

Spatialising happiness economics

Pykett, Jessica

DOI:

[10.1111/tran.12528](https://doi.org/10.1111/tran.12528)

License:

Creative Commons: Attribution (CC BY)

Document Version

Publisher's PDF, also known as Version of record

Citation for published version (Harvard):

Pykett, J 2022, 'Spatialising happiness economics: global metrics, urban politics, and embodied technologies', *Transactions of the Institute of British Geographers*, vol. 47, no. 3, pp. 635-650.
<https://doi.org/10.1111/tran.12528>

[Link to publication on Research at Birmingham portal](#)

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

ARTICLE

Spatialising happiness economics: Global metrics, urban politics, and embodied technologies

Jessica Pykett 

School of Geography Earth and Environmental Sciences, University of Birmingham, Birmingham, UK

Correspondence

Jessica Pykett, School of Geography Earth and Environmental Sciences, University of Birmingham, Birmingham, UK.
Email: j.pykett@bham.ac.uk

Funding information

Research Councils UK > Economic and Social Research Council [Grant number: ES/L000296/1].

Abstract

Happiness has become a high-profile goal for national governments, city authorities, and technology developers finding new ways to map and measure emotions through happiness economics, urban management, and digital emotion-sensing. This paper advances critical geographical analysis of the neglected rationales, mechanisms, and implications of promoting the emotion of happiness. Researchers, policy-makers, and publics alike are intrigued and troubled by how a growing concern with mapping and monitoring human happiness can co-occur with increasing levels of social inequality, human suffering, anxiety, and sadness. The paper outlines the intersection between three key trajectories (economisation, spatialisation, and technologisation) in order to demonstrate how particular assumptions about space, time, scale, and subjectivity are implied in the framing of happiness as an objective scientific construct to be measured, and as a problem of government. These trajectories combine to create what I term a new spatial science of emotions, which is yet to be defined, empirically documented, and critically analysed. It considers what kind of economic futures and contested knowledge practices are laid out by this new spatial science of emotions. By bringing together insights from critical economic geographies of neuroscientific and behavioural forms of governance, geographies of well-being, and social theories of embodied technologies, the paper challenges researchers to shift attention from subjective well-being to public well-being.

KEYWORDS

cities, digital, emotions, governance, happiness economics, well-being

1 | INTRODUCTION: THE PROBLEM OF HAPPINESS

Contemporary western societies face an urgent paradox. Our culture, media, political leaders, healthcare workers, educators, city authorities, businesses, employers, and our own personal technologies are increasingly concerned with measuring, mapping, and managing our happiness. Yet misery, social division, depression, and mental distress are increasing

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

The information, practices and views in this article are those of the author(s) and do not necessarily reflect the opinion of the Royal Geographical Society (with IBG).

© 2022 The Authors. *Transactions of the Institute of British Geographers* published by John Wiley & Sons Ltd on behalf of Royal Geographical Society (with The Institute of British Geographers)

(WHO, 2017). The pursuit of subjective well-being is plainly not having the desired effect, and some experts now identify its promotion as being “toxic and harmful to wellbeing outcomes” through its neglect of “temporal considerations such as inequality, inter-generationality and sustainability” (Atkinson, 2020, p. 1). Yet since the turn of the millennium, happiness research has proliferated. Nation states and government agencies across the globe are now concerned with maximising national happiness, often as a counter to more economic definitions of progress such as Gross Domestic Product. The establishment of annual *World Happiness Reports* (in 2012) and the *OECD Better Life Index* (in 2011) signifies concerted international effort to redefine global economic growth in terms of happiness and well-being. Countries have begun to compare themselves with others in the global league tables of happiness. In the UK, the Government’s centrepiece policy evaluation guidance, *The Green Book*, now recommends the use of subjective well-being evidence (HM Treasury, 2018, p. 42). Action on place-based and people-centred urban development, reducing inequalities, and fostering resilience have shaped an international urban well-being agenda (Shekhar et al., 2019; UN Habitat9, 2017; WHO, 2018).

Contemporary advances in biosensing technology and mobile happiness apps intensify the acquisition of spatialised data, economic analysis of happiness, and management of embodied measures of emotions, with current prototypes even proposing to embed technologies under the human skin. This heralds a new era for pioneering technology developers and researchers who are seeking novel insights into the objective measurement and mapping of real-time geo-located emotions. At the intersection of processes of economisation, spatialisation, and technologisation, which operate across vastly different scales, a new spatial science of emotions is evolving through happiness research and policies. What we learn from considering how they operate across scales is a set of promises around engineering objective, behavioural and universal solutions to the problems of urban well-being, which call for further scrutiny. This paper critically analyses the key trajectories, assumptions, mechanisms, effects, and implications of this new science. It argues that technologies of happiness such as urban biosensing and digital emotion-sensing techniques are both reliant on an economisation of definitions of happiness and a future promise of the “objective” governability of subjective emotions. These can be used to both promote a limited vision of future urban well-being and open up human subjectivity to more spatialised surveillance techniques. Rethinking the public, political, and contested contours of urban well-being as it is enacted through particular strands of economic knowledge, urban management, and digital sensing technologies provides a starting point for future geographical research.

The measurement of subjective well-being assumes that it can be quantified. Subjective well-being usually refers to a person’s self-reported happiness as distinct from objective indicators of their well-being or quality of life such as their income, employment status, or living environment. Subjective well-being is often split into three dimensions: evaluative (such as in the Gallup World Poll or World Happiness Reports, also termed life satisfaction); eudaimonic (referring to a person’s sense of whether their life seems purposeful or worthwhile); and hedonic (in psychology, also termed “happiness”). It is timely to apply critical perspectives that examine the economic, physiological, and emotional assumptions that have made these developments both possible and attractive as ways to “capture” subjective human experience (Davies, 2017; Dow Schüll, 2016; Lupton, 2016). A new emphasis on “public well-being” is needed in order to address the limitations of subjective well-being measurement and policy.

The key features of public well-being are that it is: (1) collective – it rejects the individualising tendencies of the category of subjective well-being; (2) political – it acknowledges that defining well-being is itself contested terrain, which has specific political currency through which power can be exercised; (3) situated – well-being is distributed in spatially uneven ways, emerges in relation to specific contexts, and depends on existing social structures; (4) embodied – it is concerned with but not reducible to feelings, and is tangled up with the complex dynamics of identity-formation, social difference, and processes of cultural norming; (5) exteriorised – well-being is not necessarily something one looks inside oneself to find but is related to the world around, to others, and to the public expression of feelings.

The aim of this paper is to demonstrate how the notion of public well-being draws out the geographical dimensions of emerging trends and critiques of subjective well-being. This can be useful in questioning the scale at which solutions to social and individual problems of well-being are proposed, as well as advancing understanding of how happiness has been framed as a scientific construct to be measured, and a problem of government. It achieves this by synthesising hitherto disparate literatures from critical economic geographies of neuroscientific and behavioural forms of governance, geographies of well-being, and social theories of embodied technologies. Across these literatures, issues of space, time, and scale are explored to demonstrate how situating subjectivity can aid understanding of the potential failure or success of improving happiness through public policy. This refers to the ways in which processes of subject-formation need to be taken into account in understanding well-being, consciousness, and human behaviour in particular geo-historical contexts (Pykett, 2015, 2013) and Schwanen and Wang (2014). “Happy subjects” are not out in the world waiting to be found, the secrets to their happiness to be revealed in the form of lifestyle advice. Instead, subjects of happiness are constituted

and rendered objective by the very processes, standards, indicators, policies, and technologies by which they are said to be measured. Second, recent advances in theorising relational well-being from the subdiscipline of geographies of health and well-being are supplemented with critical insights on behavioural economics and behavioural forms of governance in order to demonstrate how particular knowledge practices are configured and orchestrated at different scales to shape the emerging spatial science of happiness. This is an important step for geographers to consider in order to outline what approaches are necessary for the transformative strategies needed to ensure inclusive and sustainable forms of public well-being promotion. Finally, the assumptions, mechanics, and discourses of biosensing and urban emotion-sensing technologies are explored. A technological promise for the future of cities is conferred by novel partnerships between governments, industry, and universities in advancing biosensing and data-driven research on urban happiness. Digital and affective geographies can be strengthened by attention to the historical and contemporary representational practices and politics of digitally mediated emotion measurement by developing a theoretical account of digital affective governance.

The paper documents how a specifically economised and spatialised account of observable and objectified abehavioural happiness has become the basis for contemporary technological innovation and experimentation in the emerging field of urban emotion measurement and commercial biosensing. The first section discusses the economisation of happiness in academic debate as well as in international public policy agendas. It examines the challenges of construct definition and measurement, as identified by geographical research on well-being and the simultaneously behaviourist and universalising knowledge practices surrounding the science of happiness that now inform global public policy. The following section describes the spatial and political economic imaginaries associated with the growth of place-based ‘happy city’ initiatives, contrasting the economic futures envisaged in different political contexts. The final section examines the convergence of these trends with psychophysiological and neural accounts of body–space relations. Together these insights demonstrate the potential blindspots of an emerging spatial science of emotions, and the paper advances avenues of critical enquiry needed to scrutinise their politics.

2 | GLOBAL GOVERNANCE OF HAPPINESS ECONOMICS

2.1 | Questioning behavioural happiness

Econometric techniques are fast becoming established methods for measuring, modelling, and mapping ‘who is happy, where and why’ at a national scale across the world. The *World Happiness Report* provides an annual index of the national spatial variation in subjective well-being by using data from the Gallup World Poll, which asks respondents to evaluate their life on a scale from 0 to 10 (Helliwell et al., 2012, p. 11). Multiple regression modelling is then used to explain how much of a given nation’s happiness can be explained by six conditional factors: GDP per capita, life expectancy, generosity, social support, freedom, and perceptions of corruption (Helliwell et al., 2013, p. 19). There has been considerable effort on behalf of national statistical agencies and the OECD to standardise happiness metrics in order to ensure international comparability and to inform public policy (OECD, 2013, p. 3). However, the policy impacts of the widespread adoption of these measures are as yet relatively unknown (Exton & Shinwell, 2018, p. 24).

The idea that happiness can be enumerated, measured, and mapped, and that it varies geographically, is now widely accepted as the basis for the field of Happiness Studies. Happiness Studies emerged at the turn of the 21st century as a result of developments within psychology (Seligman, 1999; Veenhoven et al., 2000) and economics (Layard, 2005). Within economics, a recognition that increasing levels of income and choice within and between nations was not leading to increased happiness levels over time shaped the early agenda of Happiness Economics, including a focus on changes in aggregate happiness levels over time. Why weren’t people happier about their improving material conditions? If not income, what was driving happiness, and what role could economists play in advancing our understandings? This paradox was identified by economist Richard Easterlin in 1974, but it was not until the 1990s that happiness became a widely accepted and common concern for economists (Clark, 2018, p. 245). In 2005, economist Richard Layard set about addressing economists’ apparent neglect of human feelings: “economists have no interest in how happy people are and focus instead on their combined purchasing power, assuming their preferences are constant over time” (2005, p. 135). A novel engagement with psychology and neuroscience was proposed as the source for advancement of this field – there was no longer any need to speculate on the sources of happiness: “feeling can now be measured by asking people or by monitoring their brains” (Layard, 2005, p. 6). As such, in both the disciplines of psychology and economics, an overemphasis on their traditional concerns (pathology and money) warranted a

revolutionary approach to both academic research and policy: “Happiness should become the goal of policy, and the progress of national happiness should be measured and analysed as closely as the growth of GNP” (Layard, 2005, p. 147). By 2018 there was growing international consensus that public policies should be evaluated on the basis of their effects on well-being (Exton & Shinwell, 2018).

The simultaneous influence of positive psychology and happiness economics on this policy agenda is closely related to the revival of behavioural economics. This relationship is significant for understanding how an increasingly standardised measure of happiness as subjective well-being has emerged. Behavioural economics also has a long history (see Sent, 2004) but has achieved widespread prominence since 2010 with the global spread of behavioural public policies. The turn towards behavioural science in economics can to some extent be attributed to the work of psychologist Daniel Kahneman. In 2003, Kahneman commented on a novel enthusiasm among economists to consider subjective data, measures of happiness, and “agents who are less than fully rational,” but surprisingly concluded that “there are no immediate prospects of economics and psychology sharing a common theory of human behavior” (2003, p. 165–166). Yet despite a lack of agreement on how to conceptualise behaviour, a close allegiance between happiness economics and behavioural economics has in fact followed, with Kahneman playing a prominent role in this. However, the question remains as to whether the psychological study of happiness has been economised or economics psychologised. While happiness economists have been known to narrate this intellectual history as one of importing missing psychological and behavioural insights into economics (Layard, 2005), only selective insights from psychology have been imported and the primary focus has been on economic behaviour (Pykett, 2013; Sent, 2004; Whitehead et al., 2017).

Economists have made influential contributions to happiness research and the promotion of well-being in public policy. For example, Paul Dolan, who advised the UK government on the introduction of subjective well-being measurement in 2010, aims to:

Bring the latest insights from happiness research and behavioural science to bear directly on the questions of what you are trying to achieve (more happiness) and how you can bring it about (by behaving differently).
(2014: x)

He defines happiness as “experiences of pleasure and purpose over time,” and subjective well-being as “the feelings, experiences and sentiments arising from what people do and how they think” (Dolan et al., 2017, p. 3). This definition seems to draw an equivalence between experience and behaviour, and explicitly prioritises behaviour above reflexive thought – since our thoughts are hampered by biases and cognitive failures. As Dolan states: “the key here is to organise your life in ways so that you can go with the grain of your human nature and be happier *without having to think too hard about it*. This is happiness by design” (2014: xx; emphasis added). On these terms, Dolan and co-authors advise that:

Policy-makers should therefore exercise caution when drawing conclusions about how people are doing based on evaluative measures, because such measures may not be accurate representations of people's experiences and how these evolve over time due to psychological “biases” such as duration neglect.
(Dolan et al 2017: 4)

It has been argued that this behavioural account of happiness is problematic because of the way it takes the human subject experiencing subjective well-being (or not) out of their current situation. As Atkinson has noted, this has both a spatial and temporal dimension, which together lead to the “thwarted self of subjective wellbeing” (2020: 2) – an unattainable goal of self-optimisation in a situation in which infrastructures and opportunities for collective action and community well-being are in decline, pre-existing contours of social inequalities are obscured in the rush to measure immediate experiences, and there is a failure to properly account for questions of intergenerational inequalities and promote sustainable forms of well-being for the future. These issues have been highlighted by political geographers whose work has identified how the behavioural sciences and neurosciences have come to shape the economic imagination and public policy since the early 2000s (Jones et al., 2013; Reid & Ellsworth-Krebs, 2019; Whitehead et al., 2017). These are important in terms of how we envisage economic futures, as Pykett (2013, p. 849) argues, because the core assumption of behavioural and neuroscientific research is a post-rational human subject. This can foreclose debate about the value of non-economically rational activity, and reduces economics to a discipline of how humans choose. It also promotes an inward-looking approach to individual well-being by proposing the mind, brain, and behaviour as the locus of human action and decision-making. This can obscure the ways in which this ‘neoliberal’ way of thinking is itself specific to a particular political-economic regime (Whitehead et al., 2017, p. 4).

2.2 | Geographies of well-being

This behavioural account of happiness economics has thus emerged as the dominant account to inform global geographical comparisons of subjective well-being and as evaluative metrics for public policy in nations such as the UK. Yet despite these core concerns of subjective well-being and behaviour, happiness economics offers no convincing or consistent account of human subjectivity and agency. Research on the geographies of well-being has offered more nuanced accounts of the role of the social production of identity, everyday economic practices, and socio-spatial inequalities. There is value in bringing together health and economic geographies perspectives more closely in order to analyse the scalar assumptions of happiness economics and to elaborate on the construction of 'subjectivity' so central to subjective well-being measurement.

Research in economic geography, for example, has engaged with happiness economics broadly through methodological developments and multi-scalar data analysis, exploring the impacts of place, contextual effects, social and community dynamics, and spatial inequalities on happiness (Aslam & Corrado, 2012; Ballas, 2013; Ballas & Tranmer, 2012). There have been studies of the international geographies of social capital and happiness (Rodríguez-Pose & von Berlepsch, 2014), local and regional dimensions of well-being (Tomaney, 2017), and individual, neighbourhood, and household-level characteristics (Ballas & Tranmer, 2012). Given the advent of a research agenda that is primarily concerned with subjective well-being (happiness) rather than objective indicators, geographers have a key role to play in explaining how much spatial variations in subjective happiness can be variously attributed to individual, household, and contextual (objective) circumstances. Experiences of social comparison in the context of socio-economic inequalities can contribute to differences in subjective well-being (Ballas, 2013; Wang et al., 2019). Scale can determine the relative importance of different geographical and socio-economic factors as drivers of happiness (Ballas & Dorling, 2013, p. 472). These geographical dimensions are thus crucial for understanding what, who, or at what level government interventions should target to improve happiness. Geographies of well-being, in thinking across scales and combining analyses of subjective and objective well-being, thus offer a contrast to the behavioural definition that has come to shape happiness economics.

There have also been more critical perspectives on the social construction of well-being within geographies of health and well-being (reviewed by Smith & Reid, 2018). Schwanen and Atkinson in particular draw attention to the ways in which well-being "is made measurable and hence governable" (2015, p. 99). Efforts to theorise well-being spatially and across scales offer an alternative to what Atkinson (2013) has termed a "components" approach to determinants of well-being. A more relational, situated, and processual approach by which well-being is "an effect of mutually constitutive interactions amongst the material, organic and emotional dynamics of places" is envisaged, where well-being is treated neither within the sole domain of economics nor of health (Atkinson, 2013, p. 138).

Taken together, this work has the potential to challenge how happiness economics can hollow out conscious and reflective human experience by enumerating subjective well-being on a scale of 0–10. As appealing as it is to ask people directly to quantify how they feel, this simple move immediately decouples a person from their socio-spatial context. It is not self-evident that social relationships and context can be adequately represented as components in a multiple regression equation of happiness or subjective well-being metrics. Rather, as White argues, relationality is itself "fundamentally constitutive of subjectivity" (2017, p. 129). Hence, to ensure validity, the subjective self-report methods of happiness economists need more sophisticated accounts of the connections between objective and subjective well-being, between the social and the situated individual, and the performative capacity of happiness measurement to advance culturally specific normative values (Ahmed, 2010; Smith & Reid, 2018, p. 815).

As it currently stands, happiness economics tends to treat well-being as an individual state or goal, and thus to separate objective and subjective variables. For Atkinson, this presents a neoliberal vision of well-being as "a process of internal management and the object of personal responsibility" (2013: 140), leading to policy interventions that are narrow, individualised, 'healthist', and behaviourist (for example, cognitive behavioural therapies). These will ultimately be ineffective since socio-spatial inequalities are left intact. Atkinson et al. (2019) therefore argue that dominant well-being measures are "premised on a theory of the self as an autonomous, rational and independently acting or feeling individual" (2019: 1). The alternative sees the self as shaped through a priori social relations, rather than as based on a pre-existing subjectivity, as such "tackling the complex interactions of inequality, scale and time" (Atkinson et al., 2019, p. 1).

In summary, developments in happiness economics since the early 2000s have built the foundations for a new science of emotions in which particular spatialities are either assumed (the global, universal standardisation of happiness metrics) or disregarded (the added well-being value of social connection, the well-being of communities, the potentially negative impacts of social comparison (Ballas, 2013)). These knowledge practices are important because they obscure the role that academic conceptualisations and conventions, collective institutions, policy-making cultures, and structures of

power have on shaping happiness as an object of governance. As Scott has argued, there has been “a bewildering array of indicators and information [which] was not linked to any coherent framework or theoretical analysis of what constitutes quality of life, or of what needed to be achieved, for whom and how” (2012: 19). Thus, an alternative spatiality based on the public rather than individual nature of happiness is advanced by the relational approach described above. The notion of “public happiness” (Arendt, cited in Segal, 2017, p. xiv) describes a commitment to addressing political issues of resource allocation, recognition, and redistribution as pre-cursors to public policy interventions in happiness (Holmes & McKenzie, 2019). This spatially situated and outward-looking account of subjectivity rejects the notion of self-reported happiness waiting to be declared by survey respondents.

And yet happiness economics has recently begun to look even further inwards (to genetics, biomarkers, and neuroscience) to explain the pathways between behaviour and happiness (Davidson & Schuyler, 2015; Helliwell et al., 2013, p. 55; Sgroi et al., 2017, p. 63). The subject is thus inconsistently posed as someone to be mistrusted (flawed by cognitive biases), pre-determined (having genetic ‘set points’ of happiness (Lykken & Tellegen, 1996)), having a similar happiness life course as Great Apes (Weiss et al., 2012), and at the same time being sovereign (able to quantify their own happiness). Happiness is thus proposed as a behavioural problem to be solved through behavioural therapy and coaching, since it is defined and valued through an economics of scarcity:

Your happiness is determined by how you allocate your attention ... if you are not as happy as you could be then you must be misallocating your attention.

(Dolan, 2014: xviii)

To challenge this construction of happiness, the following section analyses an implicit normativity in the way in which economics reframes happiness as an emotion to be governed by considering the local urban dynamics of happiness promotion.

3 | HAPPINESS SPATIALISED

3.1 | The city in the mind

It is axiomatic that in order to obtain a proper understanding of urban environmental quality it is necessary to employ both objective and subjective evaluations. In other words, we must consider both *the city on the ground* and *the city in the mind*.

(Pacione, 2013: 20; original emphasis)

These problems of definition, measurement, context, and scale can be seen in the spatialisation of well-being at an urban scale. It is often proposed that living in cities is bad for our psyche, though, crucially, the identification of causal mechanisms is yet to be fully understood (Fett et al., 2019; Fitzgerald et al., 2016; Lecic-Tosevski, 2019; Lederbogen et al., 2011; Manning, 2019). However, countries with higher degrees of urbanisation are also said to be happier (Ballas, 2013, p. S44), as are people living near city centres (Schwanen & Wang, 2014, p. 835). So too, national-scale analysis alone can misrepresent our conclusions on this important question. Evidence from US cities has confirmed that people in cities are less happy (Okulicz-Kozaryn & Mazelis, 2018), but that younger populations are happiest in large cities (Okulicz-Kozaryn & Valente, 2019). Other studies have shown how happiness is dependent on the specific balance between density, location (downtown or suburban), and accessibility of services (Kytta et al., 2016). Happiness is also positively associated with the sustainability of cities (Cloutier et al., 2014) and shaped by the availability of urban green spaces (van den Berg et al., 2010; Bertram & Rehdanz, 2015; Ward Thompson et al., 2012). Despite these valuable efforts to increase understanding of the relationship between the city and the mind, the incidence of mental ill-health in cities is rising as rates of urban inhabitation grow (Bhugra et al., 2019; Hoare et al., 2019; Lecic-Tosevski, 2019; Okkels et al., 2018), and city authorities, employers, and social enterprises are searching for effective interventions to improve this situation.

A combination of a sense of urban malaise, the global influence of happiness economics on public policy, and increasing recognition of how local context and local policy shape subjective well-being has led to the initiation of several ‘happy city’ experiments across the world. Author of *Happy City. Transforming our lives through urban design*, Charles Montgomery observes a “battle for the shape and soul of cities” (2013: 7) that has since driven a global happy cities

movement, not least in the richest countries, where increasing levels of GDP have been accompanied by rising rates of misery (Montgomery, 2013, p. 9). Happy cities or urban well-being initiatives often focus on either urban design or 'social design' methods, trialling ways to work with communities, local authorities, the third sector, and business to measure and promote happiness in urban environments (Shekhar et al., 2019). They have found a specific rationale in the novel insights of "philosophers, psychologists, brain scientists and happiness economists" (Montgomery, 2013, p. 41), and a key mechanism for applying these insights is to undertake local data collection of objective measures and subjective well-being surveys. In this section I consider the activities of some urban well-being initiatives to highlight the difficulties involved in proposing happiness econometrics, urban architectural solutions, and design and engineering solutions to a set of problems that are inherently political.

Understanding the dynamics of happiness at a city scale is crucial on at least two counts. First, it could go some way to addressing the tendency of behavioural happiness economics to hollow out subjectivity through aggregating individualised, enumerated survey responses. A focus on the city enables us to consider the public, cultural, institutional, distributive, and collective dimensions of happiness outlined above. These are essential considerations for well-being public policies, which refer to government policies informed by insights from happiness economics and positive psychology (Fabian & Pykett, 2021). Second, it allows us to elaborate on the relational and situated nature of human experience, at the intersection of subjective and objective well-being. These have become separated in the adoption of a behavioural economic account of happiness that, as noted above, draws an unrealistic equivalence between self-reported feelings and contextualised experience.

While urban well-being and happy cities initiatives have emerged independently, there are complementarities between them. In particular, many take a local approach to community involvement and capacity-building, and the participatory nature of many of their activities could provide valuable models for the place-based promotion of happiness that would be better able to address well-being inequalities than those approaches that are spatially neutral (Barca et al., 2012). Yet by their very nature, they also risk overly localising the 'problem' of happiness – reproducing a narrowly conservative and neoliberal agenda (Scott, 2015, p. 130). This has the potential to obscure the ways in which "locally embedded economic interactions have become basic preconditions for globalized capital accumulation" (Brenner, 2004, p. 6). Global cities have become the engines of economic growth and new spaces of governance, and the place of urban happiness within this development is no less important – witness the emergence of commercial indices of 'liveable cities' that advise corporate employers on where best to locate their elite staff.¹ Happy cities initiatives could therefore be viewed with suspicion, as forms of urban experimentation that rely on public and private partnerships to establish fast and transferable mechanisms for governing human emotions (Evans, 2016; Peck, 2002). Considering the happy cities movement through the lens of urban governance can ensure we remain mindful of the ways in which they might "facilitate urban austerity and bolster competitive urbanism" (Evans, 2016, p. 440).

This scalar politics of urban well-being initiatives is a key determining factor, the importance of which is often underplayed in the new spatial science of emotions. There has for instance been very little research on what kind of conditions of governance, financing, community relationships, local decision-making, and national welfare regimes are necessary for urban well-being initiatives to have an impact. And there is wide variety in the aims of these initiatives. Two short examples illustrate this. Established in Bristol, South West England in 2010 as a Community Interest Company, Happy City (now the Centre for Thriving Places) supports communities in instigating place-based change. Since 2013, their annual Thriving Places Index has emphasised place-based measurement as a means for influencing policy, promoting equity and sustainability. Environmental economics rather than behavioural economics informs their approach (e.g., Raworth, 2017). As part of a wider network of activists under the umbrella global organisation, the Wellbeing Economy Alliance, the city is seen as a bridge towards systemic change and shaping the social and economic conditions for improving public well-being outcomes. In this sense, by focusing at the intersection of global influence and urban practice, happy city initiatives can evolve as potential sites of global economic change, by providing exemplars of community-based activism.

By contrast, in his analysis of the 2012 "Build a Beautiful and Happy New Tongren" urban renovation and cultural city project in the city of Tongren in Guizhou Province, China, Tim Oakes describes how the campaign "conceived of the city itself as a machine for producing happiness" (2019, p. 245). The space of the city was a mechanism of cultural governance and behavioural change, engineered spatially to realise the goals of "active leisure and determined happiness" (2019: 246). This was achieved through a re-branding and renovation of the city itself as a centre for (primarily 'ethnic') cultural activity, leisure, and consumption. Crucially, the city here is mobilised to *respond* to global economic change – displacing the symbols, spaces, and populations of its industrial past through a large-scale gentrification of the whole urban system. The spatialisation of happiness in the case of Tongren can therefore be seen as a means of mobilising happiness "in the service of the economy" and as a technology of the complex convergence of authoritarian statecraft and neoliberal

governmentality often seen as specific to China (2019: 246). This shows how happiness can be used as a behavioural mode of governing, and highlights the role that happiness promotion in public policy plays in the formation of subjectivity and citizenship, as will be explored in the next section. In emphasising behavioural happiness, subjective well-being, and aggregate survey measures, the new spatial science of emotions has not yet developed appropriate means to conceptualise, measure, and evaluate public policies on the basis of their impact on relational or community well-being (Atkinson et al., 2019). To the contrary, an emerging urban biosensing technology agenda spatialises an economised and objectified representation of happiness through the scale of the individual body, as the final section now details.

4 | PLACING HAPPY BODIES

4.1 | Technologies for happiness

In addition to promoting happiness at the city scale, research, design, and technological developments informed by psychophysiology and neuroscience are focused on innovative ways of embodied sensing of people's emotions in situ. This trend can be broadly referred to as a form of digital affective governance. Much of the research to date has been focused on urban areas, and several of the happy cities initiatives have experimented with these kinds of technologies (Happier by Design, 2017; Happy City, 2016). Geographers have also undertaken a number of experimental studies using wearable biosensing technologies, similarly recording Electrodermal Activity (EDA) as a psychophysiological measure of emotional arousal or momentary stress (Biremboin, 2018; Pykett et al., 2020a; Resch et al., 2014; Shoval et al., 2018; Winz & Söderström, 2021). The sensors are connected to smart phones to locate these measures geographically and in real-time. Environmental psychologists and geographers have recorded psychophysiological stress responses to moving through urban and green environments by measuring salivary cortisol levels (Olafsdottir et al., 2017; Ward Thompson et al., 2012). Happiness economists have also used mobile ecological momentary assessment methods (Bryson & MacKerron, 2017).

Neuroscience methods, such as EEG monitors to measure brain activity or reactivity and fMRI scanning, have been used to assess daily life environmental stressors and the longer term impacts of urban living on mental health (Aspinall et al., 2015; Karandinou & Turner, 2017; Lederbogen et al., 2011; Reichert et al., 2018). Psychologists have used electronic diaries and Ecological Momentary Assessment (EMA); Geographical Ecological Momentary Assessment (GEMA) – which asks participants to report on their mental state, feelings, or behaviour at specific or random times throughout the day; and the Day Reconstruction Method (DRM) – which asks participants to recall their affective experiences over a series of sequential episodes at the end of a day (Kahneman et al., 2004). The GEMA method has been used in mobile smartphone apps such as UrbanMind (Bakolis et al., 2018), which focuses on exposure to nature and mental health, and Mappiness, which focuses on geo-locating happiness. Mappiness was funded by the UK government and innovation investor NESTA and is now owned by a company called Psychological Technologies whose mission is one of self-optimisation. They “[m]easure how people think, feel and behave in real-time and deliver effective interventions to help people be at their best.”²

Often physiological and subjective emotional sensing methods are combined, and these are sometimes further triangulated with crowdsourced emotional data through techniques such as ‘social listening’ (e.g., tracking customers’ emotional engagement with brands) or sentiment analysis of data mined from social media platforms including Twitter (Resch et al., 2014; Roberts, 2017). Virtual reality is increasingly used in the relatively new field of neuroarchitecture, which since the early 2000s has been setting out a number of fundamental questions about how our buildings shape our cognitive processes, feelings, and wayfinding behaviour (Barton et al., 2012; Eberhard, 2009; Zeisel, 2006). Commercially, a number of companies offer eye-tracking software, facial emotional recognition, biosensors, and empathic machine learning to businesses who want to monitor the attention, distraction, emotional reaction and behaviour of both consumers and workers. In China, for instance, the firm Canon Information Technology has recently been using “smile recognition” technology intended to “create a positive atmosphere” (Sun, 2021: n.p.). In the UAE there is a long-running government commitment to synthesising happiness economics and smart cities agendas that frames citizens as consumers of public services aimed at maximising their happiness (Bin Bishr, 2019). Also in the UAE, machine learning has been used to infer or “automatically detect” emotions from physiological signals in order to assess the correlation between happiness and productivity among construction workers (Al Jassmi et al., 2019). These examples are indicative of the varied uses of happiness sensing and emotion measurement, and their potential deployment in surveillance and coercive forms of control, which suggests that more attention should be paid to their political geographies and implications for citizenship and governance.

Mental health and mood monitoring apps for personal use on mobile smartphones or online are also becoming more popular, as a potentially low-cost and wide-reaching tool for improving psychological well-being. There are disease-specific apps for depression, anxiety, and mood disorders (Kerst et al., 2019; Van Ameringen et al., 2017), as well as more preventive apps for alleviating stress and promoting happiness, such as the ‘Happier’ app (recommended by UK based mental health charity, Mind) and Happify.³ Such apps are generally based on cognitive behavioural therapies and behavioural activation, and are often informed by positive psychology or mindfulness practice. They develop an account of happiness as a skill to be learnt, through daily self-monitoring of mood, reflection, building behavioural habits such as gratitude, refocusing attention, and re-framing thoughts. There remains significant research to be done to demonstrate the effectiveness and effects of psychological well-being apps (Leigh & Flatt, 2015; Torous & Firth, 2016). The commercial development of these technologies is outpacing the scientific evidence needed to underpin them, and their potential side-effects have rarely been considered.

While there are many different rationalities, scientific insights, assumptions, proprietary arrangements, and operational mechanisms that underpin this diversity of emotion-monitoring technology, taken together they raise some specific questions about the placement of bodies and emotions in space, how they reimagine a ‘datafied’ relationship with our minds and bodies, and their wider political effects, which I explore in the next section.

4.2 | How cities feel us feeling them

In *Instrumental Intimacies*, a Science and Technology Studies analysis of the novel role of mobile EEG in shaping our intimate self-knowledge, behaviour, and relation to the world, Melissa Littlefield describes how the data produced by mobile neuroscience and psychophysiological instruments “are central to creating new maps of urban places and neuronal spaces” (2018, p. 97). She argues that these “neurogeographies” lead to a conflation of outer and inner experience, a prioritisation of the physiological over conscious experience, an instrumentalised understanding of aggregating intimate data for political and social agendas, and ‘fixes’ constructed and contested emotions through the ostensibly objective practices of map-making. In this sense, emotional measurement and mapping – particularly through physiological instrumentation – become the means by which researchers and companies can gain ‘direct’ expert access to people’s emotional responses as they move through space. In so doing, they risk a form of alienation that places ‘true’ emotional expression in the body and behaviour and that is suspicious of the ‘flawed’ or unreliable emotional understandings found at the level of conscious reflection (cf. Davies, 2017).

Technologies for ‘feeling the city’ are not uniform, yet there are some specific commonalities. I outline just three of these here: their reliance on specific combinations of interdisciplinary knowledge on emotions and industry-research partnerships, their spatial imaginaries of emotions, and their economic constructions of governable citizen-subjects. First, we see new types of knowledge practices and partnerships between government agencies, university researchers, and technology companies proposed as resolutions to the problems of urban unhappiness and to respond to opportunities for market investment in novel technological solutions. One example is a partnership between neuroscience academics, city authorities, and businesses, instigated through the Future Cities Catapult – a limited company funded initially by the UK government’s Technology Strategy Board and private investors, then its Industrial Strategy Fund. In 2018, Future Cities Catapult published the *Neuroscience for Cities Playbook* (Camargo et al., 2018), which envisages neurotechnological solutions to a range of urban problems, including mobility, air pollution, productivity, and well-being. Some of the stated benefits of a neuroscience approach to urban engineering include its potential to:

Help streamline a coherent universal strategy for measuring and defining wellbeing, productivity and the quality of place, based on biological/cognitive baselines. Opening up the opportunity for universal codes and less ambiguity for planners.

(Camargo et al 2018: 32)

The root causes of human problems in the urban environment are imagined through an ecological lens, identified through smart sensors, city technologies, and biological data. Neuroscience is presented as a complement to the urban industrial “drive for efficiency and functionality” (Camargo et al., 2018, p. 32).

This example highlights a second commonality of urban emotion-sensing technologies, in that they instrumentalise human emotional experience – drawing together behavioural data and biodata in space to advance simultaneously universalised and individualised (hollowed out) forms of behavioural happiness, as a solution to a number of intractable social and public health problems such as stress, mental ill-health, and health and economic inequalities. Digital sensing

technologies thus tend towards a reductive spatio-temporal imaginary – focusing on environmental stressors within a person's immediate and proximate perceptual environment as they move around cities – they are often better at assessing these kinds of phenomena than the longer term and larger scale drivers of emotional well-being (though see Helbich (2018) and Schwanen and Wang (2014) for methodological approaches that think across scales). This has significant implications for the scale at which solutions to urban problems are envisaged – for instance, promoting lifestyle changes in public health, or downplaying the social and contextual determinants of well-being (Pykett et al., 2020b). Coupled with advanced machine learning techniques to process brain, bio, and behavioural data, epidemiological knowledge, and the vast datasets owned by both scientific communities and global technology firms, they offer solutions for 'smart cities,' by which social and emotional problems can be 'designed out' of urban space. One example is the Synsis product offered by an Irish-based start-up, Sensum, which specialises in smart cities emotion-sensing and data analytic products:

Rather than fighting against the weird, contradictory world of human emotion, we have tried to work with it by designing a sensor-fusion pipeline around our empathic AI algorithms. The pipeline syncs, cleanses and tags the incoming data streams to feed the algorithms with a batch of signals from multiple modes of sensors. With this the algorithms are able to produce a universal classification of the user's state from one moment to the next.⁴

What is articulated here is the processes of taking complex physiological emotions, feeding them into a machine learning algorithm, which then is represented as having the capacity to quite passively and objectively "sync," "cleanse," and "tag" the data. This neurocomputational process is based on the principles of AI, which are modelled on the human brain but rendered non-human through practices of visual representation and "objectification." The rational cleansing process sets out to universalise what they term "weird" human experiences. The normative move here is again one of hollowing out subjectivity. It universalises in order to flatten out the variability of human experience, but is then used conversely to provide personalised solutions mapped across urban space. This confusion of subjectivity arises where the processing of emotional data is digitally codified, particularly pertinent in cases where at no stage in the process does the 'user' appear to be asked how they are feeling, or indeed who they are. The individualising, objectifying, and universalising configurations of subjectivity in this example confirm the assumptions of a non-situated and anti-public form of digital affective governance that is implicated in the promise of mobilising smart cities platforms for managing the emotional dimensions of urban problems through embodied technologies. These configurations are explored by philosophers of science Daston and Galison (1992), who have described the ways in which such technologies of visualisation have long been central to the construction of objectivity in the history of disciplines as seemingly diverse as physiology and cartography. These disciplines come together in the contemporary phenomenon of urban biosensing technologies. Daston and Galison describe the moralistic drive of the 19th-century mechanical revolution in scientific investigation as promising:

Freedom from will – from the wilful interventions that had come to be seen as the most dangerous aspects of subjectivity. If the machine was ignorant of theory and incapable of judgment, so much the better, for theory and judgment were the first steps down the primrose path to intervention.

(1992: 83)

They note during this 19th-century period of technological innovation a novel enthusiasm for "graphical representation [which] could cut across disciplinary boundaries to capture phenomena as diverse as the pulse of a heart and the downturn of an economy" (Daston & Galison, 1992, p. 116). This impulse is also evident in the apparent ease by which the contemporary technologies of emotion-sensing can be seen to jump scales, to facilitate the micro governance of personal emotions and the management of urban space, and to shape the well-being impacts of the global economy. The mechanisms of digital emotion-sensing in this way come to stand in the place of judgement and argument, especially in the realm of urban politics.

Smart cities initiatives spatialise these physiological accounts of emotion, leading geographers and urban scholars to question how "individual phenotypes are mapped to urban phenotypes, databodies to codespaces" in constructing cities as sites for bioengineering (Caprotti et al., 2017; Mattern, 2018, p. 3). Emotion-sensing and happiness technologies are not only ways of feeling the city, but are ways for the city to "feel us." Geographers have provided important insights into the ways in which computer code mediates our urban experiences and draws on behavioural data to transform space. This transformation renders the city programmable (Kitchin, 2011). The algorithms on which such transformations rely can build in social biases, entrench inequalities, and serve dominant interest groups (Crang & Graham, 2007; Haklay,

2013) and signify a “psycho-economic” shift, characterised by a merging of production and consumption (Mohammed & Sidaway 2012, p. 656). In particular, there are concerns about new forms of ‘dataveillance’ (Kinsley, 2019, p. 155), ‘geosurveillance’ (Swanlund & Schuurman, 2019), and the malign adoption of urban well-being discourses in the advancement of these surveillance practices (Crampton et al., 2020). These can be used to categorise, segment, subjectify, and govern individuals on the basis of profiling, emotion recognition, and data memes.

A third characteristic of emotional technologies is their capacity to re-configure subjectivity and citizenship, advanced through measures of happiness based on an econometric vision of subjective well-being. The practices of “neurocomputational governance” described above have been analysed as a means of inscribing a bio-social understanding of the relationship between brain, code, and space on the bodies and behaviours of subjects (Kitchin & Dodge, 2011; Williamson, 2017). It is not merely the case that emotional technologies should be understood as technologies of governance. Rather, they are key to constructing particular forms of citizen-subjects which are measured, governed, and alienated – whether through intimate personal technologies or through urban space. Feminist scholars have drawn our attention to the socio-material landscapes through which specific subject positions and a posthuman sense of agency have been produced (e.g., Hayles, 1999). As such, we begin to witness “a form of posthuman agency that is coproduced with the digitally mediated city” (Rose, 2017, p. 780). This both recognises the agency of non-human actors and challenges the false universality of Western philosophies of the sovereign subject.

At first glance, we may therefore welcome emotion biosensing technologies as a rediscovery of the embodied nature of human experiences, but their implications for embodied experience are more complicated. As Hayles outlines, the gradual erasure of the body through enlightenment science and liberal conceptions of rationality did not stop with the advent of a distinctly posthuman culture of the 1990s. Instead, we came to a view of ourselves as mediated by our interactions with technology and environment; as “data made flesh” (Gibson cited in Hayles, 1999, p. 5). Through products such as Synsis, a universalised psychobiological model of human experience can erase corporeal social differences such as ethnicity, gender, and class. We may therefore identify a distinct neuropolitics to the technological reconfiguration of brains, bodies, and behaviours in space – one that reimagines the universalised citizen as neurotic (Isin, 2004, p. 223), and through which our reflexive imagination of ourselves is viewed and objectified through a partial perspective of ‘brain culture’ (Pykett, 2015). In this manner we are called on to manage our emotions and anxieties in conditions of uncertainty and for ‘healthful citizenship’ (Dow Schüll, 2016). With the powerful capacity of data analytics and the technological promise of a happiness-enhancing re-engineered urban future, citizens are rendered governable through emotions, while the deep-rooted overlaps between social inequality, political and economic injustice, and human suffering remain relatively untouched.

5 | CONCLUSION: PUTTING HAPPINESS IN ITS PLACE

In one sense, the behavioural turn in happiness economics and public policy outlined here offers a powerful multi-scalar form of explanation. It spans the universal findings of happiness economics and the global indexing of happy places contextualised by nationally relevant drivers of well-being. It finds spatial realisation in constructing the city as an engine of happiness and instrumentalising emotions at a personal scale through embodied sensing technologies. But on the other hand, the new policy enthusiasm for happiness and the behavioural approach on which policy evaluation is to be based promote a highly narrow scalar framing of happiness as an individualised problem to be solved through expert knowledge and data analytics, new academic-industrial partnerships, and skilful self-monitored happiness habits. By seeking universal measures of aggregate happiness and comparing the emotional profile of nation-states and cities, by asking people to report their own subjective well-being *in situ*, and through seeking direct neuroscientific and psychophysiological access to people’s emotional responses to their habitats, a new spatial science of emotions has been created that is deserving of critical geographical analysis.

With a few exceptions and despite much promise, this new spatial science appears to fall short in its capacity to think *across* scales, as well as having the implicitly normative function of hollowing out subjective experience. It therefore misses out on describing how the forms of subjectivity it seeks to measure are themselves constructed in particular geographical and historical circumstances, in other words, it doesn’t fully appreciate the ways in which well-being is a public phenomenon. This leads to some unintended consequences, including the creation of new forms of expertise, measures, mappings, mechanisms, and technologies by which emotions become target objects of neurocomputational governance. Behavioural economic happiness thus configures bodies, emotions, scientific knowledge, and 21st-century technologies to imagine and engineer a positive urban future in which private and

public interests straightforwardly coincide. A naïve hope is placed in a fourth industrial revolution that seamlessly integrates and engineers the physical, digital, and biological spheres of human activity for the public good, but public definition and deliberation of well-being is neglected. There is little space left here to conceive of this neuro-bio-technological complex as itself a potential driving force of urban alienation, socio-economic division, and psychopathologies. Subjective well-being research could be strengthened by fuller consideration of how social relationships and the socio-material landscapes in which these emerge always already characterise social life. It is not my intention to dismiss the significant efforts made by happiness economists, well-being researchers, and others in advancing this field and its application in public policy, nor to reproduce an unhelpful and contrived distinction between the quantification of well-being and well-being as phenomenologically experienced. Instead, I argue that well-being researchers could usefully investigate how the assumptions, specific forms of expertise, research-industry alliances, and measurement practices of subjective well-being will shape well-being-based public policies, well-being economics activism, happiness interventions, smart cities agendas, and emotion-sensing technologies in years to come. Drawing from the perspective of ‘interdisciplinary entanglements’ and in the spirit of a mutual learning and understanding that is also sensitive to unequal relations of power (Fitzgerald & Callard, 2015), I have sought to explain, understand, and pre-empt how this particular economic account of happiness will come to shape the policy tools used to govern emotions across different national contexts, what alternatives could be developed, and how the normative questions raised by a widespread policy enthusiasm for behavioural happiness should be addressed.

ACKNOWLEDGEMENTS

Thank you to seminar participants at the Universities of Cardiff, Frankfurt, and Southampton for fruitful discussions on earlier versions of this paper, and to the anonymous reviewers and Colin McFarlane for editorial guidance. I gratefully acknowledge funding from the Economic and Social Research Council, Grant Award number: ES/L000296/1.

DATA AVAILABILITY STATEMENT

No new data were produced for this paper.

ORCID

Jessica Pykett  <https://orcid.org/0000-0002-0036-9639>

ENDNOTES

- ¹ See <https://mobilityexchange.mercer.com/quality-of-living-reports> [Accessed 26th July 2019].
- ² See <https://www.psyt.co.uk/> [Accessed 26th July 2019].
- ³ See <https://www.mindcharity.co.uk/advice-information/how-to-look-after-your-mental-health/apps-for-wellbeing-and-mental-health/> and <https://www.happify.com/> [Accessed 26th July 2019].
- ⁴ See <https://sensum.co/product> [Accessed 26th July 2019].

REFERENCES

- Ahmed, S. (2010) *The promise of happiness*. London, UK: Duke University Press.
- Al Jassmi, H., Ahmed, S., Philip, B., Al Mughairbi, F. & Al Ahmad, M. (2019) E-happiness physiological indicators of construction workers’ productivity: A machine learning approach. *Journal of Asian Architecture and Building Engineering*, 18(6), 517–526. Available from: <https://doi.org/10.1080/13467581.2019.1687090>
- Aslam, A. & Corrado, L. (2012) The geography of wellbeing. *Journal of Economic Geography*, 12(3), 627–649. Available from: <https://doi.org/10.1093/jeg/lbr041>
- Aspinall, P., Mavros, P., Coyne, R. & Roe, J. (2015) The urban brain: Analysing outdoor physical activity with mobile EEG. *British Journal of Sports Medicine*, 49(4), 272–276. Available from: <https://doi.org/10.1136/bjsports-2012-091877>
- Atkinson, S. (2013) Beyond components of wellbeing: The effects of relational and situated assemblage. *Topoi*, 32(2), 137–144. Available from: <https://doi.org/10.1007/s11245-013-9164-0>
- Atkinson, S. (2020) The toxic effects of subjective wellbeing and potential tonics. *Social Science and Medicine*, 288, 113098. Available from: <https://doi.org/10.1016/j.socscimed.2020.113098>
- Atkinson, S., Bagnall, A., Corcoran, R., South, J. & Curtis, S. (2019) Being well together: Individual subjective and community wellbeing. *Journal of Happiness Studies*, 21(5), 1903–1921. Available from: <https://doi.org/10.1007/s10902-019-00146-2>
- Bakolis, I., Hammoud, R., Smythe, M., Gibbons, J., Davidson, N., Tognin, S. et al. (2018) Urban mind: Using smartphone technologies to investigate the impact of nature on mental well-being in real time. *BioScience*, 68(2), 134–145. Available from: <https://doi.org/10.1093/biosci/bix149>

- Ballas, D. (2013) What makes a 'happy city'? *Cities*, 32(1), S39–S50. Available from: <https://doi.org/10.1016/j.cities.2013.04.009>
- Ballas, D. & Dorling, D. (2013) The geography of happiness. In: David, S.A., Boniwell, I. & Ayers, A.C. (Eds.) *The oxford handbook of happiness*. Oxford, UK: Oxford University Press, pp. 465–481.
- Ballas, D. & Tranmer, M. (2012) Happy people or happy places? A multilevel modeling approach to the analysis of happiness and well-being. *International Regional Science Review*, 35(1), 70–102. Available from: <https://doi.org/10.1177/0160017611403737>
- Barca, F., McCann, P. & Rodríguez-Pose, A. (2012) The case for regional development intervention: Place-based versus place-neutral approaches. *Journal of Regional Science*, 52, 134–152. Available from: <https://doi.org/10.1111/j.1467-9787.2011.00756.x>
- Barton, K.R., Barton, V.D. & Ellard, C. (2012) Seeing beyond your visual field: The influence of spatial topology and visual field on navigation performance. *Environment and Behaviour*, 46(4), 507–529. Available from: <https://doi.org/10.1177/0013916512466094>
- van den Berg, A.E., Maas, J., Verheij, R.A. & Groenewegen, P.P. (2010) Green space as a buffer between stressful life events and health. *Social Science and Medicine*, 70(8), 1203–1210. Available from: <https://doi.org/10.1016/j.socscimed.2010.01.002>
- Bertram, C. & Rehdanz, K. (2015) The role of urban green space for human well-being. *Ecological Economics*, 120(C):139–152. Available from: <https://doi.org/10.1016/j.ecolecon.2015.10.013>
- Bhugra, D., Ventriglio, A., Castaldelli-Maia, J. & McCay, L. (Eds.) (2019) *Urban mental health*. Oxford, UK: Oxford University Press.
- Bin Bishr, A. (2019) Happy cities in a smart world. In *The Global Happiness Council. Global happiness policy report*. New York, NY: Sustainable Development Solutions Network, pp. 159–200.
- Biremboin, A. (2018) The influence of urban environments on our subjective momentary experiences. *Environment and Planning B: Urban Analytics and City Science*, 45(5), 915–932. Available from: <https://doi.org/10.1177/F2399808317690149>
- Brenner, N. (2004) *New state spaces: Urban governance and the rescaling of statehood*. Oxford, UK: Oxford University Press.
- Bryson, A. & MacKerron, G. (2017) Are you happy while you work? *The Economic Journal*, 127(599), 106–125. Available from: <https://doi.org/10.1111/eoj.12269>
- Camargo, A., Artus, A. & Spiers, H. (2018) *Neuroscience for cities*. Future Cities Catapult, Centric Lab and University College London. Available from: <https://futurecities.catapult.org.uk/project/neuroscience-for-cities-a-playbook/> [Accessed 30th July 2019].
- Caprotti, F., Cowley, R., Datta, A., Broto, V.C., Gao, E., Georgeson, L. et al. (2017) The New Urban Agenda: Key opportunities and challenges for policy and practice. *Urban Research & Practice*, 10(3), 367–378. Available from: <https://doi.org/10.1080/17535069.2016.1275618>
- Clark, A.E. (2018) Four decades of the economics of happiness. Where next? *Review of Income and Wealth*, 64(2), 245–269. Available from: <https://doi.org/10.1111/roiw.12369>
- Cloutier, S., Larson, L. & Jambeck, J. (2014) Are sustainable cities “happy” cities? Associations between sustainable development and human well-being in urban areas of the United States. *Environment, Development and Sustainability*, 16, 633–647. Available from: <https://doi.org/10.1007/s10668-013-9499-0>
- Crampton, J.W., Hoover, K.C., Smith, H., Graham, S. & Berbesque, J.C. (2020) Smart Festivals? Security and freedom for well-being in urban smart spaces. *Annals of the American Association of Geographers*, 110(2), 360–370. Available from: <https://doi.org/10.1080/24694452.2019.1662765>
- Crang, M. & Graham, S. (2007) Sentient cities. Ambient intelligence and the politics of urban space. *Information, Communication & Society*, 10(6), 789–817. Available from: <https://doi.org/10.1080/13691180701750991>
- Daston, L. & Galison, P. (1992) The image of objectivity. *Representations*, 40, 81–128.
- Davidson, R.J. & Schuyler, B.S. (2015) Neuroscience of happiness. In: Helliwell, J.F., Layard, R. & Sachs, J. (Eds.) *World happiness report 2015*. New York, NY: Sustainable Development Solutions Network, pp. 88–105.
- Davies, W. (2017) How are we now? Real-time mood-monitoring as valuation. *Journal of Cultural Economy*, 10(1), 34–38. Available from: <https://doi.org/10.1080/17530350.2016.1258000>
- Dolan, P. (2014) *Happiness by design: Finding pleasure and purpose in everyday life*. London, UK: Penguin.
- Dolan, P., Kudrna, L. & Testoni, S. (2017) *Definition and measures of subjective wellbeing*. Available from: <https://whatworkswellbeing.org/product/definitions-and-measures-of-subjective-wellbeing-discussion-paper-3/> [Accessed 26th July 2019].
- Dow Schüll, N. (2016) Data for life: Wearable technology and the design of self-care. *BioSocieties*, 11(3), 317–333. Available from: <https://doi.org/10.1057/biosoc.2015.47>
- Eberhard, J.P. (2009) *Brain landscape. The co-existence of neuroscience and architecture*. Oxford, UK: Oxford University Press.
- Evans, J. (2016) Trials and tribulations: Problematising the city through/as urban experimentation. *Geography Compass*, 10(10), 429–443. Available from: <https://doi.org/10.1111/gec3.12280>
- Exton, C. & Shinwell, M. (2018) *Policy use of well-being metrics: Describing countries' experiences*. OECD Statistics Working Papers 2018/07. Available from: <https://doi.org/10.1787/d98eb8ed-en> [accessed 26th July 2019].
- Fabian, M. & Pykett, J. (2021) Be happy: Navigating normative issues in behavioral and well-being public policy. *Perspectives on Psychological Science*, 17(1), 169–182. Available from: <https://doi.org/10.1177/1745691620984395>
- Fett, A.J., Lemmers-Jansen, I. & Krabbendam, L. (2019) Psychosis and urbanicity: A review of the recent literature from epidemiology to neurourbanism. *Current Opinion in Psychiatry*, 32(3), 232–241 Available from: <https://doi.org/10.1097/FYCO.0000000000000486>
- Fitzgerald, D. & Callard, F. (2015) *Rethinking interdisciplinarity across the social sciences and neurosciences*. Houndmills, UK: Palgrave MacMillan.
- Fitzgerald, D., Rose, N. & Singh, I. (2016) Living well in the neopolis. *The Sociological Review*, 64(1), 221–237. Available from: <https://doi.org/10.1002/2059-7932.12022>
- Haklay, M. (2013) Neogeography and the delusion of democratisation. *Environment and Planning A: Economy and Space*, 45(1), 55–69 Available from: <https://doi.org/10.1068/Fa45184>

- Happier by Design (Happy City Vancouver, Street Plans, Space Syntax and University of Virginia). (2017) *Shore to core. Happier by design research team final project report*. Available from: <https://thehappycity.com/project/shore-to-core/> [Accessed 15th Jan 2018].
- Happy City. (2016) *Wellbeing measurement. A guide to quantitative data collection, section 3.5-3.7*. Available from: <http://www.happycity.org.uk/measurement-policy/wellworth/data-collection-guides/> [Accessed 15th Jan 2018].
- Hayles, N.L. (1999) *How we became posthuman*. London, UK: University of Chicago Press.
- Helbich, M. (2018) Toward dynamic urban environmental exposure assessments in mental health research. *Environmental Research*, 161, 129–135. Available from: <https://doi.org/10.1016/j.envres.2017.11.006>
- Helliwell, J.F., Layard, R. & Sachs, J. (Eds.) (2012) *World happiness report 2012*. New York, NY: Sustainable Development Solutions Network.
- Helliwell, J.F., Layard, R. & Sachs, J. (Eds.) (2013) *World happiness report 2013*. New York, NY: Sustainable Development Solutions Network.
- HM Treasury. (2018) *The Green Book: Appraisal and evaluation in central government*. London, UK: HM Treasury.
- Hoare, E., Jacka, F. & Berk, M. (2019) The impact of urbanization on mood disorders: An update of recent evidence. *Current Opinion in Psychiatry*, 32(3), 198–203. Available from: <https://doi.org/10.1097/ycp.0000000000000487>
- Holmes, M. & McKenzie, J. (2019) Relational happiness through recognition and redistribution: Emotion and inequality. *European Journal of Social Theory*, 22(4), 439–457 Available from: <https://doi.org/10.1177/F1368431018799257>
- Inis, E. (2004) The neurotic citizen. *Citizenship Studies*, 8(3), 217–235. Available from: <https://doi.org/10.1080/1362102042000256970>
- Jones, R., Pykett, J. & Whitehead, M. (2013) *Changing behaviours: On the rise of the psychological state*. Cheltenham, UK: Edward Elgar.
- Kahneman, D. (2003) A psychological perspective on economics. *American Economic Review*, 93(2), 162–168. Available from: <https://doi.org/10.1257/000282803321946985>
- Kahneman, D., Krueger, A.B., Schkade, D.A., Schwarz, N. & Stone, A.A. (2004) A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306, 1776–1780. Available from: <https://doi.org/10.1126/science.1103572>
- Karandinou, A. & Turner, L. (2017) Architecture and neuroscience; what can the EEG recording of brain activity reveal about a walk through everyday spaces? *International Journal of Parallel, Emergent and Distributed Systems*, 32(1), S54–S65. Available from: <https://doi.org/10.1080/17445760.2017.1390089>
- Kerst, A., Zielasek, J. & Gaebel, W. (2019) Smartphone applications for depression: A systematic literature review and a survey of health care professionals' attitudes towards their use in clinical practice. *European Archives of Psychiatry and Clinical Neuroscience*, 270(2), 139–152. Available from: <https://doi.org/10.1007/s00406-018-0974-3>
- Kinsley, S. (2019) Subjectivities. In: Ash, J., Kitchin, R. & Leszczynski, A. (Eds.) *Digital geographies*. London: SAGE, pp. 153–163.
- Kitchin, R. (2011) The programmable city. *Environment and Planning B: Planning and Design*, 38, 945–951. Available from: <https://doi.org/10.1068/b3806com>
- Kitchin, R. & Dodge, M. (2011) *Code/space: Software and everyday life*. London, UK: MIT Press.
- Kyttä, M., Broberg, A., Haybatollahi, M. & Schmidt-Thomé, K. (2016) Urban happiness: Context-sensitive study of the social sustainability of urban settings. *Environment and Planning B: Planning and Design*, 43(1), 34–57. Available from: <https://doi.org/10.1177/F0265813515600121>
- Layard, R. (2005) *Happiness. Lessons from a new science*. London, UK: Penguin Books.
- Lecic-Tosevski, D. (2019) Is urban living good for mental health? *Current Opinion in Psychiatry*, 32(3), 204–209. Available from: <https://doi.org/10.1097/ycp.0000000000000489>
- Lederbogen, F., Kirsch, P., Haddad, L., Streit, F., Tost, H., Schuch, P. et al. (2011) City living and urban upbringing affect neural social stress processing in humans. *Nature*, 474, 498–501. Available from: <https://doi.org/10.1038/nature10190>
- Leigh, S. & Flatt, S. (2015) App-based psychological interventions: Friend or foe? *Evidence-Based Mental Health*, 18, 97–99. Available from: <https://doi.org/10.1136/eb-2015-102203>
- Littlefield, M. (2018) *Instrumental intimacy. EEG wearables and neuroscientific control*. Baltimore, MA: John Hopkins University Press.
- Lupton, D. (2016) The diverse domains of quantified selves: Self-tracking modes and dataveillance. *Economy and Society*, 45(1), 101–122. Available from: <https://doi.org/10.1080/03085147.2016.1143726>
- Lykken, D. & Tellegen, A. (1996) Happiness is a stochastic phenomenon. *Psychological Science*, 7(3), 186–189 Available from: <https://doi.org/10.1111/Fj.1467-9280.1996.tb00355.x>
- Manning, N. (2019) Sociology, biology and mechanisms in urban mental health. *Social Theory & Health*, 179(1), 1–22. Available from: <https://doi.org/10.1057/s41285-018-00085-7>
- Mattern, S. (2018) Databodies in codespace. *Places Journal*. Available from: <https://doi.org/10.22269/180417>
- Mohammad, R., & Sidaway, J. D. (2012). "Reflections on affect: A meta-commentary occasioned by Pile (2010) and subsequent exchanges" *Transactions of the Institute of British Geographers* (Vol. 37, 4th edition, pp. 655–657).
- Montgomery, C. (2013) *Happy city. Transforming our lives through urban design*. London, UK: Penguin.
- Oakes, T. (2019) Happy town: Cultural governance and biopolitical urbanism in China. *Environment and Planning A: Economy and Space*, 51(1), 244–262. Available from: <https://doi.org/10.1177/F0308518X17693621>
- OECD (Organisation for Economic Co-operation and Development). (2013) *OECD guidelines on measuring subjective well-being*. Paris, France: OECD Publishing. Available from: <https://doi.org/10.1787/9789264191655-en> [Accessed 26th July 2019].
- Okkels, N., Kristiansen, C.B., Munk-Jørgensen, P. & Sartorius, N. (2018) Urban mental health: Challenges and perspectives. *Current Opinion in Psychiatry*, 31(3), 258–264. Available from: <https://doi.org/10.1097/ycp.0000000000000413>
- Okulicz-Kozaryn, A. & Mazelis, J.M. (2018) Urbanism and happiness: A test of Wirth's theory of urban life. *Urban Studies*, 55(2), 349–364. Available from: <https://doi.org/10.1177/F0042098016645470>

- Okulicz-Kozaryn, A. & Valente, R.R. (2019) No urban malaise for Millennials. *Regional Studies*, 53(2), 195–205. Available from: <https://doi.org/10.1080/00343404.2018.1453130>
- Olafsdottir, G., Cloke, P. & Vögele, C. (2017) Place, green exercise and stress: An exploration of lived experience and restorative effects. *Health and Place*, 46, 358–365. Available from: <https://doi.org/10.1016/j.healthplace.2017.02.006>
- Pacione, M. (2013) Urban environmental quality and human wellbeing—A social geographical perspective. *Landscape and Urban Planning*, 65(1–2), 19–30. Available from: [https://doi.org/10.1016/S0169-2046\(02\)00234-7](https://doi.org/10.1016/S0169-2046(02)00234-7)
- Peck, J. (2002) Political economies of scale: Fast policy, interscalar relations, and neoliberal workfare. *Journal of Economic Geography*, 78(3), 331–360. Available from: <https://doi.org/10.1111/j.1944-8287.2002.tb00190.x>
- Pykett, J. (2013) Neurocapitalism and the new neuros: Using neuroeconomics, behavioural economics and picoeconomics for public policy. *Journal of Economic Geography*, 13(5), 845–869. Available from: <https://doi.org/10.1093/jeg/lbs039>
- Pykett, J. (2015) *Brain culture. Shaping policy through neuroscience*. Bristol, UK: Policy Press.
- Pykett, J., Chrisinger, B., Kalliopi, K., Osborne, T., Resch, B., Stathi, A. et al. (2020a) Developing a Citizen Social Science approach to understand urban stress and promote wellbeing in urban communities. *Palgrave Communications*, 6(1), 85. Available from: <https://doi.org/10.1057/s41599-020-0460-1>
- Pykett, J., Osborne, T. & Resch, B. (2020b) From urban stress to neurourbanism: How should we research city wellbeing? *Annals of the Association of American Geographers*, 110(6), 1936–1951. Available from: <https://doi.org/10.1080/24694452.2020.1736982>
- Raworth, K. (2017) *Doughnut economics. Seven ways to think like a 21st century economist*. London, UK: Random House.
- Reichert, M., Tost, H., Braun, U., Zipf, A., Meyer-Lindenberg, A. & Ebner-Priemer, W. (2018) GPS-triggered electronic diaries and neuroscience to unravel risk and resilience factors of city dwellers mental health in everyday life. *European Neuropsychopharmacology*, 28(1), S87–S88. Available from: <https://doi.org/10.1016/j.euroneuro.2017.12.120>
- Reid, L. & Ellsworth-Krebs, K. (2019) Nudge(ography) and practice theories: Contemporary sites of behavioural science and post-structuralist approaches in geography? *Progress in Human Geography*, 43(2), 295–313. Available from: <https://doi.org/10.1177/F0309132517750773>
- Resch, R., Summa, A., Sagl, G., Zeile, P. & Exner, J. (2014) Urban emotions—Geo-semantic emotion extraction from technical sensors, human sensors and crowdsourced data. In: Gartner, G. & Huang, H. (Eds.) *Progress in location-based services*. Cham, Switzerland: Springer.
- Roberts, H.V. (2017) Using Twitter data in urban green space research: A case study and critical evaluation. *Applied Geography*, 81, 13–20. Available from: <https://doi.org/10.1016/j.apgeog.2017.02.008>
- Rodríguez-Pose, A. & von Berlepsch, V. (2014) Social capital and individual happiness in Europe. *Journal of Happiness Studies*, 15(2), 357–386. Available from: <https://doi.org/10.1007/s10902-013-9426-y>
- Rose, G. (2017) Posthuman agency in the digitally mediated city: Exteriorization, individuation, reinvention. *Annals of the American Association of Geographers*, 107(4), 779–793. Available from: <https://doi.org/10.1080/24694452.2016.1270195>
- Schwanen, T. & Atkinson, S. (2015) Geographies of wellbeing: An introduction. *The Geographical Journal*, 181(2), 98–101. Available from: <https://doi.org/10.1111/geoj.12132>
- Schwanen, T. & Wang, D. (2014) Well-being, context, and everyday activities in space and time. *Annals of the Association of American Geographers*, 104(4), 833–851. Available from: <https://doi.org/10.1080/00045608.2014.912549>
- Scott, K. (2015) Happiness on your doorstep: Disputing the boundaries of wellbeing and localism. *The Geographical Journal*, 181(2), 129–137. Available from: <https://doi.org/10.1111/geoj.12076>
- Segal, L. (2017) *Radical happiness. Moments of collective joy*. London, UK: Verso.
- Seligman, M. (1999) The President's address. *American Psychologist*, 54(8), 559–562. Available from: <https://doi.org/10.1037/0003-066X.54.8.537>
- Sent, E. (2004) Behavioral economics: How psychology made its (limited) way back into economics. *History of Political Economy*, 36(4), 735–760. Available from: <https://doi.org/10.1215/00182702-36-4-735>
- Sgroi, D., Hills, T., O'Donnell, G., Oswald, A. & Proto, E. (2017) *Understanding happiness. A CAGE policy report*. London, UK: The Social Market Foundation. Available from: <http://www.smf.co.uk/wp-content/uploads/2017/01/Social-Market-FoundationCAGE-Report-Understanding-Happiness-1.pdf>
- Shekhar, H., Schmidt, A.J. & Wehling, H. (2019) Exploring wellbeing in human settlements – A spatial planning perspective. *Habitat International*, 87, 66–74. Available from: <https://doi.org/10.1016/j.habitatint.2019.04.007>
- Shoval, N., Schvimer, Y. & Tamir, M. (2018) Tracking technologies and urban analysis: Adding the emotional dimension. *Cities*, 72(A):34–42. Available from: <https://doi.org/10.1016/j.cities.2017.08.005>
- Smith, T.S.J. & Reid, L. (2018) Which 'being' in wellbeing? Ontology, wellness and the geographies of happiness. *Progress in Human Geography*, 42(6), 807–829. Available from: <https://doi.org/10.1177/F0309132517717100>
- Sun, N. (2021) *China's tech workers pushed to their limits by surveillance software*. *Financial Times* June 15, 2021. Available from: <http://www.ft.com> [Accessed 2nd Aug 2021].
- Swanlund, D. & Schuurman, N. (2019) Resisting geosurveillance: A survey of tactics and strategies for spatial privacy. *Progress in Human Geography*, 43(4), 596–610. Available from: <https://doi.org/10.1177/F0309132518772661>
- Tomaney, J. (2017) Region and place III: Well-being. *Progress in Human Geography*, 41(1), 99–107. Available from: <https://doi.org/10.1177/F0309132515601775>
- Torous, J. & Firth, J. (2016) The digital placebo effect: Mobile mental health meets clinical psychiatry. *The Lancet Psychiatry*, 3(2), 100–102. Available from: [https://doi.org/10.1016/s2215-0366\(15\)00565-9](https://doi.org/10.1016/s2215-0366(15)00565-9)
- UN Habitat 9 (2017) *Cities 2013: Cities for all. Implementing the New Urban Agenda*. World Urban Forum 2018 in Kuala Lumpur, World Urban Forum (WUF). Available from: <http://wuf9.org/theme/> [Accessed 26th July 2019].

- Van Ameringen, M., Turna, J., Khalesi, Z., Pullia, K. & Patterson, B. (2017) There is an app for that! The current state of mobile applications (apps) for DSM-5 obsessive-compulsive disorder, posttraumatic stress disorder, anxiety and mood disorders. *Depression and Anxiety*, 34(6), 526–539. Available from: <https://doi.org/10.1002/da.22657>
- Veenhoven, R., Diener, E. & Michalos, A. (2000) Editorial. *Journal of Happiness Studies*, 1(1), 5–8. Available from: <https://doi.org/10.1023/A:1010077309452>
- Wang, D., Schwanen, T. & Mao, Z. (2019) Does exposure to richer and poorer neighborhoods influence wellbeing? *Cities*, 95, 102408. Available from: <https://doi.org/10.1016/j.cities.2019.102408>
- Ward Thompson, C., Roe, J., Aspinall, P., Mitchell, R., Clowd, A. & Miller, D. (2012) More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landscape and Urban Planning*, 105(3), 221–229. Available from: <https://doi.org/10.1016/j.landurbplan.2011.12.015>
- Weiss, A., King, J., Inoue-Murayama, M., Matsuzawa, T. & Oswald, A. (2012) Evidence for a midlife crisis in great apes consistent with the U-shape in human well-being. *Proceedings of the National Academy of Sciences of the United States of America*, 109(49), 19949–19952. Available from: <https://doi.org/10.1073/pnas.1212592109>
- White, S.C. (2017) Relational wellbeing: Re-centring the politics of happiness, policy and the self. *Policy & Politics*, 45(2), 121–136. Available from: <https://doi.org/10.1332/030557317X14866576265970>
- Whitehead, M., Jones, R., Lilley, R., Pykett, J. & Howell, R. (2017) *Neoliberalism. Behavioural Government in the 21st century*. London, UK: Routledge.
- WHO. (2017) *Depression and other common mental disorders. Global health estimates*. Geneva, Switzerland: World Health Organization.
- WHO. (2018) *Copenhagen consensus of mayors. Healthier and happier cities for all*. Geneva, Switzerland: World Health Organization. Available from: <http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/WHO.-european-healthy-cities-network/policy/copenhagen-consensus-of-mayors.-healthier-and-happier-cities-for-all-2018> [Accessed 26th July 2019].
- Williamson, B. (2017) Computing brains: Learning algorithms and neurocomputation in the smart city. *Information, Communication and Society*, 20(1), 81–99. Available from: <https://doi.org/10.1080/1369118X.2016.1181194>
- Winz, M. & Söderström, O. (2021) How environments get to the skin: Biosensory ethnography as a method for investigating the relation between psychosis and the city. *BioSocieties*, 16, 157–176. Available from: <https://doi.org/10.1057/s41292-020-00183-8>
- Zeisel, J. (2006[1981]) *Inquiry by design. Environment/behaviour/neuroscience in architecture. Interiors, landscape, and planning*. 2nd edition, London, UK: W.W. Norton and Company.

How to cite this article: Pykett, J. (2022) Spatialising happiness economics: Global metrics, urban politics, and embodied technologies. *Transactions of the Institute of British Geographers*, 00, 1–16. Available from: <https://doi.org/10.1111/tran.12528>