Emotion in the Digital Age: Technologies, Data and Psychosocial Life

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Emotion in the Digital Age

Emotion in the Digital Age examines how emotion is understood, researched and experienced in relation to practices of digitisation and datafication said to constitute a *digital age*. The overarching concern of the book is with how emotion operates in, through, and with digital technologies. The digital landscape is vast, and as such, the authors focus on four key areas of digital practice: artificial intelligence, social media, mental health, and surveillance. Interrogating each area shows how emotion is commodified, symbolised, shared, and experienced, and as such, operates in multiple dimensions. This includes tracing the emotional impact of early mass media (e.g. cinema) through to efforts to programme AI agents with skills in emotional communication (e.g. mental health chatbots). This timely study offers theoretical, empirical and practical insight regarding the ways that digitisation is changing knowledge and experience of emotion and affective life. Crucially, this involves both the multiple versions of digital technologies designed to engage with emotion (e.g. *emotional-AI*) through to the broader emotional impact of living in digitally saturated environments. The authors argue that this constitutes a psycho-social way of being in which digital technologies and emotion operate as key dimensions of the ways we simultaneously relate to ourselves as individual subjects and to others as part of collectives. As such, *Emotion in the Digital Age* will prove important reading for students and researchers in emotion studies, psychology, science and technology studies, sociology, and related fields.

Darren Ellis is Senior Lecturer in the Department of Social Sciences at the University of East London, UK, and co-author of *Social Psychology of Emotion*.

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Emotion in the Digital Age

Technologies, Data and Psychosocial Life

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Contents

Acknowledgements

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1 Emotion in the digital age

Why emotion, why digital?

Digitised emotion almost seems contradictory. Can emotion be simulated through digits? The cold binary codes of zeros and ones may appear in tune to the logic of cognition in the mind, but can they emulate the emotional affairs of the heart? Claims that emotional activity can be captured, identified, recognised, and potentially simulated digitally have become increasingly prevalent (Fry, 2019; McStay, 2016; 2018). Additionally, not only are we imbuing digital technologies with emotion, but technologies are emotionally engaging us, as digitality has exponentially increased. Throughout this book, we plot some of the ways these relationships are forming. To these ends, the book draws together relevant philosophies, theories, and models of emotion to detail some of the ways that processes categorised as emotion are being mobilised by digital technologies. We start with processual, relational, and psychosocial approaches to think about the emergence of emotion and affective life through relations between bodies, collectives and technologies. Our approach is necessarily selective given the reach of digitality into all areas of life. We focus of four areas of significance to the study of emotion in a digital age: Emotion-related artificial intelligence, social media, digital mental health, and surveillance.

Discussion of the impacts of digital technologies often focuses on their technical capabilities rather than the underlying social and psychological processes. Moreover, it is often what this means for future life that is discussed; a portrayal of a future digital life acts as the meaning framework for considering digital technologies in the present. Digital technologies are often judged in terms of their potential, from providing more tailored shopping experience through behavioural economics to more automated work environments. However, analysing life in a digital age through the concept of emotion allows for more breadth and depth of digital activity to be explored, which allows for a sense of psychological life to feature. This is important because 1) The *human* is often used as a category to critique digitality – with the latter deemed to be some kind of threat to and/or enhancement of the former; 2) where digital activity is related to human activity, it often includes a definition of a pre-existing individual in mind. Focusing on emotion allows us to draw upon a range of theory, from the social sciences,

philosophy, and broader scientific theory and practice, to interrogate the emergence of digital life. Avoiding a reductionist approach that locates emotional activity solely at the level of the physiological is important to draw out the limits and borders of digital life. Our approach is to address emotion as encompassing and transcending psychological, social, and physiological categories. Moreover, it is not something to be set against other categories of psychological life, which has often been the case historically – such as the distinction between emotion and rationality, or, more recently, emotion and cognition (England, 2019). Such categories are not bounded distinct entities, but rather, can be thought of as co-constituting elements of psychological life. Emotions are rarely felt in isolation from beliefs, memories, perceptions, attitudes, etc. Indeed, our whole psychological life is infused with emotion, which is inherently related to social and historical context, both individually and collectively.

The scope of this book is broad, and we will not succeed in covering all areas pertaining to emotion in a digital age. The saturation of our social worlds with digital technologies means that there are very few areas of everyday life that are not, or cannot, be mediated by technology. There are the emotional relationships we develop with personal technologies, such as mobile phones, computers, and fitness trackers. There are the emotional relations made possible by the internet, which include new forms of communication (e.g., online forums), as well as new practices that can elicit emotional responses (e.g., becoming frustrated with online tailored advertising). There is the breed of new technologies that claim to be able to identify, label, and potentially manipulate emotion. Technological advances have made it possible to process facial expressions and capture physiological responses, leading to claims that such activity brings emotion into the reach of the digital. Finally, although not exhaustively, there is the development of robots and virtual agents that are designed to interact emotionally. Each one of these areas is worthy of a book in itself. Our analysis is selective, focusing on areas we argue are key issues for life in a digital age, namely emotion-related artificial intelligence, social media, digital mental health, and surveillance. We will see that these areas intersect, and as such, are not discrete domains, but rather, operate as prominent arenas in which emotion is at stake in relation to digitisation and datafication.

A word on terminology

The terms emotion and affect are often presented together and used inter-changeably. Sometimes, this is acknowledged, with a reason provided (or not!). Part of the issue is how to articulate their use without providing a clear definition of each. In this book, we aim to use the terms as they are deployed by those we discuss. Where this is not possible, we will state so. In the sections in which we discuss the emotional and/or affective implications of a digital technology (e.g., when it is not explicitly designed to relate to emotion/affect, but we claim it does), we will provide a definition. We fully acknowledge existing theory that frames affect in terms of processes that impact upon individual and social life in ways that are presented as non-cognitive and/or non-conscious, for instance, in psychoanalysis, critical

media studies, and philosophy. Many of these feature in the field of affect studies that has emerged strongly in the last 15–20 years (Ahmed, 2004; Ash, 2015; Clough, 2007; Gregg & Seigworth, 2009; Leys, 2017; Thrift, 2008). There is also prominent use of affect in relation to affective neuroscience, which emphasises neurological activity, for example, in relation to mood disorders (e.g., depression and anxiety) as well as a broader set of psychological activity (Davidson et al., 2002; Panksepp, 2010; Stein, 2003). The prominence of neurological activity in such accounts means that questions of cognition and/or consciousness do not commonly feature.

Whilst affect has featured in approaches that emphasise non-cognitive and non-conscious approaches (Wetherell, 2012), emotion has often been used in accounts that emphasise the importance of culture and language in the development of meaningful experiences that can be categorised in emotional terms (e.g., fear, love, and anger) (Harré, 1986). Emotional categories have been thought of as being culturally-specific references used when discussing and representing our feelings, for instance, the use of emojis as visual representations of feeling. The term *emotion* has more cultural currency than *affect,* as well as being core to mainstream psychological models. Such models have garnered increased prominence through their central role in the development of computerised attempts to capture and categorise physiological expressions as different kinds of emotion, for instance, the widespread use of universalist models of a basic set of emotions in artificial intelligence- (AI) based technologies (e.g., facial expression recognition).

This book considers emotion and affect as core concepts to understand life in a digital age. They form part of the overall psycho-social operation of experience, not just discrete psychological forms operating psycho-biologically "within" people. Throughout the book, we argue that there is more at stake, emotionally, than is often considered. For instance, emotion is not just operating at the level of facial expression but is a more fundamental part of how we orient to ourselves and our environments. Emotion and affect are important parts of the ways we experience the world, both in relation to ourselves as individuals and to others. As our lives increasingly operate in and through digital practices, and processes of datafication therein, the dimensions of emotion and affect through which we engage and feel our ways through the world are mediated by digital and data practices. Emotion and affect are implicated in terms of the relations we have with digital and data practices, as well as being a core design aim of the technology (e.g., affective computing). This requires an expanded analytic unit, which goes beyond focusing on the impact of the functional aim of emotion-related technologies.

We recognise the lack of a universally agreed definition for either emotion or affect. We also note important attempts to frame processes associated with emotion and affect through other concepts, such as *feeling*, e.g. Cromby (2015). However, we are reluctant to rely on an alternative concept to describe the psychological and social processes associated with existing concepts of emotion and affect. Creating an additional concept is likely to create as many problems as solutions and can end up subject to the same accusations of essentialising as theories

of emotion and affect. As such, we follow the tradition of using both terms. In places, we will use *affective life* as a generic term (e.g., when not discussing specific emotional and/or affective activity) (Greco & Stenner, 2008; Despret, 2004). We will not follow other non-essentialist attempts in terms of only using affect (as a way of avoiding the reductionist baggage of mainstream psychological theory), as much of what we discuss concerns major psychological models. We also do not want to exclude the value of emphasising the role of cultural practices in the formation and maintenance of emotion categories (i.e., the impact of language and meaning in definitions of emotion). The scope is broad, but one which we hope draws sufficient and valuable attention to developing theoretical and empirical understandings of emotion and affective processes in a digital age.

Computation and emotion

The advent of computation catalysed much thinking about the potential for technologies to intersect with psychological processes. In the first fifty years of computation, this mostly focused on intelligence and then more discrete categories of cognition (Wilson, 2010). This is primarily due to the dominance of the information processing model of psychology that emerged in line with increased computation in the mid-20th century. Mainstream psychology claimed that minds work like computers, processing sensory information to form thoughts, perceptions, and memories (Varela, Thompson, & Rosch, 1991). Cognitive psychology has modelled emotion, but not to the same extent as the so-called "mental processes" of intelligence, perception, attention, and language processing. These were deemed more readily explainable in computational terms and fit into the historical prioritisation of rationalist thought over emotional feeling (Ellis & Tucker, 2015). This is not to suggest that emotion has never featured in computer science, as early attempts used a therapeutic context as the basis for exploring the potential for technologies to mimic human communication. For instance, Weizenbaum's Eliza programme used natural language processing to recreate a patient-doctor consultation (Weizenbaum, 1984). To Weizenbaum's surprise, the computer science field came to suggest that Eliza could create emotional responses of support for users. Whether this was by design or not, the programme has been influential in the growing field of digital mental health (which we will discuss in more detail in Chapter Five). The emergence of a designated field of "Affective Computing" has become one of the most prominent areas focused on emotion and technology (Calvo et al., 2015; Picard, 2000). Heavily influenced by psychological theory regarding universal emotional expression, multiple emotion recognition experiments have emerged since the mid-1980s and continue apace. Affective computing is concerned with emotion as expressed at an individual physiological level and the potential for digital technologies to identify and categorise such activity. Such work is deemed to have significant potential to inform industry practices, such as in commerce, as well as governments, in terms of national security (Bullington, 2005). Large scale generation of data from individuals has led to concerns regarding control and use of data. In recent years, data generation about

emotional and affective life has increased significantly, in a variety of sectors, from advertising to health sectors (McStay, 2018). Emotion-related technologies have been studied mainly in the physical sciences (e.g., computer sciences), which have focused on the technical advances being made. A social scientific analysis is important for two reasons; 1) to evaluate how emotion theories are used in, and by, the physical sciences in relation to new technological attempts to define and manipulate emotion; and 2) to highlight some of the broader social and psychological implications of living in societies in which digital technologies are increasingly powerful social agents.

Life at the intersection of emotion, affect, and digitisation

Why call the present *a digital age*? Firstly, it is important to note that throughout the book we often use the term *a digital* age, despite the book's title being *Emotion in the Digital* Age. These are similar terms, but we are keen to avoid essentialising the current time as *the* defining digital epoch, as there may well be others in the future that take new directions and consequently present new challenges. As such, we often use *a digital age,* in addition to the title's *the digital age* (which was the publisher's preference). In terms of the aims of the book, we use the term *digital age* in the sense of most contemporary uses, namely to acknowledge the ubiquity of computing technologies in almost all aspects of human life. We are not, though, focusing on *digital forms* of emotion, which would be to enter long-standing philosophical debates about whether machines can be programmed to feel (although this question does arise in places in the book). Emotion has been thought of as constituting analogic processing, whereas digitality implies a more binary system of *positive* or *negative*, *on* or *off*, *one* or *two*. The analogue includes *and* rather than just *or*, *yellow-blue-red-green* rather than just *black* and *white*, and every other *colour* and *shade* possible. The underpinning binary logic of digitality relates to the operation of neurons, in that they are either on or off and they either fire a charge or do not. The nervous system has been argued as being more stochastic (probabilistic) and analogue than many computer simulations would have us believe. For example, Wilson (2010) documents how McCulloch and Pitts (1943) understood a neuron's threshold for activation as alterable. The threshold which dictates firing is more analogue than digital, as it "varies across a spectrum of possible values and will be altered by chemical variables (ionic concentrations) and electrical variables (after potentials) that are also continuous rather than discrete" (Wilson, 2010, p. 125). While emotional and affective processes can be framed as analogic, they are often thought of as existing on dimensions representing, for example, arousal (amount of) and valence (type of). It is this contradiction between the digital life of computers and the analogical life of emotion and affect which has captivated imaginations of science fiction writers for millennia.

We have previously articulated a narrative of the important factors pertaining to social psychology and emotion (Ellis & Tucker, 2015). This ended with a brief discussion of "digital emotion", by which we considered how studies of

emotion and affect may have to change in relation to the proliferation of digital technologies in societies (rather than framing a *digital version* of emotion). The current book picks up where *Social Psychology of Emotion* left off. Our approach is *broad* in the sense that it generally avoids speaking about specific emotional categories in relation to digital life, for instance, concepts such as love, fear, disinterest, concern, shame. These commonly understood categories are important and valuable (e.g., the work on shame of Eve Sedgwick and Adam Frank (2003), but ours is a broader concern with emotional and affective life in a digital age. This is not to deny existing studies of specific emotion categories, but this does not mean that such processes innately relate to such categories and therefore, can only be understood according to the parameters of existing categories. For instance, an experience named as fear can co-exist with (or transform into) one relating to excitement. We do not ascribe to a view that an emotion (e.g., fear) exists in the form of a potentialised pattern of physiological and psychological activity that is *triggered* by life events. Significant critiques exist of the universality of emotional categories (some of which we will discuss in Chapter Two).

The rapidly increasing technological interest in emotion is operating as a (re) newed scientific claim as to emotional and affective life. This is not solely about researching emotion, but about the ways that new technologies are claiming to intervene with and inform emotion. A *technological expertise* is being claimed, based on the idea that technologies are now able to unpick some of the secrets of emotional understanding in ways not possible before and in ways out of the reach of human perception (e.g., interpreting micro-facial expressions). The role of industry and commerce is significant in these moves, and the imperative for university-based research to produce "impact" beyond the academy often means pushing at an open door when developing industry-academic partnerships for technological research with emotion. Given that many of the technologies we discuss are new, there is limited research to date as to their emotional and affective impact. Therefore, in certain chapters, our coverage will be on the claims of new emotion-related technologies, what model of emotion they propagate (which we will think of in terms of *version*), and their potential impact. In other areas, we draw on original research to highlight emotion-related technologies in action and/or to analyse people's *experiences* with digitality. The scope of the book includes emotion-related digital technologies AND emotional and affective impact of mass digitisation of everyday life. The latter includes digital technologies more broadly (e.g., social media) and not only those designed specifically with emotion in mind (e.g., so-called *emotional AI*). The limited focus on *specific* emotion categories may come as a disappointment to readers interested in particular parts of digital life and emotion, e.g. the politics of hate often argued to be facilitated by public social media such as Twitter (Ott, 2017). Our approach will demonstrate how key areas of digital life are impacting upon, and intersecting with, emotional and affective life beyond the boundaries of individual categories. This is not to suggest that attention to specific categories is unimportant, but that the remit of this book requires a broader approach.

Overview of emotion in a digital age

Chapter Two introduces the philosophical orientations pertaining to emotion and affective life that shape our thinking throughout the book. Although the relationships between human bodies and technology have exponentially increased, researching the psychological impacts of mass technologization of society are not new. We trace some key events in the history of emotion and technology to demonstrate that concerns about technology have been both a research tool in relation to emotion as well as the focus of psychological research since the earliest days of the discipline. Theories of emotion have attempted to address both aspects, with a dominance of individualistic, largely psychophysiological, models featuring in psychological research, and approaches addressing emotion and affect as more social and distributed processes featuring predominantly in studies of the impact of technologies on affective life. Both have increased in line with the rise in use and presence of digital media in society (Ellis & Tucker, 2015). Chapter Two provides some historical context to emotion-technology research, prior to discussing claims as to the inherent relationality of emotion and technology. We will draw on Vinciane Despret's *version*, a concept used to frame a practice-based analysis of emotion, emphasising context as opposed to universality; theories that have been inspired by Gilles Deleuze and Felix Guattari on *affect;* and Gilbert Simondon's work on *individuation* and *affectivity*. Moreover, Chapter Two details our approach which incorporates processual, relational, and psychosocial theories to think about emotion and affective life through collectivities, bodies, and technologies. The value of concepts emphasising process and relationality is that they shift the analytic starting point away from established taken-for-granted forms (e.g., universal emotional categories) to a concern with *emergence of* individual forms as part of broader sets of relations that are always *in the making*.

Chapter Three explores the development of technologies using forms of artificial intelligence (AI) to try to track, identify, interpret, replicate, and potentially manipulate emotion activity (much of which has been developed in *affective computing*). AI has been associated with emotion across media, the military, the state, private industries, and academia. The affective computing market is predicted to reach $90 billion by 2024 and is now constituted by a range of areas. These include (but are not exhausted by) capturing emotion through facial expression, bodily expression, speech, text, physiological data such as skin conductance and heart rate, and senses such as touch. Chapter Three details the underlying models of emotion that are drawn upon within the affective computing field. It starts by looking at Manfred Clynes's theory of essentic forms, which suggests that emotion-based expressions are traceable through parts of the body, such as the finger, and are universal across cultures. Clynes's theory, alongside Charles Darwin and Paul Ekman, put forward notions of the universality of emotion (basic emotions). These theories have been useful to people who want to develop technologies that can, for example, measure and recognise human emotion, as they offer elegant models of emotion that have been engineered into technologies. We look at some of the ways that they have been modelled through, for example, facial expression

recognition systems (such as within the iBorderCtrl technologies) and Affective Tutoring Systems (such as Affective AutoTutor), wherein students' emotions are recognised and manipulated. Our critical analyses include, for example, Lisa Feldman Barret's extensive constructionist-neuroscientific work. We argue that affective computing technologies are some way off from being able to develop something like an *emotion-chip* which Rana el Kaliouby (CEO of Affectiva) suggests will run in the background of numerous technologies, generating a constant emotional pulse. And yet, we do have systems like the iBorderCtrl scheme presently running, that uses facial micro-expression recognition to pre-screen travellers and detect deception. The algorithms programmed into the detection system can generate lasting and negative impact on people's lives, particularly when, for example, algorithms automate discrimination.

Chapter Four looks at some of the entanglements between bodies, emotion, and social media. Throughout this chapter we raise questions such as: What draws us to spend an increasing amount of our lives using social media? Do they enable new forms of emotional and affective expression? How do social media attempt to mobilise and manipulate emotion? What are the broader affective implications of living in environments saturated with social media? And how is emotion modelled and conceptualised in the social media context to facilitate research and capitalise it? We explore these questions through focusing on key areas pertaining to social media in relation to emotion and affective life: Motivation and theories of desire, personal information, emoticons and emojis, and sentiment analysis, considered alongside notions of digital and affective capitalism. Understanding emotion related to social media is a nascent but blooming field of study. Research seeking to understand emotional engagement with social media has largely been based in theories of motivation that tend to draw on cognitive and behavioural psychological theories. Motives are configured as internal needs that social media have the potential to fulfil, enabling self-actualisation and individuation, for example, through programming sociality. Here, the psychological subject is framed as having a number of internal constructs that are relatively fixed and stable. These models help computer scientists to develop social media platforms that can collect data that represent these internal constructs and to further compartmentalise and categorise in order to fit them into data-sets and algorithms, which can be manipulated and commodified. This chapter also examines a variety of sentiment analysis initiatives that have been developed in attempts to capture affective life online through, for example, collecting personal information, emoticons, and emojis. Again, it is argued that these are modelled on impoverished versions of emotion.

Chapter Five looks at the field of mental health and how it is becoming increasingly digitally mediated. A broad range of digital developments in mental health services has been proposed, from providing advice and guidance to people suffering with various mental health difficulties, through to creating digital versions of established treatments and therapeutic interventions (e.g., Cognitive Behavioural Therapy [CBT]). The App Industry has seen considerable potential in direct marketing digital aids to common mental health difficulties such as stress, depression,

and anxiety. Indeed, Apple's App Store and Google's Play Store each has tens of thousands of mental health-related apps on offer. There is also an appetite for machine learning and big data analytics to gather previously unattainable large-scale data sets, which can be used to design digital tools using artificial intelligence to interact with, and offer support to, individuals experiencing mental ill-health. Mental health care in a digital age is consequently claimed to look very different to previous services, which were location based (e.g., institutions, community) and which utilised specific forms of treatment (e.g., medication, psychological therapies). Digital forms of support are not tied to specific locations, and do not always use specific interventions. They can be temporally and spatially ready to hand, and consequently, not so reliant on real-time access to mental health services. As such, they have considerable potential to intersect with individuals' ongoing emotional experiences, both in relation to their underlying distress, as well as positive feelings that forms of support are designed to deliver to help with the management of mental ill-health. In Chapter Five we look at two apps that have been designed to help people manage mental health issues. The first is a peer support forum, *Elefriends*, designed and run by the UK mental health charity. The second is a totally automated app that does not include any real-time human intervention, called Woebot.

Chapter Six focuses on emotional responses and potential impacts of *digital surveillance,* which refers to the capture, storage and use of data through everyday interactions with technologies. This includes practices not explicitly targeting emotion (e.g., the capture of social media data). Studies of surveillance have tended to focus on the technical and operational capacities of technologies such as CCTV, as well as those whose primary purpose is not explicitly surveillance, for instance, understanding the quantity and quality of data captured by *big tech* companies, along with their use of data. Critical theory has claimed that new digital technologies have facilitated the commodification of information (Thrift, 2008) and that we are increasingly living in *societies of information*. This work has coalesced into the field of surveillance studies, which has broadened its scope beyond the traditional visual forms of CCTV surveillance to the idea that digital technologies have facilitated new forms of surveillance through the capture, storage, and use of information pertaining to individuals' *private* lives. This ranges from government and organisational data capture (e.g., big tech companies) through to social media facilitating new ways for individuals to watch each other. In this chapter, we focus on affective responses and potential impacts of datafication. Previously, we have looked at experiences of surveillance through the spatial lens of the concept of affective atmospheres (Ellis et al., 2013) and surveillance-apatheia (Ellis, 2019). Chapter Six builds on this body of work by looking at what we term the derivatives of the datafication of the body. This chapter was left until last, as it encompasses many of the themes from the previous chapters. Surveillance practices are increasingly ubiquitous and are a central node that both affects, and in turn, is affected by, emotion. The final chapter offers some concluding thoughts and *next steps* discussion of important considerations for future social scientific understanding of emotion and affective life in a digital age.

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