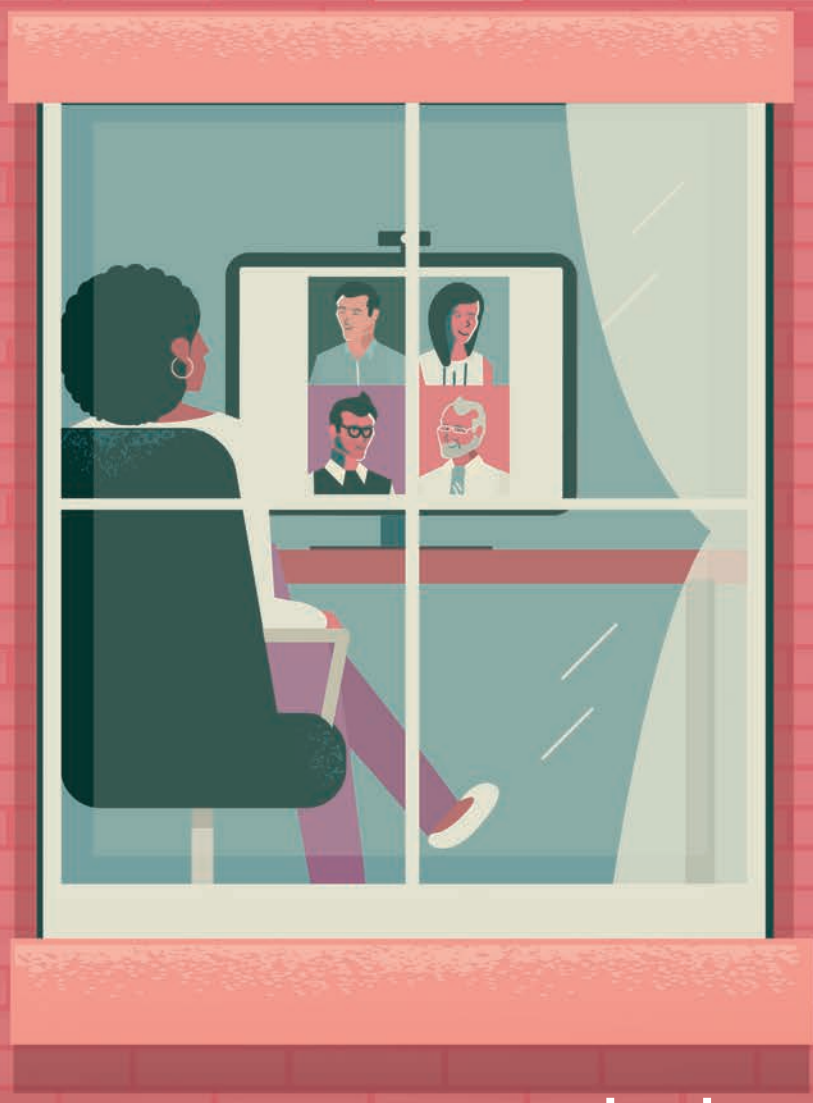


Homeworking and cognitive workload

Remote working has become the norm for many in the wake of the pandemic. **Robert Houghton** discusses the findings of his early research into the impact this has had on people's wellbeing and cognitive workload

It came as a shock to many of us when our world changed almost overnight. From March 2020 in the UK, when the first lockdown began, those who could were required to work from home exclusively and there was uncertainty as to when they would return to their workplace. As the months went by, it became clear that Covid-19 had changed how we work and the way we interact with work.

The research for my PhD involves looking into cognitive workload so I took the opportunity to include the effects of the changes to work brought about by the pandemic. Cognitive workload can be thought of as the amount of effort required by our resources such as memory, attention and perception to meet task demands. These demands include task complexity, time pressures and environmental factors such as noise and light.

A difficult transition

Almost instantaneously, Covid-19 had created an environment of both occupational and economic uncertainty. For many participants in my study, this has led to stress and anxiety which in turn, impacted motivation and productivity and had a negative effect overall on wellbeing. Additionally, for the self-employed, the Covid-19 restrictions were often paired with a loss of work or contracts and difficulty in securing new clients.

Digital meetings and communication are now commonplace and participants noted this overall had a negative effect on their wellbeing. For many, digital communication lacks sufficient connection and stimulation compared to in-person meetings. Online meetings may not meet our need to socialise and experience, and many individuals found them less satisfying. This was especially prominent amongst those whose roles included face-to-face interaction as a core part of their job, such as work in mental health and training. Participants also reported that digital meetings often overran so they found them particularly disruptive to their productivity.

Restrictions brought about by the pandemic have also resulted in drastic changes to certain occupations resulting in feelings of underemployment and role conflict. Whilst this affected individuals working in many occupations, the most affected group in this study was air traffic controllers. Air traffic has dropped significantly resulting in many aviation companies going out of business. With this reduction in air traffic, controllers found their job role changed overnight. Universally they reported their workload dropped so much they were no longer required to use their skills and training to truly control air traffic and they reported feelings of boredom and frustration stemming from a lack of challenge.

All participants reported feeling a sense of loss; a loss of variety, a loss of work, a loss of control. And with that loss came feelings of boredom and monotony due to cognitive underload. I asked all participants why they found their work, in pre-Covid times, fulfilling and interesting, and most of them reported variety as one of the things they enjoyed most. But in many occupations, people are now seeing the same tasks coming up again and again. Many individuals are now restricted to a single working environment, the home, and have been forced to carry out all work online. For many participants, the resulting boredom and monotony has led to a reduction in engagement and motivation.

Positive experiences

Whilst many participants in this study reported the negative impacts of Covid-19 on their wellbeing and workload, there were also some positives. The first of those being the creation of opportunities. Many participants discussed how the restrictions had forced them to work in different ways, to create new offerings or to fill time they previously didn't have. For example, many of the self-employed individuals interviewed had created digital products or transitioned to online work. They saw this as a positive for two reasons, the first being they could still earn a living, and secondly, it helped transition or modernise their business. Part of this was linked to necessity, that unless they digitised their content and resources so they could be accessed or delivered online, it's unlikely their business would survive.

It's important that we're aware of the impact the pandemic is having on our cognitive workload and our mental wellbeing

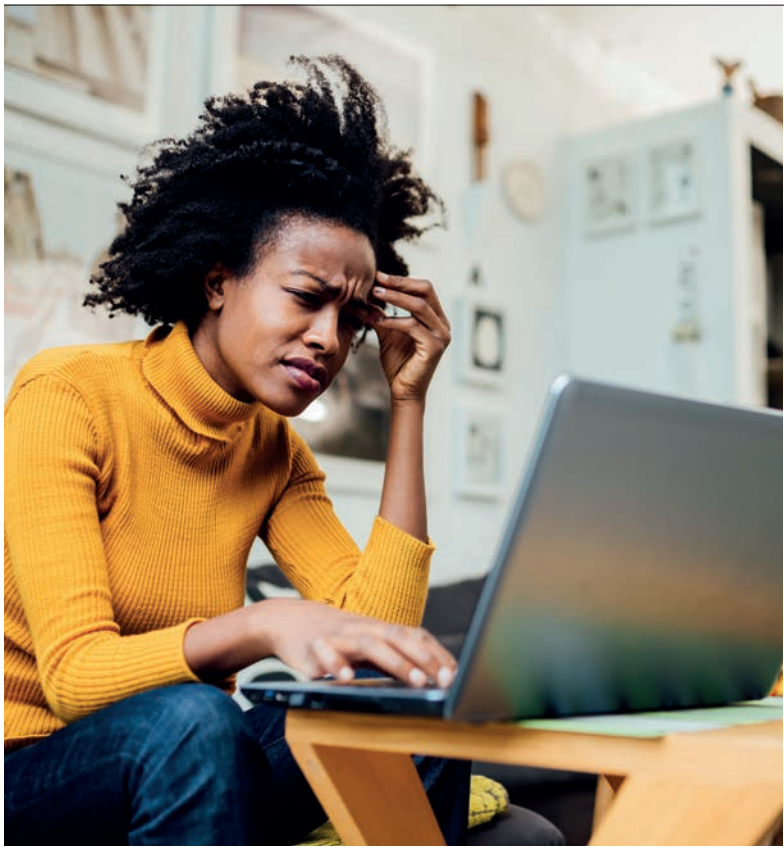
Other participants talked about the increased opportunities for training and practice, as well as having time for skill development. These led in many cases to an increase in feelings of wellbeing due to the ability to engage in tasks to ensure financial security, to improve job satisfaction and to carry out more enjoyable work-related activities.

Some loss experienced by participants was positive in that they lost aspects of their work they didn't like or enjoy. One example was work in open plan or noisy workplaces. Instead of experiencing a higher cognitive workload due to frequent distractions, participants could instead allocate all their resources to the task at hand. Many noted that overall they felt less stressed working at home and could pace their work better because they were free to take breaks when and how they wanted.

The home as a workplace

For those individuals who had never previously worked at home, some found it difficult to associate work with the home and situation was further complicated by things like childcare commitments. On one hand many participants enjoyed being at home as they could spend more time with their children but on the other, it meant having to take →

IMAGE: ISTOCK



We need to develop strategies to ensure homeworking is as stress free and productive as possible

time out of their work day to look after or home school their children. So cognitive workload essentially shifted to include not just work tasks but also those associated with the home. Other aspects related to balancing their own work with those of others in the home in regard to space and care commitments, leading to additional stress not present in the workplace.

Finally, many participants found not having to commute to work positively impacted both their wellbeing and their cognitive workload. The time could be spent preparing for or completing work and of course, there were financial savings from transport costs.

It's important in such a time of economic and organisational uncertainty that we're aware of the impact the pandemic is having on our cognitive workload and our mental wellbeing. We need to develop strategies to ensure homeworking is as stress free and productive as possible, whilst ensuring work maintains high levels of interest and satisfaction.

Homeworking can mean different things for different people

Robert Houghton is a PhD student at Imperial College London researching the use of wearable sensors to measure psychophysiological states such as fatigue and cognitive workload. He has a background in organisational psychology and is a member of the Transport Risk Management Centre at Imperial College

IMAGE: GETTY

INTERVIEW

Tina Worthy caught up with Robert to get more insight into his research

Hi Robert! What's your research looking to investigate overall?

My research overall has two branches, the first branch being the use of wearable sensors such as heart rate monitors and electroencephalograms to measure cognitive underload. Can they do it effectively, both in experimental and real-world contexts? How do people use and respond to such sensors? Do they see them as useful and trustful, or see them as a way companies could monitor their employees?

The second branch relates to cognitive underload. It's been poorly defined in the human factors and psychology literature, so my goal is to apply structural equation modelling to develop a well validated model of cognitive underload. This could be used to create a self-report measure to help understand the contexts and measure the level of underload in safety contexts.

Is this the first stage of your research and did it just involve participant interviews?

This is probably the second stage; I did some early data collection and analysis before Covid-19 assessing heart rate data and electrodermal activity using a smart watch-like device. The current purpose of the interviews is to gain an in depth and broad understanding of underload, across both safety critical and non-safety critical industries. I'm also using the interviews as a way to validate what little research we have on underload. I'll combine this together to help develop items for my measure of cognitive underload.

Are you planning on more quantitative assessment of cognitive workload?

Yes! Covid-19 restrictions permitting, I'm hoping to run some experiments using cognitive tasks at first to measure workload both physiologically through several wearable sensors and my own measure. If this goes smoothly and depending on the timing in relation to my finish date, I'm also hoping to collect data in either driving or flight simulators to assess whether my measure and the devices are suitable in more ecologically valid contexts.