© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

CONTENTS

Illustrations ix

Tables xi

Acknowledgements xiii

1 Introduction: Feelism in Government, Technology, and Culture 1

Decoding Human Experience by Coding Emotions 3

Emotionalisation of Public and Policy Discourse 6

Contesting Global Emotions 10

Methodological Note 13

About the Book 15

2 Situating Global Emotions 20

Worldly Emotions: Where Are Emotions and What Do They Do? 21

Political Affects: How Are Emotions Political? 26

Emotional Injustice: What Do Emotions Explain? 27

Digital Emotional Governance 30

3 Emotion Science and Its Critics 35

Searching for a New Era of Affectivism 36

Central Claims in Emotion Science 39

Critical Interdisciplinary Perspectives on Emotion Science 45

Machinic Emotions: What Is Being Measured and Why Does This Matter? 53

Digital Emotional Science 58

4 Cultural Politics of Digital Media Ecologies 60

Media Anthropologies and Digital Ecologies 62

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Visual Cultures and Subjectivity 69
Economic Value, Power, and Governance 72
Digital Emotional Power 77

5 Emotional Data Bodies 80
Boomtime for Digital Emotions Products and Services 81
Applications of Emotion Science in Affective Computing 82
A Media Ecology Analysis of Emotion Sensing Technics 85
Doing Things with Digital Emotions 109

6 Empathic Cities 113
Spatial Concepts for Understanding Digital Emotional Governance 117
Complex Urban Systems of Emotional Wellbeing in the New Sciences of Cities 121
Critical Neurogeographies for Empathic Cities 125
Managing Cities with Digital Emotions 128

7 Global Economic Emotions 130
Who Gets to Design the Future of GDP? 131
How GDP Becomes History and Happiness Becomes the Future 133
Heterodox Economics for Democratised Emotional Governance 139
Measuring National Progress through Emotions 148

8 Anticipatory Ethics 151
Ethical Preparedness for Digital Emotion Sensing 154

Conclusions 184
Future Research and Developments 185

Abbreviations 191
Glossary 193
Notes 203
Bibliography 225
Index 255

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

1

Introduction

FEELISM IN GOVERNMENT, TECHNOLOGY, AND CULTURE

EMOTION SENSING technologies which aim to 'decode' human experience are converging with psychology and the will to govern. Emotional AI, mood monitoring apps, facial expression coding, even brain-computer interfaces are providing new ways of measuring, monitoring and managing emotions. Emotion sensing has become a matter of acute concern as people become ever more aware of the uses of intimate data and the abuses and misuses of emotional knowledge in society. But what if these technologies and the emotion science which informs them get emotions wrong? How would we know, and what should be done? We need new ways of thinking critically about how emotions are defined, shaped, used, governed, and transformed through digital technologies. We should think more about what emotions do, what emotions explain, and what is said to be explained by them.

To understand the politics of feelings, we need to transform how we think and talk about emotions, as situated in space and time. A specific type of *feelism* has become commonplace in public and political discourse, and this way of thinking about feelings has significant limitations. This is not to deride a societal openness about feelings, nor to agree with the 'anti-woke' sentiment that suggests public services pander to people's feelings. Emotions are an essential aspect of political deliberation and action, and understanding the production and evolution and the rules and grammar of emotions is a crucial part of critical inquiry. Instead, the notion of feelism captures how a particular set of perspectives on the experience of emotions has become influential. These perspectives propose that emotional experience is at once universalised and individualised—that feelings can for instance be read from the individual body's biological data or seen on the face, and that they refer to categories that are universally applicable.

A particular kind of feelism is evident in the scientific methods, technological developments and public policy uses of digitised emotions. But these

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

definitions of emotions are already highly contested, and they act to foreclose other valid perspectives. Emotions are not global. Not everyone in the world shares the same basic emotions. Emotions have as much to do with specific cultures and histories as our 'global' human physiology. We cannot accurately, objectively and consistently evaluate our own overall 'global emotional state'. And while 'global' standards of emotion measurement may be useful for some, they are also flawed.

Treating emotions as if they are global and measuring them through digital technologies produces *machinic emotions*. Both a mechanistic perspective and the mediation of emotional experience by literal machines changes what emotions are and how we study and intervene in them. These have evolved in contexts of *neurocapitalism,* a form of socioeconomic organisation in which brain and behavioural and emotional data acquire and generate economic value. By paying attention to wider social and spatial practices *of digital emotional governance,* we can generate new lines of political enquiry around how emotion definitions, science and measurement, digital emotion sensing technologies, and processes of datafication and quantification are shaping how emotions are being governed.

This book offers an original account of how the body-digital interface has become a new site of commercialisation, control, and contestation. We will explore the knowledge produced in emotion science, new technological developments and their economies, and their social and spatial impacts. Some of these digital emotion sensing technologies hope to reach wider populations through new everyday consumer markets such as calming neurofeedback devices. Others are at the cutting edge of scientific innovation in embodied and affective computing. Some reflect established research methods in the psychological measurement of emotional states. These methods have already had long-standing impacts on how Western societies think about what emotions are, where they are found, and how they can or should be shaped.

Digital emotion sensing technologies operate across a range of sites and scales, including the body, city, and nation. By focussing on these spaces, we can begin to build an alternative account of 'worldly emotions' that is developed throughout the book. This looks beyond the head and the heart to find emotions in the world. It defines emotions as situated human relationships with physical, social, cultural, technologically mediated, and ecological worlds. We will discover new perspectives not only on what emotions do, but also on what emotions explain, and on what is said to be explained by them. Let us start with a company that wants to unlock the human brain and augment human experience.

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Decoding Human Experience by Coding Emotions

> "Welcome to Emotiv. Unlockers of the human brain and decoders of the human experience. . . . We can decode cognition, emotions and behaviours as they happen. Think of the insights, the innovation, the advantage that can come from grasping the smallest nuances of how we think, respond and feel. And the possibilities from there—as infinite as stars in the sky". Tan Le, Emotive CEO and founder, 2023.[1]

The Californian bioinformatics company Emotiv, founded in 2011, has developed a range of monitoring devices which gather EEG (electroencephalograph, or brainwave) data from the electric activity in people's brains in order to explore new scientific frontiers: "to learn about our own internal galaxies" and "learn faster, perform better, make better choices, improve mental wellbeing, gain mobility and independence, reduce stress and improve the human experience". They outline applications in neuromarketing and consumer experience, workplace wellness, gaming and creativity, education, scientific research, and Brain-Computer Interfaces (BCI). This is proposed to be universally beneficial and to level the playing field: "Not just for the 1% but for 100% of people all around the world".

What competitive advantage is envisaged by this kind of company? They mention a few examples. Firstly, a partnership between Emotiv and L'Oreal launched at the 2021 Dubai Expo saw them develop personalised perfume recommendations based on personality questions and EEG data. Secondly, and in stark contrast to the marketing targets of perfumes, theirs targets everyday consumers, promising that they will be able to control objects such as drones and wheelchairs with their thoughts and emotions: "Control apps and machines with the power of your mind and make science fiction a reality today".[2]

Innovations in intimate emotion technologies claim infinite possibilities. They promise self-determination, augmented individual agency and the acceleration of the future. But who are the actors that have the ability to unlock and decode human experience, and what knowledge assumptions and practices are they drawing on to unlock and decode? How do they want us to emote differently? What happens when our most intimate of feelings are rendered as globalised forms of data?

Monitoring, management, and intervention of universalised and individualised emotions are on the rise across a range of spheres, and it is a timely question to ask, who is all this feelism helping? Are feelings equivalent to emotions, and are emotions the only source of truth about human-embodied experience? How do these data create economic, social, and personal value?

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

What are scientists and technologists really talking about when defining, describing, and digitising emotions? What novel interventions will be generated, how might they be used to govern or control individuals and populations, and how should these emotional technology developments be regulated?

The book explores these questions in relation to science, politics, and everyday life. In particular, I highlight the role of diverse forms of emotion science and measurement, digital emotion sensing technologies, and processes of quantification and datafication in shaping techniques of *emotional governance* (Jupp et al. 2017). Emotional governance refers to the 'how' of intervening in emotions simultaneously at the level of individuals and populations. I bring a distinctively situated definition of emotions to provide an alternative critical understanding of techniques of emotional governance. We will explore in depth cases relating to embodied digital emotion sensing devices, smart cities, and global happiness measurement.

Why should you be concerned about this thing called 'digital emotional governance'? Because how we define, measure, and talk about emotions matters politically. Major new social divisions have emerged around the political place of emotions. Emotions are central to understanding political rhetoric and viral social media. They play a key role in the rapidly increasing political influence of 'big tech' plutocracy, the creeping descent into fascism in some contexts, and the means of authoritarian state control. T-shirts emblazoned with conservative slogans declare that 'facts don't care about your feelings', while politicians have famously become more willing to cry, or to express rage public during recent years. Emotions are clearly central to the most recent rise of populist politics witnessed internationally. They are recognised as an important factor in the effectiveness of creating national identities, in governing national populations through invocations of pride or fear, and in responses to international migration. Knowing and evaluating the nation's collective mood through emotional data is as important today as digitally tracking our individual daily happiness or stress.

Emotions are integral to political thinking and practice, but what are they, what do they do, and what else matters? Emotions cannot be simply categorised as good or bad, or straightforwardly manipulated by those who have formal power over populations or soft power influence. Emotions can be seen as a source of everyday political danger—as in the rise of religious, nationalist, racialised, homophobic, anti-disability, or misogynistic hate. Conversely, emotions can be a progressive force, cultivating forms of attachment, empathy, and care, which are essential to well-functioning societies.

Meanwhile the academic study of emotions has proliferated across contemporary science, social science, and humanities research. Discussion of

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

emotional regulation, emotional labour, emotion science, emotional intelligence, and emotional economies has grown to provide critical perspectives on the societal import of emotions. While it is sometimes proposed that there is a 'new' science of emotions, emotions have long been subject to scientific enquiry. Historical divisions between emotion and reason, feeling and rationality, mind and body have been dissolved.

When it comes to policy and applied research, scientific accounts of the functional and behavioural anatomy of 'global' or universal human emotions have tended to prevail. Mechanistic understandings of emotions have become fertile ground in internationally significant public policy agendas—for instance, in *Global Happiness and Well-being Policy Report*s—for addressing the global challenge of declining mental health, improving workplace effectiveness, designing emotionally aware behaviour change interventions, promoting social and emotional learning, making health and social care more relational, and designing and planning for happier cities.

Analysis of the role of emotions in political discourse, scientific explanation, deliberation, judgment, and interpretation can aid us in understanding how feelings shape contemporary public culture. Digital technology, data, and public media are clearly also key tools of feelings measurement, monitoring, and management. This emotional culture is fraught with contradictions. On the one hand, we are impelled to accept the highly emotive language of many politicians regarding threats to our security and traditions or cultivating a fear of outsiders. Emotions are invoked in protecting the free speech rights of citizens even when they are hateful emotions. People are also said to show too much emotional self-doubt and negativity in the face of uncertain futures. Other emotions such as hope, optimism, wellbeing and happiness are strategically nurtured as the emotions of choice for an emotionally sound citizenry. Conversely, anger is to be managed, and anxiety, sadness, and depression are to be treated, fixed, and overcome. Modern warfare and geopolitics also operate in an emotional register, working to change 'hearts and minds'. Economically, emotions are targeted to shape a sense of belonging, affiliation, and commitment to our work, our public services, our locality. We are required to endlessly satisfy our emotional consumer desires to spend, so that we may keep the economy afloat.

On the other hand, however, there is often suspicion or ridicule of *too much* emotion. From this perspective it is often held that evidence must be used to counter an emotive populist politics, that our relationship with digital technologies and social media must become less emotionally toxic, and that we must not let any wayward emotions get in the way of productive work. In these terms emotions should be disregarded or closely controlled in public and political life and the facts must speak for themselves.

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Proliferating in this context are digital technologies which promise to measure how we feel. 'Emotion sensing' can be used as a general term to describe these technologies and the techniques they use to gather emotional data. Although caution is also needed when assessing claims to 'sense', 'detect', and 'measure' emotions. What emotion sensing technologies seek to do with this data—whether that is to measure, detect, recognise, monitor, classify, curate, elicit, tune, stimulate, or otherwise intervene in emotional experience—is the central concern of this book. It is therefore timely to be assessing digital emotional governance. This refers to how emotion science and measurement, digital emotion sensing technologies, and processes of datafication and quantification are shaping how emotions are being governed, managed, or intervened in, at both an individual and a population level.

Emotionalisation of Public and Policy Discourse

It is possible to say that every era has its own emotional culture. The English literary and cultural critic, Raymond Williams called this a "structure of feeling" which describes the dominant "culture of a period". This culture is not always consciously expressed, is not directly learned from generation to generation, but is the basis of communication. Each new generation is engaged in "shaping its creative response into a new structure of feeling".[3] This way of life, informing but not equal to moral judgment, social character, and convention, can be traced through popular fiction and literature and historical study.[4]

In this vein, historians such as Rachel Hewitt and Thomas Dixon have investigated historical shifts in the vocabulary of emotions and how societies have approached passion, feeling, and desire. Dixon's historical unpacking of the very idea of 'the emotions' refutes any such coherent category. Instead, he argues for a more nuanced analysis of distinctive mental states such as passion, affection, sentiment, feeling, and commitment (Dixon 2003:2). Likewise, Hewitt (2017:3-4) describes emotion as "produced at the intersection between each person and the culture they inhabit". She uses the history of emotions as a new starting point for analysing political change. She outlines how new forms of scientific experimentation and instrumentation in Britain during the 1790s disconnected emotions from subjective experience, spirituality, morality, and politics. This era, alongside its evolving emotional culture of romanticism, can be considered one of the precursors to the direct digital measurement of moods and the impetus to optimise our emotional states that we now witness.

Sociologists have also helped us to understand what emotions do, rather than what they are. Arlie Hochschild (1979) developed the concept of "feeling rules" by which individuals undertake emotional work and self-management

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

in order to act within the social and class-structured norms of society. Meanwhile Eva Illouz (2013 [2007]) has described the "emotional style" resulting from how people see the relationship between themselves to others. She marks out the twentieth century, and the postwar period in particular, in terms of the rise of a consumerist therapeutic emotional style, evident in everyday life, the rise in advice and self-help literature, and emotional management workplace schemes. Emotional forms of media have been scrutinised by Vian Bakir and Andrew McStay (2022), who look at how the "civic body" and public culture have been threatened by misinformation and disinformation.

What is less certain is that one's current emotional culture is any more or less 'feelist' than that of any other era or that situated in another place. Indeed, identifying the prominence of emotion in any one culture is not the task I have set myself in this book. Nor am I asking whether we are viewing a more emotionalised public culture or political discourse than what has gone before, because this seems an historically redundant question. Certainly, this perspective is advocated for by some who have traced "new" affective modes of governance, citizen formation, and neoliberal state transformation. Others see emotionalisation, again equated with neoliberal forms of individualised subjectivity, as a fait accompli.[5]

By contrast, my intention is not to name or explain the specific emotional culture of the current era, as if it is globally relevant. Quite the opposite. I want to examine specific claims about, definitions of, and the practice of sensing, measuring, and communicating emotions in the emotion sciences, broadly conceived. We will explore how these claims have come to influence public discourse, governance techniques, and developments in digital technologies over recent decades. Overall, this helps us to bring political questions to bear on the emotion sciences, their claims, and their uses and applications in public life.

To do so, it is useful to have in our minds some understanding of the contingency and knowledge-brokering by which scientific ideas reach policy-makers, to give us some sense of the challenges of researching the science-policy interface. This is a focus which guides my overall objective. That is, to assess the convergence of emotion sciences, digital technologies, and governmental techniques. Only select disciplinary perspectives come to the attention of, let alone come to matter for, policy-makers. In the case of knowledge about emotions in the UK and the US, it can be argued that emotion science in the forms of behavioural psychology, behavioural economics, happiness economics, and affective neuroscience have begun to inform public policies which directly target impulsive emotional responses. But more plural disciplinary approaches are needed to identify their limitations and draw out

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

new ways of seeing. These approaches help us to ask new questions about the application of the emotion sciences in technological, commercial, and governance settings, and their implications for human agency, questions of value, emotional politics, and injustice.

The rise of these broad and diverse emotion sciences includes several decades of research in behavioural economics, and the emergence of a 'new science of happiness' since the early 2000s, which focuses on a specific emotion and the apparently universal and timeless quest to improve and increase happiness.[6] Within economics these are both associated with more experimental methodologies, higher evidential standards (observation, objective measurement of subjective feelings, clearly defined concepts), and more biological bases of explanation.[7] The outcome of this thinking has been a programme of governmental tools and techniques which treats our cognitive capabilities as a scarce resource. This field is by now so intertwined with governance and policy that it has given rise to the nomenclature 'behavioural public policy'[8].

Another example of how emotion science has directly shaped public policy can be traced by the impact of the work of Joseph LeDoux. His work has influenced academic advisors on behavioural public policies in the UK through the work of professor of behavioural science, Ivo Vlaev, and former health minister, Lord Ara Darzi.[9] Their account of behaviour takes the dual systems theory outlined by LeDoux (system 1—automatic, and system 2—reflexive thinking) as a starting point. They also adhere to a physiological account of emotions, referring both to LeDoux's locating of emotions in the amygdala, the cingulate cortex, and the insular cortex and to Antonio Damasio's identification of the right anterior insula as a locus for processing feeling states. Their work gives a central place to emotion science as the knowledge base for conceptualising the affective systems involved in decision-making, and thus to be "triggered by behaviour change interventions".[10]

Damasio, for his theory of embodied emotions, has been described as *"the* leading neuroscientist linked to the study of emotion" (Plamper 2012:214), and he has influenced these policy debates. His Somatic Marker Hypothesis (SMH) popularised in his 1994 book, *Descartes Error: Emotion, Reason, and the Human Brain,* holds that emotions play a central role in decision-making—speeding this up via physically observable emotional markers in the left-hand side of the brain and body—measured by skin conductance response. These markers then guide behaviour.[11] The basic claims—that much decision-making is automatic, motivated by physical emotional states and correlated with brain activity—have been adopted in efforts to shape techniques of governance and policy design, particular in relation to health and wellbeing, pro-environmental behaviour, and personal finance.[12]

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Happiness economics has also shaped policy approaches and public policy discourse in several comparable ways. In the UK in particular, happiness economics has directly shaped the decision to begin measuring subjective wellbeing and the public discourse on moving beyond Gross Domestic Product (GDP) as a measure of economic progress. For example, the All-Party Parliamentary Group on wellbeing economics[13] recommended that all UK Treasury bidding be justified in relation to the net cost of wellbeing impacts of policies, and that the Treasury Green Book used to analyse impact form the basis for some of this work[14]. This is relevant because of the methodological commitments of happiness economics to the self-report survey and its influence on international standards of emotional measurement and reporting.

The emotionalisation of policy and the technologisation of emotions have not gone uncontested in public and political spheres. Specifically, there have been significant concerns about emotion recognition markets and regulation. In 2023, European Digital Rights (EDRi), an association of civil and human rights organisations, called for an outright ban on "Europe's burgeoning emotion recognition market", calling into question the Basic Emotion Theory on which were based many commercial surveillance measures used at borders, in workplaces, by retailers, and in schools (Marda and Jakubowska 2023). In 2024, the European Parliament approved the Artificial Intelligence Act with new rules banning emotion recognition in workplaces, in schools, for social scoring, and for predictive policing in ways which manipulate behaviour to exploit people's vulnerabilities[15].

Science and technology studies (STS) and humanities scholars have also written with significant concern about the expansion of emotion sensing technologies such as mobile, wearable brain-imaging (Littlefield 2018) and new systems of "automated empathy" which are programmed to categorise and interact with our affective states (McStay 2023). They have considered the ways in which emotions are reduced, codified, and capitalised (Munn 2020), and unearthed their unstable basis within contested emotion science and experimental cognitive psychology (Leys 2017, Stark 2019, Martin 2022). Some have dismissed emotion recognition technologies as a legacy or reincarnation of scientific racism and physiognomy—powerfully calling for the end to their racially biased AI techniques, and their culturally normative and ableist use in policing and security (McInerny and Keyes 2024; Stark and Hutson 2023).

While these are important and in-depth critiques and much needed regulatory interventions, I do not set out here to just reject digital emotional governance as the application of bad or false science. Science is of course a legitimate mode of knowing and acting, and one that is built on consensus-making, high standards of rigour and evidence, transparency and openness to

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

critiques, and challenge and change. There are also important societal and individual benefits of many of the forms of emotion science outlined in this book, including neuroscience, cognitive psychology, and physiology, that have vast benefits for all kinds of applications, not least in the medical sphere.

Instead, it is my intention to call out *scientism* and its soulmate, *technological solutionism,* when these are used as the sole guide for our collective understanding of emotions, their economic value, and their governance, where they have the potential effect of maintaining structural inequalities. Rich and diverse forms of social science, arts and humanities scholarship on human experience, emotional cultures, meaning, and the democratic negotiation of political and economic interests are frequently neglected in the science-policy interface. Following Bruno Latour's (2004:231) autobiographical lamentations of critiques of science, I aim to get closer to the factual objects of emotion science, and its "matters of concern". By bringing these concerns into view, let's find an alternative route for making digital emotional governance fairer, more inclusive, and more open to democratic scrutiny.

We take as a starting point that there is little agreement on the specific political and ordinary situations in which emotions should be either actively surveyed and targeted, or 'overcome' and downplayed—*where* emotions are in and out of place, *how* emotions are 'known', detected, located, measured, mapped. We therefore need to build new ideas and concepts to help us examine these questions, open them up to scrutiny, and explore the grounds on which they are contested. To *what ends* are emotions governed, managed, and regulated in specific spaces? In what ways are our intimate and personal embodied feelings *mediated* through scientific knowledge and apparatus as well as through digital technologies in the world? And how do the forms, cultures, and institutional practices of governing emotions shape our sense of *self and agency* as citizens?

Contesting Global Emotions

The examples above suggest that specific scientific ideas about emotions have come to dominate public policy discourse. There are also some pressing concerns about the development of emotion sensing technologies and their regulation. Bringing these aspects together here, we ask, how did these accounts arise, how have they come to be seen as globally relevant when they are largely derived from the US and the UK, and what does this imply? Below, I demonstrate how emotions are constructed as global in several senses. They are often deemed universal human phenomena, they are measured and researched through global polling companies, they are represented as holistic—encompassing the 'authentic' nature of human

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

experience—and they are increasingly ubiquitous—in contexts ranging from political discourse, education, public health, and workplaces and management to everyday language.

As I will argue in chapter 2, projecting universal insights from historically and culturally specific forms of knowledge production in affective neuroscience, basic emotions, and psychological self-report surveys is a misstep which needs correcting. My focus is therefore primarily on scientific, governance, technological, and commercial developments currently dominated by the UK and the US, although other examples are also used. There is a need to rebalance the dominance of the English language and global minority White perspectives on questions of emotions, technologies, and global governance. In acknowledging this, and the shortcomings of my own efforts to do so, I draw attention in chapter 7 to some of the alternative futures for global emotional governance offered by theories, insights, and enduring historical experiences from the Global South.[16]

In one sense, emotions are always implicitly known to us—we know that we feel and how we feel. Yet the meaning of emotions is never fixed—societal conceptions of emotions shift, emotional cultures vary geographically, scientific knowledge on emotions changes, different disciplinary perspectives contrast and conflict. By exploring scholarship from emotion science and its application through digital emotional technologies and public policy interventions, we can see that there are in fact many emotional theories and assumptions which remain contested. Examining just how these theories are contested is important for showing why it matters politically when emotions are governed *as if* they are global. The assumed global characteristics are manifest in several different forms, such as:

1. universal human experiences shared globally (as in basic emotion theory),
2. embodied (as in global organismic states),
3. overall evaluations of one's life (as in global self-report ratings),
4. global standards of measurement.

Focussing on empirical sites across a range of scales enables me to connect the practices of emotional data production at the intersecting scales of the body, city, and nation. This helps me to delve into certain alternative conceptual points of departure to critically interrogate digital emotional governance, such as injustice, spatial inequalities, mediation, cultural politics, state power, economic valuation, and ethics. These are used to examine just what is supposed to be global about emotions, and how their globality is used in techniques of digital emotional governance. The analysis combines perspectives from affect theories, human geography, critical psychology, urban humanities, historical

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

and literary scholarship, media and communication theory, and science and technology studies.

Across the book, we see how *feelism* in emotion science can obscure our understanding of the historical and geographical specificity of emotional cultures. A specifically *machinic* version of emotions is being produced through the unacknowledged engineering ethos which underpins the intersection of emotion science with technological innovation. This ethos is one through which a cybernetic world view and a cybernetic imperative shape how we think about emotions as evolutionary or psychological problems to be solved. The central argument is that this partial and problematic view of emotions, senses, and feelings has shaped a new epoch-defining arena for public political, economic, and cultural struggles. By exploring critical political and economic perspectives on *neurocapitalism,* the aim is to reorientate the frontiers of emotional knowledge from their current trajectory inwards towards the brain, mind, and biology, towards situating emotions in the world. This is pursued through systematic analysis of wider societal trends concerning how technologies create emotional data, how cities sense our feelings, and how global economies measure happiness.

There is considerable value in using the tools of critical social theory and modes of interpretation from the humanities to unpack what emotions are taken to be and the means by which we seek to modify, augment, and control them. These perspectives can shed light on how emotions are inferred and represented, and how they are monitored, managed, and mediated, including how they are co-produced through technologies and public culture. As I have outlined in this chapter, this is important to understand because of the particular ways in which claims in emotion science are explicitly influencing policy-making approaches.

However, it is not my intention to portray digital emotional governance as inevitably in the service of either commercial or state power, or a combination of the two. We all know that big business is trying to sell us stuff we don't need, and that even democratic governments use information and data to manage populations. This story has been told over and over again across the history of neoliberalism. In this context, why would emotional measurement and technology be any different? Instead, there is a compelling and urgent need to investigate the precise mechanisms through which digital emotional governance operates. This is because they reflect ordinary technical, commercial, and policy developments which could easily be put to use by the autocratic, punitive, and fascist political regimes which at the time of this writing are creeping back into existence across Europe and the US at alarming speed.

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Methodological Note

The approach I adopt is one of advancing a descriptive argument to aid understanding of the phenomena of digital emotional governance and to problematise the claims of 'globality' on which this is based. This follows a methodological approach to descriptive cases outlined by political scientist John Gerring (2012). In this method, description analyses together hitherto disparate sites and practices—in this case under the designation of digital emotional governance. The sites and practices are: public policy-making; engineering and technology development; embodied and wearable sensor devices; apps and interfaces; social, cultural and economic applications of emotion sensing; the management of cities; future visions for economic systems.

Digital emotional governance is intended as a conceptual formulation through which future research on the rights and wrongs of 'worldly' emotions may be conducted and analysed. It proposes a novel set of arguments about the relationship between the production of 'global emotions' through forms of academic knowledge construction, their measurement and capture by digital media technologies, and their application in practices of governing. These arguments are informed by critical theories elaborated in chapters 2, 3, and 4.

Evidence for these descriptive arguments is provided by three main methods. Firstly, a review of a sample of influential literature from the emotion sciences since the 1980s, with a particular focus on agenda-setting editorials, opinion articles, and review papers totalling around 50 publications. I searched specifically for literature which made significant claims to emotional globality in relation to universality, organismic states, global self-reports, and global standards, as set out in chapter 3.

Secondly, I engage with debates in critical social science, new media philosophy, philosophies of technics, and social psychological literature to develop a 'machinic' typology of digital emotion sensing. This provides the analytical tools for the development of the descriptive arguments and critical perspectives on how emotions are assembled as part of wider socio-technical systems.

Thirdly, I undertake a 'digital technography' (Berg 2022) which uses methods of discourse and content analysis to develop ethnographic analysis of objects, people, and object relations. I identify 100 emotion sensing apps, devices, platforms, products, and services, based on web research and promotional materials. I also use business histories and sources from the technology trade and business press to examine the relationship between research institutes, technology innovators, and commercial markets of emotion sensing.

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

The book is based on a number of current and recent research projects, from which I draw out and develop core lines of argument. These advance an original theory of digital emotional governance which can be used to pursue interpretative analysis across a range of research sites, settings, and topics.

During research on the Affective Capture project (2017) I co-developed an experimental biosensing methodology using a wrist-worn physiological sensor which gathered data on electrodermal activity to investigate experiences of 'urban stress' among commuters. Our study combined this biosensing with ecological momentary assessment (EMA) and qualitative interviews, in pursuit of a biosocial methodology which would go 'beyond' emotion sensing to explicitly engage 30 research participants with their own biodata visualisations and situated, personal narratives. This project involved human geographers, geographic information scientists, psychologists, a neuroscientist, and a specialist in behavioural medicine.[17] The findings from this work are carried through into chapters 5, 6, and 7.

Subsequent research involved archival material and documentary analysis of secondary materials including policy documentation to trace the genealogy and knowledge practices involved in the development of biosensing. Hosting a visiting scholar, Mark Paterson, led to an historical and sociological investigation of electrodermal sensing instrumentation. Mark specialises in the history and science of bodily sensation and technologies of the senses.[18] This collaboration charted historical changes in biosensing, and situated the drivers of the development of biosensing and its relationship with nineteenth-century psychological and physiological accounts of emotions, twentieth-century developments in the social history of stress, and the speculative promises of twenty-first century digital technologies.[19]

Concerned that the earlier Affective Capture study had been taken rather too literally as a guide to capturing affects, rather than as a highly experimental effort to chart some of the inconsistencies, assumptions, incompatibilities, and potential blind spots of interdisciplinary ways of working, I returned to my earlier research, developing the concepts of 'psychological governance' and 'neuroliberalism' in order to investigate emerging forms of behavioural public policy and techniques of 'nudging' and neuroscientific insights used by governments within free societies. Between 2013 and 2016, these projects involved qualitative interviews with over 100 research participants and the design, trial, and evaluation of a mindfulness intervention with civil servants, an NGO, and an international business.[20]

I later developed transdisciplinary and co-produced research drawing on the behavioural sciences, neurosciences, and psychiatric sciences. In my role as a member of the Institute for Mental Health at the University of Birmingham, I worked with people with lived experience of mental health services,

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

neuroscientists, health psychologists, and behavioural medics to advance a particular understanding of the governance of the urban psyche, urban living, and urban wellbeing.[21] The findings from this research inform the media ecology approach developed in chapter 3. This lays out an alternative form of interdisciplinarity to that which is currently dominating these fields of enquiry.

Current research that I am involved with has provided an opportunity to further this enquiry into the convergence of digital, data, and devices in relation to knowledge practices, social formations, and policy agendas. At the ESRC Centre for Sociodigital Futures established in 2022, I work alongside computer scientists, engineering and technology developers, creative practitioners and scholars, social scientists, government departments, and community organisations to both analyse and make new technologies.[22] This pursues a research agenda which calls for a more active role for sociologists in making more sustainable and equitable futures (Halford and Southerton 2023). These perspectives inform chapters 4 and 5 most specifically.

Continuing this focus on data, digital, and devices, researching the emerging phenomenon of 'precision education' has enabled me to spend time engaging with ethical debates surrounding emerging technologies, which are the subject of chapter 8. This research involves textual analysis, social network mapping, and analysis of systems such as brain-computer interfaces (BCIs). This has influenced the way in which I examine the combinatory role of technological affordances, expert biological, genetic and neuroscientific knowledge, and the production of 'intimate data' in the realm of education policy and practice.[23]

About the Book

Emotional measurement and emotional data are providing new frontiers for scientific exploration and technological innovation. Datafied and quantified emotions have also become a new terrain for governing and public policy, and this raises questions about how we perceive, study, and shape our collective emotional cultures. Affective and embodied computing have co-evolved with a neuropsychological account of human behaviour and an engineering ethos which underpins their claims to knowledge, their research methods, and their societal impacts. These tend towards universalising and individualistic definitions of what emotions are and how they should be managed.

This book offers a critical analysis of emotion sensing technologies, the state of the science on which they rely, and how these coalesce to propose governmental, commercial, societal, and personal solutions in real spaces. An alternative perspective on how emotions are situated in the world is proposed

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

as a way to keep in view the deep political importance of how societies relate to emotions, how they are governed, augmented, and controlled, and what problems they are supposed to solve.

The central arguments made in the book are three-fold. Firstly, to understand the political stakes of governing global emotions, we need to avoid narrow definitions of emotions informed by *feelism*. Approaches which dominate technological developments and public policy tools tend to rely on evolutionary and universalising definitions of emotions, sometimes pursuing a quest for global standardisation. I call this feelism for short. By contrast, I focus on what emotions do, and what is done to emotions in the drive to measure them. I show how emotions are cultural, political, situated in social contexts and physical environments, and explicitly and implicitly shaped by governmental, corporate, and other actors who seek to shape human conduct. The public cultures of emotions are shown to be highly specific in time and space.

To flesh this out further, I establish how emotions can be defined through relationships and practices which are orchestrated and mediated—while they may have biological correlates, and be felt psychologically and physically by individuals, they are deeply social and culturally specific, rather than universal, phenomena. But I also want to go beyond the basic claim that emotions are relational, to examine the ways in which emotions are governed. Emotions are also practiced spatially—specific spaces are significant for how emotions are practiced. Spatial processes and spatial politics actively shape how we relate to emotions. These dimensions of spatial practice have been neglected. The practical ways in which emotions are governed—the mechanisms, media, techniques, technologies, and environments through which this happens—are worthy of close scrutiny. The central thesis of digital emotional governance demonstrates that emotions are not simply problems to be solved and overcome by technological advancement. I consider the basis for acknowledging and living with emotions which are in a state of disequilibrium, contestation, and division.

Drawing on secondary material across a range of academic disciplines which inform current forms of policy and governance innovation, the book's second argument is that academic knowledge produces *machinic emotions* which shape the possibilities of digital emotional governance. I explore what research on emotional governance can tell us about affective politics today. This conceptualisation of digital emotional governance advances us beyond more established fields such as the history or science of emotions to examine the practical groundwork necessary to shape specific emotional regimes, scripts, and cultures in time and space.

By setting out how digital emotional governance is practiced across different scales of enquiry, and by framing emotions themselves as relational practices situated in both formal policies and ordinary politics, I hope that the

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

book will offer a closer engagement with developments in psychology and psychiatry to build the basis for more genuinely interdisciplinary thinking in relation to understanding emotions in the world.

The third argument of the book is therefore that digital emotional governance has spatial qualities which generate new lines of political enquiry in the context of *neurocapitalism*. This becomes evident through examining the processes by which emotions come to be spatialised, economised, or technologised. Digital neurotechnologies within this context extend from those for the measurement of human experience to those providing source material for the organisation of economies.

I explore the ways in which knowledge about emotions is conceptualised, is given form, and becomes manifest in applied spatial practices of subject-formation. I problematise the spatial metaphors of globality employed in emotion science and provide analytical descriptions of digital media ecologies to demonstrate that spatialisation plays a central role in the framework of digital emotional governance developed here. This matters because the book shows that knowledge about emotions is being shaped by technological affordances and governmental programmes within specific political-economic contexts, and emotional intervention is on the rise.

Critically questioning by what means we might go about evaluating and judging the legitimacy of these forms of intervention is therefore an urgent task. The book investigates what forms of knowledge the intervention is built on, and what happens in the translation of such knowledge into policy and practice. It sets out the wider political, social, and ethical implications of digital emotional governance, and asks who is being helped or hindered? What problems is digital emotional governance trying to solve? Where are struggles, conflicts, and expressions of injustice being articulated within the sites and practices of digital emotional governance?

The book has three parts. Chapters 2, 3, and 4 set out the conceptual framework, introducing critical perspectives on digital emotional governance and providing some more historical detail on what I am terming the 'engineering ethos', which has long influenced psychological research, and is now influencing neurobiological research on emotions.

Chapter 2 proposes that a new definition of 'worldly emotions' is needed, in which emotions are situated, examined in relation to what they do rather than what they are, and investigated as a central feature of public culture and political struggle.

Chapter 3 looks in detail at ongoing efforts within the emotion sciences to find consensus about what emotions actually are. In light of historical analysis of key debates, this chapter unpacks the ways in which knowledge is produced about the globality and measurability of emotions.

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Chapter 4 focuses on digital emotion technologies in both science and commerce, establishing how they should be analysed as forms of media rather than as scientific instruments. Insights on new media ecologies and philosophies of technics are developed to formulate a 'machinic typology' of digital emotion sensing. This is characterised by what specific apps, devices, and interfaces do *to* emotions. I explore digital ecologies as mediums of data, embodiment, and emotions, the role of visualisation in representing emotions, and questions of power and governance, economic value, and data sovereignty.

Readers who love concepts, theories, questioning assumptions, and broad histories of ideas will be well served by these chapters, though I also recount some striking and detailed examples which may give cause to shiver—including a frisson machine, the Global Emotional Pulse, the Human Affectome project, facial emotion coding, tickled rats, and anxious mice. Those who prefer detailed examples may prefer to skip ahead to the second part, to the descriptive cases found in chapters 5, 6, and 7. These apply the conceptual framework developed in the first part to three distinct sites which I have organised around scale.

Chapter 5 examines the relationship between emotion sensing technologies and the body, exploring techniques of social listening and sentiment analysis, global emotion surveys and mood monitoring, biosensors, immersive experiences, and brain-computer interface systems and ingestibles.

Chapter 6 looks at the city, including smart city programmes and urban mental health and wellbeing initiatives which use ambient sensors, network connectivity, and citizen monitoring in striving towards a new emotional science of cities. Perspectives on urban systems, environmental exposure, urban atmospheres, sensory power, urban humanities, and critical neurogeographies are used to rethink the role of cities in mediating urban emotions.

The nation-state is the main site for chapter 7, which considers the future of economic valuation and national economic accounting, and the role of global standards of emotion, specifically happiness measurement. I recount my own experiences, discussing the future of gross domestic product with the government of the United Arab Emirates. The chapter critically examines what kinds of emotional relations matter in what cultural and political contexts and offers some alternative pathways through which to value emotions in ways which attend to inequalities, inequity, and political struggle.

Finally, chapter 8 demonstrates how governing emotions as if they were global, measurable, and digital has consequences. The chapter summarises the societal, political, and ethical implications of knowledge practices, technological innovations, and forms of economic value generation. It offers a practical guide which policy-makers, government scientific advisors, and ethics

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

councils may find useful. In light of the book's central critique of emotional techno-solutionism and the alternative project to resituate 'worldly emotions', we nonetheless need open debate and pragmatic tools to help us think, do, and regulate. Hence the final chapter is focussed on preparing for future technological development and convergence. It considers the pros and cons of responsible regulatory horizons, information and data capture, and issues of inclusion, ownership of the means of analysis, and plural forms of expertise.

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

INDEX

affect theory, 24–25, 27–29, 205nn2–7
affective capture, 14, 26, 193
affective economies, 24, 193
affective practices, 24, 32, 50, 110, 193, 205n6
Ahmed, Sara, 24, 193, 205n7, 220n50

Barnett, Clive, 27–30, 205n20, 206nn21, 22, 23, 25, 27 and 28
Barrett, Lisa Feldman, 47, 50, 58–59, 194, 208n21
biodata, 60, 63, 76–77, 83, 108, 154. *See also* datasets; psychophysiology
bodies, 34, 44, 50, 60–64, 73–74, 80–84; assemblage theories of, 54, 128, 179, 209n13; and corporeality, theories of, 64, 75, 178–179; electrical signals in, 3, 55, 61, 72, 82–84, 105, 172, 188; racialised, 9, 41, 76, 128, 141, 143, 171, 186, 188, 220n50. *See also* biodata; embodied experience; politics: disability; psychophysiology; senses; technologies: body area network; technologies: and internet of bodies
body-digital interface, 2, 170
brain, 3, 8, 43, 50, 55; and brain-computer interfaces, 3, 105–109, 157, 159, 166, 194, 198; and brainwaves, 3, 83, 107, 195; embodied, 178, 206n26, 224n48. *See also* neuroscience

cities: emotional pulse of, 116, 128; organicist visions of, 121; as sites of political struggle, 113; smart, 82, 113–118; and urban emotions, 32, 70, 113; as urban systems, 121–125, 209n12; and urbanicity, 116, 124, 217n10. *See also* neuroscience: neuroarchitecture and neurourbanism; wellbeing: urban
computers: and artificial intelligence, 9, 20, 48, 73, 154, 162, 167, 182; and computer vision, 84, 97, 172, 177; and cyber-physical systems, 68, 72, 79, 97, 122, 174–175, 182, 194; and hardware, 96–98, 105–107, 161, 184; and software, 81, 93, 96, 98, 100, 122, 161; and wetware, 161, 174, 182, 201
computing: affective, 1, 42, 58, 80, 82–85, 97, 108, 156, 163, 171, 175, 177; cloud, 93, 97, 108, 123, 172, 200; embodied, 2, 15
critical neurogeographies, 125, 194; application of, 127; as an interdisciplinarity programme, 125; and urban theory, 125–128
Cromby, John, 25, 31, 52, 205n9, 208nn27 and 34
cybernetics, 12, 66, 68, 194, 223n37; and computational culture, 37, 56, 90, 93, 179, 210n22; ethos of, 38, 54, 56–58, 60, 65–66, 75, 83–84, 111, 174, 180, 196; influence of, on urban theory, 121; psychology and, 83, 111, 212n8

Damasio, Antonio, 8, 24, 25, 200, 203n10, 204n12, 209n45
datasets, 40, 45, 76, 92–93, 172, 215n60, 222n28; annotation of, 21, 40–41, 43, 47, 57–59, 76, 85, 89–90, 92, 161, 168, 194, 208–209n43, 211n47; and datafication, 6, 60, 195; environmental concerns about storage of, 179–180; intimate, 3, 10, 15, 33, 76, 104, 130; and training of models, 96, 103, 169, 172, 209n10. *See also* biodata

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

Davies, William, 74, 137–138, 211n43, 215n76
digital emotional governance, 6, 10–13, 16–17, 21, 30–34, 195; and commercial interests, 9, 11–12, 54–55, 57, 73, 76, 78, 82, 88, 99, 103, 123, 162, 186; democratic alternatives of, 10, 55, 78, 112, 129, 136, 153, 186; and scientific knowledge production, 11, 26, 55, 147, 153, 208n27
digital media ecologies, 51–52, 60–65, 103–104; and biomediation, 194, 210n17; in conjunction with digital affect culture, 195, 209n7; and empathic media, 98, 106, 117–118, 171, 196, 214n52; and new media philosophies, 22, 56, 64, 105; and social media, 4, 5, 34, 54, 69, 76–77, 81, 88–92, 114, 171, 200, 215n63, 223n38; and theories of mediation, 2, 10, 64, 69, 93, 152, 159
Dror, Otniel, 70–71, 210n33, 211n35

economics: ecological, 143–145; and economisation, 119, 130, 149; feminist, 142–144; happiness, 9, 94, 131–132, 135, 137–138, 145–147, 205n9, 211n43; heterodox, 130, 139; postcolonial, 145–148, 220n48; reparative, 145–148; wellbeing, 9, 140–142, 219nn31 and 32. *See also* affective economies; neurocapitalism
Ekman, Paul, 24, 36, 40–42, 46–47, 56–57, 84, 92, 96, 98, 103, 169, 177, 187, 193, 207n9, 208n23, 208–209n43, 209n44
embodied experience, 3, 22–23, 31, 185
emotion science: and basic emotion theory (universal emotions), 9, 11, 35–36, 40, 43, 50, 56, 89, 169, 193; and behaviourism, 36, 83, 99, 111, 138; biological theories of, 8, 37, 42–44, 48, 50, 53, 61, 83, 124; and critical psychology, 25–26, 31–33; and human affectome, 36–38, 186, 193; and psychiatry, 108, 121, 124, 186; and scientism, 10, 121, 123. *See also* digital emotional governance: and scientific knowledge production; neuroscience: affective
emotion sensing, 82; and biofeedback, 78, 107, 109, 112, 157, 172, 179, 194; and biometric sensors, 64, 101, 156, 194; and ecological momentary assessment, 32, 44, 87, 99–101, 195, 197, 208n32; and electrodermal activity, 83, 122, 207n11; and eye tracking, 64, 84, 96, 98, 102–103, 106, 114, 121, 157, 195, 196; and facial expression, 40–43, 48–49, 56–59, 73, 81–84, 96–98, 103, 155, 165, 172, 177, 187–189; and gait analysis, 82, 96, 197, 213n15; and mood monitoring, 44, 100–101, 198; and psychometrics, 44–45, 51–53, 94, 153, 197, 199; and sentiment analysis, 82, 86, 88–94, 162, 168, 171, 200, 201, 224n53; and social listening, 76, 86, 88–94, 109–110, 176, 194, 200, 201. *See also* technologies: speech/voice recognition; neurotechnologies
emotional cultures, 5–7, 30, 34, 116, 203n4; role in public culture of, 26, 30. *See also* feelings: feelism
emotional governance: and agency, 10, 30, 55, 69–70, 125, 205n20, 215n74; and emotional self-regulation, 100–101, 108–109, 194, 199; and intentionality, 28, 57; and measurement, 21, 32, 49, 51–53, 59, 153; techniques of, 8, 11, 14, 24, 27, 60. *See also* power
emotions: anger as, 5, 22, 29, 32, 41–42, 58, 83–84, 102, 123, 147, 188, 193, 213n14; behavioural data and, 43, 45, 47, 49, 54, 55, 63, 77, 85, 96, 138, 195; conceptualisation of, 196; fear as, 4, 22, 41, 43, 58, 83, 102, 105, 147, 157, 193, 213n14; happiness as, 4–5, 8–9, 41–42, 45, 48, 74, 83–84, 95, 99, 114, 130; history of, 6, 33, 38, 41, 46–47, 70–71, 207n11; and human subjectivity, 7, 45, 69–70, 85, 118, 158, 210n17; linguistic expression of, 24, 25, 52, 208n34; and mental health, 5, 38, 48, 77, 100, 114, 128, 176, 195, 198, 217nn11 and 20; in relation to cognition, 29, 40, 43, 61, 99, 178, 205n5, 206n23, 224nn48 and 49; as relational

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

processes, 16, 23–25, 141–146, 205n6, 209n8; and therapy, 7, 40, 76, 87, 166, 194, 100, 102, 113, 119, 125. *See also* affective capture; affective economies; affective practices; emotional cultures; feelings; machinic emotions
ethics: and responsible research and innovation, 121, 159–165, 178, 181–183, 212n53; anticipatory, 151, 158; diversity and, 32, 161, 168, 176, 204n16; inclusion and, 146, 175–179, 185, 214n39, 224n50; neuro-, 158, 162, 174, 182; public discourse, 160, 163, 166, 200, 221n7; values and, 21, 32, 72, 86, 116, 125, 130, 139, 144, 146, 154–155, 158, 163

feelings, 1, 4–6, 8, 10, 22–26; and feelism, 1, 3, 12, 16, 45, 75, 80, 152, 197; and philosophies of mind, 25–26, 178–179, 196, 199; in relation to emotions, 23, 25; structures of, 6, 118, 127. *See also* emotions; politics: of feelings
Fitzgerald, Des, 126–127, 208n27, 217nn17 and 19

gender, 32, 54, 69, 141, 171, 177, 211nn35 and 47, 220n46
global emotions, 2, 10, 20, 24, 157; and animal models, 35, 38–39, 42–43, 59; and evolutionary theories, 16, 25–27, 37–38, 42, 44, 49–50, 54; and global brain world view, 174–175, 182, 197; and international standardisation, 16, 111, 132, 138–139, 153; and self-report psychometric surveys, 44–46, 94–96, 110. *See also* emotion science
government, 1, 8; authoritarian, 4, 131, 165, 175, 176, 181; and city authorities, 114; national, 75, 130, 132–137, 149, 169; of populations, 12, 79, 91; of self, 6, 40, 74, 76, 149, 176, 211n35. *See also* emotional governance: techniques of; policy

Halpern, Orit, 105, 111, 212n8, 216n77

Ienca, Marcello, 174–175, 183, 199, 212n53, 223n39
Iliadis, Andrew, 60, 64–68, 79, 88, 99, 101, 108–109, 198, 210nn20 and n23
Illouz, Eva, 7, 74, 75, 185, 196

Langer, Susanne, 25, 205n9
Layard, Richard, 137–138, 203n7, 219n32
LeDoux, Joseph, 8, 25, 43–44, 197, 209n45
Lepenies, Philipp, 126–137, 219nn20, 22, and 23
Leys, Ruth, 9, 30, 38, 39, 56–57, 205n13, 206nn25 and 26, 207n6, 209n44, 212n8
Littlefield, Melissa, 9, 126
Lupton, Deborah, 63, 69, 158, 209n13, 224n58

machine learning: deep neural networks as, 58, 84, 96, 126, 208–209n43; human labour and, 41, 76, 92, 111; and justice, 76; and machine perception, 169, 208–209n43; and philosophies of technics, 64–65, 68–69, 82, 85–88, 97, 101, 104, 200, 215n75. *See also* datasets: annotation; emotion sensing: sentiment analysis
machinic emotions, 2, 12, 16, 35, 38, 53–58, 198; and the cybernetic ethos, 12, 102, 111; and doing things with emotions, 18, 54, 80, 86–87, 92; and human-machine relations, 65, 105, 188; mechanology, 60, 64–65, 88, 94, 109, 198
markets, 9, 81, 90, 156, 162, 184; behavioural futures, 222n24; consumer, 2–3, 72, 76, 89, 96, 102, 176, 187; and neuromarketing, 3, 114; and services for commercial businesses, 82, 93, 97–98, 198, 200
Massey, Doreen, 119, 125–126
Mattern, Shannon, 62–63, 81, 209nn9–12
McStay, Andrew, 7, 9, 115, 163, 167, 171–172, 179–180, 183, 185, 197, 205n8, 211n42, 212n8, 222nn23 and 26, 224n55
measurement: instrumentation for, 6, 51–54, 56–57, 59–60, 71, 77, 82, problems with, 51, 53, 59, 108; and quantification, 53–55, 94, 210n34; of research subjects, 20, 32, 63,

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

measurement (*continued*)
94, 99, 206n31, 207n11; *See also* datasets: datafication; bodies: electrical signals in; emotion sensing
Michell, Joel, 53
Munn, Luke, 9, 38, 40, 54, 83, 205n14, 211n42

neurocapitalism, 2, 54–55, 74, 79, 152, 184–185, 199; alignment of, with digital technology futures, 35, 72; and value extraction, 55, 60, 69, 75–76, 184
neuroscience: affective, 38–39, 42–45, 49, 61–62; and knowledge production, 11, 211n43; and neural basis of emotions, 42–43, 49, 59, 61, 170; and neural or deep brain stimulation, 61, 166, 186, 188, 195, 196, 198, 201, 207n15, 221n8; and neuroarchitecture and neurourbanism, 121–123, 199, 200; political, 27, 50. *See also* brain; neurotechnologies
neurotechnologies: and affective computing, 42; and artificial intelligence, 170–171; for biofeedback, 60–62, 157, 196, 199; and cities, 125–126, 217n17; and everyday life, 107, 170; and power, 174–175, 185, 188. *See also* brain: and brainwaves; ethics: neuro-

Paterson, Mark, 56, 64, 188, 204n19, 210nn15, 16 and 17, 212n4
Pedersen, Isabel, 77, 112, 211n51
Pedwell, Carolyn, 23, 205n14, 209n8
policy: behavioural public, 8, 14, 136, 203n8; economic, 9, 137–141; emotionalisation of public, 6–10, 54, 203n5; and regulation of emerging technologies, 9, 40, 154–159, 162, 164, 171, 177, 180–185, 221n14; and science-policy interface, 7, 10, 138
politics: of attention, 55, 74–75, 90, 117, 193; disability, 154, 176–179; emotional, 8, 26–27, 91, 153; of feelings, 1, 60, 217n10; and inequalities, 70, 78, 79, 116, 127, 131, 141, 146, 151, 155, 175–176; and injustice, 27–30, 55, 68, 76, 99, 112, 124, 128, 132, 136, 148, 186, 206n28; ordinary, 16, 23, 26, 28–30, 75; racial, 24, 41, 76, 147–149, 164, 188, 220n50
power, 74–75, 77–79; affective forms of, 26; data, 78, 93, 195; instrumentarian, 78; predictive, 9, 45, 78, 122, 135, 176, 200, 207n16, 222n24; resistance to, 170, 178, 181, 183, 220n46; sensory, 18, 74, 78–79, 119, 200; state, 4, 134, 151, 155, 172, 174
psychophysiology, 64, 80, 130, 193, 210n34, 222n18; of the face, 1, 40–42, 47–49, 59; heart rate, 83, 102, 107, 121; skin conductance, 8, 61, 83, 107, 195, 199, 210n33, 212n7; sweat, 74, 83, 156, 195
public dialogue, 151, 160, 181, 189.
public life, 7, 20, 34, 152.

Rose, Gillian, 69, 117–118, 210n26–28, 217n9

senses: interoception and, 61, 72, 109, 198; of smell, 121, 187
sensorium: 30, 64, 200, 210nn15 and 17
spatial theory, 31, 119; and affective atmospheres, 117–118; 125, 128–129, 193, 217n10; and place, 10, 23–24, 32, 63, 71, 117, 126, 129, 146, 217–218n21; relational, 125, 127; and scale, 11, 20, 22, 110, 119, 127; and metaphors, 17, 29, 127; and science of emotions, 113, 116, 119, 200; and spatialisation, 17, 20, 22, 24, 119–120, 169, 200, 206n23
Stark, Luke, 9, 56, 58, 163, 169, 183, 196

technologies: and body area networks, 72–74, 77–78, 182, 194, 198, 211n36; chatbot, 90, 106, 196; embodied, 211n51; emerging, 71, 78, 157, 159, 175–178, 185, 224n56; emotion prosthesis, 61–62, 87, 105, 176, 196, 211n36; immersive, 101–104, 110, 117, 121, 194, 201; implantable, 61, 72–73, 105–106, 188, 194, 195, 198, 199, 211n36, 216n79; ingestible,

For general queries, contact info@press.princeton.edu

© Copyright, Princeton University Press. No part of this book may be distributed, posted, or reproduced in any form by digital or mechanical means without prior written permission of the publisher.

72, 108–109, 157, 174, 198, 211n36; as instruments, 6, 33, 35, 51–53, 56–57, 59, 71, 80, 108, 130, 210n33; and internet of bodies, 72–74, 77–78, 182, 194, 198, 211n36; as media, 56, 62, 105, 109, 117; robotic, 67, 82, 86, 105, 186, 224n61; speech/voice recognition, 86, 98, 100, 171, 176–177, 215n60; virtual reality, 101–104, 110, 117, 121, 194, 201; wearable, 9, 72, 74, 82, 96–97, 108, 123, 169, 223n46. *See also* emotion sensing; neurotechnologies
techno-solutionism, 19, 153, 185, 200
theories of technics, 60, 64–65, 68–69, 82, 85, 88, 101, 104, 110, 198, 200

Uher, Jana, 32, 52–53

visualisation, 21, 62, 70–72, 117, 186; of biodata, 70, 77, 101, 111, 128, 210n32; and computer vision, 84, 97, 105, 172, 177; and digital twins, 169, 173–174, 187, 195; histories of, 105, 111, 210n34, 216n77

wellbeing: economic, 9, 133–139, 140–142; public, 141, 146, 200; technological promises of, 3, 20, 44, 95, 98–102, 107, 109, 172, 177, 215n63; urban, 33, 99, 114, 121–125, 127
Williams, Raymond, 6, 118, 217n10
worldly emotions, 2, 21–26, 38, 129, 152, 196, 201; and cultural psychology, 32, 48; situated nature of, 71, 152–153, 206n26; and world-making, 55, 155, 170

For general queries, contact info@press.princeton.edu