BJM BRITISH JOURNAL of MANAGEMENT
BRITISH ACADEMY OF MANAGEMENT
British Journal of Management, Vol. 35, 1040–1058 (2024)
DOI: 10.1111/1467-8551.12751

Health Risks Related to COVID-19, Psychological Distress and Perceived Productivity

Sarah Park [1] and Michael Koch[2]
[1]University of Leicester School of Business, University of Leicester, London Road, Leicester, LE2 1RQ, UK[2]Brunel Business School, Brunel University London, Kingston Lane, Uxbridge, UB8 3PH, UK
Corresponding author email: sk1003@leicester.ac.uk

The COVID-19 pandemic has affected the lives of billions around the globe. Yet, our understanding of its impact on psychological distress and work productivity remains limited. Using data from two waves of the Understanding Society COVID-19 study, a representative British survey of reactions to the COVID-19 pandemic, comprising 5829 individuals, we find that perceived health risks related to COVID-19 affect the productivity of working individuals negatively via increased psychological distress. Results also show that the extent of homeworking amplifies the negative relationship between psychological distress and productivity. Additionally, we find that the negative relationship between psychological distress and productivity is stronger for self-employed individuals compared to those who are in paid employment. Psychological distress, self-employment status and gender jointly interact in reducing productivity, such that self-employed women experience the strongest decline in productivity. We discuss the implications of our findings in light of supporting individuals to reduce psychological distress and maintain their productivity following the COVID-19 pandemic.

Introduction

The COVID-19 pandemic has been the greatest single threat to health, especially mental health, since the Second World War (e.g. Sampling, 2020; Zacher and Rudolph, 2021). The social and economic consequences of the pandemic, such as lockdowns and business shutdowns, have created significant psychological burdens for countless individuals around the world (e.g. Klebe, Felfe and Klug, 2021; Koch and Schermuly, 2021; Yen *et al.*, 2021). Despite advances in pharmaceutical and medical interventions which reduce the threat of coronavirus, the COVID-19 pandemic continues to affect individuals' lives, and is expected to create further psychological distress and wreak 'long-lasting havoc on societies and workplaces' (Kniffin *et al.*, 2021, p. 65).

Psychological distress, which is ubiquitous in contemporary workplaces (e.g. Flaxman and Bond, 2010), is a highly relevant phenomenon in the context of work. It is widely associated with adverse consequences for workers, such as increased absenteeism and turnover intentions (e.g. de Croon *et al.*, 2004; Hardy, Woods and Wall, 2003). There is some evidence to suggest that psychological distress has a negative impact on individual performance (e.g. Cheng and McCarthy, 2018; Jones, Latreille and Sloane, 2016; Lim and Tai, 2014), but this evidence is limited to smaller samples of workers in specific occupations and mostly does not consider the impact of major life events such as the COVID-19 pandemic on psychological distress. An emerging stream of research has investigated individual performance during the COVID-19 pandemic. These studies mostly examine how work-related factors linked to COVID-19 affect employee performance, including, for example, communication (Shockley *et al.*, 2021a), job insecurity (Lian *et al.*, 2022) and changes in work–family interfaces (Vaziri *et al.*, 2020). However, research has not elucidated how the perceived risk of contracting COVID-19 itself is related to changes in productivity at work. Addressing this gap is important, as health risks from COVID-19 are ubiquitous, unavoidable and affect all working individuals, regardless of their work context (Fu *et al.*, 2021). Investigating to what extent they affect work productivity also allows us to better understand how stressful life events and societal crises affect work outcomes (Lian *et al.*, 2022).

Psychological distress may have presented a particular challenge for people working from home in the course of the COVID-19 pandemic. Homeworking during the pandemic required individuals to deal with numerous challenges, such as maintaining boundaries between work and non-work, coordinating with other workers and navigating their own and others' space at home (Kniffin *et al.*, 2021). These activities may interfere with work (Perry, Rubino and Hunter, 2018), raising the question of whether homeworking has affected people's ability to maintain their productivity in the face of the significant psychological distress accompanying the COVID-19 pandemic.

Psychological distress is also particularly salient for the self-employed (Kleine and Schmitt, 2021). Self-employed individuals have greater autonomy and flexibility (Hundley, 2001). However, they also experience income insecurity, risk of business failure, long working hours, complex job demands and limited financial and social support (e.g. Chadwick and Raver, 2019; Gorgievski *et al.*, 2010; Patel and Rietveld, 2020; Reid, Patel and Wolfe, 2018), all of which make self-employed individuals more liable to psychological distress. During the COVID-19 pandemic, many self-employed individuals felt that they were 'at breaking point' (Hurley, 2020), with their lives on hold (Hewison, 2020), overwhelmed by the fear that their business would not survive the pandemic (Murray, Obordo and Otte, 2020). This distress can have especially deleterious consequences for work performance. Despite the salience of psychological distress for self-employed individuals, and its potential impact on performance, previous research offers limited insight regarding the relationship between mental health and productivity (Hessels *et al.*, 2018).

Drawing on self-regulation theory (Bauer and Baumeister, 2011), and using representative data from the United Kingdom encompassing 5829 individuals, we investigate how psychological distress mediates the relationship between health risks related to COVID-19 and individual productivity, and how this relationship varies depending on the extent of homeworking and self-employment status. Additionally, we examine three-way interactions between psychological distress, homeworking and gender as well as psychological distress, self-employment status and gender in predicting productivity. Examining gender differences is especially important, as caring and domestic responsibilities during the pandemic might have led to more work–home interference for women, affecting their ability to maintain their productivity while working from home. Women also face distinct challenges with regard to being self-employed (Saridakis, Marlow and Storey, 2014), coping with the consequences of COVID-19 (Kniffin *et al.*, 2021) and how they self-regulate their behaviour to maintain performance (Hyde, 2014).

This study makes multiple contributions. First, it extends the literature on psychological distress and work performance (e.g. Cheng and McCarthy, 2018; De Clercq, Haq and Azeem, 2017; Jones, Latreille and Sloane, 2016; Lim and Tai, 2014) by analysing how a continuing distressing event such as the COVID-19 pandemic impacts the productivity of working individuals (Rudolph *et al.*, 2021). We show that stressors originally emanating outside work, such as the COVID-19 pandemic, can influence work performance. Our study also adds to our understanding of the performance implications of physical health, an important yet understudied area of research (Hill *et al.*, 2022).

Our research enriches the ongoing debate on the impact of new forms of work organization. More specifically, we contribute to the debate on the impact of homeworking arrangements (Bailey and Kurland, 2002; Lapierre *et al.*, 2016; Martínez-Sánchez *et al.*, 2008; Redman, Snape and Ashurst, 2009). Most research that examines the relationship between homeworking and performance cannot readily be generalized to the context of the COVID-19 pandemic, as it focused mostly on individuals who worked from home voluntarily, whereas the pandemic created a sudden requirement for homeworking, for which many individuals and organizations were not fully prepared (Kniffin *et al.*, 2021; Wang *et al.*, 2021).

Our study demonstrates that homeworking during the COVID-19 pandemic may have hindered people's ability to cope with the psychological distress from COVID-19, resulting in lower productivity. This contributes to the hitherto inconclusive research on the performance impact of homeworking during the COVID-19 pandemic (e.g. Deole, Deter and Huang, 2023; Kitagawa *et al.*, 2021) and responds to calls for a better understanding of the repercussions of homeworking during the COVID-19 pandemic (Beech and Anseel, 2020; Kniffin *et al.*, 2021). By investigating how homeworking and psychological distress jointly impact productivity, we provide novel insights beyond the direct effect of enforced homeworking on individual performance during the COVID-19 pandemic. This result also has important managerial implications. As homeworking is likely to remain widespread even after the pandemic (George *et al.*, 2022), we require a better understanding of how it might contribute to (or impede) individual performance, and how organizations may manage individual homeworking more successfully.

Furthermore, our study enriches the literature on mental well-being and work performance of self-employed individuals (e.g. Hmieleski and Sheppard, 2019; Wiklund *et al.*, 2019) by elucidating the differential impact of psychological distress on the productivity of the self-employed. Despite a growing scholarly interest in the consequences of well-being for self-employed individuals (Stephan, 2018), there is a dearth of work on

the relationship between mental health and productivity for self-employed individuals (Hessels *et al.*, 2018). Our study demonstrates how events such as the COVID-19 pandemic affect the productivity of the self-employed more negatively compared to individuals in paid employment.

Our study also enriches the literature examining how homeworking affects men and women differently (Ashman *et al.*, 2022; Gajendran and Harrison, 2007; Song and Gao, 2020). While previous research suggests that women might have been particularly disadvantaged by homeworking during the COVID-19 pandemic because of increased domestic and caring demands (Butterick and Charlwood, 2021; Hughes and Donnelly, 2022), we demonstrate that psychological distress does not affect the productivity of homeworking women more negatively.

Finally, we extend the research on gender differences in self-employment (e.g. Jennings and Brush, 2013; Robb and Watson, 2012) by examining how self-employed women respond to psychological distress differently in the context of work. Self-employed women face unique challenges which might affect their productivity, including work–family interference or a lack of access to resources and services (Pines, Lerner and Schwartz, 2010). Some of these challenges were exacerbated during the COVID-19 pandemic (Alon *et al.*, 2020).

Theory and hypotheses

Self-regulation theory

Self-regulation is the 'capacity to alter the self and its responses to bring them into line with various standards, such as goals and ideals' (DeWall *et al.*, 2008, p. 1655). For example, changing one's behaviour to follow rules, match ideals or pursue goals is a form of self-regulation (Baumeister and Vohs, 2007). Effective self-regulation requires several elements. One element is a personal standard that one wants to achieve (Baumeister and Vohs, 2007). A second element is monitoring, as effective self-regulation is not possible without tracking it (Baumeister and Vohs, 2007). A third ingredient required by self-regulation is self-regulatory strength, colloquially known as willpower (Inzlicht and Schmeichel, 2012). Research suggests that individuals have a limited capacity for self-regulation (Baumeister *et al.*, 1998). Specifically, self-regulatory strength is a finite resource which becomes temporarily depleted when engaging in self-regulation, which affects subsequent self-regulation tasks negatively. For instance, if one engages in an activity at work that requires self-regulation, then self-regulatory strength as a resource becomes depleted, leading to poorer self-regulation and therefore poorer performance in subsequent work tasks. The state of depletion of resources for self-regulation is commonly termed ego depletion (Baumeister and Vohs, 2007). Activities which are sensitive to ego depletion are, for example, emotion regulation, suppression of thoughts or going through uncertain situations (Bauer and Baumeister, 2011; Baumeister and Vohs, 2016). Many work-related activities are also prone to ego depletion, including decision-making, reasoning, planning and intelligent thought (Bauer and Baumeister, 2011). This illustrates the importance of self-regulation for individual performance.

Health risk, psychological distress and productivity

Psychological distress is 'a mental state characterized by negative thoughts and feelings related to anxiety, fear, or depression' (Restubog, Scott and Zagenczyk, 2011, p. 714). Psychological distress related to the COVID-19 pandemic mainly emanates from fear of the disease itself. Fear is 'one of the central emotional responses during a pandemic' (Van Bavel *et al.*, 2020, p. 461). In the case of COVID-19, fear was compounded by elevated infection and death rates (Hetkamp *et al.*, 2020). According to Terror Management Theory (TMT), significant health risks such as COVID-19 become threats to self-preservation and reminders of one's own mortality (Greenberg and Arndt, 2012), impacting a person's physical and psychological well-being (Arndt *et al.*, 2005). As the death toll attributable to COVID-19 rose, and media coverage of the pandemic became ubiquitous, individuals were constantly reminded of this existential threat. According to Anglim and Horwood (2021), fear of death and sickness was the most important source of psychological distress during the COVID-19 pandemic. This severe fear is likely to persist even after the pandemic (Duan and Zhu, 2020). Individuals form their own perceptions about the threat of contracting an infectious disease (Ferrer and Klein, 2015), and these perceptions can impact psychological distress. During previous global pandemics, such as SARS, not only actual infections but also the perceived risk of infection contributed to increased psychological distress of healthcare workers (Nickell *et al.*, 2004; Styra *et al.*, 2008). Similarly, we would expect that perceived health risks related to COVID-19 are likely to be related to higher levels of psychological distress.

Maintaining productivity at work requires effective self-regulation, which exerts self-regulatory resources (Cheng and McCarthy, 2018). However, coping with psychological distress from health risks related to COVID-19 also requires individuals to draw upon these resources, diverting them away from work-related tasks. For example, suppressing thoughts of death which might occur during the pandemic requires self-regulation, which depletes self-regulatory resources (Gailliot, Schmeichel and Baumeister, 2006).

These resources are then not available for other self-regulation processes. Increased psychological distress resulting from the health risks related to COVID-19 may slow down or prevent individuals from performing other tasks which require self-regulation (Bauer and Baumeister, 2011), such as work-related tasks. This suggests that psychological distress affects productivity negatively.

Combining the above arguments, and consistent with previous research which has established that psychological distress can act as a mediator between stressful life events and productivity outcomes (Lim and Tai, 2014), we expect that the perceived health risk related to COVID-19 influences productivity through psychological distress. This leads to the following hypothesis:

H1: Psychological distress mediates the negative relationship between the perceived health risk related to COVID-19 and productivity.

Homeworking

Homeworking, which is sometimes labelled teleworking, telecommuting or virtual working (Adisa *et al.*, 2022; Beauregard, Basile and Canónico, 2019; Gajendran, Harrison and Delaney-Klinger, 2015), involves shifting the location of work from the office to the home (Tietze and Nadin, 2011). The COVID-19 pandemic posed numerous challenges for people working from home, such as reduced face-to-face interactions with co-workers. This curtailed spontaneous employee interactions, which are important for sharing knowledge and obtaining information, as well as emotional and social support (Adisa *et al.*, 2022; Charalampous *et al.*, 2019; Waizenegger *et al.*, 2020). From a self-regulation perspective, less feedback and guidance from co-workers requires homeworkers to exert more efforts for self-leadership, including self-observation, self-goal-setting and self-rewarding (Müller and Niessen, 2019). These activities deplete self-regulatory resources (Schlaegel, Gunkel and Taras, 2023). Without access to an office, individuals are also required to expend more time and energy in contacting colleagues in order to coordinate work, obtain approvals and complete basic tasks (Perry, Rubino and Hunter, 2018). These increased communication efforts also undermine the self-regulatory resources required for maintaining productivity (Orhan *et al.*, 2021).

A lack of exposure to co-workers also leads to role ambiguities and uncertainty with regard to one's status (Perry, Rubino and Hunter, 2018; Sardeshmukh, Sharma and Golden, 2012), which in turn is related to ego depletion (Baumeister and Vohs, 2016). Furthermore, homeworking during the COVID-19 pandemic has led to workspaces intruding on home life (Ashman *et al.*, 2022) and the blurring of boundaries between home and work (Adisa *et al.*, 2022). Combined with the increased workload that often characterized working from home during the COVID-19 pandemic (Adisa *et al.*, 2022), work–home interference likely made significant demands on individuals' capacity for self-regulation. Furthermore, working from home in a virtual environment is cognitively and emotionally taxing. 'Zoom fatigue' (Waizenegger *et al.*, 2020), which depletes self-regulatory resources (Johnson and Mabry, 2022) and is associated with lower engagement and voice at work (Shockley *et al.*, 2021b), should ultimately affect productivity negatively.

In summary, the numerous challenges related to homeworking during the COVID-19 pandemic depleted psychological resources (Charalampous *et al.*, 2019; Gajendran, Harrison and Delaney-Klinger, 2015; Perry, Rubino and Hunter, 2018), preventing individuals from coping with the psychological distress due to the pandemic. This implies that psychological distress from COVID-19 should have a stronger negative impact on productivity for individuals working from home, leading to the following hypothesis:

H2: Homeworking moderates the relationship between psychological distress and productivity, such that the negative relationship between psychological distress and productivity is stronger in individuals working from home compared to individuals who do not work from home.

Self-employment

Compared to individuals in paid employment, the self-employed typically enjoy greater job autonomy. In the absence of supervision, self-employed people are able to control how, when and where they perform their work (e.g. Benz and Frey, 2008; Lange, 2012). In addition, they often perceive their work to be more interesting, are able to use their skills more fully and perform a greater variety of tasks (Hundley, 2001). Thus, the self-employed may possess greater psychological resources, which might buffer the negative impact of psychological distress on productivity.

On the other hand, self-employment is generally associated with higher job demands and more complex tasks, which require substantial self-regulation (Hessels, Rietveld and van der Zwan, 2017). During the COVID-19 pandemic, job demands were particularly pronounced for self-employed individuals (Patel and Rietveld, 2020), who were more likely to experience a depletion of the psychological resources necessary for regulating psychological distress as they engaged in cognitively demanding work (Patel and Rietveld, 2020). Compared to individuals in paid employment, the productivity of self-employed individuals relies more heavily on their capacity to make decisions effectively (Bencsik and Chuluun, 2021). Effortful decision-making also requires

self-regulatory resources, which are diminished under psychological distress (Bauer and Baumeister, 2011).

In addition, the self-employed typically work longer hours than individuals in paid employment (Schonfeld and Mazzola, 2015) and have to be 'always on' (Hilbrecht and Lero, 2014). As breaks can help prevent ego depletion (Tyler and Burns, 2008), self-employed individuals have fewer opportunities to replenish self-regulatory resources. Earnings from self-employment, which are generally low and volatile, were even more at risk during the pandemic (Patel and Rietveld, 2020), creating significant uncertainty (Giones *et al.*, 2020). Moreover, self-employed individuals feel responsible for their business and the people they employ (Boyd and Gumpert, 1983), and coping with this stress requires self-regulatory resources. The evidence outlined above suggests that self-employed individuals were more likely to experience a depletion of their self-regulatory resources during the COVID-19 pandemic, making it more difficult for them to self-regulate their work productivity. We therefore hypothesize:

H3: Self-employment status moderates the relationship between psychological distress and productivity, such that the negative relationship between psychological distress and productivity is stronger when individuals are self-employed compared to paid-employed.

Gender

Individuals use different coping strategies, that is, changes to their behaviours, thoughts or emotions, to deal with stressors (Carr and Umberson, 2013). While problem-based coping consists of taking action against the stressor in order to eliminate it, emotion-based coping consists of altering feelings about the stressor, including denial or psychological distancing (Restubog, Scott and Zagenczyk, 2011). The COVID-19 pandemic could be regarded as an unavoidable stressor, as it was difficult for individuals to entirely avoid being faced with COVID-19 or prevent this stressor from recurring altogether. This implies that problem-based coping was largely ineffective for dealing with the psychological distress from the COVID-19 pandemic, making emotion-based coping a more viable alternative coping strategy. Prior research has found that emotion-based coping is especially effective when the stressor cannot be removed (Reynolds *et al.*, 2000).

Whereas men rely more often on problem-focused coping and attempt to suppress emotions, women are more likely to employ emotion-based coping strategies, such as releasing their feelings or distracting themselves (Carr and Umberson, 2013; Matud, 2004). Using emotion-based coping is more effective for dealing with the psychological distress from COVID-19 than efforts to suppress emotions, which are likely to be used more often by men (Carver and Vargas, 2011).

On the other hand, women are also more likely to use rumination to regulate psychological distress (Hyde, 2014). Rumination refers to 'repetitive thoughts concerning one's present distress' (Conway *et al.*, 2000, p. 404). Women's stronger reliance on rumination is partly due to their belief that psychological distress is difficult to control (Nolen-Hoeksema and Corte, 2004). Instead of being an effective self-regulation strategy, rumination can interfere with problem-solving and leads to behavioural paralysis (Ward *et al.*, 2003), which in turn can have a negative impact on individual productivity.

Successful coping with psychological distress also requires social support (Schneiderman, Ironson and Siegel, 2005). Women generally spend disproportionately more time on domestic work and caretaking (Cerrato and Cifre, 2018), but receive less social support for work and family problems than men (Malach Pines *et al.*, 2011). In addition, during the COVID-19 pandemic, women were often required to take on even more caring and childcare responsibilities (Rudolph *et al.*, 2021), which require self-regulatory resources. These domestic activities interfere with homeworking and blur the boundary between home and work. Women working from home were often required to entirely rearrange their work and home lives as a result of the pandemic (Ashman *et al.*, 2022). As a result, women were more likely to experience a depletion of their self-regulatory resources during the COVID-19 pandemic (Rothbard, Beetz and Harari, 2021), making it more difficult to self-regulate their work productivity.

The depletion or lack of self-regulatory resources should also have adverse effects for the work productivity of self-employed women, who are more likely to experience lower self-regulatory resources because of increased demands not only in the domestic domain, but in particular with regard to their work. Specifically, self-employed women are often active in lower-value and more precarious service and retail sectors (Grashuis, 2021), which are disproportionately affected by government restrictions such as lockdowns and business closures (Kalenkoski and Pabilonia, 2022). Self-employed women have limited access to social and financial capital (Martinez Dy and Jayawarna, 2020), which endangered the survival of their businesses during the pandemic. These multiple, complex difficulties in the business environment of self-employed women drained their psychological resources and hindered their ability to deal with the psychological distress from health risks related to COVID-19. This should depress the productivity of self-employed women more strongly.

Based on the above arguments, we hypothesize:

H4a: There is a three-way interaction between homeworking, gender and psychological distress on

productivity. Specifically, the moderating effect of homeworking on the relationship between psychological distress and productivity will be stronger for women than men.

H4b: There is a three-way interaction between self-employment status, gender and psychological distress on productivity. Specifically, the moderating effect of self-employment status on the relationship between psychological distress and productivity will be stronger for women than men.

Methodology

Data

To test our hypotheses, we use the Understanding Society COVID-19 study (University of Essex, 2021), which surveys the experiences and reactions of the general population to the COVID-19 pandemic. This includes all members of the regular Understanding Society samples (i.e. households who participated in waves 8 or 9 of Understanding Society). Household samples are probability samples of postal addresses. Household members aged 16+ of eligible sample households were invited to participate in the COVID-19 study in April 2020 (Institute for Social and Economic Research, 2021). The Understanding Society COVID-19 study conducted surveys at multiple points in time in 2020. We use waves 4 and 5, which were collected in July and September 2020, respectively. Wave 5 includes data on work conditions, including our dependent variable productivity, which were not collected at every single wave of the survey. We only included those individuals who were employed throughout the data collection period and who had the same employment status (self-employed, in paid employment or hybrid) in both surveys. Our overall sample includes 5829 individuals.

Variables

Perceived health risk relating to COVID-19 (Time 1) is measured with responses to the question 'In your view, how likely is it that you will contract COVID-19 in the next month?' We reverse-coded the original scale to 1 = very unlikely, 2 = unlikely, 3 = likely and 4 = very likely, for easier interpretation. Similar single-item measures are commonly used to assess perceived health risks, including the risk of infection with COVID-19 (e.g. Kim, Nyengerai and Mendenhall, 2022; Xin *et al.*, 2020; Yıldırım, Geçer and Akgül, 2021).

Psychological distress (Time 1) is measured with the General Health Questionnaire (GHQ-12). The 12 items of the GHQ-12 are assessed on a four-point scale (less than usual, no more than usual, rather more than usual and much more than usual). Example items are 'Have you recently felt constantly under strain?' and 'Have you recently lost much sleep over worry?' In the data, the overall score, ranging from 0 to 36, is provided for each individual (a score of 0 to 3 is assigned for each item and the scores are summed across items). The GHQ-12 is usually assessed by this method (e.g. Abreu *et al.*, 2019). The GHQ-12 is one of the most widely used instruments for assessing psychological distress, especially in work-related settings (e.g. Hystad and Johnsen, 2020; Pepe *et al.*, 2021), and shows excellent reliability and validity (e.g. Böhnke and Croudace, 2016; Goldberg *et al.*, 1997).

Perceived productivity (Time 2) is measured with responses to the question 'Please think about how much work you get done per hour these days. How does that compare to how much you would have got done per hour back in January/February 2020?' This question is part of the 'Working conditions' module of the survey and posed alongside other questions related to the work context of the respondent. This question was only asked if the respondent was employed or self-employed, and specifically refers to the respondent's work. For ease of interpretation, we reverse-coded the original scale to 1 = I get much less done, 2 = I get a little less done, 3 = I get about the same done, 4 = I get a little more done and 5 = I get much more done. Single-item measures can be used when the underlying construct is clear to respondents, sufficiently narrow and unidimensional instead of multidimensional (Wanous and Hudy, 2001). Previous research has established that such conditions are fulfilled for even seemingly complex constructs such as job satisfaction, life satisfaction and self-esteem (Fisher, Matthews and Gibbons, 2016; Nagy, 2002; Robins, Hendin and Trzesniewski, 2001; Wanous, Reichers and Hudy, 1997). We argue that the question assessing productivity outlined above is sufficiently clear and unequivocal to fulfil these conditions as well. Similar measures of productivity have been used in previous research (Bal and De Lange, 2015; Hughes *et al.*, 2018; Klebe, Felfe and Klug, 2021; Rogelberg *et al.*, 2006; Sayre, Grandey and Almeida, 2021). Objective as well as subjective performance measures also have equivalent relationships with independent variables and are positively correlated, providing evidence of convergent validity (Bommer *et al.*, 1995; Wall *et al.*, 2004).

Homeworking is a categorical variable with the categories never, sometimes, often and always, corresponding to the categories used by Understanding Society. Self-employment status is a categorical variable which includes the categories employed, self-employed and hybrid, where the latter refers to individuals who pursue paid employment and self-employment simultaneously. Prior work on self-employment also categorized working individuals into the same three categories (Folta, Delmar and Wennberg, 2010). Gender is a dummy variable and coded as 1 for female and 0 for male.

Our analyses include several control variables. Age is captured in years. Partnership status is a dichotomous variable coded as 1 if living with a partner, and 0 otherwise. Ethnicity is a categorical variable which includes the categories White, Mixed, Asian, Black and Other. Demographic characteristics such as age and social roles (e.g. being a spouse) are important determinants of psychological distress and productivity (e.g. Drapeau, Marchand and Beaulieu-Prévost, 2011; Göbel and Zwick, 2012). Number of children (0–4 years old) is a categorical variable coded as 0 for no children up to 4 years, 1 for one child up to 4 years and 2 for two or more children up to 4 years old. Number of children (5–15 years old) is a categorical variable coded as 0 for no children between 5 and 15 years, 1 for one child between 5 and 15 years, 2 for two children between 5 and 15 years and 3 for three or more children between 5 and 15 years old. These categories correspond to how data were collected by Understanding Society. Prior studies show a relationship between having children and psychological distress as well as productivity (Astin and Davis, 1985; Bird, 1997). Long-term health condition is a dichotomous variable coded as 1 if the respondent has a long-term health condition, and 0 otherwise. Previous work indicates that long-term illnesses can impact psychological distress and productivity (e.g. Boles, Pelletier and Lynch, 2004; Drapeau, Marchand and Beaulieu-Prévost, 2011). Working hours measure hours worked. Industry includes 21 industries according to the UK Standard Industrial Classification (SIC). The relationship between psychological distress and productivity should also differ according to industry, as COVID-19 has had a stronger impact on work in industries such as services, tourism and transportation.

Analysis and results

Table 1 displays the descriptive statistics and correlation coefficients for study variables. Inter-variable correlations are generally low. Individuals in our sample are 47.7 years old on average and 58.4% of the individuals are women. 12% of the individuals are self-employed.

We tested our hypotheses by running a series of ordinary least-squares regression models in Stata. We first examined the first and second stage of the mediation model (Models 1 and 2 in Table 2), followed by an estimation of the indirect effect of perceived health risk relating to COVID-19 on productivity via psychological distress in order to test H1. Subsequently, we calculated two-way (Model 3 in Table 2) as well as three-way interactions (Model 4 in Table 2) to test H2–H4b.

To investigate the mediating role of psychological distress in the relationship between health risk related to COVID-19 and productivity, we first tested the direct relationship between health risk related to COVID-19 and psychological distress. Model 1 in Table 2 reports the results of this analysis. The coefficient for perceived health risk relating to COVID-19 is positive and significant. Next, we tested the direct relationship between psychological distress and productivity. Model 2 in Table 2 shows that the coefficient for psychological distress is negative and significant. In order to test the mediating relationship, we used the SPSS macro PROCESS (Hayes, 2018) to calculate the indirect effect of perceived health risk relating to COVID-19 on productivity via psychological distress. We generated estimates with 95% bias-corrected bootstrap confidence intervals, using 10,000 bootstrap samples. In mediation analyses, bias-corrected bootstrapping is the recommended resampling method for obtaining balanced confidence intervals (MacKinnon, Lockwood and Williams, 2004). Bootstrapping based on 10,000 resamples is considered sufficient for obtaining consistent model estimates (Wood, 2005). The results show that the indirect effect of perceived health risk related to COVID-19 on productivity is negative (estimate = −0.015, 95% CI [−0.021, −0.009]), supporting H1.

Model 3 in Table 2 reports the results of the moderating effects of homeworking and self-employment status. While the interaction terms for homeworking (often) and psychological distress as well as homeworking (always) and psychological distress are negative and significant, the interaction term for homeworking (sometimes) and psychological distress is not significant. The interaction plot in Figure 1 shows that the negative relationship between psychological distress and productivity is strengthened for individuals often or always working at home compared to individuals who never work at home. Therefore, H2 is partially supported. In terms of economic significance, an increase of psychological distress by one standard deviation is associated with a 7% drop in productivity for individuals who often work at home, and a 4% decrease for individuals who always work at home.

The interaction term for self-employment status and psychological distress is negative and significant. The interaction plot in Figure 2 shows that the negative relationship between psychological distress and productivity is strengthened for self-employed individuals. Therefore, H3 is supported. In terms of economic significance, an increase of psychological distress by one standard deviation is associated with an 8% drop in productivity for self-employed individuals and a 3% decrease for individuals in paid employment.

Model 4 in Table 2 reports the results of the three-way interaction between gender, homeworking and psychological distress as well as the three-way interaction between gender, self-employment status and psychological distress. The interaction terms for female, homeworking and psychological distress are not significant. Thus, H4a is not supported.

Table 1. Descriptive statistics and intercorrelations for brevity, industry dummies are not reported

	Obs.	Mean	SD	1	2	3	4	5	6	7	8	9	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Perceived productivity	5829	3.129	0.927	1.000																					
2. Psychological distress	5829	11.582	5.384	−0.104	1.000																				
3. Gender	5829	0.584	0.493	0.015	0.088	1.000																			
4. Age	5829	47.664	12.100	−0.059	−0.091	−0.087	1.000																		
5. Ethnicity (Mixed)	5829	0.018	0.133	0.002	0.010	0.015	−0.067	1.000																	
6. Ethnicity (Asian)	5829	0.055	0.227	0.010	0.019	−0.031	−0.109	−0.033	1.000																
7. Ethnicity (Black)	5829	0.019	0.137	0.059	−0.033	0.023	0.011	−0.019	−0.034	1.000															
8. Ethnicity (Other)	5829	0.004	0.064	0.008	0.021	−0.011	0.001	−0.009	−0.015	−0.009	1.000														
9. Partnership status	5829	0.739	0.439	−0.006	−0.086	−0.115	0.087	−0.046	−0.026	−0.063	−0.011	1.000													
10. Children 0–4 yrs (one child)	5829	0.080	0.272	0.007	0.012	−0.006	−0.244	0.003	0.018	0.019	−0.009	0.121	1.000												
11. Children 0–4 yrs (two or more)	5829	0.020	0.140	−0.019	0.034	−0.041	−0.129	0.017	0.014	0.007	0.029	0.074	−0.042	1.000											
12. Children 5–15 yrs (one child)	5829	0.150	0.357	0.039	−0.011	0.007	−0.127	0.005	0.050	−0.002	−0.012	0.095	0.171	0.009	1.000										
13. Children 5–15 yrs (two children)	5829	0.109	0.311	−0.017	0.028	0.017	−0.133	−0.002	0.033	−0.008	0.003	0.127	−0.024	−0.023	−0.147	1.000									
14. Children 5–15 yrs (three or more)	5829	0.021	0.144	−0.004	0.013	−0.006	−0.061	0.025	0.033	0.023	0.009	0.058	0.035	−0.021	−0.062	−0.052	1.000								
15. Long-term health condition	5829	0.429	0.495	−0.045	0.074	0.010	0.256	−0.013	−0.043	−0.012	−0.002	−0.021	−0.073	−0.050	−0.069	−0.051	−0.053	1.000							
16. Self-employed	5829	0.120	0.325	−0.129	−0.031	−0.089	0.208	−0.007	−0.015	−0.044	0.017	0.039	−0.049	−0.019	−0.037	−0.019	0.004	0.034	1.000						
17. Hybrid	5829	0.029	0.167	−0.011	−0.019	−0.013	0.045	0.000	−0.005	0.014	0.005	0.021	−0.017	0.005	−0.001	0.006	−0.004	0.015	−0.064	1.000					
18. Working hours	5829	27.785	16.820	0.179	−0.061	−0.215	−0.092	0.023	0.026	0.011	−0.001	−0.001	−0.030	−0.006	−0.004	−0.018	−0.026	−0.052	−0.147	−0.012	1.000				
19. Homeworking (sometimes)	5829	0.115	0.319	−0.042	0.016	0.005	0.006	−0.004	−0.032	0.005	−0.006	0.008	0.003	−0.005	−0.002	0.018	0.014	−0.010	0.054	0.051	−0.006	1.000			
20. Homeworking (often)	5829	0.097	0.296	0.030	0.004	0.000	−0.014	0.012	−0.007	0.010	−0.003	0.029	0.014	0.007	0.027	0.026	−0.008	−0.011	−0.010	0.062	0.060	−0.118	1.000		
21. Homeworking (always)	5829	0.323	0.467	0.179	−0.003	−0.024	−0.027	0.017	0.023	0.014	0.019	0.034	0.018	−0.002	0.016	0.011	0.003	0.020	0.035	0.004	0.147	−0.248	−0.226	1.000	
22. Perceived health risk related to COVID-19	5829	1.733	0.560	−0.022	0.104	0.048	−0.090	−0.002	0.054	0.037	0.012	−0.033	0.021	−0.006	0.011	0.012	−0.002	0.004	−0.045	0.002	0.022	0.016	0.021	−0.069	1.000

Table 2. Model estimation for psychological distress and perceived productivity

	Model 1		Model 2		Model 3		Model 4	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Intercept	11.493***	0.818	3.163***	0.139	3.059***	0.142	3.133***	0.150
Gender	0.592***	0.158	0.073***	0.026	0.080***	0.026	−0.066	0.084
Age	−0.037***	0.007	−0.002*	0.001	−0.002*	0.001	−0.002*	0.001
Ethnicity (Mixed)	−0.015	0.523	−0.028	0.088	−0.030	0.087	−0.022	0.087
Ethnicity (Asian)	0.173	0.309	0.011	0.052	0.011	0.052	0.009	0.052
Ethnicity (Black)	−1.598***	0.509	0.316***	0.085	0.310***	0.085	0.310***	0.085
Ethnicity (Other)	1.632	1.083	0.183	0.181	0.214	0.181	0.257	0.181
Partnership status	−0.922***	0.166	−0.011	0.028	−0.009	0.028	−0.008	0.028
Children 0–4 years old (one child)	0.077	0.270	−0.033	0.045	−0.032	0.045	−0.031	0.045
Children 0–4 years old (two or more children)	1.413***	0.504	−0.132	0.084	−0.145*	0.084	−0.127	0.084
Children 5–15 years old (one child)	−0.085	0.203	0.060*	0.034	0.061*	0.034	0.063*	0.034
Children 5–15 years old (two children)	0.465**	0.233	−0.051	0.039	−0.043	0.039	−0.041	0.039
Children 5–15 years old (three or more children)	0.743	0.487	−0.016	0.082	−0.015	0.081	−0.011	0.081
Long-term health condition	1.021***	0.145	−0.047*	0.024	−0.049**	0.024	−0.050**	0.024
Self-employed	−0.356	0.234	−0.323***	0.039	−0.034	0.089	−0.163	0.122
Both employed and self-employed	−0.668	0.418	−0.125*	0.070	−0.193	0.167	−0.435*	0.245
Working hours	−0.021***	0.005	0.007***	0.001	0.007***	0.001	0.007***	0.001
Homeworking (sometimes)	0.489**	0.234	0.080**	0.039	−0.011	0.089	0.087	0.139
Homeworking (often)	0.325	0.252	0.234***	0.042	0.540***	0.100	0.440***	0.150
Homeworking (always)	0.285	0.178	0.409***	0.030	0.529***	0.065	0.465***	0.101
Perceived risk of contracting Covid-19	0.869***	0.125	−0.022	0.021	−0.021	0.021	−0.023	0.021
Psychological distress			−0.017***	0.002	−0.010***	0.003	−0.016***	0.005
Psychological distress × Homeworking (sometimes)					0.007	0.007	−0.011	0.011
Psychological distress × Homeworking (often)					−0.027***	0.008	−0.018	0.013
Psychological distress × Homeworking (always)					−0.010**	0.005	−0.012	0.008
Psychological distress × Self-employed					−0.026***	0.007	−0.006	0.011
Psychological distress × Both					0.007	0.014	0.047**	0.020
Psychological distress × Female							0.009	0.007
Homeworking (sometimes) × Female							−0.115	0.181
Homeworking (often) × Female							0.153	0.202
Homeworking (always) × Female							0.123	0.130
Psychological distress × Homeworking (sometimes) × Female							0.025*	0.014
Psychological distress × Homeworking (often) × Female							−0.012	0.016
Psychological distress × Homeworking (always) × Female							0.002	0.010

Table 2. (Continued)

	Model 1		Model 2		Model 3		Model 4	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Self-employed × Female							0.165	0.178
Both × Female							0.472	0.334
Psychological distress × Self-employed × Female							−0.031**	0.014
Psychological distress × Both × Female							−0.076***	0.028
Observations	5829		5829		5829		5829	
R-squared	0.0486		0.099		0.104		0.110	

*, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Industry dummies are included in all analyses but not reported.

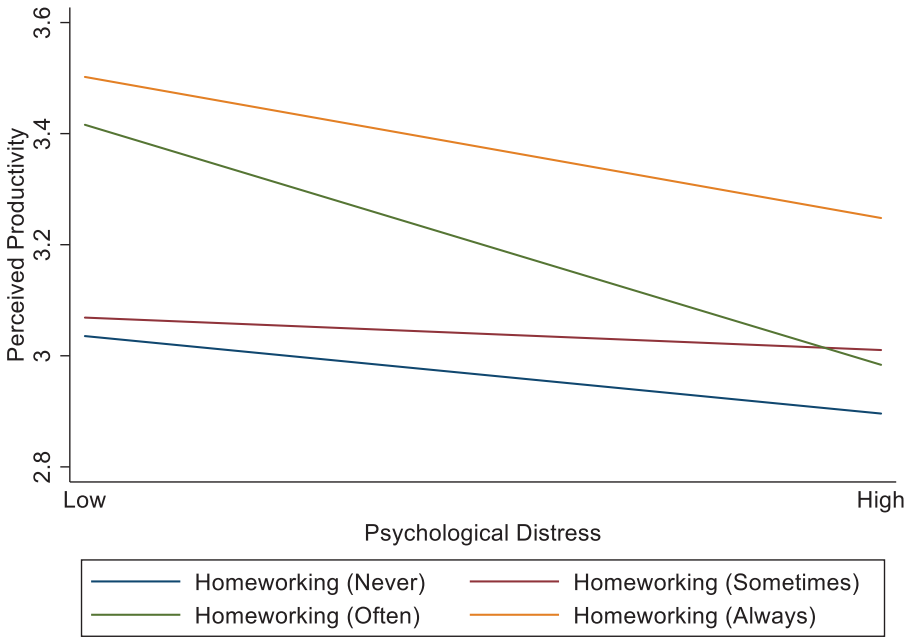

Figure 1. Interaction plot: psychological distress × homeworking status *[Colour figure can be viewed at wileyonlinelibrary.com]*

The interaction term for female, self-employment and psychological distress is negative and significant. The interaction plot in Figure 3 shows that the negative relationship between psychological distress and productivity is strengthened for female self-employed individuals. Therefore, H4b is supported. An increase of psychological distress by one standard deviation is associated with a 9% decrease in productivity for self-employed women and a 4% decrease for men in paid employment.

Robustness checks

We conducted additional robustness checks to further corroborate our results. We measured perceived health risk relating to COVID-19 with the variables COVID-19 symptoms and shielding from COVID-19, and reran the analyses. COVID-19 symptoms is a dichotomous variable measured with the question 'Have you experienced symptoms that could be caused by coronavirus?' and coded as 1 for yes, and 0 otherwise. Shielding from COVID-19 is a dichotomous variable measured with the question 'Have you received a letter, text or email from the NHS or Chief Medical Officer saying that you have been identified as someone at risk of severe illness if you catch coronavirus, because you have an underlying disease or health condition?' It is coded as 1 for yes, and 0 otherwise. The results of additional analyses were consistent with our original results.

We conducted additional analyses using another measure of productivity. The survey includes another variable on productivity, which measures whether it took more or less time previously (before the COVID-19 pandemic in January/February 2020) to complete the work the respondents can do in an hour now (time of survey during the COVID-19 pandemic). The results from the additional analyses were consistent with our

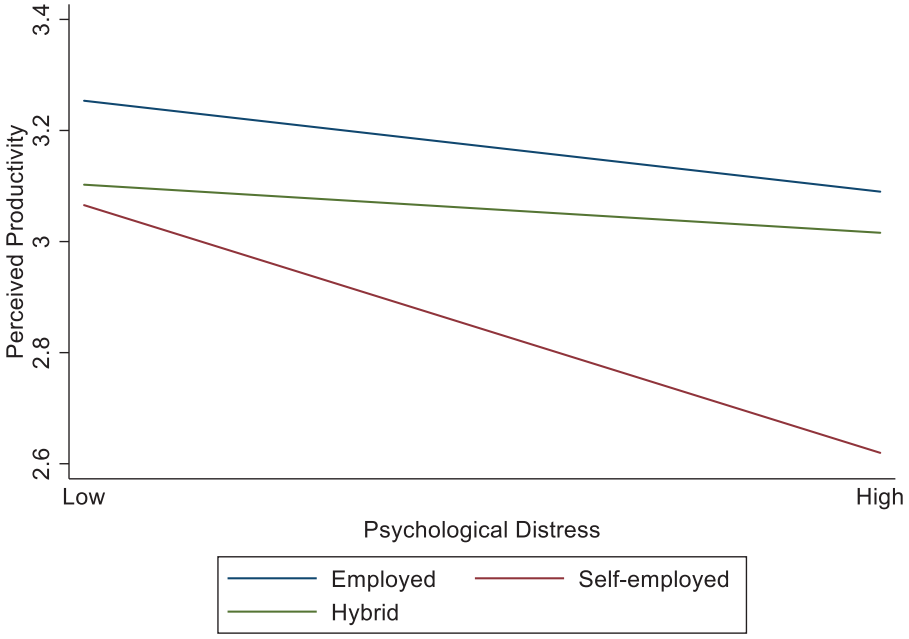

Figure 2. Interaction plot: psychological distress × self-employment status *[Colour figure can be viewed at wileyonlinelibrary.com]*

Figure 3. Interaction plot: psychological distress × self-employment status × gender *[Colour figure can be viewed at wileyonlinelibrary.com]*

original results, except for the three-way interaction between psychological distress, homeworking (scale point 'sometimes') and gender, which became positive and significant while it was not significant in the original analysis.

Finally, we considered the potential problem of reverse causality, which might affect the validity of our results. A mediation process where causality is reversed would imply that productivity affects psychological distress, which in turn affects the health risk from COVID-19. We contend that such a relationship is theoretically implausible. To further mitigate potential concerns regarding reverse causality, and following previous research (e.g. Goyal and Goyal, 2022; Rind *et al.*, 2022), we used a temporal lag, so the mediator psychological distress was measured temporally before the dependent variable productivity. This ensures that variations in the independent variable are appropriately reflected in the dependent variables (Zhang, Wang and Jia, 2022). Additionally, we ran additional analyses examining potential

reverse causality in the relationship. Specifically, we examined how perceived productivity may mediate the relationship between perceived health risk due to COVID-19 and psychological distress. The resulting indirect effect was not statistically significant. Finally, we carried out a two-stage least-squares (2SLS) regression as a further robustness check, which showed that reverse causality was not of concern. This provides further evidence for ruling out alternative explanations based on reverse causality.

Discussion

The COVID-19 pandemic has substantial and potentially long-lasting effects on psychological well-being and work outcomes. Our study demonstrated that the perceived health risk related to COVID-19 negatively impacts productivity by inducing psychological distress. We also found that individuals who work from home more often, as well as those who are self-employed, experience a stronger decline in productivity when psychological distress increases.

Contrary to what we hypothesized, the results showed no evidence for a significant three-way interaction between psychological distress, homeworking and gender. A reason for this might be that the most salient disadvantages of working from home during the pandemic did not stem from work–home interference (which affects women more than men), but primarily from other reasons which are less likely to be gender-specific, such as perceived lack of control, increased need for coordination and uncertainty regarding one's status. Congruent with our theory, we found that the perceived health risk from COVID-19 reduces the productivity of women in self-employment more significantly. This provides evidence that self-employed women, who often have to deal with increasing family demands in addition to demanding work tasks relating to self-employment, experience the most significant depletion of self-regulatory resources, and are therefore less able to regulate their productivity.

Our study makes several contributions. First, our study extends the literature on psychological distress and work performance (e.g. Cheng and McCarthy, 2018; De Clercq, Haq and Azeem, 2017; Jones, Latreille and Sloane, 2016; Lim and Tai, 2014). While evidence suggests that psychological distress has a negative impact on individual work performance, prior studies mostly do not consider the impact of major life events on psychological distress and subsequently work performance. By elucidating the process by which health risks related to COVID-19 affect productivity, this study extends our limited knowledge of how a continuing distressing event such as the COVID-19 pandemic impacts the productivity of working individuals (Rudolph *et al.*, 2021). Higher psychological distress due to health risks related to the COVID-19 pandemic depletes self-regulation resources, which in turn reduces productivity. Working individuals' productivity depends not only on organizational factors that induce psychological distress, but also on external factors that induce psychological distress. We enrich the literature that examines how stress-inducing factors outside the organization can influence work performance (De Clercq, Haq and Azeem, 2017; Lim and Tai, 2014). By linking health risks from COVID-19 to performance outcomes, we also add to our understanding of the performance implications of physical health, a topic which has received little scholarly attention (Hill *et al.*, 2022).

Second, this study enriches the debate on how newer forms of work organization such as homeworking impact performance. In general, research conducted prior to the COVID-19 pandemic broadly supports a positive relationship between homeworking and individual performance (Beauregard, Basile and Canónico, 2019; Gajendran and Harrison, 2007), although there is limited research that has shown the opposite (e.g. Golden *et al.*, 2008). However, this body of research has examined voluntary homeworking only (Lapierre *et al.*, 2016). Yet, the context of homeworking during the COVID-19 pandemic is novel in many ways, as the pandemic has created a large-scale, enforced shift towards homeworking (Beech and Anseel, 2020). This limits the generalizability of research on homeworking conducted before the pandemic (Wang *et al.*, 2021). A limited number of studies (e.g. Deole, Deter and Huang, 2023; Kitagawa *et al.*, 2021) have emerged that examine homeworking and performance during the COVID-19 pandemic, but their results have been inconsistent. The impact of an enforced shift to homeworking on individuals is highly uneven and may depend on how homeworking interacts with other relevant influences on performance (Barrero, Bloom and Davis, 2021). Instead of investigating the direct relationship between homeworking and individual productivity in isolation, our study provides a new angle on the performance implications of homeworking by considering how it interacts with psychological distress caused by the COVID-19 pandemic to predict individual productivity. By demonstrating that homeworking during the COVID-19 pandemic hindered people's ability to cope with psychological distress from COVID-19, leading to lower productivity, our study suggests that organizations may not reap the benefits of employees working from home if employees simultaneously have to deal with a significant life event which consumes self-regulation resources, such as the COVID-19 pandemic.

Third, we extend our knowledge of individual well-being and work performance of the self-employed (e.g. Hmieleski and Sheppard, 2019; Wiklund *et al.*, 2019).

There is growing scholarly interest in the consequences of well-being for self-employed individuals (Stephan, 2018). A number of studies have examined different outcomes of mental well-being of the self-employed, including persistence (Wincent, Örtqvist and Drnovsek, 2008), opportunity recognition (Gielnik, Zacher and Frese, 2012) and work behaviours (Hahn *et al.*, 2012). However, little is known about the relationship between mental health and productivity for self-employed individuals (Hessels *et al.*, 2018). We enrich this literature by clarifying the link between the mental well-being of the self-employed and work productivity. We show how a continuing distressing event can influence the productivity of the self-employed more negatively via psychological distress, compared to the productivity of the paid-employed. Compared to paid employment, self-employment is marked by more complex and demanding work, as well as heightened levels of uncertainty and accountability (Reid, Patel and Wolfe, 2018; Stephan, Rauch and Hatak, 2023). Furthermore, we shed new insights on work-related consequences of negative well-being (i.e. psychological distress) in a self-employment context, which is considerably less well researched compared to positive well-being and has distinct predictors and outcomes (Stephan, Rauch and Hatak, 2023).

Fourth, this study contributes to research which examines how homeworking affects men and women differently (e.g. Ashman *et al.*, 2022). Our research extends previous work, which has shown that the positive impact performance of voluntary homeworking is more pronounced for women (e.g. Gajendran and Harrison, 2007). Our results demonstrate that the negative consequences for performance from largely imposed homeworking do not affect men and women differently. It has been argued that women were particularly disadvantaged by homeworking during the COVID-19 pandemic, as responsibilities interfering with work, such as homeschooling and childcare, affect them disproportionately (Butterick and Charlwood, 2021; Hughes and Donnelly, 2022). However, our results show that psychological distress does not affect the productivity of homeworking women more negatively. This finding is especially interesting in light of previous research that found gender differences in psychological distress stemming from fear related to COVID-19 (Timming, French and Mortensen, 2021). Our results provide evidence that at least some of the disadvantages of (enforced) working from home apply equally to women and men (e.g. Song and Gao, 2020).

Finally, our work extends research on gender differences in self-employment, in particular regarding performance outcomes. A longstanding stream of entrepreneurship research has examined whether male-owned firms perform better than female-owned firms (Jennings and Brush, 2013). Some research has argued that self-employed women tend to perform less well than men because of discrimination, or different lifestyle choices of women which inhibit performance (Coleman, 2016). Even though there is some evidence for female underperformance, there is also research which shows that male-owned firms do not perform better than female-owned firms (Robb and Watson, 2012). Prior studies also suggest that the mixed results may be due to an indirect link between gender and performance, as gender may moderate the influence of other variables on performance (Collins-Dodd, Gordon and Smart, 2004). We extend research on gender and performance in self-employment by demonstrating how psychological distress affects the productivity of self-employed women more negatively, providing evidence regarding gender differences in the relationship between well-being and productivity for self-employed individuals. Our study also helps to better understand to what extent the COVID-19 pandemic may affect gender inequalities at work, contributing to management research that elucidates societal economic inequalities (Bapuji *et al.*, 2020).

Practical implications

Several practical implications emerge from our study. Notably, since the perceived health risk related to COVID-19 is associated with psychological distress, a decrease in health risks should contribute to a reduction in psychological distress and, by consequence, an improvement in productivity. Given that health risk perceptions are related to the threat of COVID-19, a more effective suppression of coronavirus should result in lower psychological distress, followed by improved productivity.

The results also imply that reducing psychological distress helps to maintain work productivity. The availability of mental health support is crucial for reducing psychological distress (Pfefferbaum and North, 2020). Adequate access to this type of support is often not available (Cowan, 2020), but could help to diminish the impact of COVID-19 on psychological well-being and work productivity (Van Bavel *et al.*, 2020). Working individuals would therefore benefit from mental health support and targeted efforts to encourage help-seeking behaviour. Policymakers, including governments, business federations and similar organizations, should increase their efforts to make such support available to the working population.

Organizations should also help minimize the psychological distress levels of employees, for example, by making workplaces safer from COVID-19, or by supporting their employees' adjustment to new work practices, such as working from home or virtual teamwork (e.g. Kniffin *et al.*, 2021; Wang *et al.*, 2021). Organizations should also strive to reduce the impact

of psychological distress on productivity by helping employees to replenish their self-regulation resources. In particular, employees need to be provided with adequate social support and mental health support. Self-regulation resources can also be increased by increasing autonomy at work (Wang *et al.*, 2021), promoting peer support (Kuntz, 2021), providing voice mechanisms (Lin and Johnson, 2015), or encouraging employees to engage in job crafting (Kooij, 2020). People will also be able to replenish their psychological resources by having sufficient sleep, recovery time and respite from work (e.g. Sonnentag, 2001; Tyler and Burns, 2008).

Psychological distress can also be reduced using a range of support measures which improve personal, social, financial and work resources, in particular for the self-employed (Kleine and Schmitt, 2021). For instance, as social support is an important personal resource for combating psychological distress (Drapeau, Marchand and Beaulieu-Prévost, 2011), peer networks connecting self-employed individuals can help reduce psychological distress. Various types of support are particularly important for helping self-employed women to maintain their work productivity. Other initiatives, which might assist self-employed women in coping with domestic demands and decreasing work–family conflict, are also likely to help their productivity.

Our results show that when workers experience psychological distress, homeworking is associated with lower individual productivity. It is therefore important for organizations to carefully implement and manage homeworking, especially since this mode of working is now the norm for a growing number of people (Barrero, Bloom and Davis, 2021). For example, managers should take into account individual preferences for homeworking and ensure that homeworkers have sufficient autonomy and control over their work activities, which benefits individual performance (Anderson and Kelliher, 2020; Basile and Beauregard, 2021; Gajendran, Harrison and Delaney-Klinger, 2015). This aspect also includes the control of boundaries between work and home. Organizations can help to maintain such boundaries by establishing guidelines which prevent an 'always on' culture, where employees feel obliged to be constantly available (Basile and Beauregard, 2021). Furthermore, management needs to provide adequate social support and ensure regular interactions with coworkers. This promotes information exchange and reduces uncertainty (Waizenegger *et al.*, 2020), which should help to prevent ego depletion. If homeworking is imposed (e.g. because of renewed lockdowns), appropriate training and guidance should be provided to employees. Finally, managers should provide frequent and detailed feedback to homeworkers. Homeworking relies on electronic communication, which is less rich than face-to-face interactions and provides fewer cues regarding individual performance (Golden *et al.*, 2008). This requires homeworkers to seek more information about tasks, or to resolve misunderstandings and conflict (e.g. Sardeshmukh, Sharma and Golden, 2012). Improved feedback helps to reduce these ego-depleting activities and maintain productivity.

Limitations and future research

The results of our study have to be interpreted in light of several limitations, which give rise to opportunities for future research. The results were obtained using a British sample, which might restrict their generalizability to other countries in which the COVID-19 pandemic has unfolded differently. For example, Asian countries such as South Korea or Taiwan have largely avoided national lockdowns (e.g. Kim *et al.*, 2020), which means that some repercussions of the pandemic are likely to differ from the British context. Research in other countries with dissimilar cultural, economic and institutional contexts is necessary to contextualize and validate the results of our study (Rudolph *et al.*, 2021).

Further, although our analyses suggest links between health risks, psychological distress and productivity, they do not provide insights into the behaviours and strategies that people engage in to respond to health risks and psychological distress. More fine-grained research is necessary to investigate, for example, relevant coping and self-regulation processes in this context. In-depth qualitative research might also be useful to elucidate the way people experienced changes in their personal productivity during the COVID-19 pandemic. Research from a more holistic, qualitative perspective might provide richer insights into contextual influences on productivity, which are comparably difficult to capture with a quantitative approach.

Our study did not examine how individuals perceive changes in their productivity over time, even though productivity can be expected to fluctuate during the pandemic. Future research might examine the development of individual productivity as a function of psychological distress and health risks over time, using, for example, an experience sampling approach (Heggestad *et al.*, 2021), which can also account for the influence of various types, forms and contexts of work. Our measure of productivity is self-reported and subjective; future research might validate the hypothesized relationships using different performance outcomes, such as supervisor-rated performance or objectively quantifiable metrics for productivity.

Finally, the psychological and behavioural effects of COVID-19 and their consequences, the effects on well-being and productivity, may take years to materialize. Hence, studies employing longer time frames and applying different measures of productivity would be desirable to validate and extend our findings.

Conclusion

The COVID-19 pandemic caused significant psychological distress and upended working lives. Our research represents an attempt to understand the consequences of the pandemic not only for psychological distress, but in particular also for productivity. Using a robust research design which relies on data collected over two waves, and based on a representative sample reflecting a country heavily affected by COVID-19, this study clarified the relationships between the health risks related to COVID-19, psychological distress and productivity, taking into account contextual and individual differences including homeworking, self-employment status and gender. Our results highlight how individuals struggle with maintaining productivity at work as a result of a stressful life event such as the COVID-19 pandemic. Our research has a number of practical implications, which should help organizations and individuals to mitigate the deleterious impact of the COVID-19 pandemic on individual productivity.

Acknowledgements

Understanding Society is an initiative funded by the Economic and Social Research Council and various government departments, with scientific leadership by the Institute for Social and Economic Research, University of Essex and survey delivery by NatCen Social Research and Kantar Public. The research data are distributed by the UK Data Service. The COVID-19 study (2020–2021) was funded by the Economic and Social Research Council and the Health Foundation. Serology testing was funded by the COVID-19 Longitudinal Health and Wealth – National Core Study. Fieldwork for the web survey was carried out by Ipsos MORI and for the telephone survey by Kantar.

References

Abreu, M., O. Oner, A. Brouwer and E. van Leeuwen (2019). 'Well-being effects of self-employment: a spatial inquiry', *Journal of Business Venturing*, **34**, pp. 589–607.

Adisa, T. A., E. Antonacopoulou, T. A. Beauregard, M. Dickmann and O. D. Adekoya (2022). 'Exploring the impact of COVID-19 on employees' boundary management and work–life balance', *British Journal of Management*, **33**, pp. 1694–1709.

Alon, T., M. Doepke, J. Olmstead-Rumsey and M. Tertilt (2020). 'The impact of COVID-19 on gender equality', NBER Working Paper w26947.

Anderson, D. and C. Kelliher (2020). 'Enforced remote working and the work–life interface during lockdown', *Gender in Management*, **35**, pp. 677–683.

Anglim, J. and S. Horwood (2021). 'Effect of the COVID-19 pandemic and big five personality on subjective and psychological well-being', *Social Psychological and Personality Science*, **12**, pp. 1527–1537.

Arndt, J., C. Routledge, C. R. Cox and J. L. Goldenberg (2005). 'The worm at the core: a terror management perspective on the roots of psychological dysfunction', *Applied and Preventive Psychology*, **11**, pp. 191–213.

Ashman, R., L. Radcliffe, A. Patterson and C. Gatrell (2022). 'Re-ordering motherhood and employment: mobilizing 'Mums Everywhere' during Covid-19', *British Journal of Management*, **33**, pp. 1125–1143.

Astin, H. S. and D. E. Davis (1985). 'Research productivity across the life and career cycles: facilitators and barriers for women'. In M. F. Fox (ed.), *Scholarly Writing and Publishing: Issues, Problems and Solutions*, pp. 147–160. Boulder, CO: Westview Press.

Bailey, D. E. and N. B. Kurland (2002). 'A review of telework research: findings, new directions, and lessons for the study of modern work', *Journal of Organizational Behavior*, **23**, pp. 383–400.

Bal, P. M. and A. H. De Lange (2015). 'From flexibility human resource management to employee engagement and perceived job performance across the lifespan: a multisample study', *Journal of Occupational and Organizational Psychology*, **88**, pp. 126–154.

Bapuji, H., C. Patel, G. Ertug and D. G. Allen (2020). 'Corona crisis and inequality: why management research needs a societal turn', *Journal of Management*, **46**, pp. 1205–1222.

Barrero, J. M., N. Bloom and S. J. Davis (2021). 'Why working from home will stick', NBER Working Paper w28731.

Basile, K. A. and T. A. Beauregard (2021). 'Boundary management: getting the work–home balance right'. In E. Russell and C. Grant (eds), *Agile Working and Well-Being in the Digital Age*, pp. 35–46. Cham: Palgrave Macmillan.

Bauer, I. M. and R. F. Baumeister (2011). 'Self-regulatory strength'. In K. D. Vohs and R. F. Baumeister (eds), *Handbook of Self-Regulation: Research, Theory, and Applications*, 2nd edn, pp. 64–82. New York: Guilford.

Baumeister, R. F., E. Bratslavsky, M. Muraven and D. M. Tice (1998). 'Ego depletion: is the active self a limited resource?', *Journal of Personality and Social Psychology*, **74**, pp. 1252–1265.

Baumeister, R. F. and K. D. Vohs (2007). 'Self-regulation, ego depletion, and motivation', *Social and Personality Psychology Compass*, **1**, pp. 115–128.

Baumeister, R. F. and K. D. Vohs (2016). 'Chapter Two – Strength model of self-regulation as limited resource: assessment, controversies, update', *Advances in Experimental Social Psychology*, **54**, pp. 67–127.

Beauregard, T. A., K. A. Basile and E. Canónico (2019). 'Telework: outcomes and facilitators for employees'. In R. N. Landers (ed.), *The Cambridge Handbook of Technology and Employee Behavior*, pp. 511–543. Cambridge: Cambridge University Press.

Beech, N. and F. Anseel (2020). 'COVID-19 and its impact on management research and education: threats, opportunities and a manifesto', *British Journal of Management*, **31**, pp. 447–449.

Bencsik, P. and T. Chuluun (2021). 'Comparative well-being of the self-employed and paid employees in the USA', *Small Business Economics*, **56**, pp. 355–384.

Benz, M. and B. S. Frey (2008). 'Being independent is a great thing: subjective evaluations of self-employment and hierarchy', *Economica*, **75**, pp. 362–383.

Bird, C. E. (1997). 'Gender differences in the social and economic burdens of parenting and psychological distress', *Journal of Marriage and the Family*, **59**, pp. 809–823.

Böhnke, J. R. and T. J. Croudace (2016). 'Calibrating well-being, quality of life and common mental disorder items: psychometric epidemiology in public mental health research', *The British Journal of Psychiatry*, **209**, pp. 162–168.

Boles, M., B. Pelletier and W. Lynch (2004). 'The relationship between health risks and work productivity', *Journal of Occupational and Environmental Medicine*, **46**, pp. 737–745.

Bommer, W. H., J. L. Johnson, G. A. Rich, P. M. Podsakoff and S. B. Mackenzie (1995). 'On the interchangeability of objective and subjective measures of employee performance: a meta-analysis', *Personnel Psychology*, **48**, pp. 587–605.

Boyd, D. P. and D. E. Gumpert (1983). 'Coping with entrepreneurial stress', *Harvard Business Review*, **61**, pp. 44–64.
Butterick, M. and A. Charlwood (2021). 'HRM and the COVID-19 pandemic: how can we stop making a bad situation worse?', *Human Resource Management Journal*, **31**, pp. 847–856.
Carr, D. and D. Umberson (2013). 'The social psychology of stress, health, and coping'. In J. DeLamater and A. Ward (eds), *Handbook of Social Psychology*, pp. 465–487. Amsterdam: Springer.
Carver, C. S. and S. Vargas (2011). 'Stress, coping, and health'. In E. S. Friedman (ed.), *The Oxford Handbook of Health Psychology*, pp. 162–188. Oxford: Oxford University Press.
Cerrato, J. and E. Cifre (2018). 'Gender inequality in household chores and work–family conflict', *Frontiers in Psychology*, **9**, pp. 1–15.
Chadwick, I. C. and J. L. Raver (2019). 'Not for the faint of heart? A gendered perspective on psychological distress in entrepreneurship', *Journal of Occupational Health Psychology*, **24**, pp. 662–674.
Charalampous, M., C. A. Grant, C. Tramontano and E. Michailidis (2019). 'Systematically reviewing remote e-workers' well-being at work: a multidimensional approach', *European Journal of Work and Organizational Psychology*, **28**, pp. 51–73.
Cheng, B. H. and J. M. McCarthy (2018). 'Understanding the dark and bright sides of anxiety: a theory of workplace anxiety', *Journal of Applied Psychology*, **103**, pp. 537–560.
Coleman, S. (2016). 'Gender, entrepreneurship, and firm performance: recent research and considerations of context'. In M. Connerley and J. Wu (eds), *Handbook on Well-Being of Working Women*, pp. 375–391. Dordrecht: Springer.
Collins-Dodd, C., I. M. Gordon and C. Smart (2004). 'Further evidence on the role of gender in financial performance', *Journal of Small Business Management*, **42**, pp. 395–417.
Conway, M., P. A. Csank, S. L. Holm and C. K. Blake (2000). 'On assessing individual differences in rumination on sadness', *Journal of Personality Assessment*, **75**, pp. 404–425.
Cowan, K. (2020). 'Survey results: understanding people's concerns about the mental health impacts of the COVID-19 pandemic'. Available at https://acmedsci.ac.uk/file-download/99436893. Last accessed June 4, 2023.
De Clercq, D., I. U. Haq and M. U. Azeem (2017). 'Perceived threats of terrorism and job performance: the roles of job-related anxiety and religiousness', *Journal of Business Research*, **78**, pp. 23–32.
de Croon, E. M., J. K. Sluiter, R. W. B. Blonk, J. P. J. Broersen and M. H. W. Frings-Dresen (2004). 'Stressful work, psychological job strain, and turnover: a 2-year prospective cohort study of truck drivers', *Journal of Applied Psychology*, **89**, pp. 442–454.
Deole, S. S., M. Deter and Y. Huang (2023). 'Home sweet home: working from home and employee performance during the COVID-19 pandemic in the UK', *Labour Economics*, **80**, art. 102295.
DeWall, C. N., R. F. Baumeister, M. T. Gailliot and J. K. Maner (2008). 'Depletion makes the heart grow less helpful: helping as a function of self-regulatory energy and genetic relatedness', *Personality and Social Psychology Bulletin*, **34**, pp. 1653–1662.
Drapeau, A., A. Marchand and D. Beaulieu-Prévost (2011). 'Epidemiology of psychological distress'. In L. L'Abate (ed.), *Mental Illnesses – Understanding, Prediction and Control*, pp. 105–134. Rijeka: InTech.
Duan, L. and G. Zhu (2020). 'Psychological interventions for people affected by the COVID-19 epidemic', *The Lancet Psychiatry*, **7**, pp. 300–302.
Ferrer, R. A. and W. M. Klein (2015). 'Risk perceptions and health behavior', *Current Opinion in Psychology*, **5**, pp. 85–89.
Fisher, G. G., R. A. Matthews and A. M. Gibbons (2016). 'Developing and investigating the use of single-item measures in organizational research', *Journal of Occupational Health Psychology*, **21**, pp. 3–23.
Flaxman, P. E. and F. W. Bond (2010). 'Worksite stress management training: moderated effects and clinical significance', *Journal of Occupational Health Psychology*, **15**, pp. 347–358.
Folta, T. B., F. Delmar and K. Wennberg (2010). 'Hybrid entrepreneurship', *Management Science*, **56**, pp. 253–269.
Fu, S. Q., L. M. Greco, A. C. Lennard and N. Dimotakis (2021). 'Anxiety responses to the unfolding COVID-19 crisis: patterns of change in the experience of prolonged exposure to stressors', *Journal of Applied Psychology*, **106**, pp. 48–61.
Gailliot, M. T., B. J. Schmeichel and R. F. Baumeister (2006). 'Self-regulatory processes defend against the threat of death: effects of self-control depletion and trait self-control on thoughts and fears of dying', *Journal of Personality and Social Psychology*, **91**, pp. 49–62.
Gajendran, R. S. and D. A. Harrison (2007). 'The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences', *Journal of Applied Psychology*, **92**, pp. 1524–1541.
Gajendran, R. S., D. A. Harrison and K. Delaney-Klinger (2015). 'Are telecommuters remotely good citizens? Unpacking telecommuting's effects on performance via i-deals and job resources', *Personnel Psychology*, **68**, pp. 353–393.
George, T. J., L. E. Atwater, D. Maneethai and J. M. Madera (2022). 'Supporting the productivity and wellbeing of remote workers: lessons from COVID-19', *Organizational Dynamics*, **51**, art. 100869.
Gielnik, M. M., H. Zacher and M. Frese (2012). 'Focus on opportunities as a mediator of the relationship between business owners' age and venture growth', *Journal of Business Venturing*, **27**, pp. 127–142.
Giones, F., A. Brem, J. M. Pollack, T. L. Michaelis, K. Klyver and J. Brinckmann (2020). 'Revising entrepreneurial action in response to exogenous shocks: considering the COVID-19 pandemic', *Journal of Business Venturing Insights*, **14**, art. e00186.
Göbel, C. and T. Zwick (2012). 'Age and productivity: sector differences', *De Economist*, **160**, pp. 35–57.
Goldberg, D. P., R. Gater, N. Sartorius, T. B. Ustun, M. Piccinelli, O. Gureje and C. Rutter (1997). 'The validity of two versions of the GHQ in the WHO study of mental illness in general health care', *Psychological Medicine*, **27**, pp. 191–197.
Golden, T. D., J. F. Veiga and R. N. Dino (2008). 'The impact of professional isolation on teleworker job performance and turnover intentions: does time spent teleworking, interacting face-to-face, or having access to communication-enhancing technology matter?', *Journal of Applied Psychology*, **93**, pp. 1412–1421.
Gorgievski, M. J., A. B. Bakker, W. B. Schaufeli, H. B. van der Veen and C. W. Giesen (2010). 'Financial problems and psychological distress: investigating reciprocal effects among business owners', *Journal of Occupational and Organizational Psychology*, **83**, pp. 513–530.
Goyal, L. and V. Goyal (2022). 'Performance shortfall, feedback interpretation and R&D search: the differential effects of peers' performance below historical and social aspirations', *British Journal of Management*, **33**, pp. 1584–1608.
Grashuis, J. (2021). 'Self-employment duration during the COVID-19 pandemic: a competing risk analysis', *Journal of Business Venturing Insights*, **15**, art. e00241.
Greenberg, J. and J. Arndt (2012). 'Terror management theory'. In P. A. M. Van Lange, A. W. Kruglanski and E. T. Higgins (eds), *Handbook of Theories of Social Psychology*, pp. 398–415. London: Sage.
Hahn, V. C., M. Frese, C. Binnewies and A. Schmitt (2012). 'Happy and proactive? The role of hedonic and eudaimonic well-being in business owners' personal initiative', *Entrepreneurship Theory and Practice*, **36**, pp. 97–114.
Hardy, G. E., D. Woods and T. D. Wall (2003). 'The impact of psychological distress on absence from work', *Journal of Applied Psychology*, **88**, pp. 306–314.
Hayes, A. F. (2018). *Introduction to Mediation: A Regression-Based Approach*, 2nd edn. New York: Guilford.
Heggestad, E. D., L. Kreamer, M. M. Hausfeld, C. Patel and S. G. Rogelberg (2021). 'Recommendations for reporting sample and measurement information in experience sampling studies', *British Journal of Management*, **33**, pp. 553–570.
Hessels, J., C. A. Rietveld, A. R. Thurik and P. Van der Zwan (2018). 'Depression and entrepreneurial exit', *Academy of Management Perspectives*, **32**, pp. 323–339.

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**, pp. 178–196.

Hetkamp, M., A. Schweda, A. Bäuerle, B. Weismüller, H. Kohler, V. Musche, *et al.* (2020). 'Sleep disturbances, fear, and generalized anxiety during the COVID-19 shut down phase in Germany: relation to infection rates, deaths, and German stock index DAX', *Sleep Medicine*, **75**, pp. 350–353.

Hewison, F. (2020). 'Covid-19: the self-employed facing their income dry up'. Available at https://www.bbc.co.uk/news/uk-england-tyne-54499640. Last accessed June 4, 2023.

Hilbrecht, M. and D. S. Lero (2014). 'Self-employment and family life: constructing work–life balance when you're "always on"', *Community, Work & Family*, **17**, pp. 20–42.

Hill, N. S., H. Aguinis, J. Drewry, S. Patnaik and J. J. Griffin (2022). 'Using macro archival databases to expand theory in micro research', *Journal of Management Studies*, **59**, pp. 627–659.

Hmieleski, K. M. and L. D. Sheppard (2019). 'The yin and yang of entrepreneurship: gender differences in the importance of communal and agentic characteristics for entrepreneurs' subjective well-being and performance', *Journal of Business Venturing*, **34**, pp. 709–730.

Hughes, E. and R. Donnelly (2022). 'Theorising the impact of macro-turbulence on work and HRM: COVID-19 and the abrupt shift to enforced homeworking', *Human Resource Management Journal*, 10.1111/1748-8583.12465.

Hughes, M., J. C. Rigtering, J. G. Covin, R. B. Bouncken and S. Kraus (2018). 'Innovative behaviour, trust and perceived workplace performance', *British Journal of Management*, **29**, pp. 750–768.

Hundley, G. (2001). 'Why and when are the self-employed more satisfied with their work?', *Industrial Relations: A Journal of Economy and Society*, **40**, pp. 293–316.

Hurley, J. (2020). 'Frozen out, self-employed face fight to survive'. Available at https://www.thetimes.co.uk/article/frozen-out-self-employed-face-fight-to-survive-rkj55z9gn. Last accessed June 4, 2023.

Hyde, J. S. (2014). 'Gender similarities and differences', *Annual Review of Psychology*, **65**, pp. 373–398.

Hystad, S. W. and B. H. Johnsen (2020). 'The dimensionality of the 12-item General Health Questionnaire (GHQ-12): comparisons of factor structures and invariance across samples and time', *Frontiers in Psychology*, **11**, pp. 1–11.

Institute for Social and Economic Research (2021). *Understanding Society COVID-19 User Guide, Version 10.0*. Colchester: University of Essex.

Inzlicht, M. and B. J. Schmeichel (2012). 'What is ego depletion? Toward a mechanistic revision of the resource model of self-control', *Perspectives on Psychological Science*, **7**, pp. 450–463.

Jennings, J. E. and C. G. Brush (2013). 'Research on women entrepreneurs: challenges to (and from) the broader entrepreneurship literature?', *Academy of Management Annals*, **7**, pp. 663–715.

Johnson, B. J. and J. B. Mabry (2022). 'Remote work video meetings: workers' emotional exhaustion and practices for greater well-being', *German Journal of Human Resource Management*, **36**, pp. 380–408.

Jones, M. K., P. L. Latreille and P. J. Sloane (2016). 'Job anxiety, work-related psychological illness and workplace performance', *British Journal of Industrial Relations*, **54**, pp. 742–767.

Kalenkoski, C. M. and S. W. Pabilonia (2022). 'Impacts of COVID-19 on the self-employed', *Small Business Economics*, **58**, pp. 741–768.

Kim, A. W., T. Nyengerai and E. Mendenhall (2022). 'Evaluating the mental health impacts of the COVID-19 pandemic: perceived risk of COVID-19 infection and childhood trauma predict adult depressive symptoms in urban South Africa', *Psychological Medicine*, **52**, pp. 1587–1599.

Kim, M.-H., W. Cho, H. Choi and J.-Y. Hur (2020). 'Assessing the South Korean model of emergency management during the COVID-19 pandemic', *Asian Studies Review*, **44**, pp. 567–578.

Kitagawa, R., S. Kuroda, H. Okudaira and H. Owan (2021). 'Working from home and productivity under the COVID-19 pandemic: using survey data of four manufacturing firms', *PLoS One*, **16**, art. e0261761.

Klebe, L., J. Felfe and K. Klug (2021). 'Healthy leadership in turbulent times: the effectiveness of health-oriented leadership in crisis', *British Journal of Management*, **32**, pp. 1203–1218.

Kleine, A.-K. and A. Schmitt (2021). 'Entrepreneurs' psychological wellbeing'. In T. Wall, C. L. Cooper and P. Brough (eds), *The SAGE Handbook of Organizational Wellbeing*, pp. 199–214. London: SAGE Publications.

Kniffin, K. M., J. Narayanan, F. Anseel, J. Antonakis, S. P. Ashford, A. B. Bakker, *et al.* (2021). 'COVID-19 and the workplace: implications, issues, and insights for future research and action', *American Psychologist*, **76**, pp. 63–77.

Koch, J. and C. C. Schermuly (2021). 'Managing the crisis: how COVID-19 demands interact with agile project management in predicting employee exhaustion', *British Journal of Management*, **32**, pp. 1265–1283.

Kooij, D. T. A. M. (2020). 'The impact of the Covid-19 pandemic on older workers: the role of self-regulation and organizations', *Work, Aging and Retirement*, **6**, pp. 233–237.

Kuntz, J. C. (2021). 'Resilience in times of global pandemic: steering recovery and thriving trajectories', *Applied Psychology*, **70**, pp. 188–215.

Lange, T. (2012). 'Job satisfaction and self-employment: autonomy or personality?', *Small Business Economics*, **38**, pp. 165–177.

Lapierre, L. M., E. F. Van Steenbergen, M. C. Peeters and E. S. Kluwer (2016). 'Juggling work and family responsibilities when involuntarily working more from home: a multiwave study of financial sales professionals', *Journal of Organizational Behavior*, **37**, pp. 804–822.

Lian, H., J. K. Li, C. Du, W. Wu, Y. Xia and C. Lee (2022). 'Disaster or opportunity? How COVID-19-associated changes in environmental uncertainty and job insecurity relate to organizational identification and performance', *Journal of Applied Psychology*, **107**, pp. 693–706.

Lim, S. and K. Tai (2014). 'Family incivility and job performance: a moderated mediation model of psychological distress and core self-evaluation', *Journal of Applied Psychology*, **99**, pp. 351–359.

Lin, S. H. J. and R. E. Johnson (2015). 'A suggestion to improve a day keeps your depletion away: examining promotive and prohibitive voice behaviors within a regulatory focus and ego depletion framework', *Journal of Applied Psychology*, **100**, pp. 1381–1397.

MacKinnon, D. P., C. M. Lockwood and J. Williams (2004). 'Confidence limits for the indirect effect: distribution of the product and resampling methods', *Multivariate Behavioral Research*, **39**, pp. 99–128.

Malach Pines, A., M. B. Neal, L. B. Hammer and T. Icekson (2011). 'Job burnout and couple burnout in dual-earner couples in the sandwiched generation', *Social Psychology Quarterly*, **74**, pp. 361–386.

Martinez Dy, A. and D. Jayawarna (2020). 'Bios, mythoi and women entrepreneurs: a Wynterian analysis of the intersectional impacts of the COVID-19 pandemic on self-employed women and women-owned businesses', *International Small Business Journal*, **38**, pp. 391—403.

Martínez-Sánchez, A., M. Pérez-Pérez, M. J. Vela-Jiménez and P. de-Luis-Carnicer (2008). 'Telework adoption, change management, and firm performance', *Journal of Organizational Change Management*, **21**, pp. 7–31.

Matud, M. P. (2004). 'Gender differences in stress and coping styles', *Personality and Individual Differences*, **37**, pp. 1401–1415.

Müller, T. and C. Niessen (2019). 'Self-leadership in the context of part-time teleworking', *Journal of Organizational Behavior*, **40**, pp. 883–898.

Murray, J., R. Obordo and J. Otte (2020). '"It's really hit us": UK small businesses on impact of coronavirus'. Available at https://www.theguardian.com/business/2020/mar/11/uk-small-businesses-impact-coronavirus-sick-pay. Last accessed June 4, 2023.

Nagy, M. S. (2002). 'Using a single-item approach to measure facet job satisfaction', *Journal of Occupational and Organizational Psychology*, **75**, pp. 77–86.

Nickell, L. A., E. J. Crighton, C. S. Tracy, H. Al-Enazy, Y. Bolaji, S. Hanjrah, *et al.* (2004). 'Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution', *CMAJ*, **170**, pp. 793–798.

Nolen-Hoeksema, S. and C. Corte (2004). 'Gender and self-regulation'. In K. D. Vohs and R. F. Baumeister (eds), *Handbook of Self-Regulation: Research, Theory, and Applications*, 1st edn, pp. 411–421. New York: Guilford.

Orhan, M. A., S. Castellano, I. Khelladi, L. Marinelli and F. Monge (2021). 'Technology distraction at work: impacts on self-regulation and work engagement', *Journal of Business Research*, **126**, pp. 341–349.

Patel, P. C. and C. A. Rietveld (2020). 'The impact of financial insecurity on the self-employed's short-term psychological distress: evidence from the COVID-19 pandemic', *Journal of Business Venturing Insights*, **14**, pp. 1–11.

Pepe, A., L. Addimando, J. Dagdukee and G. Veronese (2021). 'Psychological distress, job satisfaction and work engagement: a cross-sectional mediation study with a sample of Palestinian teachers', *Educational Studies*, **47**, pp. 275–291.

Perry, S. J., C. Rubino and E. M. Hunter (2018). 'Stress in remote work: two studies testing the demand–control–person model', *European Journal of Work and Organizational Psychology*, **27**, pp. 577–593.

Pfefferbaum, B. and C. S. North (2020). 'Mental health and the Covid-19 pandemic', *New England Journal of Medicine*, **383**, pp. 510–512.

Pines, A. M., M. Lerner and D. Schwartz (2010). 'Gender differences in entrepreneurship', *Equality, Diversity and Inclusion: An International Journal*, **29**, pp. 186–198.

Redman, T., E. Snape and C. Ashurst (2009). 'Location, location, location: does place of work really matter?', *British Journal of Management*, **20**, pp. S171–S181.

Reid, S. W., P. C. Patel and M. T. Wolfe (2018). 'The struggle is real: self-employment and short-term psychological distress', *Journal of Business Venturing Insights*, **9**, pp. 128–136.

Restubog, S. L. D., K. L. Scott and T. J. Zagenczyk (2011). 'When distress hits home: the role of contextual factors and psychological distress in predicting employees' responses to abusive supervision', *Journal of Applied Psychology*, **96**, pp. 713–729.

Reynolds, P., S. Hurley, M. Torres, J. Jackson, P. Boyd and V. W. Chen (2000). 'Use of coping strategies and breast cancer survival: results from the Black/White cancer survival study', *American Journal of Epidemiology*, **152**, pp. 940–949.

Rind, A. A., S. Akbar, S. Boubaker, S. Lajili-Jarjir and S. Mollah (2022). 'The role of peer effects in corporate employee welfare policies', *British Journal of Management*, **33**, pp. 1609–1631.

Robb, A. M. and J. Watson (2012). 'Gender differences in firm performance: evidence from new ventures in the United States', *Journal of Business Venturing*, **27**, pp. 544–558.

Robins, R. W., H. M. Hendin and K. H. Trzesniewski (2001). 'Measuring global self-esteem: construct validation of a single-item measure and the Rosenberg self-esteem scale', *Personality and Social Psychology Bulletin*, **27**, pp. 151–161.

Rogelberg, S. G., D. J. Leach, P. B. Warr and J. L. Burnfield (2006). '"Not another meeting!" Are meeting time demands related to employee well-being?', *Journal of Applied Psychology*, **91**, pp. 83–96.

Rothbard, N. P., A. M. Beetz and D. Harari (2021). 'Balancing the scales: a configurational approach to work–life balance', *Annual Review of Organizational Psychology and Organizational Behavior*, **8**, pp. 1–31.

Rudolph, C. W., B. Allan, M. Clark, G. Hertel, A. Hirschi, F. Kunze, *et al.* (2021). 'Pandemics: implications for research and practice in industrial and organizational psychology', *Industrial and Organizational Psychology*, **14**, pp. 1–35.

Sampling, I. (2020). 'Covid poses "greatest threat to mental health since Second World War"'. Available at https://www.theguardian.com/society/2020/dec/27/covid-poses-greatest-threat-to-mental-health-since-second-world-war. Last accessed June 4, 2023.

Sardeshmukh, S. R., D. Sharma and T. D. Golden (2012). 'Impact of telework on exhaustion and job engagement: a job demands and job resources model', *New Technology, Work and Employment*, **27**, pp. 193–207.

Saridakis, G., S. Marlow and D. J. Storey (2014). 'Do different factors explain male and female self-employment rates?', *Journal of Business Venturing*, **29**, pp. 345–362.

Sayre, G. M., A. A. Grandey and D. M. Almeida (2021). 'Does sleep help or harm managers' perceived productivity? Trade-offs between affect and time as resources', *Journal of Occupational Health Psychology*, **26**, pp. 127–141.

Schlaegel, C., M. Gunkel and V. Taras (2023). 'COVID-19 and individual performance in global virtual teams: the role of self-regulation and individual cultural value orientations', *Journal of Organizational Behavior*, **44**, pp. 102–131.

Schneiderman, N., G. Ironson and S. D. Siegel (2005). 'Stress and health: psychological, behavioral, and biological determinants', *Annual Review of Clinical Psychology*, **1**, pp. 607–628.

Schonfeld, I. S. and J. J. Mazzola (2015). 'A qualitative study of stress in individuals self-employed in solo businesses', *Journal of Occupational Health Psychology*, **20**, pp. 501–513.

Shockley, K. M., T. D. Allen, H. Dodd and A. M. Waiwood (2021a). 'Remote worker communication during COVID-19: the role of quantity, quality, and supervisor expectation-setting', *Journal of Applied Psychology*, **106**, pp. 1466–1482.

Shockley, K. M., A. S. Gabriel, D. Robertson, C. C. Rosen, N. Chawla, M. L. Ganster and M. E. Ezerins (2021b). 'The fatiguing effects of camera use in virtual meetings: a within-person field experiment', *Journal of Applied Psychology*, **106**, pp. 1137–1155.

Song, Y. and J. Gao (2020). 'Does telework stress employees out? A study on working at home and subjective well-being for wage/salary workers', *Journal of Happiness Studies*, **21**, pp. 2649–2668.

Sonnentag, S. (2001). 'Work, recovery activities, and individual well-being: a diary study', *Journal of Occupational Health Psychology*, **6**, pp. 196–210.

Stephan, U. (2018). 'Entrepreneurs' mental health and well-being: a review and research agenda', *Academy of Management Perspectives*, **32**, pp. 290–322.

Stephan, U., A. Rauch and I. Hatak (2023). 'Happy entrepreneurs? Everywhere? A meta-analysis of entrepreneurship and wellbeing', *Entrepreneurship Theory and Practice*, **47**, pp. 553–593.

Styra, R., L. Hawryluck, S. Robinson, S. Kasapinovic, C. Fones and W. L. Gold (2008). 'Impact on health care workers employed in high-risk areas during the Toronto SARS outbreak', *Journal of Psychosomatic Research*, **64**, pp. 177–183.

Tietze, S. and S. Nadin (2011). 'The psychological contract and the transition from office-based to home-based work', *Human Resource Management Journal*, **21**, pp. 318–334.

Timming, A. R., M. T. French and K. Mortensen (2021). 'Health anxiety versus economic anxiety surrounding COVID-19: an analysis of psychological distress in the early stages of the pandemic', *Journal of Affective Disorders Reports*, **5**, art. 100152.

Tyler, J. M. and K. C. Burns (2008). 'After depletion: the replenishment of the self's regulatory resources', *Self and Identity*, **7**, pp. 305–321.

University of Essex (2021). 'Understanding Society: COVID-19 study, 2020–2021 [data collection], 11th edn', 10.5255/UKDA-SN-8644-11.

Van Bavel, J. J., K. Baicker, P. S. Boggio, V. Capraro, A. Cichocka, M. Cikara, *et al.* (2020). 'Using social and behavioural science to support COVID-19 pandemic response', *Nature Human Behaviour*, **4**, pp. 460–471.

Vaziri, H., W. J. Casper, J. H. Wayne and R. A. Matthews (2020). 'Changes to the work–family interface during the COVID-19

pandemic: examining predictors and implications using latent transition analysis', *Journal of Applied Psychology*, **105**, pp. 1073–1087.
Waizenegger, L., B. McKenna, W. Cai and T. Bendz (2020). 'An affordance perspective of team collaboration and enforced working from home during COVID-19', *European Journal of Information Systems*, **29**, pp. 429–442.
Wall, T. D., J. Michie, M. Patterson, S. J. Wood, M. Sheehan, C. W. Clegg and M. West (2004). 'On the validity of subjective measures of company performance', *Personnel Psychology*, **57**, pp. 95–118.
Wang, B., Y. Liu, J. Qian and S. K. Parker (2021). 'Achieving effective remote working during the COVID-19 pandemic: a work design perspective', *Applied Psychology*, **70**, pp. 16–59.
Wanous, J. P. and M. J. Hudy (2001). 'Single-item reliability: a replication and extension', *Organizational Research Methods*, **4**, pp. 361–375.
Wanous, J. P., A. E. Reichers and M. J. Hudy (1997). 'Overall job satisfaction: how good are single-item measures?', *Journal of Applied Psychology*, **82**, pp. 247–252.
Ward, A., S. Lyubomirsky, L. Sousa and S. Nolen-Hoeksema (2003). 'Can't quite commit: rumination and uncertainty', *Personality and Social Psychology Bulletin*, **29**, pp. 96–107.
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**, pp. 579–588.
Wincent, J., D. Örtqvist and M. Drnovsek (2008). 'The entrepreneur's role stressors and proclivity for a venture withdrawal', *Scandinavian Journal of Management*, **24**, pp. 232–246.
Wood, M. (2005). 'Bootstrapped confidence intervals as an approach to statistical inference', *Organizational Research Methods*, **8**, pp. 454–470.
Xin, M., S. Luo, R. She, Y. Yu, L. Li, S. Wang, *et al.* (2020). 'Negative cognitive and psychological correlates of mandatory quarantine during the initial COVID-19 outbreak in China', *American Psychologist*, **75**, pp. 607–617.
Yen, D. A. W., B. Cappellini, H. P. Yang and S. Gupta (2021). 'Coping with coping: international migrants' experiences of the Covid-19 lockdown in the UK', *British Journal of Management*, **32**, pp. 1219–1241.
Yıldırım, M., E. Geçer and Ö. Akgül (2021). 'The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19', *Psychology, Health & Medicine*, **26**, pp. 35–43.
Zacher, H. and C. W. Rudolph (2021). 'Individual differences and changes in subjective wellbeing during the early stages of the COVID-19 pandemic', *American Psychologist*, **76**, pp. 50–62.
Zhang, Z., X. Wang and M. Jia (2022). 'Poverty as a double-edged sword: how CEOs' childhood poverty experience affect firms' risk taking', *British Journal of Management*, **33**, pp. 1632–1653.

Sarah Park is Professor of International Business at University of Leicester School of Business, University of Leicester. Her research interests include international entrepreneurship, entrepreneurial finance and entrepreneurial well-being. Her research has been published in the *Journal of Business Venturing*, *Entrepreneurship Theory & Practice*, *Journal of World Business*, *Social Science & Medicine*, *International Small Business Journal* and *Journal of Small Business Management*.

Michael Koch is Senior Lecturer in Human Resource Management & Organizational Behaviour at Brunel Business School, Brunel University London. His research focuses on individual career trajectories and well-being and careers of entrepreneurs. His research has been published in *Human Resource Management*, *Journal of Business Venturing* and *Social Science & Medicine*.