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ORIGINAL ARTICLE

Stress, domination and basic income: considering a citizens' entitlement response to a public health crisis

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Abstract In 2015/16, stress was found psychologically to be responsible for 37% of all work-related illnesses and 45% of all working days lost due to illness in Great Britain. Stress has also been linked to long-term chronic health conditions—including heart disease, stroke, cancer, type 2 diabetes, arthritis and depression—responsible for 70% of NHS England spend, 50% of GP appointments, 64% of outpatient appointments and 70% of inpatient bed days. It is apparent that medical responses to stress-related illness contribute to the NHS funding crisis without resolving underlying causes. It is necessary to address the *social* bases of this public *health* issue. We argue that one of the primary causes of stress stems from a basic assumption of modern economics: that hierarchies are essential to organizational success. We argue that the combination of hierarchy and possibility of destitution inflicts domination on individuals. We then consider the potential contribution of universal basic income (UBI) to dealing causally with this public health problem. This marks a new development in both the public health and UBI literature studies. We conclude that future trials and studies of UBI ought to measure physiological effects on stress as part of a holistic evaluation of the policy.

Keywords Stress · Domination · Universal basic income · Public health

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Introduction

In 2015/16, stress as a psychological phenomenon was found to be responsible for '37% of all work related ill health cases and 45% of all working days lost due to ill health' in Great Britain (Health and Safety Executive 2016, p. 2). The effect of stress on health and the attendant burden on public finances is, though, much broader. In 2012, the Department of Health estimated that a quarter of all people in England, some 15 million, suffered from long-term chronic health conditions such as heart disease, stroke, cancer, type 2 diabetes, arthritis and depression (2012, p. 5). The same Department of Health report suggests that caring for patients with long-term conditions accounts for 70% of NHS England spend, representing 50% of all GP appointments, 64% of outpatient appointments and 70% of all inpatient bed days (2012, p. 3). The medical literature strongly suggests that many such long-term conditions are linked to stress as individuals respond first psychologically and then biologically to threatening stimuli (see Cooper and Quick 2017; Cohen et al. 2012; Schneiderman et al. 2005; Dhabhar 2009; Henderson and Baum 2004; Everly and Lating 2013; Thoits 2010; cf. Liu et al. 2016).

Increasingly, it is becoming apparent that medical responses to stress-related ill-health fail adequately to promote health, while actively contributing to the NHS funding crisis. In order to deal effectively with this issue, it is necessary to understand and address the *social* bases of this public *health* issue. In what follows, we argue that one of the primary causes of stress stems from a basic assumption in modern economic thinking: that hierarchies are essential to organizational success (Kastelle 2016). We draw upon the republican political philosophical tradition and the epidemiological literature to argue that the combination of hierarchy and the possibility of destitution inherent in modern, neoliberal corporate structures inflicts domination on individuals. We engage with a number of empirical studies, including the Whitehall Study of UK Civil Servants (see Marmot et al. 1978) and the Labour Force Survey (see Office for National Statistics 2017), to contend that such domination inflicts stress even on those who do not exist in absolute poverty. We examine the medical literature to outline the way in which stress responses to these experiences lead to illness and disease. This enables us to assert that, in order to address the causes of the present endemic, public health policy ought to be grounded in social and economic policy aimed at minimizing sources of domination.

We consider the potential contribution of one socio-economic policy: universal basic income (UBI). UBI is a system of unconditional cash transfers to citizens that is typically presented as an alternative to needs-based welfare systems. UBI is subject to trials in a number of contexts, with the Scottish government considering a proposal to give citizens up to £150 per week (Farrell 2017). Historically, UBI has been justified as a means of promoting citizens' rights (Pettit 2007) within a state (see discussion in Ferry 1995), increasing efficiency in welfare systems (Gordon 2014) and promoting growth (Sheahan 2012). The notion of deploying UBI for reasons of public health, and grounding those reasons in the medical literature, marks a key development within the field. At a time in which

the UK Government has a long-standing commitment to austerity, we argue that UBI may be an efficient means of dealing causally, rather than symptomatically, with the problem of stress. As such, we conclude that there are good reasons to measure physiologically the effect of UBI on stress, including, and especially, among the employed, in future studies. Broader prospective arguments for and against the costs and benefits, which have been discussed in length elsewhere (see, for example, Martinelli 2017; OECD 2017; Standing 2017), are beyond the scope of this article. We begin by tracing the relationship between social structures, stress and health.

The stress response and health consequences

Homeostasis—the state of near constant biological regulation—is the existential foundation of all living organisms (see Maslow 1970, pp. 35–36; Chrousos and Gold 1992, p. 1245). Stress consists in the perception of, and response to, a threat to homeostasis. Stress represents, therefore, the most fundamental challenge an individual being can experience (see Cannon 1932). It effects a cascade of biological changes that prime the body to respond to physical and existential harm (see Currie and Symington 1955). In normal circumstances, in which a healthy individual faces only occasional threats, this response is considered adaptive (Smith and Vale 2006, p. 383; Schneiderman et al. 2005, p. 612; Henderson and Baum 2004, p. 72). Through a process of nervous and endocrine activation (Chrousos and Gold 1992, pp. 1245–1246; Hartzell et al. 2017, p. 211; Henderson and Baum 2004, p. 72), physiological changes are effected including 'increased cardiovascular tone, respiratory rate, and intermediate metabolism, along with inhibition of general vegetative functions such as feeding, digestion, growth, reproduction' (Smith and Vale 2006, p. 383; see also Henderson and Baum 2004, p. 72). Acute stress can also enhance innate and adaptive immune responses to 'prepare the immune system for challenges (e.g. wounding or infection) that may be imposed by a stressor (e.g. predator or surgical procedure)' (Dhabhar 2009, p. 300).

Following appraisal of a stimulus as a threat, there is an initial fast, but short-lived, response from the sympathetic nervous system (SNS) using direct synaptic transmission that increases, among other things, heart and respiratory rate, followed with stimulation of the endocrine system to maintain this response and activate longer-term support mechanisms (Hartzell et al. 2017, p. 211; Henderson and Baum 2004, p. 72). Two systems, in particular, drive this secondary response: the sympathoadrenal medullary (SAM) system, which releases catecholamines, including adrenaline (Everly and Lating 2013, p. 34; Carrasco and Van de Kar 2003, p. 237; Schneiderman et al. 2005, pp. 612–613) to augment and support direct SNS effects (Henderson and Baum 2004, p. 72); and the hypothalamic pituitary adrenal (HPA) axis that, following a chain of hormonal causation, releases corticosteroids, including cortisol—a glucocorticoid—, which effects metabolism, inflammation (Henderson and Baum 2004, p. 72; Hartzell et al. 2017, p. 211) and, crucially, short-term innate immune system activation involving macrophages and natural killer cells to respond to unknown pathogens (Schneiderman

et al. 2005, p. 613; Dhabhar 2009, p. 300). These effects are usually self-limiting by natural feedback inhibition (Chrousos and Gold 1992, p. 1249; Dhabhar 2009, p. 310). Glucocorticoids, such as cortisol, inhibit corticotropin-releasing hormone (Carrasco and Van de Kar 2003, pp. 237–238; Smith and Vale 2006, p. 384), which usually acts to cause the secretion of Adrenocorticotropic hormone (ACTH) (Henderson and Baum 2004, p. 72; Smith and Vale 2006, p. 384). This stimulates the secretion of glucocorticoids, such as cortisol (Smith and Vale 2006, pp. 386–387; Carrasco and Van de Kar 2003, p. 237; Henderson and Baum 2004, p. 72). A more direct feedback system exists in the SAM system, with the adrenal medulla sensitive to the effects of adrenaline through 'α2-adrenoceptors on central and sympathetic axon terminals and on the chromaffin cells' (Fagerholm et al. 2011, p. 365).

When these feedback systems are disrupted, the effects on health can be deleterious (Dhabhar 2009, p. 301; Henderson and Baum 2004, p. 72; Everly and Lating 2013, pp. 40–43; Schneiderman et al. 2005, pp. 616–617). Chronic psychological stress is 'associated with a greater risk of depression, cardiovascular disease (CVD), diabetes, autoimmune diseases, upper respiratory infections (URIs), and poorer wound healing' (Cohen et al. 2012, p. 5995; see also Henderson and Baum 2004, p. 73). It was formerly believed that this association resulted simply and directly from long-term (over)activation of the SAM and HPA systems, especially through excessive secretion of cortisol. Proponents contended that this causes 'allostatic load': 'wear and tear' that undermines the capacity to achieve allostasis—'the ability to achieve stability through change' (McEwen 1998, pp. 171–172; see also Cohen et al. 2016, p. 457). It was speculated that this 'allostatic load over a lifetime may cause the allostatic systems to wear out or become exhausted' (McEwen 1998, p. 173) leading to reduced secretion of, for example, cortisol, responsible for an increase of inflammatory cytokines (p. 173)—proteins released by cells to communicate with each other.

However, recent studies have demonstrated that levels of cortisol are a poor predictor of disease risk (Cohen et al. 2012, p. 5997; see also Edwards et al. 2003). Instead, psychobiological evidence has suggested that the effect of chronic stress and excessive release of cortisol is 'compensatory downregulation of glucocorticoid receptor (GR) expression and functioning' (Miller et al. 2009, p. 824; see also Cohen et al. 2012, p. 5997). Such 'glucocorticoid resistance' renders anti-inflammatory instructions from glucocorticoids to (immune) cells insufficient (Cohen et al. 2012, p. 5995; Miller et al. 2002, p. 538) and likely impedes function of the hypothalamic–pituitary–adrenal feedback loop (Marques et al. 2009, p. 6; see also Miller et al. 2002, p. 539). This (indirect) process can increase inflammation and autoimmunity, leading to increased risk of disease (Cohen et al. 2012, p. 5997; Cohen et al. 2016, p. 460). Cohen et al. provide a simplified representation of the primary potential pathways for stress to induce or increase ill-health that seeks to unify what have often been distinct epidemiological (environmental trigger-focused), psychological and biological models. Figure 1 outlines potential feedback loop effects, especially from levels four, five and six to one, two and three.

These illnesses associated with stress include 'seven of the ten leading causes of death in the United States, United Kingdom and all developed nations': heart

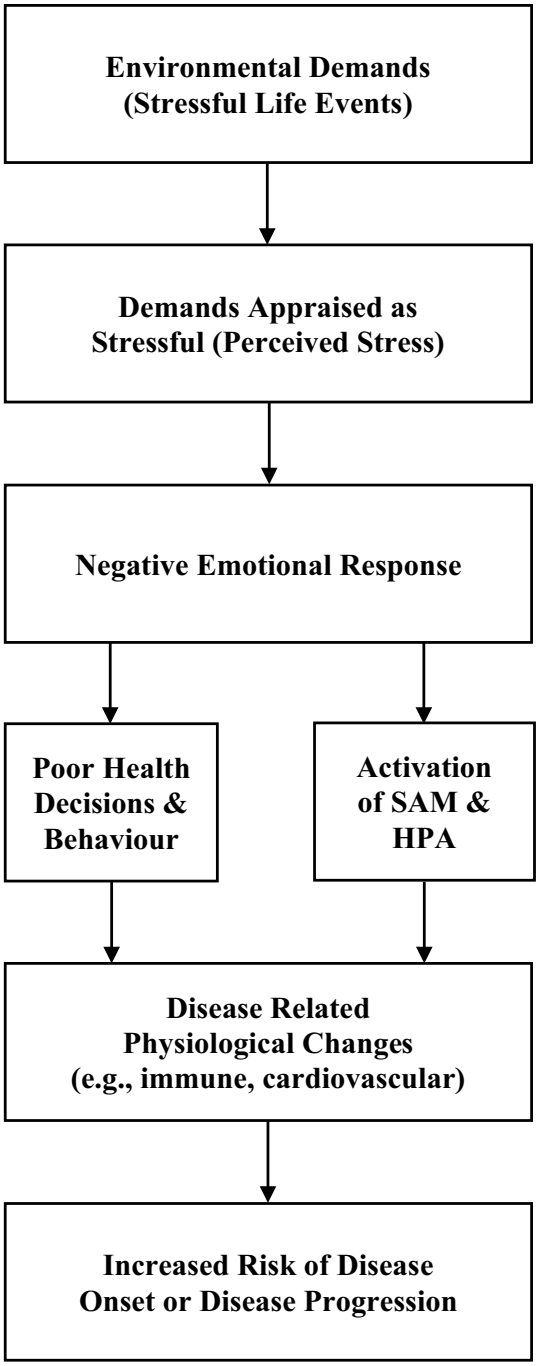

Fig. 1 A heuristic model of the stress process illustrating potential integration of environmental, psychological and biological definitions. *Source* Cohen et al. (2016, p. 460)

disease, cancer, stroke, injuries, suicide/homicide, chronic liver disease and emphysema or chronic bronchitis (Cooper and Quick 2017, p. 1).

The causes of stress are many, but work often and increasingly features centrally. For example, in a survey by Mind (2013), significantly more respondents (34%) reported that their work life was either very or quite stressful than did financial problems (30%) or health (17%). The existential reasons to regard such phenomena as stress-inducing are evident in the abstract. Today, however, there are many structural socio-economic reasons that link these causes harmfully.

Domination and work-related stress

The UK Health and Safety Executive defines stress as 'a harmful reaction… to undue pressures and demands placed on them at work' (2016, p. 2). It has identified six key factors involved in work-related stress: excessive demands; a lack of control over performance of tasks; a lack of support from colleagues and superiors; damaging relationships, including unacceptable behaviour and bullying; lack of clarity in role or responsibility, and a lack of engagement and consultation during organizational change (Health and Safety Executive 2017). At least five of these are inherent in modern corporate structures: excessive demands from employees are a natural consequence of the drive for *per capita* productivity (Standing 2011, pp. 49–50); a lack of real control over workload and performance can stem from belief in the need for decisive management and competition both between managers within a company (see Rajan and Zingales 2001, pp. 808–809) and between companies (see Syverson 2011); unacceptable behaviour and bullying can stem from individuals needing to uphold their status and authority within a competitive system that emphasizes the importance of hierarchy (see Hales 2001, pp. 24–38, 120, and implications of Fast, Halevy and Galinsky 2012); worker consultation and input during times of change is regarded as contrary to organizational prioritization of efficiency (see van Elteren 2017, pp. 6, 158, etc.), and job losses and diminution of work conditions and pay reflect the need for flexibility (see Gordon 1996).

This 'corporate experience' renders employees, in Guy Standing's terms, 'denizens': 'partial insider[s]' with some economic, but few or no political rights, subject to '"unaccountable domination"' (2011, pp. 7–8, 9). Domination in this context is often misunderstood. Republican (the tradition, not the party) political thinkers, such as Philip Pettit, have argued that domination consists in being subject to 'arbitrary interference', in which individuals are at the mercy of 'the *arbitrium,* the decision or judgment, of the agent'. The 'agent', in this case, is the manager or employer, who is 'in a position to choose… or not choose…, at their pleasure', with choices made 'without reference to the interests, or the opinions, of those affected', in this case the employees. An arbitrary choice is one that is 'not forced to track what the interests of those others require according to their own judgments' (Pettit 2006, p. 225). The consequence is that individuals are perpetually in a state of preparedness for threat; always at risk of having their existential interests undermined (see Howard 2005, pp. 621–622). Individuals who are dominated cannot ever relax their guard; they must

always adopt tactics to uphold their interests, no matter how demeaning or unnatural those tactics may appear.

As Standing demonstrates, experience of domination advances in accordance with neoliberal reform aimed at promoting labour force flexibility and productivity. Employees, like asylum seekers or other denizens, often 'lack the capacity to claim or enforce rights, or fear that the act of asserting a claim right would have a high probability of retributive consequences or disastrous costs' (2011, p. 9). For example, although an employee subject to arbitrary and harmful management decisions has the right to appeal to a tribunal, this is a lengthy, costly and uncertain means of upholding interests (Hirsch 2017). In the UK, if an employee is dismissed on the grounds of alleged 'misconduct', they will be subject to a benefits sanction, preventing them from claiming Jobseekers Allowance, the primary unemployment benefit, for a minimum of 13 weeks (Department for Work and Pensions 2016). Until a recent Supreme Court judgment ruled it unlawful (Marsh and Elgot 2017), there was a cost attached to filing a claim to an employment tribunal to appeal against dismissal, with financial assistance provided in a relatively opaque and discretionary manner (Gov.uk 2017). If employees are not sacked for resisting domination, they may instead be subject to workplace retaliation, having contractual terms enforced more strictly or being overlooked for promotions (see Vodanovich and Piotrowski 2014).

Because of this and because of the expansion of low-paid, precarious positions, there are genuine costs attached to seeking and sustaining paid employment. As Standing puts it,

> the old recipe of job creation – "work is the best route out of poverty" – is increasingly wrong and counter-productive. Governments may be able to boost the number of jobs by rolling back labour protections in order to make labour markets more flexible, but in doing so they make many more people more economically insecure (Standing 2017, p. 74).

Often, there are good reasons, such as the 'marginal tax rate' attached to entering low-paid employment and the increased possibility of domination, to remain economically inactive and to retain the security of whatever 'needs-based' welfare payments that still exist (see Standing 2017, pp. 76–77). The response of Government to reduce those needs-based forms of security merely fosters domination in the name of economic ends that are increasingly unrelated, even rhetorically, to the interests of the population.

Domination, as an institutionalized, inter-subjective phenomenon, can occur within any deeply hierarchical socio-economic structure. There are, clearly, opportunities for, and examples of, domination in slave, feudal, capitalist (Marx and Engels 1967, pp. 222–224) and state capitalist societies. The majority of forms faced in the present are clearly often less egregious than those in other contexts, but the effect is real and felt nonetheless.

This effect is clarified through reference to the epidemiological and evolutionary psychological literatures. In effect, domination serves as a cue for 'extrinsic mortality' by invoking two existential threats—resource scarcity and unpredictability. Being dominated lowers anticipated lifespan and raises anticipation of imminent

harm. The consequence is two-fold: people face stress and associated illness and adopt 'adaptively patterned shifts in behaviour, which then become propagated through social transmission' (Pepper and Nettle 2014, pp. 236–237). These patterns focus on short-term interests, increasing impulsive, sensory and hedonistic behaviour (see Frankenhuis et al. 2016, p. 76; Páal et al. 2015). Adams et al., for example, found that 'Greater anticipated survival was cross-sectionally associated with lower likelihood of smoking, and higher physical activity levels', while 'Lower anticipated survival was associated with decreased probability of adopting healthier patterns of physical activity, and increased probability of becoming a smoker at follow up' (2015, p. 1). Even those raised in affluent circumstances are only partially protected against the effects in adulthood (Nettle and Bateson 2017). Whatever the source and structure through which domination emerges, its effect on the body is the same: the epidemiological and evolutionary psychological literature studies indicate that domination is deleterious.

Domination and hierarchy

Thinking about domination as a cluster of related cues for 'extrinsic mortality' is important insofar as it helps us to understand data indicating a relationship between hierarchy status and health outcomes, even when phenomenological studies do not identify the cause as domination explicitly. The data on stress indicate that the causes stem from hierarchical relationships. Respondents to the 2009/10–2011/12 Labour Force Survey, for example, reported workload, then lack of clarity and support, then violence, threats or bullying as the three leading causes of stress (Health and Safety Executive 2016, p. 8). Workload stems from a worker's inability to control their activities, either because they cannot resist their manager's demands or because they take on increased workloads that they regard as unreasonable in order to advance professionally (see Galinsky et al. 2004; Standing 2011, p. 20); lack of clarity and role uncertainty speak to individuals' being trapped in conditions of stress response, unable to feel secure against arbitrary interference from their superiors, while violence, threats and bullying are explicit means of demonstrating domination.

The hierarchical source of stress is apparent within research such as The Whitehall Study of Civil Servants. The study, which covers a broad range of social and health topics, revealed that health followed a social gradient (Marmot et al. 1984): 'the lower the position in the social hierarchy, the higher the mortality from cardiovascular disease and from a range of other major causes of death' (Marmot and Steptoe 2008, p. 42). This confounds received opinion on 'executive stress', in which those at the top are deemed to deserve enhanced remuneration due to the exceptional stress associated with responsibility. Whitehall demonstrated that Civil Servants at every level experienced greater stress than those above them in the hierarchy, including those one step away from the top level of management (Marmot 2006, p. 1304). These deputies are endowed with significant status and power and are remunerated accordingly. However, they remain subject to domination by those occupying the one remaining 'superior' tier.

Civil Servants, in general, are not subject to objective levels of poverty, so could not suffer from resource scarcity, while standard risk factors for mortality (cholesterol, smoking, systolic blood pressure, glucose intolerance and diabetes) explain only a third of social gradient's predictive power (van Rossum et al. 2000). A follow-up study, Whitehall II, examined the likely psychosocial factors at play (Marmot and Steptoe 2008, p. 42). The results indicated that, in general, the magnitude of psychobiological stress response to tasks was not strongly related to the social gradient. Rather, those of lower socio-economic status (SES) experienced delayed recovery and prolonged activation of stress markers after the task had ended (Steptoe et al. 2002; Marmot and Steptoe 2008, p. 48). The levels of other markers were greater for those in lower occupational grades on workday mornings. Markers included those for ambulatory blood pressure (Steptoe et al. 2003), which has been associated with increased risk of cardiac events (Giles 2006), and cortisol awakening response (Kunz-Ebrecht et al. 2004), which has been found in those experiencing depressive symptoms and work and financial stress (Pruessner et al. 2003) and appears to be an indicator of stress-related hypothalamic–pituitary–adrenal dysfunction (Chida and Steptoe 2009). Both an excessive secretion of cortisol in response to stress and a slow recovery from its effects after repeated exposure are consistent with Cohen's model of the development of glucocorticoid resistance.

While executives experience unpredictability, they do so without the exposure to domination as described above: unpredictability more often stems from circumstance or from the actions of those without direct control over their lives, such as executives in other companies and organizations (see Worrall and Cooper 1995, p. 10). Moreover, executives are the first to receive information, and have power to dismiss requests and to delegate tasks to respond to changing circumstances (see discussion in Wulf 2012, p. 6). Those operating at lower levels of the hierarchy operate under conditions of domination, even when they are relatively well remunerated. Individuals may have experienced domination for much of their lives, meaning that they are in a continuous state of preparedness for unpredictable demands. As the epidemiological and evolutionary psychological literatures suggest, this experience of firefighting or short-term survival thinking, rather than long-term planning, renders individuals, on a psychobiological level, less able to progress professionally, which is especially unfortunate given that such progress up a hierarchy has been shown to improve health (see Marmot 2004b, p. 152).

The burden that dominated individuals face has been explored by Mullainathan and Shafir (2014), who have coined the notion of the 'psychological bandwidth tax'. In common with even a modern, high-powered computer, every individual has a limited capacity for dealing with tasks, especially those inducing stress. When overloaded with tasks, the mind lacks the necessary psychological resources by which to function. To substantiate their thesis, Mullainathan and Shafir presented participants with a scenario in which their car required maintenance, but their insurance would cover only half the cost of a $300 service. The service is an objective benefit in which future damage, and further costs for repair, could be avoided, but with an up-front cost. Participants were asked to consider whether they would pay for the service or hope that it lasted longer and risk doubling the prospective $150 deficit. They were also questioned how, and with what difficulty, they would go about making

such a decision. Others were asked the same question but with a $3000 service cost. The authors followed this with a series of Raven's Matrices problems, which are used to measure fluid intelligence and are common in IQ tests, and divided participants into rich and poor cohorts based on median income. Those required to find $150 were relatively unaffected by the scenario. However, when faced with a $1500 deficit, those with lower incomes were significantly less able to respond to Raven's Matrices problems by virtue of their psychological bandwidth tax (2014, pp. 48–51).

Mullainathan and Shafir focus on the effect of resource scarcity on cognitive functioning (see also Mani et al. 2013). However, their approach is compatible with concern for domination insofar as domination works by threatening resource scarcity as the consequence of employees' actions or inactions. Indeed, they accept relativity of scarcity, suggesting that even those above the poverty line can be burdened by the tax. While wealthier individuals may not be impaired by the scenario above, they may be burdened by a scenario in which they are faced with a deficit of $15,000 (see Mullainathan and Shafir 2014, p. 11). The point is that resources insure us against extrinsic threats to our survival. Those on higher wages may be more protected, but domination still triggers the stress response on account of threatening destitution or an intolerable quality of life. As such, the work of Marmot (2004a) shows that absolute poverty is only part of the problem. Relative position within hierarchies, indicated in part by relative wealth, has the capacity to inflict absolute deprivation in health. As Marmot (2004b, p. 153) puts it,

> A way to stress an animal, of the human or non-human variety, is to remove control. This is true whether the animal or person is high status or low status, but low control is more common the lower down the pile you find yourself. Low grade chronic stress, acting through the brain, mobilises hormones – cortisol and adrenaline and noradrenaline – that lead to profound biological changes. Among these is likely to be the metabolic syndrome, linked to insulin resistance that increases risk of diabetes and heart disease.

The consequences of the subjective activation of stress response according to social status have been mapped in a meta-analysis by Tang et al. (2016), who contend that low Subjective Social Status (SSS), or an individual's perceived position in the social hierarchy, significantly increases odds of coronary artery disease, hypertension, diabetes and dyslipidaemia, with a trend towards increased odds of obesity (p. 1). This builds on the findings of Whitehall II, confirming that the gradient follows more objective measures of SES within whatever hierarchy individuals inhabit, but highlighting that 'increasing evidence suggests that low SSS may have adverse effects on health due to internalization of perceptions of inferiority resulting in activation of stress-related neuroendocrine mechanisms, and increased tendency to participate in behaviours that may negatively influence health' (Tang et al. 2016, p. 2). The psychobiological effect, therefore, is not just the result of one's objective position in a hierarchy, but an individual's perception of that position in the hierarchy: hierarchies create scope for domination and perception of hierarchies influences the extent to which domination is deployed perniciously.

This pushes back at the social Darwinian notion of status as health selection (see Marmot 2004a, pp. 58–60). In this account, 'ill-health determines social position,

not the other way round: good health leads to winning the Oscar' (Marmot 2004b, p. 152). Rather, capacity emerges, in part, by virtue of inhabiting a particular social position, whether that position is reached through systemic advantage or otherwise (see Marmot 2004b, p. 152). The benefits of holding and retaining a position of domination within hierarchies has been demonstrated in a more practical context by Knight and Mehta (2017) who suggest that high social status confers benefit in reducing experience of stress when challenged by a social stressor (a mock job interview), but improves performance only in a stable hierarchy. There is no such benefit in an unstable hierarchy. Those in higher positions in the hierarchy, therefore, have both a strong material and physiological interest in maintaining domination, locking those below them in perpetual conditions of stress.

A social approach to tackling the social health gradient

At present, the approach adopted to dealing with stress-related illness and disease is to treat medically individual patients as they present themselves symptomatically. This either neglects and fails adequately to deal with the social bases of the health crisis or reflects a neoliberal assumption, with social Darwinian implications, that stress and ill-health are inevitable consequences of employment to be addressed individually by sufferers themselves. We argue that, on health grounds alone, there is good reason to reject this approach and to consider means of reducing domination.

In order to promote health, we need to promote what the republican thinker, Pettit, has termed 'freedom as nondomination' (2006, p. 225), in which no individual has 'the capacity to interfere in another's 'affairs on an arbitrary basis' (1999, p. 165). The state may still interfere in people's lives, through compelling taxation, for example, but only within a resilient institutional framework that precludes partial acts 'that worsen the agent's situation—or at least worsen it significantly—either by reducing the alternatives available in choice or by raising the actual or expected costs associated with some of the alternatives' (2006, p. 225). The point, here, is that republicans distinguish between conditions in which two individuals experience similar levels of non-interference: one is a dominated slave who relies upon the grace and favour of their master; the other is a non-dominated citizen who exists within a resilient institutional structure that guarantees liberty. The slave is subject to contingent non-interference, while the citizen experiences resilient non-interference. As Widerquist (2013, p. 27) puts it, in order to secure real freedom for individuals, they must have 'the power to say no'. Workplace stress stems from the absence of the power to say no, even when there is no interference. It is the ever-increasing lack of resilient non-interference that renders them unwell.

Pettit specifically identifies means of challenging such forms of domination 'by introducing a form of social security that would make the prospect of losing a job less than wholly intolerable' (1993, p. 26). More recently, discussion has shifted towards the introduction of UBI (see, for example, Taylor 2017, pp. 22, 54), which is one of a range of approaches aimed at ensuring that all citizens receive a minimum income. In UBI, the government provides an unconditional monthly stipend to all adult citizens. There are no forms of means testing, work requirements or

potential sanctions (Wright 2006, p. 5). The approach seeks to ensure that no citizen falls below the poverty line and that all are free from interference to engage, or not engage, in economic activity suited to their circumstances, talents or interests (Wright 2006, p. 6). In so doing, proponents such as Standing (2011, pp. 171–173) argue that UBI is pragmatic: it does not seek fundamentally to challenge capitalism; instead, it eliminates the onerous administrative exercise and expense of means-tested welfare and is grounded in rights-based liberal thinking. However, there is reason to believe that the policy has scope for significant impact: it releases or relieves workers from workplace domination, such that employees can refuse to acknowledge arbitrary managerial demands and resign from positions safe in the knowledge that their basic needs will be satisfied (see Pettit 2007, p. 6). Although Birnbaum and De Wispelaere (2016), among others, argue that capacity for exit is less clear cut insofar as resignation imposes other costs, those costs are greatly reduced in comparison to existing welfare systems that actively punish workers who resign. This all suggests scope for reducing stress, expanding psychological bandwidth and improving health.

Evidence drawn from trials indicates a positive effect on health. The 1974–1979 trial of MINCOME, a Canadian Guaranteed Annual Income (GAI), was conducted in the province of Manitoba. Unlike UBI, MINCOME included a means testing element with a tapered payment based on other sources of income. The study 'found a significant reduction in hospitalization, especially for admissions related to mental health and to accidents and injuries, relative to the matched comparison group. Physician contacts for mental health diagnoses fell relative to the comparison group' (Forget 2011, p. 0). Some such pilots have included evaluation of psychological benefits, including stress as a psychological state. Indeed, phenomenological data from Finland indicate a reduction in stress (Independent Staff 2017). Psychologists are increasingly making a public health case for UBI on account of its effect on mental health, calling for UK trials 'incorporating psychological impact measurements, including the healthy social indicators of sense of agency and control; uncertainty and security; connections with others; sense of meaning and purpose in life; and social trust and cohesion' (Psychologists for Social Change 2017, p. 3). We argue that the medical literature on the effect of stress on health give good grounds for exploring such impacts more clearly, specifically with regard to psychobiological effects. Indeed, medical and social researchers have begun to use findings from investigations into the socio-economic contribution to inflammatory biomarkers (see Davillas et al. 2017) to develop policies by which to reduce their impact, recommending, for example, early retirement for those in more stressful positions (see Arney 2017).

At present, evaluation of UBI focuses, understandably, on its effect on poverty as an independent variable in determining health outcomes. Forget (2011, p. 2) contends that the health benefits of MINCOME were secured via a reduction in poverty, while the Public Health Agency of Canada (2016) notes the importance of 'upstream investments', addressing 'social, economic and environmental conditions'. Others have noted the social health gradient and recognized the importance of promoting policy based on reducing 'health inequalities, the structural conditions that put people "at risk of risks"': 'discrimination, poverty, residential segregation, inadequate

schools, unemployment' (Thoits 2010, S47). Domination presents each of these factors as threats that constitute extrinsic mortality cues. As such, proponents of UBI would be better served examining the broader effect of UBI in minimizing domination as the basis of its effect on health.

Public cost and public benefit

The debate on UBI is broad and considers many prospective costs and benefits that are beyond the scope of this paper and discussed in depth elsewhere (see OECD 2017; Martinelli 2017; Standing 2017). Most clearly, though, that debate has often returned to concern for financial feasibility (see Lewis et al. 2005). Abstracted from progressive revisions to income tax rates and comparison with existing costs associated with current welfare arrangements, the notion of allocating a monthly stipend even to the richest seems absurd. However, there are grounds for regarding the scheme as part of a broader redistributive regime with concomitant deployment of increased tax rates for higher earners (see discussion in, for example, Pelzer 1999) and/or the introduction of a Land Value Tax (see Robertson 1999) or the imposition of a flat income tax rate of 30–50% that is progressively negated by UBI for lower earners (Atkinson 1995, esp. pp. 24–46; Straubhaar 2017). Whatever the model, it is clear that the system offers prospective benefits to those significantly above the poverty line (see OECD 2017).

The benefit to more affluent citizens in terms of reducing their exposure to stress has seldom been granted sufficient attention. This is of particular justificatory importance in affluent countries, such as the UK, in which the average rate of poverty ranges between around a quarter to a fifth of the population and those at risk of persistent poverty around one in 15, compared to 1 in 10 in the EU (Office for National Statistics 2016a). In such contexts, concern for addressing the poverty of the 6.5% of the UK population at risk of persistent poverty can be supplemented by concern for the 15 million people affected by long-term stress-related illness (Department of Health 2012, p. 5).

Promoting health among such a large proportion of the population offers potential means of reducing the burden on the NHS and increasing workplace productivity. The policy would substitute a single payment administered by a streamlined Department for Work and Pensions for existing welfare spending, which accounted for £258bn of UK public spending in 2014/15, including £108bn on pensions, £44bn on family benefits, income support and tax credits, £41bn on incapacity, disability and injury benefits and £27bn on housing benefits and just £3bn on unemployment benefits (Office for National Statistics 2016c). Martin Farley (2016) has demonstrated how a UBI of £7200 for all adult citizens in the UK and pensioners living abroad, some 53 million people, would be feasible fiscally with the introduction of a flat tax rate of 35% on all income that would, in effect, cancel out income tax for the lowest 45% of earners. His calculations include additional 'spare' income for the Government to be spent on benefits for those who require further assistance, such as those with disabilities, housing needs and contribution-based pensions.

There are, though, several reasons to revise such an approach and qualify its potential benefits. Firstly, the level of UBI hardly stands as a viable alternative to well-remunerated employment with domination. Beyond mere survival, the level of income at which a life becomes liveable has a subjective element—high earners may regard even median earnings insufficient (Bamfield and Horton 2009). In this regard, adjustments to the formula, which does not include the substantial savings to be made from streamlined administration, could be made to increase the UBI to a level of around £10,000–£15,000 at which basic needs can be met. Secondly, calculations of cost do not account for the possibility of reducing health and social care spending, which amounted to approximately £170bn in 2015/16 (Luchinskaya et al. 2017, p. 142), and improving productivity, given that 139 million work days are estimated to have been lost to sickness absences in 2015, with 15 million the direct result of stress, anxiety and depression (Office for National Statistics 2016b). However, judging savings to the NHS and welfare spending overall is extremely complicated, not least insofar as improving public health means increasing life spans which, in turn, increases the length of time in which individuals require the greatest number of medical interventions. Thirdly, retaining any needs-based monetary element may sustain elements of the benefits trap insofar as individuals lose income as they become healthy, subjecting individuals to domination by virtue of health assessments. As such, there is good reason to favour a system based solely on a single, unconditional payment combined with increased investment in public health and care services for those in medical need that confer no monetary advantage on recipients. The investment in institutions is especially important insofar as, as the Nordic Model has demonstrated (see Arnesen and Lindahl 2006), there is need for institutionalization of norms to encourage citizenly participation in work once domination has been challenged. Finally, UBI may serve to challenge domination in work, but would not deal with other sources of stress that are commonly implicated in physical and psychological ill-health, not least traumatic life events (van der Kolk 2014).

However, even with these qualifications, at a time in which UK public support for tax and spending is at its highest in over a decade (see Harding 2017, pp. 3–5), there is potential political will for trials which evaluate a contribution to health that has been neglected by UBI proponents.

Conclusion

UBI is gaining traction on both the left and right of the political spectrum for a range of reasons, including increasing precariatization and automation of work and inefficiencies in needs-based welfare systems. If we accept the validity of the literature on the psychobiological effect of stress, the insights gleaned from Whitehall II provide good grounds for examination of the effect of UBI on domination and, in consequence, health. We contend that it is this specific contribution that offers the most significant potential impact of the policy and argue that proponents ought to draw more clearly and heavily upon the medical literature in order to advance the case.

Long-held opposition to UBI on account of cost and disincentive to work needs to be evaluated within this broader public health context, since the full effect on public finances beyond welfare spending abstracted from amendments to tax codes has seldom been considered. Moreover, cost-based opposition has often been grounded ideologically in neoliberal dogma, holding that corporate hierarchies are essential to delivering efficiency and that cliff edges are important means of incentivizing success. Non-manager-based enterprises, including Ricardo Semler's Semco Partners and the Mondragon Corporation, have demonstrated the power of flat organization (see Herr 2009, p. 14; Kastelle 2016), with workers contributing to decision making and possessing the capacity to move between projects. Such organizations have experienced enhanced productivity and growth precisely because they minimize domination. In other words, even according to their own standards, neoliberals propound inefficient systems. As such, given the potential contribution to health, pragmatic governments have every reason to evaluate UBI with regard to public health. To this end, we call for all trials and studies of UBI to measure physiological indicators of stress responses among all participants, whether in work or not.

References

Adams, J., E. Stamp, D. Nettle, E.M.G. Milne, and C. Jagger. 2015. Anticipated survival and health behaviours in older english adults: Cross sectional and longitudinal analysis of the english longitudinal study of ageing. *PLoS ONE*, 10(3), e0118782. https://doi.org/10.1371/journal.pone.0118782.

Arnesen, A.-L., and L. Lindahl. 2006. Still social and democratic? *Scandinavian Journal of Educational Research* 50: 285–300.

Arney, K. 2017. How your blood may predict your future health. *Guardian*, 10 October. https://www.theguardian.com/inequality/2017/oct/10/how-your-blood-may-predict-your-future-health-biomarkers (Accessed 10 October 2017).

Atkinson, A.B. 1995. *Public economics in action*. Oxford: Oxford University Press.

Bamfield, L., and T. Horton. 2009. *Understanding attitudes to tackling income inequality*. York: JRF.

Birnbaum, S., and J. De Wispelaere. 2016. Basic income in the capitalist economy. *Basic Income Studies* 11 (1): 61–74.

Cannon, W. 1932. *Wisdom of the body*. New York: W.W. Norton & Company.

Carrasco, G.A., and L.D. van de Kar. 2003. Neuroendocrine pharmacology of stress. *European Journal of Pharmacology* 463 (1): 235–272.

Chida, Y., and A. Steptoe. 2009. Cortisol awakening response and psychosocial factors. *Biological Psychology* 80 (3): 265–278.

Chrousos, G.P., and P.W. Gold. 1992. The concepts of stress and stress system disorders. *JAMA* 267 (9): 1244–1252.

Cohen, S., P.J. Gianaros, and S.B. Manuck. 2016. A stage model of stress and disease. *Perspectives on Psychological Science* 11 (4): 456–463.

Cohen, S., D. Janicki-Deverts, W.J. Doyle, G.E. Miller, E. Frank, B.S. Rabin, and R.B. Turner. 2012. Chronic stress, glucocorticoid receptor resistance, inflammation, and disease risk. *Proceedings of the National Academy of Sciences* 109 (16): 5995–5999.

Cooper, C.L., and J.C. Quick. 2017. Introduction. In *The handbook of stress and health*, ed. C.L. Cooper and J.C. Quick, 210–222. London: Wiley.

Currie, A.R., and T. Symington. 1955. The pathology of the pituitary and adrenal glands in systemic disease in man. *Proceedings of the Royal Society of Medicine* 48 (11): 908–909.

Davillas, A., M. Benzeval, and M. Kumari. 2017. Socio-economic inequalities in C-reactive protein and fibrinogen across the adult age span. *Scientific Reports* 7: 2641.

Department for Work and Pensions. 2016. Guidance: Jobseeker's allowance sanctions. *Department for Work and Pensions Website*, 9 December. https://www.gov.uk/government/publications/jobseekers-allowance-sanctions-leaflet/jobseekers-allowance-sanctions-how-to-keep-your-benefit-payment (Accessed 31 July 2017).

Department of Health. 2012. *Long term conditions compendium of information*. London: Department of Health. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216528/dh_134486.pdf (Accessed 31 July 2017).

Dhabhar, F.S. 2009. Enhancing versus suppressive effects of stress on immune function. *NeuroImmunoModulation* 16 (5): 300–317.

Edwards, S., F. Hucklebridge, A. Clow, and P. Evans. 2003. Components of the diurnal cortisol cycle in relation to upper respiratory symptoms and perceived stress. *Psychosomatic Medicine* 65 (2): 320–327.

Everly, G.S., and J.M. Lating. 2013. The anatomy and physiology of the human stress response. In *A clinical guide to the treatment of the human stress response*, ed. G.S. Everly and J.M. Lating, 17–51. New York: Springer.

Fagerholm, V., M. Haaparanta, and M. Scheinin. 2011. α2-Adrenoceptor regulation of blood glucose homeostasis. *Basic & Clinical Pharmacology & Toxicology* 108 (6): 365–370.

Farley, M. 2016. How a basic income would reduce taxation. *The Medium*, 6 November. https://medium.com/basic-income/how-a-basic-income-would-reduce-taxation-bbc2b5d13b35 (Accessed 31 July 2017).

Farrell, J. 2017. Scotland is considering giving each citizen a universal basic income. *The Independent*. http://www.independent.co.uk/news/uk/home-news/universal-basic-income-scotland-week-cash-payment-life-nicola-sturgeon-first-minister-snp-a7934131.html (Accessed 10 September 2017).

Fast, N.J., N. Halevy, and A.D. Galinsky. 2012. The destructive nature of power without status. *Journal of Experimental Social Psychology* 48: 391–394.

Ferry, J.-M. 1995. *L'Allocation universelle. Pour un revenu de citoyenneté*. Paris: Cerf.

Forget, E.L. 2011. The town with no poverty. *Canadian Public Policy* 37 (3): 283–305.

Frankenhuis, W.E., K. Panchanathan, and D. Nettle. 2016. Cognition in harsh and unpredictable environments. *Current Opinion in Psychology* 7: 76–80.

Galinsky, E., S.S. Kim, J.T. Bond, L. Backon, E. Brownfield, and K. Sakai. 2004. *Over work in America*. New York: Families and Work Institute.

Giles, T.D. 2006. Circadian rhythm of blood pressure and the relation to cardiovascular events. *Journal of Hypertension* 24: S11–S16. https://www.ncbi.nlm.nih.gov/pubmed/16601555 (Accessed 31 July 2017).

Gordon, R.J. 1996. Comment on Akerlof, Dickens and Perry. *Brookings Paper on Economic Activity* 1: 60–66.

Gordon, N. 2014. The conservative case for a guaranteed basic income. *The Atlantic*, 6 August. https://www.theatlantic.com/politics/archive/2014/08/why-arent-reformicons-pushing-a-guaranteed-basic-income/375600/ (Accessed 31 July 2017).

Gov.uk. 2017. Make a claim to an employment tribunal. *Gov.UK*. https://www.gov.uk/employment-tribunals/make-a-claim (Accessed 31 July 2017).

Hales, C. 2001. *Managing through organization*. London: Thomson.

Harding, R. 2017. *British social attitudes 34*. London: National Centre for Social Research.

Hartzell, M.M., C.D. Dodd, and R.J. Gatchel. 2017. Stress and musculoskeletal injury. In *The handbook of stress and health*, ed. C.L. Cooper and J.C. Quick, 210–222. London: Wiley.

Health and Safety Executive. 2016. *Work related stress, anxiety and depression statistics in Great Britain 2016*. London: Health and Safety Executive. http://www.hse.gov.uk/statistics/causdis/stress/stress.pdf (Accessed 31 July 2017).

Health and Safety Executive. 2017. Causes of stress. *Health and Safety Executive*. http://www.hse.gov.uk/stress/furtheradvice/causesofstress.htm (Accessed 31 July 2017).

Henderson, B.N., and A. Baum. 2004. Biological mechanisms of health and disease. In *The Sage handbook of health psychology*, ed. S. Sutton, A. Baum, and M. Johnston, 69–93. London: Sage.

Herr, P. 2009. *Primal management*. New York: AMACOM.

Hirsch, A. 2017. On tribunal fees, the government has been given a lesson in patriotism. *The Guardian* [Online], 27 July. https://www.theguardian.com/commentisfree/2017/jul/27/employment-tribunal-lesson-patriotism-judges-britain (Accessed 31 July 2017).

Howard, M. 2005. Basic income, liberal neutrality, socialism, and work. *Review of Social Economy* 63 (4): 613–631.

Independent Staff. 2017. Finland's universal basic income trial for unemployed reduces stress levels, says official. *The Independent*, 8 May. http://www.independent.co.uk/news/world/europe/finland-universal-basic-income-trial-pilot-scheme-unemployed-stress-levels-reduced-a7724081.html (Accessed 31 July 2017).

Kastelle, T. 2016. Hierarchy is overrated. *Harvard Business Review*, 20 November. https://hbr.org/2013/11/hierarchy-is-overrated (Accessed 31 July 2017).

Knight, E.L., and P.H. Mehta. 2017. Hierarchy stability moderates the effect of status on stress and performance in humans. *Proceedings of the National Academy of Sciences* 114 (1): 78–83.

Kunz-Ebrecht, S.R., C. Kirschbaum, M. Marmot, and A. Steptoe. 2004. Differences in cortisol awakening response on work days and weekends in women and men from the Whitehall II cohort. *Psychoneuroendocrinology* 29 (4): 516–528.

Lewis, M.A., S. Pressman, and K. Widerquist. 2005. An introduction to the basic income guarantee. In *The ethics and economics of the basic income guarantee*, ed. K. Widerquist, M.A. Lewis, and S. Pressman, 1–10. Aldershot, England: Ashgate.

Liu, B., S. Floud, K. Pirie, J. Green, R. Peto, V. Beral, and Million Women Study Collaborators. 2016. Does happiness itself directly affect mortality? *Lancet* 387: 874–881.

Luchinskaya, D., P. Simpson, and G. Stoye. 2017. UK health and social care spending. In *The IFS Green Budget 2017*, ed. C. Emmerson, P. Johnson, and R. Joyce, 141–176. London: The Institute for Fiscal Studies. https://doi.org/10.1920/re.ifs.2017.0124.

Mani, A., S. Mullainathan, E. Shafir, and J. Zhao. 2013. Poverty impedes cognitive function. *Science* 341 (6149): 976–980.

Marmot, M.G. 2004a. *Status syndrome*. London: Bloomsbury.

Marmot, M.G. 2004b. Status syndrome. *Significance* 1 (4): 150–154.

Marmot, M.G. 2006. Status syndrome: A challenge to medicine. *JAMA* 295 (11): 1304–1307.

Marmot, M.G., G. Rose, M. Shipley, and P.J. Hamilton. 1978. Employment grade and coronary heart disease in British civil servants. *Journal of Epidemiology and Community Health* 32 (4): 244–249.

Marmot, M.G., M.J. Shipley, and G. Rose. 1984. Inequalities in death. *The Lancet* 323 (8384): 1003–1006.

Marmot, M.G., and A. Steptoe. 2008. Whitehall II and ELSA. In *Biosocial surveys*, ed. National Research Council, 42–59. Washington: National Academies Press.

Marques, A.H., M.N. Silverman, and E.M. Sternberg. 2009. Glucocorticoid dysregulations and their clinical correlates. *Annals of the New York Academy of Sciences* 1179 (1): 1–18.

Marsh, S., and J. Elgot. 2017. Ministers vow to end employment tribunal fees after court defeat. *Guardian* [Online], 26 July. https://www.theguardian.com/money/2017/jul/26/union-supreme-court-fees-unfair-dismissal-claims (Accessed 31 July 2017).

Martinelli, L. 2017. *The fiscal and distributional implications of alternative universal basic income schemes in the UK*, IPR Working Paper. Bath: Institute for Policy Research.

Marx, K., and F. Engels. 1967. *The communist Manifesto*. London: Penguin.

Maslow, A.H. 1970. *Motivation and personality*. New York: Harper Collins.

McEwen, B.S. 1998. Protective and damaging effects of stress mediators. *New England Journal of Medicine* 338 (3): 171–179.

Miller, G.E., S. Cohen, and A.K. Ritchey. 2002. Chronic psychological stress and the regulation of pro-inflammatory cytokines. *Health Psychology* 21 (6): 531.

Miller, G.E., A. Gaudin, E. Zysk, and E. Chen. 2009. Parental support and cytokine activity in childhood asthma. *Journal of Allergy and Clinical Immunology* 123 (4): 824–830.

Mind. 2013. Work is biggest cause of stress in people's lives. *Mind* [Online]. http://www.mind.org.uk/news-campaigns/news/work-is-biggest-cause-of-stress-in-peoples-lives/#.WM_0qfnyghe (Accessed 31 July 2017).

Mullainathan, S., and E. Shafir. 2014. *Scarcity [Kindle]*. London: Penguin.

Nettle, D. and M. Bateson. 2017. Childhood and adult socioeconomic position interact to predict health in mid life in a cohort of British women. *PeerJ*, 5: e3528.

OECD. 2017. *Basic income as a policy option, policy brief on the future of work*. Paris: OECD.

Office for National Statistics. 2016a. *Persistent poverty in the UK and EU: 2014*. London: Office for National Statistics. https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/articles/persistentpovertyintheukandeu/2014 (Accessed 31 July 2017).

Office for National Statistics. 2016b. *Estimate of the number of days of sickness absence taken*. London: Office for National Statistics. http://bit.ly/2mFuZlH (Accessed 31 July 2017).
Office for National Statistics. 2016c. *How is the welfare budget spent?* http://visual.ons.gov.uk/welfare-spending (Accessed 30 September 2017).
Office for National Statistics. 2017. *Labour Force Survey (LSF)*. London: Office for National Statistics. https://www.ons.gov.uk/surveys/informationforhouseholdsandindividuals/householdandindividualsurveys/labourforcesurveylfs (Accessed 31 July 2017).
Páal, T., T. Carpenter, and D. Nettle. 2015. Childhood socioeconomic deprivation, but not current mood, is associated with behavioural disinhibition in adults. *PeerJ* 3: e964. https://doi.org/10.7717/peerj.964.
Pelzer, H. 1999. *Finanzierung eines allgemeinen Basiseinkommens. Ansätze zu einer kombinierten Sozial- und Steuerreform*. Aachen: Shaker Verlag.
Pepper, G.V., and D. Nettle. 2014. Socioeconomic disparities in health behaviour. In *Applied evolutionary anthropology: Darwinian approaches to contemporary world issues*, ed. D.W. Lawson and M. Gibson, 225–243. New York: Springer.
Pettit, P. 1993. Negative liberty, liberal and republican. *European Journal of Philosophy* 1 (1): 15–38.
Pettit, P. 1999. Republican freedom and contestatory democratization. In *Democracy's value*, ed. I. Shapiro and C. Hacker-Cordon, 163–190. Cambridge: Cambridge University Press.
Pettit, P. 2006. The republican ideal of freedom. In *The liberty reader*, ed. D. Miller, 223–243. Edinburgh: Edinburgh University Press.
Pettit, P. 2007. A republican right to basic income? *Basic Income Studies* 2 (2): 1–8.
Pruessner, M., D.H. Hellhammer, J.C. Pruessner, and S.J. Lupien. 2003. Self-reported depressive symptoms and stress levels in healthy young men. *Psychosomatic Medicine* 65 (1): 92–99.
Psychologists for Social Change. 2017. *Universal basic income*. London: PAA.
Public Health Agency of Canada. 2016. Key element 4: Increase upstream investments. *Canadian Best Practices Portal* [Online], 7 July. http://cbpp-pcpe.phac-aspc.gc.ca/population-health-approach-organizing-framework/key-element-4-increase-upstream-investments/ (Accessed 31 July 2017).
Rajan, R.G., and L. Zingales. 2001. The firm as a dedicated hierarchy. *The Quarterly Journal of Economics* 116 (3): 805–851.
Robertson, J. 1999. *The new economics of sustainable development*. Luxembourg: Office for Official Publications of the European Communities.
Schneiderman, N., G. Ironson, and S.D. Siegel. 2005. Stress and health. *Annual Review of Clinical Psychology* 1: 607–628.
Sheahan, A. 2012. *Basic income guarantee: Your right to economic security*. Basingstoke: PalgraveMacmillan.
Smith, S.M., and W.W. Vale. 2006. The role of the hypothalamic-pituitary-adrenal axis in neuroendocrine responses to stress. *Dialogues in Clinical Neuroscience* 8 (4): 383–395.
Standing, G. 2011. *The precariat*. London: Bloomsbury Academic.
Standing, G. 2017. *Basic income: And how we can make it happen*. London: Penguin.
Steptoe, A., P.J. Feldman, S. Kunz, N. Owen, G. Willemsen, and M. Marmot. 2002. Stress responsivity and socioeconomic status. *European Heart Journal* 23 (22): 1757–1763.
Steptoe, A., S. Kunz-Ebrecht, N. Owen, P.J. Feldman, G. Willemsen, C. Kirschbaum, and M. Marmot. 2003. Socioeconomic status and stress-related biological responses over the working day. *Psychosomatic Medicine* 65 (3): 461–470.
Straubhaar, T. 2017. On the economics of a universal basic income. *Intereconomics: Review of European Economic Policy* 52 (2): 74–80.
Syverson, C. 2011. What determines productivity? *Journal of Economic Literature* 49 (2): 326–365.
Tang, K.L., R. Rashid, J. Godley, and W.A. Ghali. 2016. Association between subjective social status and cardiovascular disease and cardiovascular risk factors. *British Medical Journal Open* 6 (3): e010137.
Taylor, R.S. 2017. *Exit left*. Oxford: Oxford University Press.
Thoits, P.A. 2010. Stress and health major findings and policy implications. *Journal of Health and Social Behavior* 51 (1 suppl): S41–S53.
van der Kolk, B. 2014. *The Body Keeps the Score*. New York: Allen Lane.
van Elteren, M. 2017. *Managerial control of American workers: Methods and technology from the 1880s to today*. Jefferson: McFarland & Company.

van Rossum, C.T., M.J. Shipley, H. van de Mheen, D.E. Grobbee, and M.G. Marmot. 2000. Employment grade differences in cause specific mortality. *Journal of Epidemiology and Community Health* 54 (3): 178–184.

Vodanovich, S.J., and C. Piotrowski. 2014. Workplace retaliation. *The Psychologist-Manager Journal* 17 (2): 71–78.

Widerquist, K. 2013. *Independence, propertylessness, and basic income*. New York: Palgrave Macmillan.

Worrall, L., and C.L. Cooper. 1995. Executive stress in different industrial sectors, structures and sizes of business. *Personnel Review* 24 (7): 3–12.

Wright, E.O. 2006. Two redistributive proposals. *Focus* 24 (2): 5–7.

Wulf, J. 2012. The flattened firm. *California Management Review* 55: 5–23.