RISCS Research Institute for Sociotechnical Cyber Security

Remote Working and Cyber Security

Literature Review

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THE CYBERFISH CYBERPSYCHOLOGY SOLUTIONS

ROYAL HOLLOWAY UNIVERSITY OF LONDON

RISCS

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1. Context and Framing

This document was prepared in the context of scoping the Cyber Security Leadership and Culture theme of 2020/21 at the Research Institute for Sociotechnical Cyber Security (RISCS) sponsored by, and in cooperation with the UK's National Cyber Security Centre (NCSC).

The aim of the project is to understand the implications of mass remote/hybrid working arrangements due to the Covid-19 outbreak, that started in March 2020 and is still on-going at the time of writing this document.

The research objectives focus on the psychological contract between employees and leadership from the perspective of cyber risk, specifically:

- To understand how different organisations adjusted to new forms of working while maintaining/reducing their cyber risk exposure.
- To explore strategies used by cyber security leaders to keep a positive cyber security culture front of mind.
- To gather best practices used for maintaining trust, nurturing teamwork, safeguarding mental health of team members (reducing insider risk / human error).

This document represents the first evidence-gathering phase of the project and formed the basis of the topics of interest to be discussed in the next stage, during the expert interviews. The document includes gathering evidence on fresh research carried out within the research scope, and also previous, non-Covid 19 related research on the dynamics of remote working, mental health and cyber security risk.

The initial scoping of the research and the current literature review document was brought together by the broader RISCS community. It is an example of a much needed co-operation between academic researchers (Georgia Crossland and Amy Ertan, PhD researchers at the Information Security Group at Royal Holloway, University of London), small business owners (Berta Pappenheim, RISCS Research Fellow and Co-Founder at The CyberFish and Nadine Michaelides, Founder at Anima) working together with, and supported by the UK Government (Nico B, from the Economy and Society engagement team at the NCSC).

The second phase of the project will be the delivery of 15-20 structured interviews with Cyber Security Leaders within the wider RISCS community, and beyond, to gather insight into practical examples of strategies and processes, that were implemented within the context of the research themes. Interview outcomes will be analysed and published in a White Paper, to provide practical advice to industry leaders based on best practice, and to inform future scope for policy/funding directions including further industry consultation, in the context of the research objectives.

2. Introduction

On January 30th 2020 the World Health Organisation (2020) named COVID-19 an international public health emergency. In the months that followed the world would see almost ubiquitous national lockdowns to try and prevent the spread of the virus. In addition to taking the lives of millions across the globe, COVID-19 and the national lockdowns have changed the daily functioning of businesses and billions of people, had massive detrimental impact on the global economy and significantly increased mental health problems in individuals (Ornell, Schuch, Sordi & Kessler, 2020; Usher, Durkin & Bhullar, 2020). Mental health problems included an increase in anxiety and depression, and for some, noted in front-line workers in particular, symptoms of Post Traumatic Stress Disorder (Carmassi et al., 2020).

Owing to the rapid person to person spread and the prolonged incubation period of COVID-19, many countries decided to close educational facilities and the offices of non-essential businesses, and restrict both local and international travel. Millions of people across the globe went into lockdown and therefore had to work from home. Owing to a combination of cyber crime opportunism in a global pandemic, and new vulnerabilities posed by working from home (WFH), we will look at the effects of remote working on cyber security in this context.

This literature review summarises the evidence demonstrating the impact of the pandemic and the organisational move to working from home on both employee mental health and cyber security, with a focus on the psychological contract and how a breakdown in implicit agreements can negatively impact both the employee and subsequently, the organisation. This literature review will examine the ways whereby organisations may, or have, mitigated risks posed by this new working environment, considering risks specifically related to employee mental health and cyber security.

Section two reviews the literature on how the pandemic and shift to remote working impacted mental health and employee wellbeing, providing the context for observed behavioural change in the workplace.

Section three examines how pandemic conditions impacted the cyber security landscape, both in terms of emerging threats (such as COVID-19 themed cyber-criminal activity) and in terms of employee cyber awareness and cyber security behaviours in the workplace.

Section four introduces the concept of the psychological contract and outlines how the relationship between employees and an organisation has been impacted by the pandemic. In particular, the section examines on-boarding and continued employment in remote working conditions, and examining how the psychological contract may 'break'.

Finally, section five outlines identified opportunities for future research.

3. The Impact of COVID-19 and Remote Working on Mental Health

This section addresses the literature on how pandemics have been shown to impact mental health. The literature draws on experiences with severe acute respiratory syndrome (SARS), Ebola, avian influenza and COVID-19. Section 2.1 highlights the range of consequences to people's mental health as a result of infectious disease outbreaks. This is followed by a focus in section 2.2 on how the widespread shift to working from home has impacted workers' mental health and wellbeing. Section 2.3 highlights several recommendations listed in the literature on how organisations may mitigate a reduction in employee wellbeing.

3.1. Impact of disease outbreaks on mental health

In the past few decades, a number of infectious disease outbreaks have required high-level and immediate responses from national governments and their respective health care workers globally. These outbreaks have come from multiple parts of the world and include the severe acute respiratory syndrome (SARS) outbreak in 2003; the Ebola outbreak in West Africa (Fowler et al., 2014), endemics of avian influenza in Hong Kong; and the Norwalk virus infection in Australia (Maunder et al., 2003). Many research studies have looked at how these outbreaks affected people's mental health, which we are now able to draw on to estimate the impact of the current COVID-19 pandemic on mental health. However, despite the devastation caused by the previous outbreaks mentioned, these pandemics are relatively small in size compared to the current COVID-19 pandemic. For example, SARS was recorded in 8,422 people in 29 countries, with the main mortality rates found in healthcare workers (World Health Organization, 2015). In comparison, the COVID-19 pandemic reports show (at time of writing) there have been over 81 million confirmed cases worldwide, with almost every country in the world recording cases and impact (World Health Organisation, 2020). This means that while there are opportunities to leverage findings from existing relevant research, the relatively huge size of the current pandemic limits the applicability of previous research to some extent.

Existing research on past pandemics has largely focussed on the mental health of healthcare workers and infected patients. Even though the current pandemic had a perhaps extensive mental health impact to the wider population, we can still learn from this previous research. For example, while research shows that crisis response can be rewarding for front line workers (Thoresen, Tønnessen, Lindgaard, Andreassen, & Weisæth, 2009), research studies also show that crises can cause high rates of varying psychological problems in healthcare workers and patients including anxiety, stress, a lack of motivation and post-traumatic stress symptomology (Reynolds, Garay, Deamond, Moran, Gold & Styra, 2008; Sim, Chong, Chan, & Soon, 2004; Styra et al., 2008). These mental health challenges decrease healthcare workers willingness to respond to and work during these outbreaks (Balicer et al., 2010).

Research has also included recommendations on how stress may be alleviated for such workers during infectious disease outbreaks. Organisational support has been found to have a big impact on healthcare worker's mental health. One study found that higher levels of organisational support predicted lower levels of anger, stress and burnout/decreased motivation (Marjanovic, Greenglass & Coffey, 2007). Although this study specifically focussed on health care workers, it speaks to wider research demonstrating that organisation culture and support influences job satisfaction (Colakoglu, Culha, & Atay, 2010).

The current COVID-19 pandemic has not only been demonstrated to impact healthcare workers' mental health (Labrague & De los Santos, 2020), but has also had a large impact on the mental health of the wider workforce and general population (Brooks et al., 2020). This is not only due to the widespread infections and health anxieties felt by many, but also due to the repeated national lockdowns that cause isolation and a total shift from what is considered to be 'normal living'. Wherever feasible, workers had to adapt to working from home, and many people had to quarantine completely for up to two weeks, or shield their households for extended periods of time, from the beginning of the outbreak to the present day.

Studies have demonstrated the impact of COVID-19 and associated lockdown restrictions on mental health. Research has shown that quarantine periods can have negative psychological effects including post-traumatic stress symptoms, confusion, anger and sleep problems (Brooks et al., 2020; Xue, Lin, Zhang, Gong, Liu & Lu, 2020). Stressors that may increase such psychological effects include longer quarantine duration, infection fears, boredom, inadequate supplies, inadequate information, financial loss and stigma (Brooks et al., 2020). As a recommendation for future communication of changes to restrictions, literature has suggested that when officials make decisions to quarantine individuals, they should provide clear rationale for quarantine, ensure sufficient supplies are provided, and quarantine individuals for as little time as possible (Brooks et al. (2020).

3.2. Impact of remote working on work and wellbeing

Remote working, also known as working from home or telecommuting (Molino et al., 2020), due to the COVID-19 and subsequent imposed lockdowns, is now considered by many to be the 'new normal' (Davis, Kotowski, Daniel, Gerding, Naylor & Syck, 2020; Williamson, Colley & Hanna-Osborne, 2020). This section outlines how remote working has occasionally provided benefits to some employees, but has also taken away the affordances the office provides while creating new stressors (for example, where schools are closed during lockdown, employees with parental responsibilities are also forced to balance work and childcare).

Some research showed benefits of remote working. Bloom, Liang, Roberts and Ying (2015) in a research study in China found that working from home led to a 13% performance increase. Home workers also reported improved work satisfaction and their attrition rate halved. An IBM case study (Heinonen, 2009) found that flexible working increased perceptions of productivity, with women especially placing high importance on working from home as a benefit. However, these studies took place before the pandemic, through which remote working was likely considered an optional benefit.

Research during COVID-19 shows that remote working has resulted in negative impacts to employee wellbeing and mental health. Some research suggests remote working promotes an 'always on' working mode, which encourages mental and physical fatigue (Hernandez, 2020; Molino et al., 2020).

One study consisting of qualitative interviews of 50 newly working from home employees suggested that working from home can impact productivity in a negative way (Mustajab et al., 2020). This reduction in productivity was stated by participants to be due to a number of reasons, such as multitasking, decreased motivation and childcare responsibilities. Participants also attributed the decline to psychological issues (Mustajab et al., 2020).

The Institute of Employment working at home wellbeing survey (Bevan, Mason and Bajorek, 2020) also looked at how working from home was affecting the UK workforce and their mental health. Participants reported problems with health, aches and pains, diet and exercise, poor sleep and increased exhaustion. Half the participants reported not being happy with work life balance, while 30% felt isolated. The survey found mental health to be even worse in younger workers (ISE, 2020). King's College London and Ipsos Mori (2020), in a survey of over 2000 UK residents, found that half of the respondents said they felt more anxious or depressed than normal, and that 38% have slept less or less well than normal. However, it should also be noted that during a global pandemic, it is hard to tease out the differences between what are the mental health costs of working from home and the psychological repercussions of a global pandemic.

Some organisations have used technology to monitor and track employee performance. Electronic surveillance methods include web browsing activity, email communications, and the personal information of employees (Blumenfeld, Anderson & Hooper, 2020). The increased use of these technologies through lockdown poses several challenges to the privacy of employees. while also represents a form of micromanagement that both limits worker autonomy and increases job strain (Blumenfeld, Anderson & Hooper, 2020).

Remote working has introduced a number of additional challenges to employees' effectiveness and productivity, with employees reporting experiencing communication problems owing to internet glitches, workplace isolation, not taking breaks like they would in the office, interruptions and prioritising work too much (Prasad, Rao, Vaidya & Muralidhar, 2020).

3.3. Potential mitigations to increase employee wellbeing

Firstly, it should be noted that anyone experiencing high levels of stress, anxiety, depression or any other mental health condition should be supported by the organisation in seeking professional psychological help. During the pandemic, research has pointed to the success of using video conferencing for assessing patients' mental health and conducting therapy (Connolly et al., 2020; Shehata et al., 2020). Due to the confidential nature of therapy, this highlights that securing video conferencing applications should be a top priority.

Some studies have also looked at how we may alleviate stress during lockdown and working from home. This is where technology has demonstrated significant impact, providing several alternatives for workers to face-to-face communication in order to alleviate stress and isolation (Molino et al., 2020).

Many meetings are now largely conducted via online video conferencing. Waizenegger, McKenna, Cai and Bendzc (2020) interviewed 29 workers about their experiences of working from home, finding that people reported feeling less isolated when they had video conference meetings at the beginning of the day. However, some participants also reported a 'virtual meeting fatigue', highlighting the importance of individual differences in response to virtual meetings, and suggesting that managers should consider allowing individuals to work differently and join meetings only when they want to, or as necessary. DeFilippis, Impink, Singell, Polzer and Sadun (2020) further found that during lockdown there were increases in the number of meetings per person (all now virtual) and the number of people per meeting, but decreases in the average length of meetings. Furthermore, they found significant increases in length of the average workday. All these factors could contribute to stress and 'virtual meeting fatigue'.

Effective leadership styles have been found to be important in fostering work performance in virtual environments. Bartsch, Weber, Büttgen and Huber (2020) found that managers were required to balance managerial behaviour between task-oriented behavior, behaviour that sets a clear direction, in order to help improve teamwork in a virtual work environment; and also allowing their employees autonomy and support, enabling them to handle crisis-induced situations in an individual way that may be different for each individual.

The increased reliance on technology in the remote working environment has opened up various information security concerns, as discussed in the following section.

4. Broader Impact: Cyber Security and COVID-19

Because of the sudden reliance on technology for connecting people, and the move to a perhaps 'less' cyber secure home environment, remote working has had a significant impact on the cyber security of organisations, cyber security employees and the cyber security industry.

Khan, Brohi and Zaman (2020) identified their view on the 'Top Cyber Security Threats Amid COVID-19 Pandemic', highlighting cyber security threats that have either increased or been adapted as a result of pandemic conditions. Many organisations have seen an increase in Distributed Denial of Services (DDoS) attacks. There has been an increase in malicious domains using words such as 'corona-virus' and malicious websites. Cyber criminals are also taking advantage of the current situation by spreading Malware, Spywares, and Trojans, launching ransomware attacks and sending out spam email. Furthermore, attackers are sending out malicious messages via social media and using browsing apps, such as fake COVID-19 information apps. Attackers are also using business email compromise scams by using coronavirus disease as a tool (Khan et al., 2020), as part of the wider trends whereby cyber criminals have taken advantage of the situation and have been targeting vulnerable people and systems (Pranggono & Arabo (2020). These diverse range of issues have put an enormous strain on the cyber security industry and the respective information security departments and staff inside organisations.

In 2019, Nominet released a survey concerning Chief Information Security Officers (CISOs) stress and wellbeing. The survey demonstrated that CISOs are generally under high levels of stress that impact both their mental and physical health. CISOs also reported working beyond contracted hours, not taking holiday or sick leave. This then negatively impacts the organisation, as stress prevents CISOs from performing efficiently and can result in burnout (Nominet, 2019). During COVID-19 this stress and these long hours are very likely to have increased (Salari et al., 2020).

Limited relevant cyber security awareness relating to remote working have also been highlighted as a potential challenge to cyber security. Cyber security practices in the home are different from those in the office, therefore employees need to be made aware of and trained in new behaviours and practices they may need to adopt. Johnston, Wech, Jack and Beavers (2010), in a survey of over 500 remote and in-office employees, found some factors that contributed to information security policy compliance and compliance differences between remote and in-house employees. The study found that remote employees differ from office employees in their perceived levels of security and privacy policy awareness, self-efficacy, and compliance intentions. These findings suggest that the lack of support (be it verbal, demonstrative, or material-based) reduces remote employees' ability for awareness of security and privacy policies within their organisations and their ability to comply with such policies (Johnston et al., 2010). This is also supported by previous work demonstrating how the 'remote-worker status' can lead to diminished information security awareness (Johnston, Wech, & Jack, 2000).

Other researchers have argued that working from home increases the risk of (usually unintentional) insider threats. Research claims that a third of surveyed organisations had experienced a cyber attack as a direct result of an employee working outside of the businesses' security perimeter (Cybsafe, 2018). Chapman 2020 argues that working from home may cause the same issues as 'bring your own device', or BYOD, policies. If employees are working on a personal device, the device should be secured with a company-sanctioned level of

anti-virus software and password protection technologies. Furthermore, malicious cyber actors are taking advantage of the pandemic and targeting home workers in an attempt to steal information (Chapman, 2020). In terms of potential guidance to employees, Okereafor and Adebola (2020) make some recommendations for staying secure in light of COVID-19 themed malicious cyber activity. They suggest individuals: test commercial websites before making payments, be vigilant to phishing emails and other social engineering techniques, install anti-malware software, avoid clicking on suspicious web addresses and URLs, verify information sources about coronavirus, and back up data.

Kritzinger and von Solms (2010) propose the E-Awareness Model (E-AM) to overcome issues of information security awareness with remote working. The authors suggest that home users can be forced to acquaint themselves with the risks involved in venturing into cyberspace, by being forced to take information security modules online. However, this model does not necessarily mean users would be more likely to comply with organisational policies, as awareness does not always lead to behavioural change (Bada, Sasse & Nurse, 2019; Ertan et al., 2018). Furthermore, employees may respond negatively to enforced training, reducing their trust with the organisation. Researchers have suggested that information security knowledge and awareness, once developed in the workplace, is transferred to the home environment (Talib, Clarke & Furnell, 2013). The authors suggest that this learning strategy presents an opportunity to move away from organisational awareness programs and to move towards awareness raising strategies that will develop an all-round individual security culture for users independent of whether they work in the office or remotely (Talib et al., 2013).

The risk of low awareness, insider threats, employee satisfaction and wellbeing, both in relation to cyber security and more generally, are greatly influenced by the psychological contract between an organisation and its employees. This will be discussed in the next section.

5. The Psychological Contract

5.1. Introduction to the Psychological Contract

The psychological contract is an implicit agreement between employer and employee, and can be defined as 'the individual beliefs, shaped by the organisation, regarding terms of an exchange agreement between the individual and their organisation' (Rousseau, 1996). However, the definition between researchers can differ (Anderson & Schalk, 1998). Rousseau (1996) stresses that the psychological contract is guided by the individual employee's understanding of the employment relationship (Meghana & Vijaya, 2019; Rousseau, 1996).

When an individual employee finds that their organisation has satisfied its psychological contractual expectations, the relationship between the organisation and individual prospers, resulting in positive outcomes for both the individual and the organisation (Chan, 2020). However, breaches in the psychological contract can occur when employees feel a discrepancy between what was promised by the organisation and what was received. Psychological contract breaches can violate the employee's trust in the organisation and vice versa, undermining loyalty for both parties. Breaches can also lead to lower levels of job satisfaction, organisational commitment and extra role behaviour (McLean Parks & Kidder, 1994).

Furthermore, recent research has linked the psychological contract to information security behaviours. Han, Kim and Kim, (2017) suggest that employees and supervisors were more willing to accept the perceived costs of being compliant with information security policy if they perceived the psychological contract to have been fulfilled. In addition, employees were more likely to comply when they recognised the benefits of the information security policy (Han, Kim & Kim, 2017).

There are two major types of the psychological contract; namely the transactional and relational (Rousseau, 1996; Rousseau, 1990). A relational psychological contract consists of exchanges, which are built on trust and implicit emotional attachment (Chan, 2020). The relational contract is often long-term and comes with a degree of flexibility between the organisation and the individual employees (Rousseau & McLean Parks, 1993). In comparison, the transactional type of contract consists of direct and explicit expectations, focusing on financial transactions between the employee and organisation (O'Donoghue, Grimmer & Teo, 2014). This is generally a tit-for-tat exchange including rumination and rewards as well as sanctions if the contract is not satisfied (Chan, 2020). This contract is usually more short term, and accounts for less of the intrinsic aspects of the individual employee. Despite a clear definition of these types in the literature, other studies have suggested a more layered approach, with transactional promises at the base of all contracts, and long-term engagement adding more relational aspects (De Cuyper & De Witte, 2006).

The psychological contract has been found to be a useful construct in explaining a diverse range of employee attitudes and behaviours. For example, a positive psychological contract has been found to be linked to positive mental and physical health (Parzefall & Hakanen, 2010). Similarly, Reimann and Guzy (2017) found that the effects of psychological contract breach included negative impacts on both physical and mental health. Moreover, the psychological contract can be thought of as important for researchers and organisations owing to the impact it can have if it goes wrong. This includes negative consequences on; behaviour (Al-Abrrow, 2019), attitudes of employee cynicism (Pate, Martin & Staines, 2000), commitment towards the organisation (McLean Parks & Kidder, 1994; Pate, Martin & Staines, 2000; Robinson & Rousseau,

1994), subsequent performance (Restubog et al., 2008), citizenship behaviours (Gupta et al., 2016), trust (Robinson, 1996) and job satisfaction (Rayton & Yalabik 2014).

The psychological contract is not without criticism in the surrounding literature. There is no consensus on the definition of the psychological contract, with established definitions using varying combinations of terms used, including 'perceptions, expectations, beliefs, promises and obligations' (Anderson & Schalk, 1998). Several key dimensions of the theory are argued to be conceptually and empirically flawed, including the extent to which a psychological contract is said to be mutual between an employee and their organisation, the distinction between (transactional and relational) contract types, and the details around contract violation detection and response (Arnold, 1996). In particular, a frequently mentioned challenge to key dimensions of the psychological contract is that organisations do not often offer traditional job security or stable career routes, and frequently violate their promises (Guest, 1998). For example, organisations use performance reviews in which objectives may be unachievable and therefore lead to employee disengagement (Anderson & Schalk, 1998). Non-traditional employment contracts such as graduate development schemes (with promises to convert into permanent positions), formal mentoring programmes, and zero hour contracts fit awkwardly with the assumptions laid out by the psychological contract theory.

In summary, the concept of the psychological contract is generally accepted to be valuable but incomplete, requiring continued empirical testing and careful application in modern practice. Guest (1998) states that while analysis highlights serious doubts about the validity and applicability of the psychological contract as a concept, it is a useful heuristic tool in examining employee relations as well as the distribution of power between employees and their employers, Understanding the incompleteness of a theory as a full analytical tool, future research opportunities exist to incorporate the aspects highlighted by the critical reflections mentioned above, building on a tool that facilitates significant interdisciplinary insights into organisational behavior (Guest, 1998).

5.2. The psychological contract and continued employment in remote working

Most of the psychological contract research and literature takes place with employees working from the office, and with close contact with their organisations (Al-Abrrow, 2019; McLean Parks & Kidder, 1994; Restubog et al., 2008; Robinson & Rousseau, 1994). As this has been the norm for most of the work-force. Through 2020, remote working has become the new normal across organisations. This shift to remote working requires a deep exploration of how the transition impacts the psychological contracts of the employees and organisations involved. There is some research on how positive psychological contracts may continue in remote environments, and how best to foster this. There is also existing research relating to remote working, which has often been encouraged in order for employees to gain a better work-life balance.

In a qualitative case study approach, Tietze and Nadin (2011) analysed the role of the psychological contract in a local authority, implementing a three-month remote working pilot scheme. It was found that when moving to home-working, the obligations and boundaries of the employee are often redrawn. The move to remote working allowed employees to repair some faults in their psychological contracts, such as those of a transactional nature. Furthermore, it was found that although employees became more productive, the employee's relationship with their organisation becomes much more transactional in the home environment. However, employees exhibited a more transactional orientation to work; threatening to leave if remote working was withdrawn as an option (Tietze & Nadin, 2011).

Meghana and Vijaya (2019) found that positive leadership greatly influenced the prospect of relational psychological contracts. This study used a quantitative research method, and collected data from 57 remotely working professionals across the world. They suggested that their research implied that better e-leaders (leadership over technology) can influence employees to go beyond the transactional elements of the job and can build trust relationships. This was done through good interpersonal communication and positive social messages. It was suggested that those e-leading could effectively do so through regular, immediate and continuous feedback and employee-driven communication (Meghana & Vijaya, 2019). This influence of leadership importance is also supported by other research. Lombardo (2013) evaluated management styles of remote defense contractor employees when working remotely. The research found that transformational leadership, relational psychological contracts and open management communication are positively associated with increased organisational commitment.

Blumenfeld, Anderson and Hooper (2020) highlight the impact of increased use of employee surveillance technologies contributes to a culture of mistrust by employees, challenging the trust fundamental to the psychological contract. The use of surveillance technologies represent a mechanism for employer control that is often counterproductive, representing a low trust practice that does not contribute to employer productivity objectives, but instead fosters employee animosity towards management (van Gramberg et al., 2014).

Other researchers have pointed to the importance of temporal flexibility in the psychological contract of remote workers (Collins Cartwright & Hislop, 2013), through which employees create idiosyncratic routines for themselves, in order to create their desired flexibility (Hornung, Rousseau & Glaser, 2008). This demonstrates the importance of working hours negotiation in remote working environments. This is likely to be of particular importance in the current pandemic, where remote workers often had simultaneous childcare responsibilities.

However, more research needs to be conducted during the current climate. Pre-pandemic studies looked at flexible remote workers, where companies were likely not under the strain of having to move every employee to remote working at once. Through the pandemic, employees have had extra remote and care responsibilities required of them, and owing to the abruptness of the lockdown, there were virtually no opportunities to prepare and train leaders on the new management styles and techniques required by the new system. This combination of challenges likely resulted in increased stress in leaders and employees, which may have impacted the psychological contract in another way. In relation to cyber security, the trust originally vested in virtual communications tools at the beginning of the pandemic was questioned from the perspective of security (Williams, Chaturvedi & Chakravarthy, 2020).

5.3. The Psychological Contract and onboarding in remote working

Onboarding employees involves the creation of a psychological contract between the employee and the employer. This is an extremely important process for the psychological contract as generally this is where the new employee is introduced to their new new role; acquainted with the organisation's goals, values, rules and policies, and processes; and socialised with some colleagues and into the organisational culture (Caldwell & Peters, 2018; Sherman & Morley, 2015). Onboarding also usually involves the initial stages of establishing trust between the employer and employee. Onboarding can be an arduous task, and ineffective onboarding can have significant ramifications for the efficiency of organizations and for the effectiveness of incoming employees (Caldwell & Peters, 2018; Kleczek, 2019).

Caldwell and Peters (2018) suggest ways on how to onboard employees ethically, while fostering the creation of a positive psychological contract for the organisation and employee. They suggest that organisations should: create a personal online relationship from the beginning; appoint a mentor; assist new employees to create relationships; prepare orientation booklets; create physical location and office support beforehand; assist in transitional logistics such as relocation; clarify and affirm priorities and expectations; engage, empower, and appreciate the employee; involve top managers in this process, and lastly, create an ongoing coaching and mentoring process.

However, when employees are working remotely, especially during a national lockdown, many of these points become harder for organisations and leaders to actualise, with organisations having little or no time to get such structures in place. When workers are remote, researchers argue that the onboarding process becomes even more crucial (Bhakta & Medina, 2020). Unfortunately, much of the research on onboarding is largely not representative of remote onboarding processes. Remote work during a pandemic is different to standard remote working owing to the new various challenges and restrictions.

Rodeghero et al. (2020), in the COVID-19 pandemic, studied onboarding in software development teams at Microsoft. Through surveys and interviews, the research explored their remote onboarding process, including the challenges faced by new employees and their social connectedness in the work environment. This provides some empirical evidence of unique challenges that new employees encountered during onboarding in the COVID-19 pandemic. It was found that new employees never had the opportunity to meet their team in person, found communication and collaboration difficult, and struggled to find useful documentation.

Based on the results of the survey and interviews, the researchers suggest that organisations should; promote communication and asking for help; encourage teams to turn cameras on (as many employees demonstrated a desire for their colleagues to do so); schedule 1:1 meetings; provide information about the organisation; emphasise team building; assign an onboarding buddy; assign an onboarding technical mentor; support multiple onboarding speeds; assign a simple first task; and provide up-to-date documentation (Rodeghero et al., 2020).

Other pieces of research have also demonstrated factors such as communication within a team, well-prepared learning materials, having a good mentor, and the systematisation of the process were important factors for new hire satisfaction when working remotely during the pandemic (Kassymtayeva, 2020). It is also likely that during a pandemic, onboarding processes should consider other responsibilities new employees may have, such as child care responsibilities or mental health responsibilities to themselves. Therefore, when onboarding, organisations should further highlight a degree of flexibility in order for employees to meet such needs.

Overall, in order for new employees to benefit from a positive psychological contract during remote working in a pandemic organisations must reconsider their onboarding processes. Remote onboarding processes need to be clear and supportive, as well as encourage virtual socialisation with new colleagues.

5.4. Psychological Contract breaches during remote working

As mentioned in the introductory paragraph to the psychological contract, there are severe consequences to both the employee and the organisation if the psychological contract is broken or breached. Psychological breach cases may include failure to pay salaries on time, delays in promotion and annual increment, job insecurity or poor working conditions. Of course during the COVID-19 pandemic, many of these scenarios became a reality for workers. Many sectors faced, and continue to face, job insecurity (Wilson, et al., 2020), pay cuts (Gonzalez et al., 2020; Wilson, et al., 2020), and working conditions that were not compliant with social distancing rules (Wismans et al., 2020). Many of these factors further negatively influence the mental health of workers (Wilson, et al., 2020). Unemployment rates in October 2020 reached 4.9% (Office for National Statistics, 2020) compared with 3.8% (Office for National Statistics 2019) the previous year. By December 2020 9.9 million employee jobs had been furloughed, with redundancies at their highest since 1995 (Houses of Commons Library, 2020). It would not be surprising then if the job insecurity in the pandemic combined with the sudden working from remote practices, future research found an increase in psychological contract breaches during this time.

Previous research demonstrates the extent of the consequences when breaches happen. Turnley and Feldman (1999), in a sample of over 800 managers, found that psychological contract violations resulted in increased levels of exit, voice, and neglect behaviors and decreased levels of loyalty to the organisation. This is supported by the work of Pugh, Skarlicki and Passell (2003), who also found that psychological contract breaches led to people exiting the organisation.

A few studies have demonstrated that breaches of psychological contracts can lead to workplace deviance. Workplace deviances are deliberate acts against the organisation that violate organisational norms and consequently negatively affect the well-being of the organisation and its employees (Bennett & Robinson, 2000). Workplace deviance often occurs to punish the organisation for not fulfilling its own side of the psychological contract (Balogun et al., 2018). Balogun et al., (2018), in a quantitative study involving 232 Nigerians in the public sector, found that psychological contract breaches were positively associated with feelings of violation and workplace deviance. Furthermore, Bordia, Restubog and Tang (2008, 2013), found that psychological contract breaches and violation initiate feelings of revenge and consequential deviant acts.

This then also relates back to issues of information and cyber security and the possibility of insider threats. The possibility of insider threats pose great risk to government organizations, businesses, and continue to be a critical concern within organisations (Saxena et al., 2020). Of course, insider threats are most often unintentional, resulting from poor security training, and increased by the lack of security controls when working remotely (Chapman, 2020). For the purpose of this section in the review we will look at research and cases where the threat comes from disgruntled employees. As previously noted research has found that employees were more willing to accept the costs of being compliant with information security policies if they perceived the psychological contract to have been fulfilled (Han, Kim & Kim, 2017). This poses a challenge for organisations if the employee perceives the psychological contract to be breached or broken. Sarkar (2010) further proposes that remote working can affect loyalty and devalue the long-term employer–employee relationship and suggests this could further increase risks of insider threats.

Research has also found that one of the most common events that leads to insider threat incidents is employee termination (Keeney et al., 2005). To mitigate against this, organisations remove employee access to systems almost immediately and retrieve any loaned hardware. However, if an employee is fired when

working remotely, it is harder for organisations to take action to retrieve organisational property and information.

Greitzer et al. (2010) developed a behavioural model for predicting employees at risk of becoming an insider threat. It was noted that in many cases managers and other coworkers observed that the 'offenders' had exhibited signs of stress, disgruntlement, and other issues, but no alarms had been raised when these factors were originally noticed. This suggests that managers and employees should be encouraged to raise early alarms with management about any behaviour they deem to be unusual.

In summary, there are severe consequences to both the employee and the organisation if the psychological contract is broken or breached. This includes increased levels of exit and neglect behaviors and decreased levels of loyalty to the organisation (Turnley & Feldman, 1999). However, there is no research on breaking psychological contracts and insider threats while working remotely during the pandemic.

6. Directions for Future Research

The current pandemic has opened up a variety of avenues of future research. Research to date has demonstrated that the current COVID-19 pandemic has had an impact on healthcare workers' mental health (Labrague & De los Santos, 2020), and impact on the mental health of the wider workforce and general population (Brooks et al., 2020). However, as the prospect of extended (current and potential future) lockdowns become more likely, research is needed to examine the impact of these repeated restrictions on mental health, as well as the longitudinal effects. Research is also needed in order to understand how we might support the population and mitigate such effects.

Although there is existing research demonstrating both positives and negatives of remote working for organisations and employees, more research is needed to understand how far these factors apply in pandemic circumstances. The longitudinal effects of remote working on organisations and individuals employees is also required. In addition, if remote working is to continue, research is needed to understand how staff might be better supported by organisations at home.

More research is needed to understand the impacts of both the pandemic and the changing cyber security landscape practices, as well as employee engagement with cyber security processes, procedures, and training plans. Research should also consider the practical impact of not being able to access immediate in-person support in regards to technology and cyber security, and whether such challenges have increased the stress levels of employees.

Future research is needed in a variety of areas associated with the psychological contract. The literature has highlighted that the theory is incomplete in not describing how the psychological contract is formed, especially in home environments. It is also not yet known how contracts have been impacted by the mass move to remote working, or what happens when breaches in the psychological contract occur in remote working conditions. Furthermore, more research is needed to look at how the psychological contract might impact cyber security behaviours of employees, both when the contracts are positive and when they are breached.

Overall the effects of the pandemic on wellbeing, remote working and the contracts between organisations and employees are all intertwined. Understanding the complexities of societal and organisational dynamics will require a multidisciplinary approach to research.

7. Conclusions

It is difficult to underestimate the impact of COVID-19 on societies around the world. Attempting to examine the impact on remote working on mental health, wellbeing, and cyber security behaviours reveals a complex and nuanced set of effects on employee performance and attitudes. A focus on the literature relating to employee cyber security practices during the pandemic, drawing on existing research on remote working and employee behaviours, reveals a vast range of consequences including employee fatigue, reduced productivity, inadequate risk awareness on remote working cyber security principles, and several implications for the psychological contract. Examining employee relations through the concept of the psychological contract highlights that unspoken contracts and understandings between the employee and organisation need to be re-examined in the new context of remote working, as well as the importance of researching how leadership styles may need to change.

Several recommendations emerge from the literature that may provide useful guidance for organisations seeking to mitigate the pandemic's impact both on employee wellbeing and on mitigating insecure cyber security practices. Effective leadership styles, clear communication, holistic risk awareness training and flexibility to allow employees to escape 'zoom fatigue' may all go some way to enabling an organisation to uphold their obligations within the psychological contract.

This literature review has also highlighted a number of future directions for possible research, including a required focus on how the lockdown has impacted mental health across populations, including for populations such as remote workers who have experienced some of the greatest relative increases in terms of social isolation. There is little research on how the psychological contract is developed and maintained where the employee is working remotely, or how employee relationships with their employer are impacted through prolonged remote working. More research should take place examining the long-term implications of lockdown on wellbeing, while research with a specific focus on cyber security practices during the onset of COVID-19 related lockdowns would help develop insights on a shifting cyber threat landscape. In turn, greater insights into the impact of major crises events such as COVID-19 will allow for better informed mitigation strategies, allowing for evidence-based recommendations that organisations can leverage for the benefit of their employees, and their cyber security resilience postures.

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