du Burnout des Dirigeants de PME - D'une Recherche Académique à une Valorisation Sociétale." *Revue Française de Gestion* 45 (284): 171–189. doi:10.3166/rfg.2019.00379.
- Torrès, O., G. Soenen, and R. Thurik. 2022c. "Entrepreneurs' Well-Being, Burnout and Recovery Experiences". Paper presented at the 20<sup>th</sup> Interdisciplinary European Conference on Entrepreneurship Research (IECER), Maastricht, October 26-28.
- Torrès, O., and R. Thurik. 2019. "Small Business Owners and Health." *Small Business Economics* 53 (2): 311–321. doi:10.1007/s11187-018-0064-y.
- Van der Zwan, P., R. Thurik, I. Verheul, and J. Hessels. 2016. "Factors Influencing the Entrepreneurial Engagement of Opportunity and Necessity Entrepreneurs." *Eurasian Business Review* 6 (3): 273–295. doi:10.1007/s40821-016-0065-1.
- Visentin, D. C., M. Cleary, and S. Minutillo. 2020. "Small Business Ownership and Mental Health." *Issues in Mental Health Nursing* 41 (5): 460–463. doi:10.1080/01612840.2020.1733871.
- Wach, D., U. Stephan, E. Weinberger, and J. Wegge. 2021. "Entrepreneurs' Stressors and Well-Being: A Recovery Perspective and Diary Study." *Journal of Business Venturing* 36 (5): 106016. doi:10.1016/j.jbusvent.2020.106016.
- Wei, X., S. Cang, and R. D. Hisrich. 2015. "Entrepreneurial Stressors as Predictors of Entrepreneurial Burnout." *Psychological Reports* 116 (1): 74–88. doi:10.2466/01.14.PR0.116k13w1.
- Weinberger, E., D. Wach, U. Stephan, and J. Wegge. 2018. "Having a Creative Day: Understanding Entrepreneurs' Daily Idea Generation Through a Recovery Lens." *Journal of Business Venturing* 33 (1): 1–19. doi:10.1016/j.jbusvent.2017.09.001.
- White, J. V., and V. K. Gupta. 2020. "Stress and Well-Being in Entrepreneurship: A Critical Review and Future Research Agenda." In *Entrepreneurial and Small Business Stressors, Experienced Stress, and Well-Being*, edited by P. L. Perrewé, P. D. Harms, and C. H. Chang, 65–93. Bingley: Emerald Publishing Limited.
- Wiklund, J., B. Nikolaev, N. Shir, M. D. Foo, and S. Bradley. 2019. "Entrepreneurship and Well-Being: Past, Present, and Future." *Journal of Business Venturing* 34 (4): 579–588. doi:10.1016/j.jbusvent.2019.01.002.
- Williamson, A. J., J. J. Gish, and U. Stephan. 2021. "Let's Focus on Solutions to Entrepreneurial Ill-Being! Recovery Interventions to Enhance Entrepreneurial Well-Being." *Entrepreneurship Theory & Practice* 45 (6): 1307–1338. doi:10.1177/10422587211006431.
- World Health Organization (WHO). 1948. Constitution. <https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf?ua=1>
- Xu, F., and L. Jin. 2022. "Impact of Daily Entrepreneurial Stressors on Long-Term Transformational Leader Behaviors and Well-Being: Differences in Experienced and Nascent Entrepreneurs." *Journal of Business Research* 139: 280–291. doi:10.1016/j.jbusres.2021.09.059.
- Yanguas, J., S. Pinazo-Henandis, and F. J. Tarazona-Santabalbina. 2018. "The Complexity of Loneliness." *Acta Bio-medical: Atenei Parmensis* 89 (2): 302–314. doi:10.23750/abm.v89i2.7404.
- Yeager, D. S., C. J. Bryan, J. J. Gross, J. S. Murray, D. Krettek Cobb, P. HF Santos, H. Graveling, M. Johnson, and J. P. Jamieson. 2022. "A Synergistic Mindsets Intervention Protects Adolescents from Stress." *Nature* 607 (7919): 512–520. doi:10.1038/s41586-022-04907-7.
- Zahra, S. A. 2007. "Contextualizing Theory Building in Entrepreneurship Research." *Journal of Business Venturing* 22 (3): 443–452. doi:10.1016/j.jbusvent.2006.04.007.
- Zbierowski, P., A. Brzozowska, and M. Gojny-Zbierowska. 2019. "Well-Being of Immigrant Entrepreneurs in Their Entrepreneurial Life." *Problemy Zarządzania* 1/2019 (81): 212–238. doi:10.7172/1644-9584.81.10.