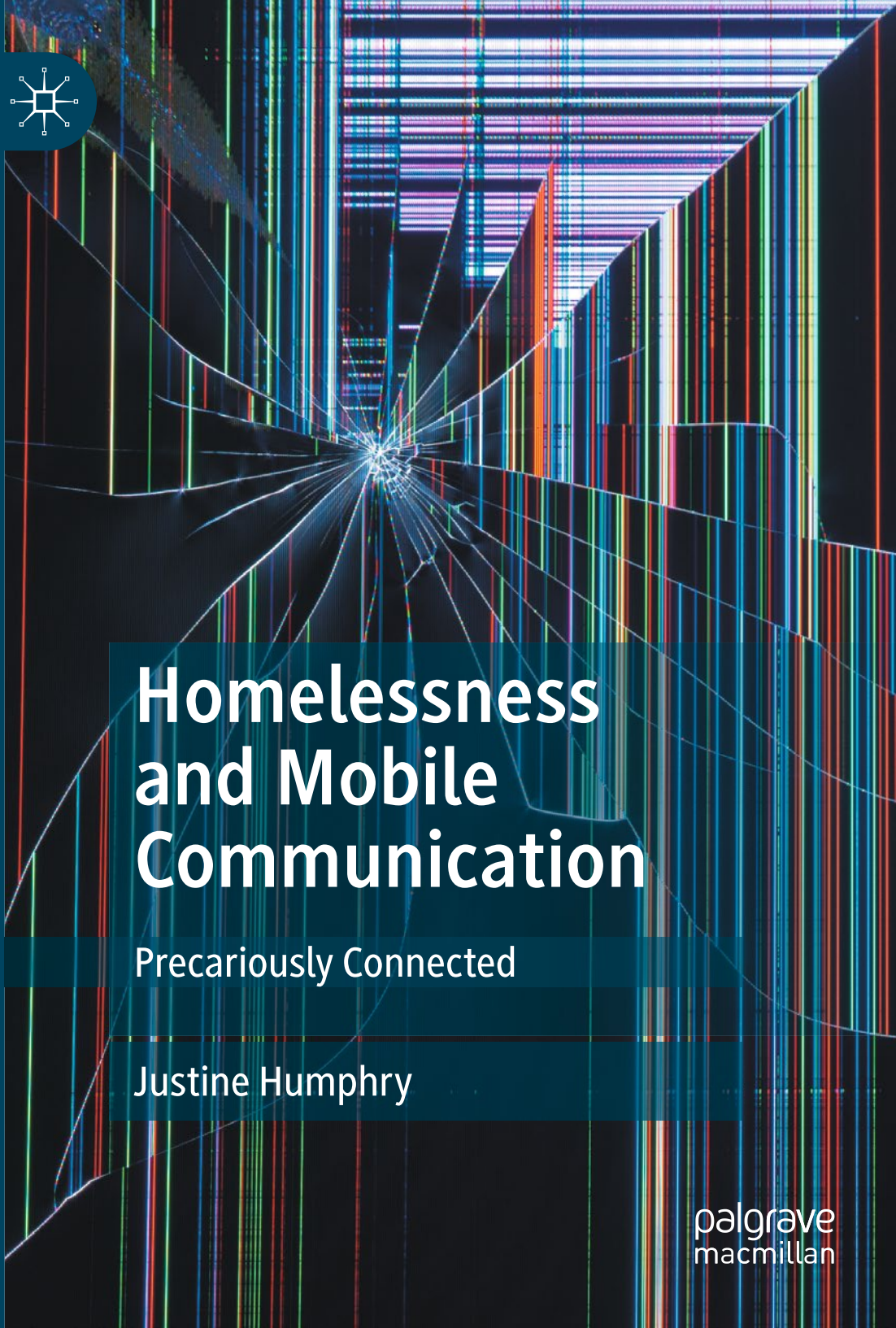

Homelessness and Mobile Communication

Precariously Connected

Justine Humphry

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This book is dedicated to my much-loved father, Christopher Humphry, who always believed in me and my endeavours. He was an essential source of inspiration and support. Our regular calls about movies, books, politics, friends, family, and life are sorely missed.

Foreword

Experiences of homelessness have been on the margins of media and communication, as they have in wider societies. The conditions of housing injustice, transience, the kinds of mobilities and habitation, income and resource inequality, and other factors associated with homelessness have posed many issues for the full participation of these diverse groups in media—with serious implications for their belonging in and membership of their societies.

This has clearly been an issue given the role of media in representing homelessness in culture and framing it as a social problem—something which has figured significantly in research. In recent years with the development of information and communication technologies, access to, use of, and agency in media have moved onto the agenda for researchers and policymakers because of the growing importance of technology to the lives of people who are homeless—and because their societies depend on digital connectivity for managing and addressing all citizens, especially those who bear the burden of social inequalities. This is a major issue, given the number of people living homeless in the world—1.1 billion people on a 2015 United Nations estimate.

Payphones are clearly one technology that is a forerunner in the area of public provision of communication and especially important when homeless. In the environment of fixed-line telecommunications,

payphones offered by phone companies but also via privately operated payphones provided access in public places, shops, cafes, libraries, and elsewhere—without the user needing a subscription. With the rise of the internet, public internet access points and internet cafes have also offered access and service to homeless users. It is with the social and technical developments associated with mobile communication and media that a complex quantum leap in access and connection for the homeless or otherwise marginalised has become evident in the twenty-first century.

As laid out in Justine Humphry's landmark book, mobile communication has become indispensable in the lives of millions of people experiencing homelessness around the world—whose lives are shaped by the realities and exclusionary politics of mobilities and housing in ways that their societies struggle to grasp let alone transform. As Humphry suggests: 'While smartphones are not a substitute for the digital experiences made possible by "home", mobile communication plays a special and vital role for a range of homeless groups, including families, young people, and adults'. She notes that mobile communication can 'lead to a strong sense of agency and of being "at home", alongside extreme feelings of vulnerability and powerlessness, revealing the fragility of the mobile as lifeline when there are no alternative options'.

Mobile communication offers connection in people's everyday lives, in precious and sustaining ways, as the voices recorded in Humphry's study communicate. What the book makes clear is that homelessness needs to be fully unfurled as integration into the research, policy, and practice agenda on digital inequalities and digital inclusion. And indeed the taken for granted essentials in the communication field internationally.

There is a great deal we need to know about homelessness and mobile communication across different groups, places, and regions, and in relation to particular situations and dynamics. We know little about the social, policy, market, and technology responses to homelessness—as it has typically been an area that flies under the radar of the 'high table' of communication policy. It also falls between the stools of different policy areas, such as social, urban—or rural—policy, rather than communications. The idea that homeless cultures of media use might be of significance for research interest in their own right remains novel also, something that has its echoes in wider research on poverty or low-income ICT use.

So we need more acknowledgement and exploration of the 'non-instrumental' practices, meanings, and contexts of mobile communication for homeless users, their lives, and prospects.

If this book puts homelessness fully on the agenda for communication, it also articulates the paradox of digital connectivity. Digital technologies are essential for participation in contemporary societies; yet digital connectivity, as recent debates and research have emphasised, can be a poisoned chalice. Digital technologies are part and parcel of the power relations of social life and are often the new face of how oppressive power relations and social inequalities play out. This is especially something that people who are homeless and others experiencing the brunt of inequality have to negotiate—but to do so from situations of constrained resources, leverage, and options. This is most evident in the place that mobile communication plays in the new kinds of governance associated with digital government systems, especially in the last few years of development of automated decision-making, data, and algorithms. Those who are homeless are very much in the frame for these forms of compulsory digital inclusion; yet their capacity—and indeed citizens more generally—to contest the terms of inclusion is often moot.

Last, but not least, this book does us the precious service of drawing attention to the fundamental rethinking of home that is at stake with homelessness and media. As Humphry notes this is a complex, rich, and important topic. It is often referenced in digital media research, especially in mobile communication research because of the major changes to home with which digital technologies are interlaced. When we put homelessness at the centre of our inquiry, as Humphry does in this marvellous and powerful book, it is a radical shift to how home and communication have hitherto been understood.

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Contents

1

Introduction: Meanings, Mediations, and Mobilities

Jenny was a young mother in her mid-twenties who I met at a homelessness service on Melbourne's suburban fringe. The day of our interview was sweltering, and the exposed asphalt footpaths created heat traps as I walked towards the charity-based community centre at the far end of the shopping strip. Jenny had come in to seek crisis accommodation that night with her three young children, having left her partner because of repeated incidents of violence. She agreed to meet with me to talk about her mobile phone and internet use while she waited for an appointment with a caseworker. As we talked, her children vied for her attention. She passed them her well-used, older-generation smartphone with its cracked screen. They launched an app that beeped and dinged in the background as we spoke. At one point, Jenny's mobile rang, and she took it back to accept the call, the stress of her situation noticeable in her voice. It was a customer service officer from Centrelink, the Australian Government department responsible for social security payments. The call had been set up by one of the charity's employees, and Jenny had been waiting for the opportunity to explain her change of circumstances, an obligation for remaining eligible for income support. After the call, she was visibly more relaxed. Arranging callbacks is a common practice among services, to

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reduce the stress and cost to their clients of spending long periods on hold using up precious phone credit.

Jenny's story of homelessness has characteristics in common with many who become homeless. In Australia, domestic violence is the primary reason for women and children to seek assistance for homelessness (Murray & Theobald, 2014). In Europe and North America, women who are homeless are also more likely to have experienced domestic violence and need alternative accommodation as a result (Baptista, 2010; Heslin et al., 2007; Jasinski et al., 2010). These patterns also indicate the problem of defining home around physical housing alone, since for those subjected to violence in domestic spaces, the home is not a safe space but rather an out-of-control place where one's sense of self is severely impaired by ever-present surveillance and upheaval (Nunan & Johns, 1996). Situations like these can produce feelings of being 'homeless at home' (Wardhaugh, 1999; Watson & Austerberry, 1986) and, for some, a sense that living precariously out of home is preferable (in the short term) to being at home in an abusive relationship (Tomas & Dittmar, 1995).

This book is about how mobile communication and processes of digitisation mediate people's lived experiences of homelessness. Mediation, in media research, refers to a continuous and dialectical process of communication media shaping society and vice versa, an understanding that corresponds to Silverstone's (2002) definition of mediation as: 'a transformative process in which the meaningfulness and value of things are constructed' (p. 761). As life becomes saturated by media, the process of mediation provides a framework for the ordering and representation of experience (Silverstone, 2002); a process differentiated according to people's living conditions and circumstances.

From 2014 to 2016, I carried out two studies on the access to and use of mobile phones and the internet by a range of homeless subgroups (parents with children, adults, and young people) in two Australian cities, Sydney and Melbourne. In 2018, I built on this research with a study in New York City on the use by the city's street homeless of a city-wide free telephone and Wi-Fi service called LinkNYC. In the first study, I

surveyed 95 clients of homelessness services and charities across the two Australian cities and carried out 13 in-depth interviews with these clients and 7 with support workers of community homelessness services and managers of state and federal departments responsible for welfare payments and social housing. In a subsequent research project I worked with a group of eight recently homeless young people in Sydney to co-design digital access solutions, and in the last study, I spent many hours observing the use of the LinkNYC Wi-Fi network and phone kiosk, and asking rough sleepers and other members of the public about their digital technology uses and needs.

My research in both Australia and the United States found that mobile phones and the internet are now part of the everyday lives of people experiencing homelessness. For Jenny, and many other participants who were homeless and in the process of receiving help from a support service, the mobile was a 'lifeline'. A vital tool for reaching out to services, it was also a means of staying safe and contacting friends and family members, a source of entertainment and identity, and a platform for coordinating schooling and finding accommodation and employment. Furthermore, beyond being essential during homelessness, the mobile was important for accessing the resources necessary to move out of homelessness, with parallels found in the experiences of other highly mobile and precarious populations, such as refugees, migrants and transient workers (Alencar et al., 2019; Gillespie et al., 2018; Harney, 2013; Wall et al., 2017; Wallis, 2013).

At the same time, mobile phones, especially smartphones, are a new financial burden, with limits on the kinds of activities that can be performed on them. There are also those who, through lack of interest, confidence, or ability to pay, do not own a mobile or have no regular internet access, relying instead on borrowed mobiles, public payphones, and publicly accessible computers. For the homeless population as a whole, costly, insecure, and lower quality digital access produces an experience of being precariously connected, marked by periods of unstable, contingent or no access, also known as 'dependable instability' (Gonzales, 2014, 2016; Gonzales et al., 2016).

Trends and Definitions of Homelessness

Homelessness is a global phenomenon and is a direct consequence of social inequalities (Busch-Geertsema et al., 2016). The United Nations estimates that the majority of the 1.1 billion people living homeless (those without adequate housing or sleeping rough) are in developing countries (United Nations, 2015), yet there are rising rates of homelessness in developed countries as well. In the United States, over half a million people were recorded as sleeping rough on a single night in January 2018 (Henry et al., 2018). In England, the homeless population grew by 28 per cent from 2010 to 2017. In Australia, homelessness was up by 14 per cent from 2011 to 2016, with 116,000 counted as homeless in the national Census in 2016[1] (ABS, 2016). These are considered minimum estimates since there are many forms of homelessness besides street homelessness, including couch-surfing with friends, living in cars and caravans, staying in night shelters, refuges and overcrowded dwellings, and being 'homeless at home' owing to the threat of violence (Busch-Geertsema et al., 2016; Wardhaugh, 1999; Watson & Austerberry, 1986).

Homelessness has global dimensions but also has local characteristics and causes. This book draws on data gathered largely in Australia, as well as from a study in New York City, but the insights it provides and the conclusions drawn are relevant to a wide range of social groups and contexts. In Australia, while ideals and narratives of home ownership are very much part of the national cultural imagination, the reality of unaffordable housing and increasing inequality means that home security—let alone ownership—is unattainable for many; this is a key contributor to homelessness (Muir et al., 2018). This affordability crisis has seriously worsened in the first decades of the twenty-first century for a number of reasons, including the high cost of housing, a scarcity of new housing stock at the lower end of the market, and an increase in the cost of rentals. Policy decisions around social and affordable housing have exacerbated these market trends, with insufficient investment in social housing to meet demand. In 2018, almost 200,000 people around Australia were on social housing waitlists, with the expectation in some parts of the country of a 10-year wait to reach the top of the queue (Muir et al., 2018).

While lack of affordable housing is one of the direct causes of homelessness in Australia and elsewhere, other housing-related factors also create the conditions for homelessness, including overcrowding, insecure tenancies, discrimination in the housing market, lack of disability-accessible options, and inadequate support for social needs (Muir et al., 2018). At a deeper level, ideals of home ownership stem from a Western property system, which Crabtree (2013) describes as 'underpinned by the idea of land as a resource and the blank canvas for modernisation through particular forms of delineation, occupation, and transformation' (p. 102). For Indigenous Australians, who are half as likely to own their own home and 14 times more likely to become homeless than other Australians, root causes of homelessness cannot be divorced from a history of colonisation and dispossession. Not only does this history create the conditions for contemporary disadvantage, but it also leads to what has been called 'spiritual homelessness', understood as a disconnection from the homeland, family, kinship networks, and cultural familiarity (Spinney et al., 2016).

Mediating Home(lessness)

How we understand homelessness is important, and it is a contention of this book that meanings of homelessness are mediated within the context of changing media practices and patterns of digitisation. Defining homelessness is not just important for determining the subject of research and writing; it has real consequences for those to whom this label is applied. A definition of homelessness based purely on a technical definition of a lack of housing affordability or supply does not get to the heart of the meaning of home (Somerville, 1992), the social stigma attached to the homelessness label (Veness, 1993), or the many other non-housing drivers that produce it (Wood et al., 2015). Somerville (1992) offers a multidimensional definition of homelessness built from seven dimensions of home: *shelter*, *hearth*, *heart*, *privacy*, *roots*, *abode*, and *paradise*. Each one of these signifiers is mapped onto its opposite connotations to define the absence of home or homelessness. So, for example, privacy, the fourth dimension of home, is correlated with its opposing connotations of

powerlessness with regards to the ability to exert territorial control and have a living space free of surveillance, making one vulnerable to others and external forces.

A conceptually rich and relational approach, this definition nevertheless reproduces culturally specific notions of the ideal home as a private and enclosed space, which are troubled, and are contested through feminist and cross-cultural accounts. These perspectives offer conceptions of home as radically distinct from, but not exclusive of, a physical location premised on ownership and the separation of the private realm from the public sphere (Blunt & Dowling, 2006; Chambers, 2016; Lloyd & Vasta, 2017). Research into domestic violence has shown that the home can be a place of physical threat and ever-present surveillance (Nunan & Johns, 1996), with the qualities of safety and security more likely to be attained outside the home, such as during stays with friends and family (Tomas & Dittmar, 1995). Ahmed (1999), who writes about home in the context of narratives of migration and travel, stresses that home is better described as a 'complex and contingent' process that is always emerging out of dynamics of 'movement and dislocation' (p. 340). In her critical review of the literature of home, Mallett (2004) concludes that home will always have contradictory meanings since it functions 'as a repository for complex, inter-related and at times contradictory socio-cultural ideas about people's relationship with one another, especially family, and with places, spaces, and things' (p. 84).

A common definition of home adopted by government departments and social services in Australia serves as the basis for the statistical definition of homelessness. Home is defined as a sense of security, stability, privacy, safety, and the ability to control living space. Homelessness is defined as an absence of these qualities across the physical, legal, and social domains.[2] This definition does not say anything about the causes of homelessness or about its cultural and historical construction, but it does provide a benchmark to assist with counting homelessness, a task considered notoriously difficult and prone to under-enumeration (Chamberlain & MacKenzie, 2014).

Largely absent in the scholarly literature on definitions of homelessness is an understanding of home, and conversely homelessness, as mediated by media technologies. In this formulation, home is not distinct and

separate from technology, but is relationally constructed in and through cultures, contexts, and platforms of media. The idea of home as mediated is not new. There is a long history of scholarship on home-based media and its role in transforming domestic life. In this vast literature, media technologies, from the telephone through to smart voice assistants, are examined for the various ways in which they buttress and support certain ideas of home, values and practices of family life and public/private boundaries, or contest and reconfigure these (for overviews see Chambers, 2016; Morley, 2000, 2017).

Mediation has been a core concept used in studying the consumption of media technologies within households. Silverstone, Haddon, Morley and Hirsch were among the first media scholars to position the house and relations within it as an important sphere in the mediation of the meanings and uses of media technologies, developed using the model of domestication (Haddon & Silverstone, 2000; Silverstone et al., 1992; Silverstone & Haddon, 1996). Since then, there has been an opening up of approaches to studying media domestication in other sites and contexts such as in workplaces, cafes (Henriksen & Tjora, 2018), on social media (Sujon et al., 2018), and when mobile (Hartmann, 2013; Humphy, 2014). New research lines and concepts such as 'polymedia' (Madianou & Miller, 2013), 'dis-domestication' (Hebrok, 2010), 'defamiliarization' (Bell et al., 2005), and 'mediated mobilism' (Hartmann, 2013) point to the multifarious, mobile, and contingent aspects of mediation.

However, the implications for understanding homelessness as mediated have not been featured in this scholarship, despite recognition of the special role of mobile communication technologies in 'uncoupling domesticity from the spatial specificity of the "home"'(Chambers, 2016, p. 18). In this sense, the idea of home, and certain practices associated with it, can travel, taking place away from the physical home. The concept of 'mobile privatisation' posited by Williams (2003 [1974]) captures this shift in modern life, where individuals are supported by technologies such as the car and television to live increasingly private and self-enclosed lives. Another related concept, 'telecocooning' (Habuchi, 2005), describes how the mobile phone is used to maintain intimate relationships with others at a distance, facilitating private virtual encounters in public spaces. Equally, mobile communication presents new ways to bring

aspects of public life into the domestic realm. Hills (2009) refers to this process as 'private mobilisation', inverting Williams's term, to stress the way that new zones of private technology use are created within the home.

These 'mobile domesticities' (Berry et al., 2010; Lloyd & Vasta, 2017; Morley, 2002, 2017) are not merely extensions of practices of the home; they also mediate the experience of what it is like to be dislocated from or without a home. 'Communication technologies can function as disembedding mechanisms', Morley (2000) explains, 'powerfully enabling individuals (and sometimes whole families or communities) to escape, at least imaginatively, from their geographical locations' (pp. 149–150). This can be more than imaginative. A rich field of research on migration, transnational communities and refugees has shown that digitally networked technologies, in particular the mobile phone, are used to bridge, re-create and reconfigure home at various stages of people's migration journeys and settlement experiences (see, for example, Bonini, 2011; Madianou & Miller, 2012; Panagakos & Horst, 2006; Wallis, 2013; Wilding, 2006). Significantly, even though the absence of a secure, private and safe house does not preclude migrants and refugees from engaging with media technology, it does condition and constrain the possibilities for access and use, configuring practices of home-making and daily survival in transit and during resettlement (see Alencar, 2020; Mancini et al., 2019 for scoping reviews). But, while there are crossovers and shared experiences, particularly in the important role of mobile communication, homelessness cannot be just explained in terms of migration. Asylum seekers and migrants represent one of the growing subsets of people who are homeless, and forced migration is recognised as a structural factor that contributes to homelessness (Hermans et al., 2020), yet homelessness also impacts other groups and has a range of structural causes and risk factors (Wood et al., 2015).

This book contributes new understandings of homelessness as a mediated condition and experience. The concept of mediation used in the book recognises the mutual shaping of homelessness and mobile communication, addressing not only how people use mobile media when homeless, but also how the label of homelessness is negotiated, and at times contested, through these practices (Silverstone et al., 1992). As Veness (1993) has argued, definitions of homelessness are contextual and

politically motivated, and people who are subject to this designation interpret and resist its power to define their realities. Similarly, meanings of home are unsettled and transformed in and through the use of mobile communication, bringing about new kinds of mediated domesticities: in the creation of online identities, during encounters with services and institutions, and when making geographical claims on urban space. Building on this argument, this book shows how certain digital technologies and communicative practices symbolically intervene in and stand in for home, reproducing some of the feelings of being at and with home, while also reinforcing and drawing attention to its absence.

Homelessness, Poverty, and Precarity

While many of the conditions and trends behind worsening homelessness in Australia and other developed Western nations can be explained in terms of housing-related factors, one of the most recognised structural causes of homelessness is poverty. Understandings of what constitutes poverty vary considerably, but the vast majority of people who are homeless struggle financially, and are more likely to be in debt, to have little or no secure paid work and to be reliant on welfare benefits (Johnsen & Watts, 2014; Sharam & Hulse, 2014).

Poverty is exacerbated by changes in labour conditions and lack of access to social welfare. McCulloch (2017) identifies rough sleeping in the United Kingdom as a 'violent condition of poverty' (p. 171) amplified by austerity measures introduced by successive governments in the wake of the 2007–2008 financial crisis. During this period of intense welfare reform, punitive welfare sanctions, loss of benefits, changes to eligibility, and service cuts resulted in increased financial hardship, mental stress, and detrimental health outcomes, leaving many without the support they needed to escape homelessness (McCulloch, 2017). Between 2010 and 2015, the estimated number of rough sleepers in England doubled, exposing people to the harmful and often violent effects of street homelessness.

In Australia, the Rudd Labor government of the time framed its response to the global financial crisis in terms of 'stimulus' rather than

'austerity'. The fiscal stimulus included federal investment in a range of education, health, transport, and home-ownership programs as well as cash bonuses in three stimulus packages, in late 2008 and early 2009. This short-lived, short-term stimulus response has been credited with helping Australia to weather the global recession (Barrett, 2011) but it had little impact on the ongoing tightening of welfare and service cuts carried out by successive governments in power throughout the 1990s and 2000s. Since then, welfare benefits have stagnated, with no appreciable growth to match the rising cost of living (and housing). Alongside efforts to 'prune' the welfare state, there has been a concurrent deployment of digital systems to improve government efficiencies (Henman, 2010) and compliance systems to monitor welfare recipients (Wilcock, 2016).

In this book, homelessness is understood as a product of structural inequalities that are inextricably connected to the organisation of labour, welfare, and social relations in advanced capitalist economies, and to related 'changing economies and modes of governance' (Farrugia & Gerrard, 2016, p. 278). This approach builds on an analysis and critique of neoliberalism as a mode of governance that has come to prominence in the shift away from the 'welfare state', one in which the individual management of risk and insecurity has become a central and defining feature (Beck, 1992; Rose, 1996). Bourdieu (1998) referred to *précarité* or 'insecurity' as a generalised condition of society linked to the de-localisation of work in processes of globalisation. Barbier (2002) adopted the term *précarité*, which was initially used to refer to generalised poverty in France, to explain contemporary work conditions under global capitalism. Standing (2011) linked neoliberal agendas to the emergence of a new class order he called 'the precariat'. In his account, seven forms of work insecurity are at the heart of this 'class-in-the-making', including insecurity of the labour market, employment, conditions on-the-job, career pathways, skill development, wage level and worker representation. While the term 'precarious' is still largely confined to literature on changing relations of work and labour, there has been a broadening of its application for analysing precarity as a life condition (Butler, 2004; Gerrard, 2017). Homelessness is itself a state of extreme precarity (Gaillard et al.,

2019) and overlaps with other forms of precarity including lack of income, insecure health, and barriers to education and employment.

This book shows how digital technology is central to precarious living conditions within globalised digital economies. It addresses the way this manifests in people's everyday use of digital media and communication when they are homeless, in the organisation of people's access to technology, in the goods and services they consume (including welfare, health, and housing services), and in their use and navigation of urban space. Everyday life is multidimensional and composed of fields of practices and relations that are codified and regulated in a variety of ways, through habits and routines as well as in formal structures, spaces, and media (Burkitt, 2004; Silverstone, 2002). The relationship between people's lived experience of homelessness and the structural factors that produce it are thus revealed in mediated practices and relations across different domains of everyday life. I locate mediation by media within larger-scale processes of social, cultural, and economic change, opting for the term 'digitisation' over 'mediatization' (Couldry, 2008; Couldry & Hepp, 2013; Hepp, 2013) to foreground the shift in society's material foundations to digital form underlying these large-scale changes.

In this book, 'precarious connectivity' refers to a condition of uneven, insecure, and costly digital access in which mobile phones, and especially smartphones, are used as the main or exclusive communication medium. Precarious connectivity is explained with reference to governance regimes and models of digital citizenship premised on access to digital technology, skills and literacies, and the data generated through users' everyday interactions (Hintz et al., 2018). The concept is developed with attention to traditional models of precarity, and more recent formulations such as Heidkamp and Kergel's (2017) heuristic of 'double precarity', and the concept of 'information precarity' in refugee studies (Wall et al., 2017). It also has parallels with the concept of 'technoprecarity', which can be understood as an inherent condition of accelerated 'death or debility' in digital economies, as particularly experienced in the Global South (Precarity Lab, 2020, p.11). In this book, precarious connectivity is one dimension of *précarité* (Barbier, 2002) that manifests in digital societies shaped by global capitalism and is a key expression of digital inequality.

Mobile Communication, the Digital Divide and Digital Inequalities

The book situates its focus on mobile communication and homelessness within the history of scholarship of the digital divide, suggesting that while access is no longer the only factor in digital exclusion, access inequalities persist along a number of fronts and take on new meanings in different contexts. Homelessness is a growing front of digital inequality that until recently has largely been subsumed within research on other minority groups such as young people, migrants and refugees, Indigenous communities, people living with disabilities, seniors, and people on low incomes.

A key contribution this book makes to this scholarship is an understanding of how the dynamics of digital inclusion and exclusion play out in relation to everyday experiences of homelessness. It shows how mobile communication, in particular, has become a key platform for social and economic inclusion—an essential technology or lifeline for people who are homeless. And it shows how this important role cannot be separated from the market of mobile access or from the processes of digitisation related to regimes of data-driven governance and citizenship that have transformed social contexts, institutions, services, and urban space. The concept of precarious connectivity developed in this book helps to analyse the link between everyday uses of mobile communication and the broader forces that structure people's communication experiences when homeless.

Accounting for the social, political, and material conditions of access is important for going beyond the view that access is just a matter of the digital and physical resources needed, as argued by Warschauer (2004). The approach taken in this book develops an understanding of how social inequalities are materially re-inscribed in the media, the systems, and the spaces that people who are homeless interact with in their everyday lives. Building on a turn to addressing the materiality of digital media (Reichert & Richerterich, 2015), this approach is used to interrogate the underpinning structures, patterns, and dynamics that shape the differential experiences of the digital condition and to extend growing critiques of normative

stances to digital inclusion and participation (Eubanks, 2018; Kvasny, 2006; Qiu, 2009; Tsatsou, 2011; Uy-Tioco, 2019). So, for example, the mass uptake of mobile phones and the dominance of certain social media platforms create new imperatives of connectivity (van Dijck, 2013), while at the same time more traditional concerns over limitations or 'gaps' of access remain as relevant as ever (van Dijk, 2020). Similarly, new modes of governance using automated digital systems require that people are connected in order to access services and comply with eligibility rules, yet inclusion in such systems can intensify financial hardship, imperatives of movement, disciplinary actions, and risks of surveillance (Dencik et al., 2019; Dencik & Sanchez-Monedero, 2022; Eubanks, 2018; Hintz et al., 2018; Hoffmann, 2021).

Beyond the facts of access, which are complicated by many factors, including issues of availability, affordability, accessibility, and ability, the discourse of ubiquitous connectivity has other effects that bear on the dynamics of digital inequality. This is because discourse has performative power (Butler, 1990); it operates as an ideology, setting in train a set of expectations, ideals, and norms that shape and govern our actions, identities, and possibilities for social inclusion, citizenship, and resistance. This is the case for many social groups, even those presumed to be well connected, but is particularly so for vulnerable and marginalised groups. For these groups, access to digital resources, and the space and time to use technology, are not a given, and yet as the groups who often engage most with government services, they are often the first to have to negotiate new digital service regimes (Baldry et al., 2012).

The book highlights the strategies and resourcefulness of people who are homeless in accessing media and making their connections work in the absence of the affordances and infrastructure of home. However, it concludes that while home is not a prerequisite for digital media use, it is essential for digital equality. The physical home functions as media infrastructure and a site of use or non-use: a zone to embrace, fight over, ignore and resist media technology; to make it meaningful within the routines of everyday life (Lally, 2002; Pink et al., 2017). The physical home in this sense provides many of the conditions of possibility for making home in and through media technology. This point was eloquently made by a homelessness policy officer who explained that 'homes are places to mess around in'.[3]

The affordances of the home as a space for the active production of lifestyles and identities in and through media has meant, as Chambers (2016) explains, that 'many homes have evolved into complex communication hubs by facilitating personal and shared engagement in a wide range of media-based activities' (p. 5). Alongside these trends, a growing population of mobile-only users in Australia and other developed Western countries rely exclusively on smartphones for all their communication activities (ACMA, 2019; Thomas et al., 2019). For many, it may be the only communication technology of the home, and for those without homes, their only form of communication. Yet smartphones are not a substitute for the digital experience made possible by 'home', understood as a safe and secure physical house, as well as a place to belong in a wider sense, free of discrimination and stigmatisation, with pathways to build capital and spaces in which to learn, work and play.

Researching Mobile Communication and Homelessness

The book draws on three separate studies of the digital experiences of a range of homeless subgroups carried out between 2014 and 2018 and adopts a mixed methods methodology (Hesse-Biber, 2010; Tashakkori & Creswell, 2007). The book's examination of digital practices and patterns adopts an intersectional approach, seeing homelessness as constituted through intersecting social identities and lived experiences (Zufferey, 2016). For the purposes of research and recruitment, the term 'homelessness' encompassed people who were either living rough, unstably housed, or in a violent domestic environment. Participants in the studies were recruited from multiple subsets (young people, families, and adults) from 14 separate agencies, and the research was carried out at urban metropolitan sites within Australia and the United States. Participants were of different genders, ages, cultural backgrounds, sexuality, and educational and income levels, and included (in addition to the aforementioned groups) Indigenous Australians, refugees, people living with one or more disabilities, and people who have reported a mental illness.

The first of the studies, carried out in 2014, was a survey of 95 homeless young people (15–24), families (defined as single parents with children or couples with children), and adults (over 24) recruited from homelessness services, charities, and food van services in Sydney and Melbourne. The survey participants included 57 young people aged 15–24; 21 families, comprising single parents as well as couples with children; and 17 adults over 24, of whom 13 were over 40. I conducted 13 in-depth interviews with participants of the survey, with the aim of obtaining evidence and insights into patterns of media access and use across a range of homeless subgroups. I also interviewed seven support workers of community homelessness services and managers of service design and delivery in government human service departments to understand how services were being redesigned and delivered using digital and online systems. The government departments were the federal Department of Human Services (now Services Australia) and the NSW Family and Community Services and Housing NSW (now Department of Communities and Justice).

A second study, carried out between 2015 and 2016, involved participatory research and co-design to develop targeted services and access solutions with a group of eight recently homeless young people recruited from inner city and western Sydney homelessness youth services. Representatives were brought together from libraries, councils, charities, mobile service providers, and peak homelessness agencies to participate in subsequent co-design activities and help develop pathways to support and implement the young people's access solutions. The participatory methodology was integral for generating ideas and findings through story-telling about the connectivity experiences and challenges of homeless young people. These stories and ideas formed the basis for the solutions and videos produced to capture these ideas.

The book includes ethnographic research carried out in another study in 2018 on the use of LinkNYC, a Wi-Fi kiosk network in New York City. For this study, I interviewed 36 people and conducted site observations at multiple locations to understand the role of these kiosks in the digital inclusion of New York's street homeless. I interviewed LinkNYC users, staff and clients of homelessness services, representatives of Intersection, counsel to the former Mayor of New York City, Bill de Blasio, members of Rethink LinkNYC (a community group opposed to

the Links) and digital inclusion of advocates, librarians, and policymakers. I conducted site observations of Links in the boroughs of Queens, Manhattan, the Bronx, and Brooklyn.

This mixed methods approach, interweaving multiple components and sources of data to conform to a 'multiple triangulation' (Denzin, 1989, p. 297), provides the basis for the book's analysis of mobile communication and homelessness in the context of changing media practices, evolving expectations of connectivity and large-scale digital transformation of systems and services.

Of the adults and young people who participated in my research, all were or had recently been homeless or were at imminent risk of homelessness, either sleeping rough on the streets or living in temporary, transitional, emergency, or supported accommodation. A small number were renting privately, who may have been living in such severely overcrowded dwellings as to count as homeless. Participants were on government income benefits, in part-time, low-paid employment, or without employment. Of those surveyed, 41 per cent were from culturally and linguistically diverse backgrounds. Just over half (56 per cent) were women and more than half (60 per cent) were under 25, reflecting the higher proportion of young people in the overall homeless population, though trends indicate that this is changing as more people experience difficulties maintaining housing as they age.[4]

There are a number of methodological considerations for researching people experiencing homelessness, not least the fact that they are often highly mobile and hidden from researchers (Bender et al., 2014). Moreover, the homeless population is highly heterogeneous, and there is potential for inequalities to arise as a result of institutional and research power relations (Humphries & Truman, 2017). To address these issues, I employed ethical principles and practices in all phases of the research to bring forward the voices of participants and to provide opportunities for them to be involved in the research and its outcomes. For example, caseworkers and volunteers were trained in data collection and ethical research practice to help with delivering questionnaires, and young people were involved in the development of access solutions using participatory research and co-design techniques. To make sure that participants who

were street homeless and might not be engaged with formal services could participate in the research, I visited a city park over two evenings, accompanying volunteer workers for a charity-run food van service that provided meals to people who were homeless, and approached customers of the service. In recognition of the barriers to participating in research when homeless, a dedicated 1800 number was set up to enable participants and potential participants in the Australian research to make free phone calls to the researcher to ask questions. A telephone card with A$20 of phone credit for the Australian participants and a subway card with US$20 of travel credit for the participants in New York City were provided to support participation in the research, in consideration of the difficulties of digital access and contactability, as well as the cost of travel.

This ethical framework and the mixed method approach underpin recognition of the lived experiences and narratives of people who are homeless, as well as of the ideological construction of homelessness (McNaughton, 2008; Ravenhill, 2012; Somerville, 1992; Veness, 1993). A limitation of the research was the reliance on homelessness services to reach people who, owing to their vulnerable circumstances, may have had less autonomy to resist or challenge the categorising and labelling that homogenises participants' homeless experiences within service paradigms. Most of the participants in this study were recruited through homelessness services, and for this reason they were receiving some form of support for housing, education, counselling, food, or financial assistance. Whether or not a person has received help from a formal support service can make a substantial difference to their experience of homelessness, the length of homelessness, the capacity to break the cycle of homelessness, and, potentially, the ability to access and engage with digital technology. I take up this point in making suggestions for future research, as well as in analysing the risks associated with the digitisation and automation of services and of digital citizenship more broadly.

Overview of Chapters

Chapter 2 introduces the importance of mobile phones and the internet, with a focus on everyday activities and interactions with services at the point of and during homelessness. The chapter examines the patterns of access and use of mobile phones and the internet by homeless adults, families, and young people based on research conducted in two separate Australian studies from 2014 to 2016. I analyse these results with reference to international research on homelessness and mobile phones, much of which has taken place in the United States, and to current trends in homelessness. Mobile phones with internet access prove to be key to this group's ability to interact with a wide range of services, used as a tool for staying safe and contacting support workers, as a platform for maintaining ties with friends and family, and as a source of entertainment and identity development. In this sense, the mobile phone functions as a lifeline for surviving when homeless and for building up the resources necessary to move out of homelessness, with parallels found in the experiences of other highly mobile and precarious populations such as refugees, migrants, and transient workers (Alencar et al., 2019; Gillespie et al., 2018; Harney, 2013; Wall et al., 2017; Wallis, 2013). The chapter profiles the ways in which homelessness shapes the digital experiences of a range of homeless subgroups, including families, adults, young people, and older adults. This is illustrated through survey results, interviews, and stories shared at a series of co-design workshops. The chapter explores the reasons for differences in digital engagement between these groups, including the gendered experience of homelessness, the age at which homelessness is experienced, and the effects of long periods spent on street homeless, also known as 'chronic homelessness'. I note the evolution of the mobile from being considered a 'luxury' to a 'necessity' in this chapter, with attention to the specific ways that the mobile's identity is shaped by changes in media patterns and uses by different groups, as well as by dynamics of independence/dependence and security/risk.

Chapter 3 turns the focus from everyday activities and service interactions to the mobile marketplace. The chapter starts with an examination of patterns of smartphone dependence in Australia and other countries,

where a wide range of users rely exclusively or mostly on their mobile phones for their online activities (see, e.g. Napoli & Obar, 2014; Pew Research Center, 2015; Thomas et al., 2019). I make the argument that when the mobile is the only means of telephone and internet connection, it represents 'second-class access'—a limited form of communication and a more costly and precarious option. I situate these usage patterns within an analysis of the market construction of the mobile phone, examining the design of products and plans, and industry and retail practices. The chapter reveals three main ways in which the market structures mobile internet access to disadvantage poor and vulnerable consumers: by producing cheaper and limited handsets and services and a pool of second-hand, poorer condition devices; by imposing 'poverty premiums' that establish expensive and lock-in pricing plans; and through confusing retail practices and products.

This chapter offers insights into how this market structuring shapes the communication experiences and prospects of poor and marginalised groups, materialising a 'second-class' form of access. I also engage with economic theories of daily expenditure (Agüero & de Silva, 2009) and access to essential services (Prahalad & Hammond, 2002), and explore how people who are homeless negotiate these market structures and practices. I advance the argument that while mobiles are a lifeline when homeless, they are at the same time a limited form of access compared to multi-platform access (Donner, 2015; Marler, 2018; Napoli & Obar, 2014). In this sense, mobile technologies should not be considered as adequate to bridge the digital divide for those without home broadband (let alone without homes).

Chapter 4 focuses on the institutional uses of digital technology, and profiles stories of people experiencing homelessness as they interact with a range of health, housing and welfare services, and government departments. The chapter draws on interviews with homeless Australian families, adults, and young people who were surveyed about their mobile phone and internet use, and the personal accounts of recently homeless young people who shared their stories at a co-design workshop. Interviews with support workers and managers of program design units in federal and state-based government departments provide first-hand explanations of the ongoing digital reform of government services. I situate this

research in the context of international studies of homelessness, particularly those in the United States that have focused on the role of mobile and social media in providing health and welfare services to people experiencing homelessness.

The chapter examines how mobile communication use by people who are homeless and processes of digitisation change the service relationship with homelessness support services. The precarity of social relations is part of people's experience of homelessness and is also one of the leading causes of homelessness (Gaillard et al., 2019). While mobile communication can help to maintain a line of contact with key people and support systems, acting as a lifeline and enabling essential relational maintenance (Baym, 2010), mobile access also creates new social and institutional expectations of connectivity and availability that, in the context of unstable and insecure access, can lead to further disruptions to people's social and support networks. People who are homeless have a range of strategies for overcoming these challenges. I identify and explain these strategies for repairing and maintaining social networks and support systems during times of extreme financial hardship and homelessness.

I then examine the implications of the rise of large-scale government digitisation in Australia and the advancement of digital citizenship agendas and welfare reform internationally. These digital service reforms are justified on the basis of a society-wide shift in connectivity and mass take-up of mobiles among traditionally marginalised groups. Indeed, the high rate of mobile ownership within the homeless population has been used to make a case for technology-based health and support interventions (Eyrich-Garg, 2010; McInnes et al., 2013, 2015; Rhoades et al., 2017; Rice et al., 2011). The chapter shows how, with these changes, people who are homeless are increasingly required to access services in an online environment, heightening the need for a smartphone. I make the argument that people experiencing homelessness and other smartphone-dependent users carry a disproportionate share of the increased cost of institutional digital service reform. They pay more for their digital access and suffer from less reliable connections, with fewer options and features.

Chapter 5 examines the way in which people who are homeless navigate the urban environment in order to meet their needs for digital access, basic survival, and to move out of homelessness. I describe the challenges

as well as the affordances of cities as sites of connectivity, and show how digital access barriers, in combination with the design and regulation of urban space, subject people who are homeless to new imperatives of movement, which perpetuate homelessness. The chapter engages with literature on digital inequalities and urban sociology to address a gap in our understanding of digital disparities within places (Crang et al., 2006; Gilbert, 2010; Jackson, 2015), and scholarship on urban mediated mobilities (de Souza e Silva & Frith, 2012; Hartmann, 2013; Humphreys, 2010; Ling, 2012; Morley, 2017; Ureta, 2008; Wilken & Goggin, 2013). It connects with the book's broader conceptualisation, showing how precarious connectivity is coexistent with differential spatial mobilities that play out in digital societies and is shaped by homelessness in distinctive ways. The chapter combines findings from a participatory research and co-design study carried out in Sydney in 2016 with research done in 2018 on the use of the LinkNYC Wi-Fi kiosk network by people who are homeless in New York City. I also attend to the experiences of different groups of homeless, such as young people, women, and communities of colour, who encounter distinct challenges as a result of the gendered and racialised dynamics of homelessness.

The chapter situates the issues and difficulties of digital connectivity in cities in relation to the often hostile and oppressive acts of urban policing and architecture imposed on people who are homeless. The media and spatial practices used to negotiate connectivity barriers and maintain a reliable digital connection are described through the concept of 'survival infrastructuring', which I have introduced elsewhere (Humphry, 2019). This concept describes the usage strategies of people who are homeless for making their connections work in the context of heightened physical risk and in the absence of the affordances and infrastructure of home. This concept builds on work on 'infrastructure' by Star and Ruhleder (1996) and more recent adaptations (Donner, 2015; Gonzales, 2016; Gonzales et al., 2016; Hartmann, 2018; Horst, 2013; Karasti & Syrjänen, 2004).

Chapter 6 examines the rise of smart cities and algorithmic technologies and what this means for those who are homeless. I take up issues raised in former chapters to explore the shift by states, institutions, and cities towards technologies of smart governance premised on the algorithmic processing of data, and the impact of these changes on people who

are experiencing homelessness. I argue that with the increasing datafication of government services and urban environments, social and spatial inequalities become further embedded into the logics and infrastructures of cities and states. The chapter examines examples from algorithmic debt collection systems introduced by governments in Australia and the Netherlands to recover overpayments to welfare recipients. It explores the impact of these systems on welfare recipients targeted for an unpaid debt, many of whom were in precarious situations that worsened as a result of their interactions with the system, even leading to homelessness. In the case of Robodebt, new barriers of access from a lack of digital connectivity or capacity, and the subsequent powerlessness to sort out and contest debts, resulted in new experiences of hardship and exclusion.

Likewise, returning to the LinkNYC study, the chapter argues that while smart city technologies purport to enable city authorities and planners to better manage the complexity of the contemporary urban environment, and promise to provide essential connectivity to digitally deprived urban communities, they also allow police and other third parties to carry out new forms of control, exploitation, and surveillance. The research on LinkNYC found that the smart kiosks performed as a lifeline for people who were homeless as well as for young people, both highly mobile groups in urban spaces that depend on smartphones for access. At the same time, the Links also drew people into public spaces, making them more visible to local authorities and the public alike. The chapter concludes by highlighting the tensions in the provision of public infrastructures that are privately funded and that adopt a data-driven private business model, a point taken up in the next chapter.

In Chap. 7 I reaffirm the argument that mobile communication and processes of digitisation mediate people's lived experiences and meanings of homelessness in specific ways. This has implications for homelessness policy and research as well as for research and action on digital inequalities. While mobile phones act as a lifeline when homeless, digital barriers and forms of exclusion remain for those who are homeless and for other marginalised and low-income smartphone-dependent groups. The chapter revisits the changing status of the mobile from 'luxury' to 'necessity' and what it means for these platforms to be considered essential

communication in terms of government support and regulation. In developing policy responses, I suggest the need to recognise different communication needs but also to respond to the way digital economies and digitisation processes produce and exacerbate precarious connectivity and other social harms.

The chapter engages with homelessness and digital inclusion policies and explores solutions within these paradigms, but questions whether digital inclusion is an appropriate framework for addressing the new kinds of harms and risks associated with current digital transformations. I suggest that while the renewed focus on digital inequalities is welcome, there is an urgent need to deal with the potential for marginalised groups to be implicated in the unequal distribution of datafication harms that can perpetuate and even worsen inequalities.

In concluding, I reflect on precarious connectivity as revealing the double bind or paradox of the role of mobile communication as lifeline when homeless. To groups who might otherwise be digitally excluded due to homelessness, mobile phones offer personal communication, access to information and services, and ways to counter social inequalities that result from differential resources and treatment. At the same time, mobiles create new forms of precarity, and their use can subject people who are homeless to new kinds of disciplinary powers and measures that have detrimental outcomes. It can intensify imperatives of movement and risks of surveillance and policing, particularly through digital processes and modes of governance through which life is captured, regulated, and administered as data. This chapter elaborates on this conundrum with reference to critiques by media communication scholars (Couldry & Mejias, 2019; Madianou, 2019; Watkins & Cho, 2018) and social justice theorists (Dencik et al., 2019; Dencik & Sanchez-Monedero, 2022; Eubanks, 2018; Hintz et al., 2018; Hoffmann, 2021) who have similarly explored the contradictions that trouble the digital inclusion paradigm and the way technology reproduces inequality. The chapter concludes on the need to centre home and home-making practices in digital inequalities and mobile communication research to better understand people's choices and practices when homeless, and the effects of digital exclusion. Meanwhile, the linking of mobile communication to

the broader framework of precarious connectivity supports an understanding of the broader forces structuring people's communication experiences when homeless, and the interventions and imaginaries needed to tackle these.

Notes

1. The Australian Bureau of Statistics provides a count of the national homeless population in the Census conducted every five years. The last reported census was carried out in 2016. The 2021 Census will provide updated figures in staged releases from June 2022 to mid-2023.
2. Australian Bureau of Statistics 2012 Information Paper—A Statistical Definition of Homelessness, cat no. 4922, ABS, Canberra. In this definition, a person is classified as homeless if (1) the house or flat is inadequate (the physical domain); (2) they have no security of tenure (the legal domain); and (3) they do not have space for social relations (the social domain).
3. The quote was made in the context of a presentation by a senior policy officer of Homelessness NSW at a forum on homelessness and public libraries on 25 April 2017.
4. See Specialist Homelessness Services Annual Report 2016–17. Australian Bureau of Statistics, AIHW, last updated February 12, 2018.

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2

Mobile Lifelines in the Lives of People Who Are Homeless

Robyn was a single parent with two children from Sydney's western suburbs who I interviewed in 2014 at a charity where she was receiving counselling support and help to secure housing. A violent incident with her partner had left her and her children homeless. Robyn recalled the night she had to suddenly leave home, fearing for her own and her children's safety:

> *It was in the middle of the night … I was driving around and had nowhere to go. Had the phone, but no money inside … My little daughter, she was just one. My son, he has a disability. I put them at the back. It was a winter night. Drove, drove, drove, till I came to the police station.*

Without any money and unable to call anyone on her mobile phone, Robyn drove to a police station to ask for help. The police helped her to find emergency accommodation for the night, but the next day she was unable to contact the support services she had been referred to by the police because her mobile phone was still without credit. She returned to the police station and the officers offered the use of the station telephone. Four days later she received emergency funds transferred from a family member. After buying food for her children, she purchased credit for her

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mobile phone. Robyn described the effect of a mobile phone in her life as transformative and was enthusiastic about it despite the difficulties she had experienced with phone debts. Periodically she ran out of phone credit, causing her to lose online access. She explained how her smartphone made her feel:

> *It's a world in your hand and without it it's like I'm naked to everything … When there's nothing, there's nothing. I learn to deal with that.*

Robyn's story shines a spotlight on the dynamic of vulnerability that comes about when homeless and without a mobile phone. The mobile functions as a lifeline for her, as it does for many in such circumstances. An essential communication device for reaching out to services, it is also used as a tool for staying safe and contacting friends and family, as a source of entertainment and identity, as a platform for coordinating schooling, and for finding housing and employment. At the same time, new vulnerabilities emerge with the need to have a mobile phone. These come in the form of new costs for handsets, plans, and data, as well as feeling cut off and helpless without one (or one that functions), and being exposed to new kinds of social and technology-related harms.

This chapter introduces the importance of mobile phones and the internet at the point of and during homelessness based on two separate studies I conducted in Australia from 2014 to 2016. Drawing on the findings, the chapter profiles the ways in which homelessness shapes the digital experiences of a range of Australian homeless subgroups, including parents with children, young people, and adults. For these groups, the internet and the mobile phone have a variety of meanings and uses within the context of their social identity and lived experience of homelessness. The chapter explores factors behind the different uses and benefits of mobile communication, such as the gendered nature of homelessness, being a young person, and the effects of longer periods spent street homeless, sometimes categorised as 'chronic homelessness' (Willse, 2010). Understanding these differences helps to break down the homogeneity of the homeless category and experience, notwithstanding the common issues around digital access and use for those in situations of homelessness. This supports an intersectional approach to homelessness

as constituted through multiple and intersecting social identities and lived experiences of disadvantage and discrimination (Zufferey, 2016).

This chapter draws on results of a survey conducted in 2014 of 95 homeless adults, families, and young people about their use of mobile phones and internet services, 13 follow-up face-to-face interviews, and additional interviews with 7 support workers of community homelessness services and managers of program design units at the Department of Human Services (now Services Australia) and the Family and Community Services and Housing NSW (now NSW Department of Communities and Justice). The survey was conducted with the support of the Australian Communications Consumer Action Network. The chapter also includes personal accounts of eight young people who had recently been homeless, accounts which were shared in storytelling sessions at a co-design workshop held in Sydney in late 2015 for a research project funded by the Young and Well Cooperative Research Centre. In addition to the subsets identified, those surveyed were of different genders, ages, cultural backgrounds, and sexuality, and included Indigenous Australians, people living with one or more disabilities, and people who have had or have a mental health illness.

The chapter contributes to the overall argument by demonstrating the ways in which experiences of homelessness are mediated, with mobile phones playing a special role for this population as a whole. It highlights the dynamic of risk (Beck, 1992; Giddens, 1999) that comes with mobile phones becoming the primary or only form of communication in the everyday lives of people who are homeless, and the state of precarity that results. Mobile phones provide a certain amount of *independence* in circumstances of extreme precarity but are attended by *dependence* in the form of new barriers, costs, and harms that reliance on them brings. This dynamic takes place in the context of large-scale changes to digital connectivity and communication practices across multiple domains of everyday life—welfare, health, education, finance, government, policing, and entertainment—and is exacerbated during national and global disasters such as the COVID-19 global pandemic.

From Luxury to Lifeline

The trajectory of mobile phones has been towards mass adoption and use by more and more social groups, including those that have hitherto been excluded from these devices because of their cost. In 1989, there were only 100,000 mobile phone subscribers in Australia and most of these were wealthy business users (Goggin, 2006). By 2011, the total number of global subscriptions had risen to just under six billion, and 75 per cent of these were in developing countries. In 2019, there were more mobile subscriptions than there were people (108 devices per 100 inhabitants) worldwide, with relatively small differences between developed and developed countries, according to the International Telecommunication Union (2019).

As a result of these global changes, the mobile phone might be said to be ubiquitous, having evolved from a luxury item to a necessary, taken for granted personal communication tool integrated into everyday social relations (Ling, 2012). Over this period the mobile phone also transformed from communication device to convergent multimedia platform, incorporating other media such as in-built cameras, and supporting new media possibilities through the default of 'always on' mobile internet access. As Campbell (2013) explains, 'mobility is a fundamental characteristic of the technology' (pp. 10–11), enabling communication and media consumption while moving and shaping the relationship that people have with space.

For people experiencing homelessness, this has led to benefits, as well as new challenges in carrying out regular daily activities and relationships, and in accessing a wide range of services and forms of support. Young people, parents with children, women, and older men who are homeless face specific kinds of issues that manifest because of the different contexts and causes of homelessness, and their distinctive relationships to digital technology in the context of changing patterns of access and communication. But one thing these groups have in common is their use of mobile access and the high degree of importance ascribed to the mobile phone.

In a study I carried out in 2014 involving a survey and face-to-face interviews, 95 per cent of the ninety-five homeless families, young people,

and adults surveyed had a mobile phone and 77 per cent of these were smartphones, exceeding the total rate of smartphones in the general Australian population at the time by 4 per cent (ACMA, 2014). Staying in touch with friends and family and contacting support services were among the most important uses of the mobile phone. Receiving phone calls, making phone calls and texting were the top three uses, followed by taking photos and listening to music. Participants were also using a wide range of social media and web-based platforms for communicating and accessing information in their daily life. Of those surveyed, 69 per cent used their phones to access online information, 67 per cent to access social network sites, 54 per cent to download apps, and 44 per cent for banking.

These activities are regularly measured and reported on, and are considered indicators of participation in the digital economy (ACMA, 2013). The findings correlated with research results in the United States, Canada, Australia, and the United Kingdom that have found high rates of mobile phone possession and their use for accessing online services and social networks to stay safe, find work, stay in contact, and learn new skills to overcome homelessness through easier access to information, health and support services, and employment and housing opportunities (Eyrich-Garg, 2010; Gonzales et al., 2016; Goodwin-Smith & Myatt, 2013; Gui et al., 2016; Le Dantec, 2010; Rice & Barman-Adhikari, 2014; Rice & Katz, 2003; Rice, Lee, & Taitt, 2011; Savill-Smith et al., 2005; Selfridge, 2016; Woelfer et al., 2011). While there is now ample evidence of the mobile phone's benefits for people when homeless for survival and broad social inclusion, little attention has been paid to differences in usage within subsets of the homeless population nor to the liabilities that come with dependence on this technology.

A Safety Device

People experiencing homelessness, whether living rough, unstably housed, or in a violent domestic environment, face significantly more physical safety risks than others. At the same time it has been found that people exert agency in managing their personal safety when homeless (Stolte & Hodgetts, 2015). A key finding of my 2014 survey of homeless

families, young people, and adults was the use of the mobile phone in situations of heightened physical risk: 23 per cent identified the mobile's importance for personal safety and 20 per cent for contacting emergency services. The internet was similarly seen as important for safety, with 43 per cent rating it important for contacting support services and 34 per cent for contacting emergency services.

For certain subgroups within the homeless population, the ability to control communication—how and when it happens—is an especially important aspect of the mobile's utility as an emergency and safety device. A support worker of a homelessness service who had provided support and assistance to clients escaping family violence explained to me that this control, and the ability to screen calls easily, is something that landlines do not easily offer:

> *I think mobile phones allow people to see who is potentially calling them by the numbers that come through. If clients don't know a number or it's got no caller ID, they won't pick up the phone. I think that at times this can make my job frustrating but in terms of instances of family violence—changing the home number is a lot more onerous.*

Texting using Short Message Service (SMS) offers a similar ability to control communication, as explained by Viv, a manager of a specialist homelessness centre in outer Melbourne:

> *Texting is a really important way of engaging with young people because it is less confrontational, so you can choose when and how you respond. You might respond immediately, you might leave it an hour or two … It is about doing it in your own time.*

Many of the homeless clients receiving support services identified the value of texting, noting that it was helpful for coordinating meetings and maintaining contact with their caseworkers. But perhaps its most significant value lay in the enhanced control over when and how clients communicated, an expression of power in the service relationship that otherwise favoured support providers.

An important benefit of texting via SMS is that it is accessible to those with limited mobile service capability. App-based messaging, while varied and growing in number, requires a smartphone and internet access. Of those surveyed in my study, 23 per cent had mobile phones that either did not support or had limited access to the internet, including the ability to run apps and stream services. SMS was also used as a way to avoid the cost of charged mobile calls and voicemail services. Support service staff regularly used SMS to leave messages and be reachable in the absence of voicemail, which was often not used by clients because of the cost of retrieving stored messages.

Research on the use of text-based messaging in health provision has found it to be an effective tool for reaching groups that do not interact with or who are underserved by existing services (Berrouiguet et al., 2016). Its success has been credited to its convenience, privacy, control, and the greater comfort that some users experience communicating online in the absence of facial cues, known as 'the disinhibition effect' (Suler, 2004; Williams et al., 2021). An enhanced sense of connectedness from more regular contact between carer and patient has also been identified in studies (Berrouiguet et al., 2016; Rathbone & Prescott, 2017) and evaluations of SMS programs (Williams et al., 2021) such as in the Australian pilot Lifeline Text, which was launched in July 2018 to provide text-based night-time crisis support. The utilisation of SMS health services is typically understood as a preference by some help seekers and a matter of individual choice. However, my research points to communication limits, such as the availability and quality of access and the dominant paradigm of support, being just as important.

While the service paradigm of telephone-based and face-to-face support was in a state of transition over the period of my research, shifting towards online delivery with goals of self-management (a transformation discussed in detail in Chap. 4), this change was less apparent at the level of frontline services. Many of the homeless groups in my research continued to rely on the telephone as the main method of contact for communicating with homelessness services and government agencies, as well as for reaching emergency services. Of those surveyed, 98 per cent used their mobile to receive calls and 93 per cent to make calls. My interviews revealed some of the main reasons behind these statistics. Many

participants felt that interacting online was frustrating and alienating, and because of this, speaking to a person was preferred over anonymous online systems. This also applied to long times waiting in telephone queues, which drove some participants to attend in-person appointments.

Of central importance to ensuring services are inclusive to all groups is the need to recognise how people communicate and the technology they use, which is not reduceable to a common set of needs or a single communication medium as it may have been in the era of fixed-line telephony. This especially applies to marginalised groups and subgroups who have distinctive needs and uses, such as for reducing loneliness or for supporting safety. These distinctions exist within subgroups of the homeless population as well, even as they overlap and intersect with other marginalised identities. As Mayock et al. (2016) point out, reflecting on women's homelessness and domestic violence, 'women's experiences are shaped by diverse exclusionary and intersecting processes' (p. 146). Women's experiences are also differentiated by their greater involvement in parenting while homeless, which may be a direct result of escaping an abusive home environment but is not limited to this.

Parenting and the Versatility of Apps

The mobile phone—and especially the smartphone—plays a key role in maintaining contact with family members and coordinating family life. Of the 21 families in my study, only three were without a mobile phone with internet access and app capabilities. The smartphone was also a tool used for banking and budgeting, for finding out about and scheduling school activities, for accessing government services, and for self-study. Learning new skills was recognised by 35 per cent of participants as an important use for the mobile. Melinda, a single parent living in an outer Melbourne suburb with a 5-year-old son, juggled her formal learning with other parenting duties. She explained that she completed all her assignment work on her smartphone and also used it to access her son's school app, which listed school events and activities and was searchable by grade. Melinda also used her smartphone for price comparisons when shopping for groceries:

The main things are the school stuff, my banking, job searches. I've got my Centrelink on there. I've got the deals, a lot of shopping deals, OurDeal, CatchofTheDay, Groupon, so if I can always buy something cheaper from somewhere else, I'll do that.

Researcher of family and media life, Clark (2011) has suggested that as digital and mobile media, including mobile phones, laptops, and other mobile entertainment devices, change the landscape of family media use, these technologies both 'potentially solve, and potentially exacerbate, many dilemmas of family life' (p. 324). For Melinda and other participants in the study, the smartphone was a powerful platform enabling coordination and running of the family, including managing the family budget. At the same time, the smartphone was a source of contestation and struggle. Parents in the study were more likely to share their own mobile with their partners and children, and to have to juggle its use for time-sensitive activities.

Parents interviewed identified monitoring children's data use and in-app purchases as one of the challenges of smartphones and engaged in a variety of strategies to regulate their children's media use. Melinda, for example, explained how her son had never run up a bill because she switched the iPhone to Aeroplane Mode when he used it. However, this also meant she was not contactable for this time:

I've always been smart like that. I'd only give him my phone when I'm driving or he wants to play a game on there and I'm doing something, like when I know no one is going to call me. So it cuts off everything, no one can call me, no one can email me. He can't call out.

For homeless parents with children, the smartphone's versatility as a multipurpose device and its affordances of portability and readiness-to-hand were particularly well aligned to the variability of contexts and settings they encountered, from service appointments to co-habiting in emergency accommodation. Such multiple uses aligned well with the app ecosystem, which supports users to compartmentalise everyday tasks and gain a sense of mastery over them. These results sit alongside identity strategies employed by parents, and women in particular, to 'protect and

preserve their parental identity' (Baptista, 2010, p. 3) by performing their competence as parents in the face of the high levels of perceived stigmatisation and judgement experienced while homeless.

The use of smartphones for coordinating and carrying out school homework is also critical for improving educational outcomes for school-aged children. In the United States, about a third of low-income households with school-aged children do not have access to high-speed home broadband. Of these, 45 per cent rely on their smartphones to complete their homework, according to a study by Pew Internet Research (Anderson & Perrin, 2018). This 'homework gap', as it is known, is of similar concern in many countries worldwide.

In Australia, 125,000 Australian students did not have internet access at home (including via mobile devices or games consoles) to carry out their homework and studies, according to data from the national Census in 2016. This lack is particularly pronounced in remote and regional areas, among students of low-income households, and among Indigenous Australians. In a study prepared for the Australian Education Union analysing the 2016 census data, almost a third of 20,000 public students living in remote areas had no internet access at home (Preston, 2020).

There are indications that smartphones are being used to partially address this 'homework gap' by families with children and young people without home landlines or internet. However, as Santillana et al. (2020) point out, this 'dependence creates its own divide, since many aspects of homework cannot be done with a smartphone' (n.p., para 6). These limitations in both device and online experience have an impact on a wide range of areas of everyday life when homeless, including participation in education, access to health and government services, and performing the social and cultural activities expected of citizens in a digital economy, with specific effects for subgroups within the homeless population such as women, families, and young people.

Young People, Mobile Communication, and Social Network Sites

Homeless young people are particularly exposed to spaces of risk, and this can be difficult to measure because of hidden youth homelessness (those sleeping rough or couch-surfing but not in contact with any agencies). A 2014 UK study that surveyed 2011 homeless young people found a prevalence of rough sleeping, with a third having couch-surfed, and a fifth having done so within the last year (Clarke, 2016). The value of the smartphone for young people to be able to survive the difficulties of street living and get help was highlighted in my survey, but was expressed most strongly in the interviews. One young woman summed it up this way:

> *When you're homeless, having access to a mobile can literally mean the difference between having a bed in a refuge and sleeping on the street.*

Another young man observed:

> *It's getting harder and harder to find out about (let alone access) services without a smartphone.*

The experience of public safety, as well as the use of the mobile as a safety device, is highly gendered. While this applies to women who are exposed to unsafe situations within the home, it also affects women who are unstably housed and spend time in public spaces. A young woman who attended a co-design workshop explained that rather than sleep on the street or in a park, she would seek out spaces like the foyers of libraries and universities, which were safer places to rest and typically offered some internet connectivity such as free Wi-Fi. Young women's different experiences of public safety thus revealed the critical role of the mobile phone for safety, as well as the way their movements were shaped through seeking out places for connecting safely.

While social media use was not restricted to young people, platforms that support social networking play an especially important role for

young people as a whole. Studies have found that social network sites are particularly important for homeless young people's survival when homeless, as well as for their identity and sense of belonging (Barman-Adhikari et al., 2016; Guadagno et al., 2013; Harpin et al., 2016; Madden et al., 2013; Rice & Barman-Adhikari, 2014; Rice, Milburn, & Monro, 2011; Selfridge, 2016; Woelfer & Hendry, 2012; Young & Rice, 2011).

My research found similar results, with smartphones fulfilling a special role in giving young people access to social media as a physical, and social, lifeline. Out of the total sample, 67 per cent rated the mobile phone as important for accessing social network sites, with the internet rated comparably. Social media messaging apps like Facebook Messenger, Skype, and Live Chat were perceived by young people in particular as a vital way to defray the cost of pricey mobile voice calls: 30 per cent of total participants used the internet for making free phone or video calls and 45 per cent for instant messaging. Jen, a young woman living in supported accommodation, explained it like this: 'Yeah, because that's pretty much how I talk to most of my friends like overseas … or I'll be messaging my mum …'

Social network sites like Facebook, Twitter, and Instagram facilitate the articulation of one's profile to a network of others online and enable users to expand their networks and reach through these connections (boyd & Ellison, 2007). Within these 'networked publics' (boyd, 2011), young people curate impressions of themselves for others to consume through participatory practices such as posting, sharing, commenting, liking, and tagging. While identity play is not as central to these self-performances as once thought (Marwick, 2013), social network sites provide a powerful space for young people to imagine and enact identities alongside their peers, and through this, to make friendships and maintain ties (boyd, 2007). This identity play can involve challenging restrictive and stigmatised identities such as being labelled homeless.

In my studies, the young people interviewed and those who shared their stories at a co-design workshop in Sydney talked about the centrality of social media in their lives and identities. One young woman was using Facebook to post photos of plated meals she had prepared, building her social network around her food and culinary interests. Taylor and Narayan (2016) found a similar result in their case study of a Twitter user

who used microblogging to support being themselves and developing a positive self-image, which in turn resulted in improved health outcomes.

In a digital economy in which young people are expected to develop their own opportunities and make themselves employable, social network sites are platforms for acquiring digital skills and cultivating networks of 'weak ties' (Grannoveter, 1973). This aspect of young people's engagement with social media accessible via smartphone also came through in the survey, interviews, and co-design storytelling sessions. A 19-year-old woman who was in community housing but had been living on the street wrote about the ways the mobile had supported her access to social support, public transport, banking, shopping, and employment:

> *Having a mobile allows me to maintain relationships and support from my friends and family. As I travel a lot by public transport it keeps me safe, allows me to search timetables, be punctual, online banking and shopping etcetera. It has helped me to get a job and keep that job.*

Research on the benefits of expanding social networks for overcoming marginalisation dates back to Granovetter's (1973) research on the strength of weak ties. He found that weak connections with acquaintances outside one's neighbourhood or close circle acted as a 'bridge' to new opportunities and employment prospects. Since then, studies have focused on whether social media provides similar benefits, with evidence mounting that it does enable homeless young people to build the economic, social, and cultural capital that they lack. In their study of homeless youth at a drop-in service in Los Angeles, California, Rice and Barman-Adhikari (2014) found that social media and the internet were a means by which young people connected beyond networks of homeless youth to establish 'nonstreet relationships' (p. 241). Ellison et al. (2007) found that online network tools enabled homeless youth to stay connected to social networks from which they have become physically distant.

Social media platforms are increasingly the site of young people's efforts to earn a living by building an online business or career. One young man who attended the co-design workshop had a dream to start his own social media enterprise but had no access to the funds needed to

establish a business. He devised a microloans solution to help himself and others like him gain access to the financial capital required to start a business. The 'Ned Kelly Start-up Scheme' solution he proposed was a loan program targeted specifically at young people who were homeless between the ages of 18 and 24, allowing them to access $1000 without interest for a period, which, once paid back, they could reaccess to further build their business. Not only was his idea an inventive take on *connectivity*, interpreted as providing opportunities and social connections rather than access to technology; it also displayed the entrepreneurial subjectivity celebrated in a digital economy.

Mobile Entertainment for 'Screening Out' Homelessness

Loneliness is a feature of homelessness, with those who are homeless having higher levels of alienation, isolation, and stress than are experienced in the general population (Rokach, 2005). In this context, the mobile phone plays an important though often underestimated role, for coping through listening to music, movie-watching, and reading. In my research, 73 per cent surveyed said they used their mobile to listen to music and 66 per cent listened to music through the internet. Playing games on the internet was also popular, and some participants with more than one mobile phone used their old handset as a dedicated music player. Music played a diversionary role, used to 'screen out' unpleasant surroundings and experiences and provide a sense of comfort to ward off loneliness.

Similar results have been found in other studies. Lemos and Frankenburg (2015) found in their UK study that games and music provide essential comfort in times of homelessness and are a way to cope with severely challenging and stressful circumstances. They found that 80 per cent of respondents considered digital devices to be 'important or very important' sources of entertainment and leisure (p. 37), without which they might feel 'a bit isolated' (p. 38). Comments on mobile phones as entertainment included, 'I use it to help myself not think about

my situation' (p. 4) and 'I love music. You don't think about the shit in your life when you have music. It helps you stay calm' (p. 40).

Gui et al. (2016) found in their research into street homelessness in Los Angeles that mobiles are used as 'virtual havens' to cope with physical hardship and social isolation. Savill-Smith et al. (2005) found that homeless participants were more likely than non-homeless participants to use their device to listen to music. In my study, music listening was also tied to emerging user content production or 'produsage' (Bruns, 2008) practices. An 18-year-old young man in emergency housing, for example, explained he used his Nokia Lumia to record his singing as well as to play music, reflecting the content creation activities that accompany media consumption.

While all of these uses of the mobile for entertainment point to its benefit for coping with the struggles of homelessness, the consumption of media for leisure is itself an important social need and an unquestioned expectation of citizens who are stably housed. Household media entertainment is a large segment of the multi-trillion-dollar global media and entertainment industry and one of the only ones to have grown during the periods of lockdowns and closures of in-person venues during the COVID-19 pandemic (PwC, 2021).

The use of media by people who are homeless for leisure has been noted as important by some mobile communication scholars. Rice and Barman-Adhikari (2014) identified social interactions, recreation, and entertainment as significant components of time spent online that were not specifically goal-oriented behaviours. In ethnographic research of low-income groups with low literacy in the United States, Summers et al. (2018) found that smartphones enable 'a sense of playfulness around information, including the fun of pursuing random interests' (p. 661). The high use of mobile phones for entertainment by people experiencing homelessness points to the need to recognise the use of media for leisure as a necessity rather than a luxury practice. Multi-platform media access is now the norm in most households in developed nations, so assessments of baseline access for digital inclusion need to take into account these changing habits and standards of media consumption.

Older and Chronically Homeless

One group in particular, those who are older, male, and chronically homeless, suffer considerably because of their lack of digital access and engagement, and the compounding effects of their age and length of time on the street. Older homeless men have not been a specific focus of research into digital technology use. This might be explained by the fact that many that make up this subgroup do not interact with support services and are thus difficult for researchers to reach. Although older Australians make up a smaller proportion of the overall homeless, 63 per cent of this group are men over 55 and the majority of those are classified as 'chronically homeless'—unable to obtain or sustain long-term housing over an extended period and living permanently or semi-permanently on the street. This is compounded by a significant lack of affordable housing and a public housing shortage, and by high rates of mental illness and chronic poor health (Australian Institute of Health and Welfare, 2018).

In order to access participants for my research from this group, in addition to the survey (which reached some of these participants), I spent two nights at an inner-city park in Sydney, accompanying a food van service that visited regularly. The service was well known by people who were homeless and the park itself was a well-used spot, opposite a public hospital and with many benches and natural shelter from established trees. Over the two nights, I surveyed and spoke to the food van customers, almost all of whom were living in emergency housing, in boarding houses, on the street, or in temporary accommodation, about their mobile phone and internet use.

Their experiences provided insights into those who identify as non-users but who, upon closer examination, have a degree of engagement with digital technologies, including with mobile phones. Many had mobile phones, and smartphones, but a small minority—five—had no form of mobile communication, relying instead on public payphones, borrowed mobile handsets, and public computers in libraries and government foyers. For this group, the ongoing cost of devices and plans, and low levels of literacy and confidence, were particularly acute problems, suggesting that a type of digital divide exists within the homeless

population even though levels of mobile use are high overall. Of the five without mobile phones, all were single adult males, three were long-term homeless who had been living on the street or in temporary shelter for two or more years, four had experienced a mental illness and three were over 40.

This group had different practices in use, such as higher rates of sharing mobile handsets and reliance on proxy users, and was also particularly vulnerable to debt, having overlapping complex needs, such as being homeless and having a mental health illness, poor health, or a disability. A few of these marginally connected individuals had owned a phone but had not replaced it after it had broken or been stolen because it was not perceived to be worthwhile. This may have been related to the cost of replacement, a lack of confidence and literacy in technology, or a lack of relevant information that mobile phones give access to (two of the five said there was 'no need' to replace it), highlighting a known issue that access to technology does not necessarily translate into access to information. Hersberger (2003) observed, and Le Dantec and Edwards (2008) also found, that the availability of information is not sufficient in itself; information needs to be relevant and socially sensitive, particularly since clients of support services often have to deal with an excess of confusing information from multiple, uncoordinated sources.

Another important insight that came from closer examination of this group was their continued reliance on the public payphone. Two of the five who did not have a mobile phone reported using a public payphone. This was despite the rapid demise of such utilities in Australia and in other developed countries. In Australia, there are 15,900 payphones around the country (as of August 2020), down from a peak of about 80,000 in the 1990s. There were just under 100,000 pay phones left in the United States in 2016 according to statistics collected by the US Federal Communications Commission, down from over two million in 1997 (Federal Communications Commission, 2020). Yet, the use of public payphones for emergencies is still a recognised need, not only for people experiencing homelessness but also for remote communities where people may have no fixed landline and poor mobile phone coverage (Rennie, 2019), as well as during times of disaster. Telstra, the Australian carrier that maintains the national payphone network, reported high use

of payphones during the 2019–2020 bushfire season when more than 2,546,000 free calls were made from 832 payphones in areas directly affected by bushfires (Simpson, 2021).

As discussed in more detail in Chap. 5, public libraries provide a critical role for all homeless subgroups, for accessing technology, services and in-person help, for meeting people, and as a refuge from uncomfortable and sometimes hostile urban environments. However, libraries don't usually provide phone services or 24-hour internet access and are limited in their reach and location, and thus are no substitute for emergency communication.

'No other way to call'

When support is only accessible by mobile phone, and formerly widespread communication infrastructures such as public payphones disappear or fall into disrepair, people are placed into more vulnerable situations. While this point speaks to the wider shift in the status of all communication media, the mobile phone, and in particular the smartphone, plays a key role as a communication device of last resort for groups who are most vulnerable in a crisis.

The role of the mobile as a lifeline for those in immediate situations of risk and danger is increasingly being recognised. Among refugees in exile from their homes, the smartphone has similarly been found to be considered an essential utility. In their research on Middle Eastern refugees (from Syria, with one from Iraq), Alencar et al. (2019) found that refugees themselves 'referred to the smartphone as a lifeline, as the (only) solution in case of an emergency, or at least as a resource that provided some emotional relief because it allows refugees to feel connected to potential sources of help' (p. 839). Gillespie et al. (2018) found that for Syrian and Iraqi refugees making their passage through Europe, 'smartphones are lifelines as important as water or food' (p. 1). Harney (2013) observed the important role that mobile phones played for migrants in Naples, Italy, to create a mediated sociality that acted as a defence against the precariousness of life as a non-citizen.

As Harney (2013) observes of the migrants in his study, there are strong affective dimensions to this profound reliance on the mobile phone. This extends to people who are homeless in a wide range of circumstances. Many homeless participants in my research felt their mobile provided a sense of security and competence, expressed in such terms as 'gives confidence', 'reassurance', 'I feel safe when it is with me', 'always have what you need in your hands'. This was similarly observed in the aforementioned study of 12 low-income and low-literate smartphone users in the United States by Summers et al. (2018), which found that people felt empowered by their smartphones through access to news and information and felt a sense of ownership in using their phone's capabilities for storage and recall. Notably, these positive feelings were accompanied by inverse feelings of inadequacy among almost half of their participants, with the phone itself perceived as a site of enhanced risk and vulnerability due to the potential for theft, breakage, and hacks.

My own research bore this out, with a similar dynamic of security and insecurity in the way the mobile's status as lifeline was experienced and felt. This is well captured in Robyn's remark that 'It's a world in your hand and without it it's like I'm naked to everything'. The mobile service or the handset can lead to a strong sense of agency and of being 'at home' alongside extreme feelings of vulnerability and powerlessness, revealing the fragility of the mobile as lifeline when there are no alternative options. A mother of four children at a homelessness service in outer Melbourne explained it this way:

> *I'm able to contact people in time of need when without a phone I probably could not of, and would of been left stranded, isolated and potentially in danger. But [my] phone is broken and unable to afford a new one.*

Milne (2015) has suggested the term 'degrees of essentialness' to describe the primacy of the mobile phone in the lives of lower-income and vulnerable communication consumers. Since then several other terms have been proposed to describe this special relation to the mobile phone: 'mobile-only' (Thomas et al., 2019), 'exclusively mobile' (Newlands & Lutz, 2021), 'smartphone dependent' (Pew Research Center, 2015) and 'smartphone-only' (Park & Lee, 2015). These terms

appear as neutral descriptors, potentially allowing the degree of reliance that some groups have with this medium to be characterised as a logical choice or individual preference. But the special place of the smartphone is more usefully located in the context of the deeply unequal and risky conditions that structure the everyday lives of these groups.

The flip side of the mobile's benefits as a lifeline is the new risks and harms that come from being reliant on a single form of communication and contact. This is particularly so for some groups such as refugees, people who are older and chronically homeless, and women whose ownership of a mobile phone enables access by an abusive partner. Mobile technologies are used 'to control, stalk and abuse women in the context of domestic violence', a practice known as 'technology-facilitated stalking' (Woodlock, 2017, p. 584). One of the characteristics of this type of abuse is the 'omnipresence' of harassment afforded by the 'always on' connectivity and reach of the mobile, providing instantaneous access to the person concerned as well as a platform to publicly intimidate and embarrass partners or ex-partners within interconnected social networks.

In a similar way, the ability of homeless young adults to connect to large social networks to build bridging capital comes with risks and limits. Marler (2019), who carried out research on the use of Facebook by unstably housed adults in Chicago, found that the perception of this platform as a global gateway, promulgated by platform narratives of open-connectedness, drove participants to 'friend' as many people as possible. He describes this practice of casting the net widely to maximise network reach and to access resources as 'connective ambition'. At the same time, he found that through these practices, participants were exposed to threats, breaches, scams, and unwanted advances, with lower levels of digital skills to protect themselves. In a subsequent analysis, Marler (2022) points to the interlocking effects of offline inequalities and online barriers that inhibit the potential to realise the capital-enhancing benefits of internet use.

Technology users have some agency in their negotiation of such abuses. For example, a young woman in my research who had been the target of online harassment by students at her school had deleted her Facebook profile and created a new one with another name. Marler (2019) found similar tactics enacted by the adults in his study, noting others such as the

use of multiple accounts and limiting acceptance of friend requests. He called these tactics 'creative caution'. The risk of technology being used harmfully by others is thus negotiated by people when homeless in specific ways, interacting with dynamics of age, gender, and the affordances of communication mediums and social media platforms. Users make strategic trade-offs between the opportunities and the risks of access, developing tactics to limit the harms they are exposed to online and via mobile phone.

The 'Risk Society' and Mobile Dependency

The individualisation of risk is a key characteristic of the rise of a 'risk society' in late modernity (Beck, 1992). Beck (1992) explains that in such a society, risk is both induced by human activity, rather than external forces, and is central to economic and social processes of individualisation and globalisation. In relation to this, numerous political scientists and social researchers have suggested that risk and 'risk thinking' have become organising principles of governance, with a particular reliance on markets and technologies buttressed by norms of active citizenship and consumer choice (see Giddens, 2013; O'Malley, 2004; Rose, 1998; Scott, 2007).

In this context, social and mobile media and services substitute for institutions; individual consumers become more actively involved in the prevention of risk and even participate in the delivery of critical services. Giddens (2013) described this active self-assessment of risk as an 'ever-present exercise' in which individuals reflexively monitor and calculate risk as part of their daily activities and life planning (pp. 124–125). As scholars of risk have observed, risk is increasingly mediated by digital technology (van Loon, 2002, 2014), giving rise to new kinds of practices and a 'digital risk society' (Lupton, 2016). The techno-individualisation of risk assessment is well illustrated in disasters such as the Australian bushfires over the 2019–2020 summer. The NSW Rural Fire Service's mobile app *Fires Near Me* was used extensively to alert citizens to nearby fire-affected areas. In the COVID-19 pandemic, citizens were enrolled in the work of contact tracing through the extensive use of QR code

check-ins and tracing apps such as the Singapore Government's *TraceTogether* app.

Being able to call emergency services from your mobile phone (without the need for credit) when homeless and in immediate danger provides a similar function of individual risk mitigation. Participants in my research described this emphatically as one of the big changes having a mobile phone has had on their lives, providing safety and security. Giddens (1999) provided a perspective on 'risk society' that described this shift towards self-responsibility as 'manufactured risk' (p. 4), pointing to the expanding uncertainties that accompany the intrusion of risk into personal and social life. In a later work he explained that it was impossible for individuals to disengage from the risks embedded in highly interdependent systems operating at a global scale (Giddens, 2013). Though neither Beck nor Giddens explicitly addressed the unequal distribution of risk; those who have few or no alternatives experience this individuation of risk disproportionately, and this is exacerbated in times of acute risk.

The dependency dynamic, which applies to different technologies in a wide range of contexts, is the focus of critical thinking in fields such as development studies, welfare studies, data studies, and critical race studies. For example, in the context of ICT-for-development campaigns by the Global North in developing countries, Wade (2002) has argued that these run the risk of 'locking developing countries into a new form of dependency on the West', whereby access to the global information economy is controlled by 'technologies and "regimes" (international standards governing ICTs) [that] are designed by developed country entities for developed country conditions' (p. 443). This dependency dynamic similarly operates in a developed-nation context, where it is expressed in and through the structures of social hierarchies and inequalities, which discourses of technology can conceal and reproduce (Hoffmann, 2021). Digital connectivity and the discourse of ubiquity are central to large-scale social, economic, and political transformations, and are becoming the default means through which the ground of the everyday is experienced, and this is problematic for many.

Conclusion

Robyn's story at the start of this chapter highlights the dilemmas of dependence on the mobile phone as the primary or only form of communication in the context of these larger-scale social, technological, and economic changes. This dependence is a problem addressed throughout this book and is connected to the broader phenomenon of precarious connectivity that has emerged as a structural feature of globalised digital economies. The status of the mobile as lifeline and its special place for people who are homeless must be understood within this context as it represents the extent to which digitisation processes and communication trends have altered the grounds of the everyday and what is meant by survival. All of these homeless groups negotiate this digital transformation within the context of their daily lives and social worlds, and have developed distinctive strategies and practices for dealing with the risks and new barriers that come with mobile dependency. While this chapter has focused on drawing out the importance of the mobile phone and its benefits when homeless, the consequences of this dependency, and the ways that users respond to it, have just begun to be identified.

Over the course of this book, I explore these consequences across a series of key life domains of people who are homeless: the mobile marketplace, the digitisation of health and welfare services, the design and regulation of urban spaces, and the rise of smart cities and algorithmic governance. Analysing the mobile phone in terms of dependency casts a very different light on its role as lifeline, suggesting a far more complex and problematic set of outcomes than might at first appear. In Chap. 3, dependence on the mobile phone is discussed in relation to smartphone usage patterns and the role of the telecommunications market in shaping access options for low-income and marginalised media consumers. The chapter explores how people experiencing homelessness negotiate market structures and practices in the face of substandard, precarious, and more expensive mobile communication, constituting a form of 'second-class' access.

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3

‘Second-Class’ Access: Smartphone Dependence and the Mobile Marketplace

I met Jack at a community housing centre in Western Sydney. Jack was an enthusiastic mobile phone user with a mild intellectual disability who from the age of 18–21 had been signed up to four mobile plans and now had a debt of over $10,000, owed to two mobile phone providers. Jack had been homeless on the streets and had been getting help to find stable housing and advice about his phone debt. Jack had tried to deal with the problem by himself, speaking to customer service officers and writing emails to the companies concerned, but the costs mounted up and then debt collectors were engaged to pursue the debts. They sent letters of demand to his registered address at his mother’s house and visited her to track down his whereabouts, culminating in a downgrade of Jack’s credit rating. Jack spent time in intensive psychiatric care for schizophrenia and depression over this period, and explained to me the personal impact of this experience:

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They're still trying to get money out of me … I've got a bad credit rating—I can't even rent anything. I can't get loans, I can't get anything.

In this chapter I argue for an understanding of mobile communication as a form of 'second-class' access (Crawford, 2011) that is experienced by people who are homeless and others who are smartphone dependent. The term 'second-class' plays on a dual meaning of class, as a system of social stratification, and as a poorer quality of digital media that is materialised in mobile phone designs, plans, and services. 'Second-class' access means access only to cheaper, older, and underpowered mobile handsets, more expensive mobile voice and data plans, and confusing and exploitative retail practices, resulting in substandard, precarious, and more expensive digital access for low- and no-income media consumers. This chapter contributes to the book's main argument by showing the part the mobile marketplace plays in bringing about precarious connectivity, a feature of digital societies in which access to information and communication is insecure, expensive, and poor quality for some segments of the population, whose media experiences are shaped by existing inequalities.

I begin with an examination of patterns of smartphone dependence, in which a wide range of users rely on their mobile phones for all or most of their online activities. I situate these usage patterns within an analysis of the market construction of the mobile phone, examining products, plans, and industry and retail practices in Australia, with examples from other countries. This analysis draws on research I carried out on the access to and use of mobile phones and the internet by families, adults, and young people experiencing homelessness in Sydney and Melbourne. The chapter draws attention to the role of 'digital materialities' (Reichert & Richerterich, 2015) in developing an understanding of the inscription of unequal connectivity in mobile handsets, plans, and services: (1) through the production of cheaper, older-generation handsets, with less features and in poorer condition; (2) by imposing 'poverty premiums' that establish and lock in certain kinds of pricing strategies that disadvantage the poor and homeless; and (3) through the creation of confusing retail practices and products that target and exploit vulnerable and disadvantaged customers. I analyse the negative consequences this market structuring has on people experiencing homelessness in combination with the

specific challenges of communication access and use that result from being without safe and stable shelter. Although smartphones act as a lifeline for people experiencing homelessness, if they are the only means of connection, they represent a severely limited form of communication, as well as being a more costly and contingent option. This 'second-class' access positions homeless and other low-income users in a relation of dependence, restricted use, and precarity.

'I just have my phone': The Rise of Smartphone Dependence

Mobile communication was first described as 'second-class' access in a 2011 *New York Times* editorial penned by Susan Crawford. The term designated new patterns of digital exclusion resulting from low or no internet connectivity among low-income, rural, and minority groups in the United States. The concept was taken up and developed by Mossberger et al. (2012), who argued that the quality of digital access matters and that having to rely solely on a mobile phone to carry out all online activities is not sufficient for enabling full citizenship.

Mounting evidence suggests that for many, the mobile phone is the only form of access. In 2015, the Pew Research Center first reported on a new pattern of use they had identified among a group of Americans who depended on their smartphones for online access. At the time of this report, 7 per cent of the US population were found to own a smartphone but were without access to a broadband internet service at home and had limited other options for going online (Smith, 2015). By 2018, the number of Americans accessing the internet only through their smartphones had grown to one in five—predominantly young people, non-whites, and lower-income groups (Pew Research Center, 2021).

In Australia, around four million people, or 16 per cent of the population, rely exclusively on mobile access to the internet and correspond to the most disadvantaged groups (Thomas et al., 2019). These mobile-only consumers have been found to have a substantially lower inclusion score in the Australian Digital Inclusion Index than the national average,

measured across the key indicators of access, affordability, and digital ability. Mobile-only users are also much more likely to be from low-income households, be unemployed, have lower levels of education, be single parents with school-aged children, be persons living with a disability or be Indigenous Australians (Thomas et al., 2019). My research has shown that people who are homeless are among the groups who are least likely to have access to other forms of access and who rely almost entirely on their mobile phones.

While some maintain that the take-up of mobile phones offsets exclusion among groups previously without digital access in a wide range of developing and developed country contexts (Boyera, 2007; Perrin & Turner, 2019), others argue that a more complex picture of access and engagement is unfolding. For example, Donner's (2015) research on mobile internet access in South Africa explores users' distinctive 'digital repertoires', the tools and skills developed to negotiate the constraints and different experiences of the internet encountered by South Africans. Ureta's (2008) study on the use of mobile phones in low-income households in Chile found that because of their expense, mobile phones were used in quite limited and limiting ways, often as a stand-in for fixed landlines. These empirical studies of mobile communication in practice have helped to challenge overly optimistic accounts of the mobile phones 'leapfrogging' fixed broadband infrastructures in the developing world (Chigona et al., 2009; Hyde-Clarke & Van Tonder, 2011; Napoli & Obar, 2013).

The growth in the number of users who rely heavily on a smartphone for online access has also been a focus of concern in developed countries. In their comparative analysis of mobile versus PC-based forms of internet access, Napoli and Obar (2014) refer to an emerging 'mobile internet underclass' to highlight growing disparities within the United Kingdom. Tsetsi and Rains (2017) examine the different uses and outcomes that result from smartphone versus multimodal internet access, finding smartphones to be masking a widening usage gap between low- and high-income earners in the United States. Watkins (2012) conducted research with Latino and African American teenagers at a Texan high school and found their engagement with digital media was still constrained, despite gains made from access through mobile connections: 'If mobile phones

are primarily being used as an anytime, anywhere source to access games, music, and video, then the capacity of these devices to bridge the participation gap may not be realized' (p. 7). In all these cases, this method of connecting in the absence of other options has resulted in a limited and unequal form of access.

After three decades of research on the digital divide, there is plentiful evidence that interrelated inequalities of class, race, and geography constrain the nature and extent of people's digital access and engagement, and conversely that digital inequality exacerbates pre-existing social disadvantage (Gilbert, 2010; Ragnedda, 2017; Robinson et al., 2015; van Deursen & van Dijk, 2014, 2019). Reviewing the state of the digital divide in the United States in 2015, the Pew Research Center found that nearly half of Americans who earn less than US$30,000 have neither high-speed internet access nor a desktop computer at home and are much less likely to have multiple devices with which to go online (Anderson, 2017). Ethnic and racial differences are also contributing factors, with more Black and Hispanic American adults smartphone dependent than white Americans, who make up a higher percentage of those with broadband and a computer at home (Perrin & Turner, 2019).

Noble and Senft (2013) caution against explaining such differences using a 'digital-divide competition rhetoric' (pp.112–113) whereby categories of people are compared based on problematic racial categories. They suggest this might do more harm than good by encouraging default assumptions of whiteness as a baseline for measurement. Understanding these digital differences requires going beyond the statistics and delving into their structural causes and implications, a project at the heart of the digital inequalities approach (Ragnedda, 2017; Robinson et al., 2015). Hong, for example, has documented how places where poor and working-class Chinese Americans have traditionally lived and which have historically been used to racially segregate these populations, such as San Francisco's Chinatown, suffer from poor-quality and slow internet connectivity (Hong, 2016). She builds a convincing case that unequal digital access is a product of 'enduring legacies of place-based racial formation' (n.p., Conclusion) and one of the key ways in which race-based social inequalities are perpetuated.

There is a long history of 'redlining' in the United States, a practice whereby infrastructure and service roll-outs are differentiated based on racialisation. The term originally applied to the colour-coding scheme used by US banks in the 1930s to assess housing loans by the Home Owners Loan Corporation under the New Deal. More economically valuable residential areas (green) were rated against those less desirable (red), leading to the large-scale exclusion of low-income communities of colour based on this coding (Friedline et al., 2020; Prieger, 2001). Digital redlining corresponding to racial geo-formations has since been a concern of digital inequalities scholars and inclusion advocates. The US National Digital Inclusion Alliance has argued, drawing on 2018 data from the Federal Communications Commission and the US Census's American Community survey, that structural racism is behind federal policies to invest in broadband infrastructure in rural areas rather than in densely populated urban centres with inadequate or no broadband access (Siefer & Callahan, 2020).

Digital media experiences are thus highly differentiated by the impact of social inequalities associated with historically hegemonic formations of class, gender, and race. Homelessness is itself an intersectional and lived experience (Zufferey, 2016), with income and class positioning only some of its causes. As argued by Somerville (1992), homelessness is a condition produced by a system that privileges home ownership, supports evictions, and makes housing unaffordable. Homelessness produces distinctive digital uses, needs, and barriers that are shaped by these intersecting inequalities and conditions, with smartphone dependence a key expression of these.

In the following analysis I explore the complex interplay between people's communication experiences mediated by homelessness and the market construction of new forms of precarious and substandard communication access. Patterns of smartphone dependence say little about the underlying causes and conditions of disparities and distinctive uses of digital media. An approach that foregrounds the material effects and agency of mobile media (Reichert & Richerterich, 2015) reveals the ways inequalities are inscribed into the technologies and products themselves. This approach builds on feminist scholarship on the material and

situated basis of our online interactions and identities, grounded in everyday lives and cultures (Haraway, 2006; O'Brien, 1999; Suchman, 2004), as well as on research strands that have consolidated this reorientation around the materiality of digital media (Fuller, 2005; Kittler, 2006; Parikka, 2013; Reichert & Richerterich, 2015). These approaches are committed in varying ways to developing a political analysis of the materiality of objects, devices, and systems and their binding form and relations.

The Marxist critical media school has contributed to this 'digital material' turn, exposing the hidden forms of digital labour in the use of social media and in the production of digital devices that reproduce exploitative capitalist structures and ideologies. As argued by Fuchs and Dyer-Witheford, corporate platform owners who dominate the Web 2.0 landscape exploit the activities and content that users generate; these are sold as commodities to advertisers, thereby creating the surplus value upon which the capital of social media firms and internet giants like Google and Amazon is based (Fuchs, 2014; Fuchs & Dyer-Witheford, 2014). Nevertheless, while a Marxian class-based analysis provides the basis for a material account of a society transitioning to a digital capitalist form, it says very little about the implications of an already classed, gendered, and racialised society on the communication experiences of digital media users with the least capital at hand.

Paying attention to the material agency and effects of media provides the basis for understanding inequality as a system that is both internal to media and an external structuring force. As digital material, the mobile phone may be broadly conceptualised as an assemblage encompassing 'objects, practices, symbolic representations, experiences and affects' (Herman et al., 2015, p. 2). In the following analysis, I maintain a narrower focus, on the constitutive elements of mobile handsets, plans, and services, with regard to one subset of disadvantaged media users. In my research on people who are homeless, inequality and digital media play out in distinctive ways: homelessness itself is a product of inequality; the media used by people who are homeless embed and reflect conditions of inequality; and the lived experiences of people when homeless are mediated by what, how and if, media are used.

Cheaper, Older, Underpowered

Despite the high rate of mobile ownership, mobile handsets in possession of people who are homeless are generally cheaper and older (second- or third-generation handsets), with fewer features and in poorer condition. Of the almost 100 people surveyed in my 2014 study about their mobile phones and internet use, 23 per cent had basic or feature phones with very limited or no internet access. I also found a large variation in the age and functionality of mobile phones, spanning a number of generations of handset models. The majority of handsets (57 per cent) were acquired second-hand from mobile dealers or online e-commerce platforms such as eBay and Gumtree, or were given as gifts by family, friends, a support service, or other sources.

A lack of internet functionality on mobile handsets corresponded to lower rates of internet use and digital engagement. Those with smartphones used the internet to stay in touch with friends and family, seek employment, access health services, find accommodation, access social media, create content and gain new skills. In contrast, basic and feature phones were used for texting and calling. Of the five participants who reported that they did not use the internet, three had basic phones and two were without mobiles altogether. To access the internet, non-smartphone users relied on other internet sources: at public libraries, government foyers, and community centres or on a personal computer belonging to a friend or family member.

The reliance on cheaper, older, and underpowered mobiles for accessing the internet meant that digital engagement was restricted to sites and services that supported older features and operating systems and slower access speeds. Many of the study participants spoke of their frustrations with their handsets, not being able to see or read material online or take photos and upload them to social media sites. Some limitations had been self-imposed, by turning off apps and high data use services that operated in the background, in order to strategically manage data use and keep the cost of the mobile service down.

These limitations are not trivial, especially for homeless young people. Studies have repeatedly shown that the preferred social media platforms of Facebook, Snapchat, and Instagram are much the same for socially

marginalised young people as for their non-disadvantaged peers (Lenhart, 2015; Regan, 2017). Far from being a case of 'selfie' narcissism, these visually oriented apps involve young users in ways that are different from other, more text-based platforms, forming the literal grounds of social membership and a sense of belonging. One young woman I interviewed in a youth refuge spoke of the strengthened self-confidence she had gained from posting photographs of meals she had prepared to her growing audience of social media fans, illustrative of the global movement of self-styled young female bloggers and microcelebrities (Senft, 2008):

> *I take photos depending on what I make in the restaurant and here when I get creative. I make butter chicken and I design it, like, fancy, and plate it up and then I might post it on Facebook or show me friends or send it to them. It makes me feel proud.*

Moreover, the free messaging services and apps built into social media platforms are an important substitute for more expensive communication options such as voice calls on mobile plans. Many of the participants reported that they kept in touch with their family via Facebook Instant Messenger. Yet full access and engagement to these social media platforms also requires higher quality and consistent internet connectivity and fully featured smartphones with cameras—neither of which are readily available to homeless young people because of the high cost of data, interrupted connectivity, and broken, faulty, cheaper handsets with less functionality and smaller screens.

Another implication of only having access to small screens, more likely to be a limitation of older mobile handsets, is the difficulty in accessing, viewing, and reading information designed for media devices with larger-format screens. For the participants in my research, this created new barriers to participation in education and employment activities. Several of these were in the process of studying at the time of the research and explained how they used their phones for enrolling in courses, accessing course content, communicating with tutors, and completing assessments and other study tasks. Jack, the young man quoted at the start of this chapter, accessed how-to videos on YouTube while on the job for his apprenticeship as a mechanic:

I look up stuff on You Tube about how to fix things and so it will show me the video, I'll do it. I'll pause it, I'll do it and then wait for the next step and then do that.

In this instance, the video-sharing platform performed an important supplement to his formal training. So, on the one hand, mobile phones have proven to be essential for enabling access to education opportunities. On the other hand, the small screen, the non-mobile-friendly sites, the higher cost of mobile data and slow internet speeds set strict limits, and disadvantage students with no other regular form of access, forcing them to make do with a platform insufficient for the full range of tasks their study involves. This is compounded by the lack of access to safe, comfortable learning spaces, and explains why public libraries are so important to people without secure housing. Not unlike the 'homework gap' identified between children of families who have high-speed internet at home and those who don't (Horrigan, 2017), people experiencing homelessness encounter an 'education gap' produced by the limits of mobile-only learning.

The shift to online learning and Bring Your Own Device (BYOD) programs in schools and colleges generates further difficulties for those with access and space constraints. Such programs presume that students have access to a laptop with certain requirements, reliable mobile internet connectivity, and generous data plans to complete homework, check schedules, and correspond with teachers. Parents and young people living independently who I interviewed spoke of the extra costs involved in having to pay for a laptop for study:

Yeah, I had to get an advance from Centrelink to be able to buy a second-hand laptop because I just couldn't afford to—like, I didn't have the money and I needed a laptop because I was starting TAFE.

Reporting on their three-year longitudinal study of 60 Australian households, Balmford and Hjorth (2019) concluded that BYOD programs have the dual effect of creating a potential digital divide for schoolchildren of lower socio-economic families while simultaneously creating an added financial burden in adhering to normative conceptions of what

constitutes a 'proper education', revised through new standards of mobile device ownership (p. 116).

It should not need stating that having a stable residence without the threat of eviction or violence is an essential prerequisite for an environment conducive to learning. While having access to digital technology is essential, it is not separate from the social and material context, which must be able to support safe and secure use. In the United States in 2019, over 1.35 million children and youth aged 5–11 were without a stable residence (Gultekin et al., 2020). Multiple studies have identified negative educational outcomes associated with being unstably housed, including delayed grade progression, social isolation, poorer health, bullying, and compromised future educational opportunities. In Mission Australia's annual youth survey, even though going to university was the post-school plan for the majority (52.5 per cent) of young people who had experienced family homelessness, this group had much lower levels of confidence in their ability to achieve their plan (Hall et al., 2020).

While it is accurate to say that many of the limitations that people in my studies faced were an outcome of their homeless circumstances and the consequent conditions of heightened mobility, insecurity, and poverty, this does not provide a full account of these barriers to digital access and engagement. Options for access are also structured by the segmentation of the mobile phone market, which is differentiated according to a wide range of psychographic and demographic variables including income, age, gender, education, and ability (Weinstein, 1994). One negative outcome of strategies of market segmentation is that consumers with less purchasing power are precluded from features and services that are available to others. To illustrate this gap, at the time of writing this chapter, a new entry-level Apple iPhone 13 with a dual ultra-wide camera system, night mode, HDR retina 6.1-inch display, facial identification, 128 GB storage, and A15 Bionic chip was priced at A$1349 (Australian Apple Store, 2022). For a young person on a government youth allowance, this represents more than a month of their fortnightly income of $530 (as of January 2022).

The structuring of the mobile market around the production of newer, more expensive models and the ensuing 'upgrade culture' create a pool of cheaper handsets available for consumers with less to spend. However,

reliance on cheaper, older, and underpowered handsets has negative consequences for people experiencing homelessness. It reduces the range and quality of engagement and the potential to leverage digital activities and social networks to connect with peers, expand opportunities, access education, and build capital. It restricts access to only those sites and services that support older features and/or operating systems and slower access speeds. It takes more work and effort to use faulty and underpowered models, peering through broken screens and obtaining replacement models on the hop when older models are lost, stolen, or beyond repair. It locks users into a process of having to maintain, repair, and replace their handsets more often and at a higher cost. Second-hand laptops can result in a similar experience of restricted use and reliability, creating what Gonzales, in her study of 72 low-income US residents, described as a culture of 'technology maintenance'. This refers to the ongoing work by resource-poor media users to repair recurring disruptions to their access, a cycle she calls 'dependable instability' (Gonzales, 2016).

Prepaid and Lock-In Contracts, Exit Fees, and Bill Shock

'Poverty premiums', or the additional expense charged to people on low incomes for mobile services, are another negative effect of a market structured by segmentation and other pricing strategies that disadvantage the poor and those in precarious circumstances. A 2016 study carried out on connectivity costs for low-income consumers by the South Australian Council of Social Services, found that poverty premiums in the telecommunications industry were rife across a number of fronts. The study found that one of the key ways in which poor telecommunications consumers pay more is through the limited allocation of mobile data in prepaid plans (Ogle & Musolino, 2016).

Prepaid plans are mobile phone plans that allow consumers to prepurchase selected amounts of data and voice minutes on a needs basis. This capacity to flexibly adjust spending makes them a popular choice among low-income consumers. They are also the preferred option for

homeless mobile media users. Of the participants in my first study, only 18 per cent were signed up to mobile contracts, with many having converted to prepaid after exiting a postpaid contract. However, even with a prepaid service, a large proportion of users—57 per cent—reported having difficulty with their mobile phone payments.

The key problem with prepaid plans is that the allocation of data and call minutes is not enough for the digital needs of those who rely on mobiles as their main or exclusive form of access. People experiencing homelessness use their mobiles for keeping in contact with friends and family and for interacting with support and government services. Yet mobile calls to timed numbers and wait times on hold are very costly[1] and are a regular feature of contact with these agencies. Some participants reported that they attended centres in person just to avoid the cost of the call and wait time. Others spoke of running out of credit on their prepaid mobile service and having to sign up for a postpaid plan just to be able to meet the contact and reporting requirements of Centrelink, the social security service run by the Australian Government's Department of Human Services (now Services Australia). Some had creative ways to save costs and stay connected, like using public Wi-Fi in shopping centres, cafes, and at McDonald's. Others simply ran out of credit, left unable to make calls, send texts, or access the internet.

The implications of not having a working phone when homeless, including immediate risks to physical safety, are so adverse that people who are homeless are forced into making purchase decisions that ultimately cost more, sometimes resulting in 'catastrophic spending' (Mendoza, 2011, p. 2). Catastrophic spending, as described by Mendoza, is when a purchase of a good or service is made even though it may result in a more extreme outcome like missing out on other essential items such as food and housing, or going into further debt. The purchase of a postpaid mobile plan in order to gain immediate access if a handset has been stolen or lost is an example of catastrophic spending. This happened to a young woman interviewed, who told me:

> *When I was young, I lived on the street. So, I'd lose a lot of phones or they'd get stolen from me. Then when I was old enough to get a phone plan, I got them and then I had a lot of trouble with that, so they blocked the phone. I'd get rid*

of the phone and get another one and then they kept letting me sign up for plans that I couldn't pay. Now they've given me a bad credit rating, so a friend had to put a phone in their name for me.

Having the time and wherewithal to seek out longer-term, affordable options is hardly possible when facing multiple threats and complex life challenges. As a result of mobile contracts with high exit fees, and not being able to meet monthly payments, people who are homeless and already in a situation of extreme hardship face mounting bills and spiralling debt. Of the 28 per cent of participants who reported having a mobile phone debt, I found those who were most vulnerable and had the most complex needs—participants with a mental illness or a disability, and single parents—were more likely to have reported difficulties paying bills and experiences of debt relating to their mobile phone.

It is important to understand that the heavy dependence on smartphones, while in large part a product of homeless circumstances, is also a result of the necessity to access services by digital means and to fulfil reporting and compliance obligations that others are not required to satisfy. This pushes up the demand for digital access and data usage. Moreover, as Ogle and Musolino (2016) found in their analysis of monthly spend to value of service, many prepaid plans do not represent the same value per dollar spent than postpaid plans, so that even when mobile users prudently opt to use prepaid plans to avoid getting into debt, they end up paying more for their data and voice calls by virtue of needing to purchase top-ups and accruing excess fees over and above their prepaid data allocation. This poverty premium built into the pricing strategies of mobile products and services, working alongside neoliberal regimes that penalise recipients of welfare and other social benefits, reinforces and compounds social and digital exclusion.

The concept and phenomenon of the 'poverty premium', also known as the 'poverty penalty', while recognised by poor mobile phone users who feel its impacts, is under-theorised and under-researched. We know from the work of Prahalad and Hammond (2002) that it is a feature of emerging economies. Their research found slum dwellers in Dharavi, a district of Mumbai in India, paid more for rice, medication, water, credit, and telecommunications. Increasingly, the same phenomenon of paying

more per unit is the subject of study by economists and social scientists in developed countries (Dalsace et al., 2012). This extra cost paid by lower-income consumers goes beyond financial expenditure. A 2011 report by Anglicare Tasmania, *The Price of Poverty*, found that in addition to paying more for telecommunications, poor Tasmanians pay more for food, housing, and electricity (Flanagan & Flanagan, 2011).

The poverty premium is not isolated to the telecommunications industry; as Mendoza (2011) has argued, it is a more generalised function of inequality in participation in the market. However, we know that access to an internet-enabled mobile phone has become increasingly essential for social participation, something without which it is difficult to access government services and satisfy service demands and obligations that are disproportionately imposed on some sections of the populations. The relatively rapid shift in status of the mobile phone from a so-called 'luxury' to a 'necessary' good is a worldwide phenomenon; Agüero and de Silva (2009) carried out research on patterns of expenditure on mobile phone services, finding that in six emerging Asian economies (Bangladesh, Pakistan, India, Sri Lanka, Philippines, and Thailand) the mobile phone is economically classified as a necessary good. At the same time, they found that real expenditure did not vary much according to income, with the poorest consequently paying more as a proportion of their personal income. Poverty premiums built into mobile products and services are an additional burden for people on low incomes and others experiencing various forms of extreme hardship, resulting not only in extra financial expense but also in additional costs on their time and health.

Consumer Confusion and Exploitative Retail Practices

The number and variation in mobile plans and services have created an environment for consumer confusion and retail practices that target and exploit vulnerable and disadvantaged customers. In interviews with people experiencing homelessness, I learned that encounters with retailers and customer service officers produced the biggest cost on their mental

health and wellbeing. Jack, the young man introduced at the chapter opening, who owed over $10,000 to two telecommunication companies after being signed up to four mobile phone contracts in short succession, was severely impacted by his mobile debt experience. As a result of his inability to pay for these services, his accumulating debt, and some difficult customer service interactions, his mental health declined:

> *Yeah, it was a lot of stress. A lot of stress and sleepless nights and stuff like that, and them saying, 'I'm sending debt collectors round to your mum's house'.*

The ability to navigate this treacherous landscape is highly dependent on having cultural and social capital (Bourdieu, 1986): confidence in making decisions based on familiarity with available products and services and access to a network of friends and family members who can share their tips and know-how. Leek and Chansawatkit (2006), in their study of the Thai mobile phone industry, found that handsets, carriers, and phone services were a source of considerable confusion to consumers, with older consumers much more likely to experience confusion than younger ones. Reliance on friends and family as a source of information was the foremost strategy employed to allay consumer confusion relating to the mobile phone market. Similarly, in my study, young people in particular relied on peers, as well as stories shared on social media, to get information about the most affordable product or tips on how to save on costs.

The problem of unscrupulous mobile resellers signing up vulnerable people without any affordability checks has been widely reported on and interpreted as a failure in the market (Flanagan & Flanagan, 2011). In Australia and elsewhere, various consumer protections have been put in place to try to reduce these practices, including financial hardship policies, consumer protection codes, and the appointment of a telecommunications ombudsman. However, I argue that consumer confusion and exploitative retail practices are more than market failures: they are an intrinsic way in which access is controlled and commodified within an unequal market system that exposes those people who need access the most to more cost and harm. Their greater need for a working mobile phone, in combination with their being in a position of diminished

power to access information, negotiate or obtain advice from others, creates what might be described as a 'risk premium' that is built into the mobile telecommunications marketplace. This disproportionately disadvantages vulnerable and low-income mobile-only consumers.

Mobile-Only Means 'Second-Class' Access

People who are homeless are highly dependent on smartphones; they are their primary, if not exclusive, form of internet and telephone access. On the surface, smartphones fulfil an access need by making digital connectivity possible for a group who are highly mobile and who lack the resources necessary to have regular access to the internet and telephone. This can be interpreted as a 'digital choice', something that makes sense in the context of the practical everyday challenges of digital access and use. As Rennie et al. (2019) found in a research on remote Indigenous communities in Australia, cultural kinship practices and residential mobility are important factors in the preference for mobile phones over fixed connections. They suggest that 'shifting the discussion of digital exclusion to "digital choices" restores some agency for those for whom the decision not to adopt [satellite broadband] is a practical choice, weighed up against a host of trade-offs and inconveniences' (Rennie et al., 2019, p. 115). However, as they also point out, this 'choice' is not without its consequences. Mobile-only access results in a range of deprivations relating to poorer-quality, lower-standard, more expensive, and contingent access, as well as exploitative retail practices that structure the experience of digital access not only on the cost and quality of the service but also in terms of users' time and health.

Mobile phones are an extremely limited form of access compared to the multi-platform access enjoyed by the majority; a choice imposed where there are few or no options. Pointing out the rise of an 'emerging underclass' of smartphone-dependent users in the UK, Napoli and Obar (2014) argued: 'mobile Internet access represents an inferior form of Internet access on a number of fronts—content availability, platform and network openness, speed, memory, and interface functionality among other things' (p. 330). Home broadband is considered the gold standard

of access, providing a central hub for a wide range of digital devices and experiences (Mossberger et al., 2012). This multi-platform environment is also increasingly required for full participation and citizenship in a digital society.

We know from the extensive research carried out on digital disparities around the world that being on the digital margins results in being locked out of or having curtailed access to a wide range of economic and political activities and ways to enhance one's prospects through new skills and opportunities (Robinson et al., 2015). While the route out of homelessness is not a straightforward matter of securing and capitalising on digital access, there is little doubt that social members with higher levels of digital access and engagement are likely to be more advantaged social members (Robinson et al., 2015). People experiencing homelessness, and homeless young people in particular, have their social worlds and opportunities curtailed as a consequence of having limited, poor-quality 'second-class' access.

The phenomenon of 'second-class' access via mobile internet is starting to gain traction among policymakers and researchers. Thus, while some have argued that mobile phones go some way towards offsetting digital exclusion, there is a growing concern about their limitations for achieving full access and engagement (in addition to the aforementioned, see also Correa et al., 2020; Marler, 2018; Reisdorf et al., 2020). During the COVID-19 pandemic, this problem has become more acute, with new studies showing much higher COVID-19 risk profiles among those who encounter digital inequalities (Beaunoyer et al., 2020; Robinson et al., 2020). To advance a research agenda, van Deursen and van Dijk (2019) have proposed the model of 'material access inequalities' to highlight the existence of the first-level divide in countries where fixed and mobile broadband have become ubiquitous and taken for granted. Drawing from the results of their survey of a representative sample of 110,000 citizens in the Netherlands, they identify three areas in which these differences materialise: *device opportunity*, *device and peripheral diversity*, and *maintenance expenses*. The advantage of this model is that offers a way to measure and quantify the impact of new and existing access differences in digital societies. However, though personal and positional inequalities are linked to the model, technologies and the industries that produce them are assumed to be neutral in the construction of such differences.

My research contributes to this emerging literature by confirming the existence of mobiles as 'second-class' access among groups experiencing homelessness and by showing how poverty of access is bound up in existing social disadvantage and class positioning as well as its materialisation in mobile media products and services. 'Second-class' is a product of homelessness, which makes mobile-only access a normal and inexorable feature of everyday digital media use. 'Second-class' access is also an outcome of classification and ordering of media products and services within a system that distributes resources unequally, privileging those who have more of these resources and thus more purchasing power, and penalising those with less. The mobile communication market is very much part of this system of segmentation and punishment, in the way handsets and plans are designed and costed, and the way the market is organised and controlled. This produces a new set of barriers and burdens for people experiencing extreme financial and other forms of hardship. In this way, the mobile marketplace operates as one of the key domains through which relations of inequality are reproduced.

'Second-class' access is also closely tied to the overarching argument made in this book that connectivity is one of the key dimensions of precarity, which since Barbier's (2002) original formulation, has come to refer to a generalised life condition within globalised and neo-liberalised capitalist economies. More recent formulations of 'precarity' engage with its digital dimensions, and from these, we can start to develop a picture of the role of digital connectivity. Kergel and Heidkamp (2017) offer the heuristic of 'double precarity' to capture the dual processes of precarity that exist within and through digital media. Precarity *within* digital media is a result of 'a stable instability' that emerges from rapid media changes that are hard to keep up with, and precarity *through* digital media is produced by the acceleration of economic precarity by digitisation.

The term 'information precarity', by Wall et al. (2017), has been devised to describe the unstable and unpredictable conditions that refugees encounter in accessing news and personal information. Harney (2013) observes that mobile technologies function as a defence against the precarity of migrants' working lives in the context of neoliberal regimes and diminished welfare. The authors of the *Digital Precarity Manifesto* and members of the Precarity Lab see precarity as an inherent

function of digital economies, in which technology is used to take advantage of and extend conditions of flexible labour and insecure employment, particularly in the Global South (Precarity Lab, 2019; 2020).

My term 'precarious connectivity' describes how traditionally excluded social groups unevenly bear the risks and uncertainties associated with shifts in communication patterns and processes of digitisation. As do these other authors, I prioritise the digital aspects of precarity as these encompass broader dimensions of everyday life, arguing that features of communication access create or exacerbate structural inequalities. Far from securing a platform for independence and participation in a digital society, people who are homeless and others struggling with various forms of precariousness are positioned in a relation of dependence, contingency, and restricted use through their reliance on smartphones and the imposition of a 'second-class' form of access.

Conclusion

The rise of 'second-class' access presents a new set of challenges for developing digital inclusion policies and approaches to digital inequalities. First and foremost, mobile-only access needs to be recognised for what it is not: it is not a substitute for all other forms of digital access, nor is it a magical salve that will overcome existing inequalities by enabling people to escape extreme hardship and deprivation. Following on from this, we cannot address 'second-class' access without addressing the interrelated social inequalities that give rise to it: the need for secure and affordable housing, for an adequate basic income, for affordable and equitably distributed goods and services, and for social support that enables people to belong in a wider sense and to build on their social and cultural capital. Without addressing these inequalities, there is a risk of perpetuating unstable and inequitable conditions of access, and indeed homelessness, rather than mitigating against these. Finally, while investment in digital inclusion schemes such as public connectivity networks, public libraries, subsidy schemes, and other access measures are needed, these approaches alone fail to get to the crux of inequality and how it is reproduced. Rather, as Crooks (2022) suggests, we need to shift our attention from technological

solutions: 'the persistent appeal of access to technology and the equally persistent failure of tech-focused solutions to address social problems reinforce each other' (p. 11). Paying attention to the market and the material structuring of the mobile phone exposes the ways in which media assemblages embed inequalities in their design and delivery. Just as homeless smartphone-dependent users pay more for their digital access and suffer from less-reliable connections with fewer options and features, so too do they carry a greater share of the increased cost of institutional digital service reform. Chapter 4, Bearing the burden, focuses on how people who are homeless use mobile communication to navigate digitisation in the service relationship, such as with homelessness support services and health and government agencies. This group is increasingly required to access a wide range of services online, increasing the need for an internet-enabled mobile phone and heightening the risks of smartphone dependency in the provision of critical health, welfare, and support services.

Note

1. The Australian Commonwealth Ombudsmen carried out an investigation into complaints made by customers of Centrelink and found the cost of calling was a heavy financial burden on mobile calling customers. Colin Neave, Department of Human Services: Investigation into Service Delivery Complaints about Centrelink (Commonwealth Ombudsmen, Australia, April 2014).

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4

Bearing the Burden: Digitisation of Government, Health, and Welfare

At the bus stop this morning, I looked up from my social media reverie to see the words 'Hungry for data?' plastered to the side of a bus, advertising a new deal from a budget mobile reseller. The question stared back at me in large, urgent-looking font, demanding to be answered. Sure enough, it is a question that taps into a real issue for many media consumers: the amount of data available is simply not enough.

The Australian Bureau of Statistics reported that total data downloaded by Australians over 3 months to June 2018 was over 3.8 million Terabytes, a 28% increase from the previous year (ABS, 2018). In 2021, during the COVID-19 pandemic, this grew to 8.8 million Terabytes over the same period (ACMA, 2021). It is a similar story around the world. Alongside this growth in data traffic is the multiplication of devices to carry out digital activities. Australian adults use on average four or more types of devices to access the internet, with 73 per cent

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J. Humphry, *Homelessness and Mobile Communication*,
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accessing internet-connected smart technologies such as smart TVs, wearables, voice-controlled speakers, smart security systems, and GPS tracking devices (ACMA, 2020).

The relation of data use to devices is important to understand because it indicates people's choices and capacities to shape and manage their data use. In Chap. 3 we saw that a growing number of people are predominantly or only using a mobile phone for their online access, and this is a worldwide phenomenon. While this trend is expanding digital access for social groups who hitherto had no other way of connecting, it is a limited, expensive, and precarious form of 'second-class' access. In Australia, mobile-only consumers have a substantially lower inclusion score than the national average and they are much more likely to experience other forms of disadvantage (Thomas et al., 2019).

In contrast, the average Australian internet user accessed the internet and consumed data in a multi-platform media environment, with the home a key hub of digital activity. There has also been a big rise in the number of households connected to Australia's National Broadband Network (NBN), with 73 per cent of networked households now using a fibre connection (ACMA, 2021). Being mobile-only means paying more for data. Accessing video, audio, and data-driven content on a mobile phone is more expensive than via fixed broadband. As previously noted, if on a prepaid plan, you pay a premium for data, and this will limit or shape your digital activities. This is a concerning trend and, as Thomas (2016) points out, suggests that the rise of the mobile internet might be leading to a further stratification of access because even though the overall price of data has gone down, we are using more of it than ever before.

The changing practices and norms of device and data use have implications for digital participation and inclusion, particularly for homeless and otherwise marginalised and lower-income groups. How might these changes in data use and expectations of access be contributing to social and digital inequalities? What new directions and approaches in digital inclusion research and policy are necessary to tackle exclusion in data-driven societies? Digital inclusion research has shifted to a broader program focusing on digital inequalities, and within this, there is robust attention on the different types and capacities of connection, literacies and skills, and the ability to benefit from digital participation (DiMaggio

& Hargittai, 2001; Halford & Savage, 2010; Ragnedda, 2017; Robinson et al., 2015; Van Deursen & Helsper, 2015; van Deursen & van Dijk, 2014). However, we are starting to learn that digital participation in data-driven systems can lead to new harms through the dangers of increased surveillance, exclusion, and discrimination (Daniels, 2018; Dencik & Kaun, 2020; Eubanks, 2018; Henman, 2020; Noble, 2018; Pasquale, 2015).

In this chapter, I explain how the digitisation of government, health, and welfare services creates an extra cost burden for people experiencing homelessness. Despite a wide range of user strategies for negotiating access and affordability barriers, deepening dependence on smartphones leads to more expense and 'dependable instability' (Gonzales, 2014, 2016; Gonzales et al., 2016). I argue that the outcome of these changes is further complicated by the circumstances of homelessness and by the different treatment of such groups accessing online services. As a consequence of widescale processes of datafication that run in parallel with service digitisation, relations of connectivity are entangled in new fronts of social and digital inequality. This has far-reaching implications not only for the design of services but also for how we ought to tackle the digital and social inequalities produced by such changes.

From Lifeline to Leash in the Context of 'Digital First'

The essentialness of the mobile phone for people who are homeless has been established through multiple studies, with my own research and research in the United States, Canada, and the United Kingdom confirming that a mobile acts as a lifeline to stay safe, find work, stay in contact, and learn new skills to overcome homelessness through easier access to information, health and support services, employment, and housing opportunities. The flip side of these digital benefits is that access to mobile communication is structured in a way that penalises poor and marginalised media consumers. As explained in Chap. 3, the marketplace of mobile handsets, plans, and services creates the conditions for a

'second-class' form of access for those who can't afford middle-range and higher-end products. Likewise, reliable access to the internet and data is needed for participation in an online service environment, and this data access comes at a cost.

In Australia, the Digital Transformation Agency, the Australian government's dedicated unit for implementing its digital agenda, developed its 'Digital First' roadmap for shifting all government services into a digital environment by 2018. A five-year Digital Transformation Strategy (2018–2025) was developed to extend the roadmap to deliver digital 'services that are simple, personalised and available wherever you need them' (DTA, 2018). Similar whole-of-government transformations are underway in other countries. In the United Kingdom, the 'Digital-by-default' strategy was first established in 2010 in response to the recommendations of Martha Lane Fox, known as the UK's 'Digital Champion'. The goal of the UK Government Transformation Strategy 2016–2020 was to 'transform the relationship between citizens and the state—putting more power in the hands of citizens and being more responsive to their needs' (Gov.UK, 2017, p. 6). Similarly, under President Barack Obama, the US government introduced its Digital Government Strategy with the main aim to '[e]nable the American people and an increasingly mobile workforce to access high-quality digital government information and services anywhere, anytime, on any device' (Digital Government, 2018).

With these changes, people who are homeless are increasingly required to access services in an online environment. When I conducted my 2014 study, which consisted of a survey and interviews with 95 young people, families, and adults experiencing homelessness, 70 per cent of those surveyed accessed information online to use banking, government, health, and other essential services. This was relatively early in the digital transformation of government agencies. Program managers who I interviewed at the Australian government's Department of Human Services (now Services Australia) expressed pride in the progress of their digital service reform. They had just launched a national trial of their 'Digital by Design' project, in which selected client groups (students, families, and jobseekers) of Centrelink, the agency that looks after social security payments, were shifted to online portals and mobile channels for all their

transactions, which had previously been conducted over telephone and face-to-face.

Contrary to the assumptions we might have as to who the early adopters of digital government are, it is often the most vulnerable groups who are at the forefront of these changes, since it is they who engage most with government services (Baldry et al., 2012). Even within subsets of the homeless population, the use of support services goes up among those who are multi-disadvantaged. A 2016 study of homeless young people seeking help from Specialist Homelessness Services (SHS) found that those who had been in the child protection system or under youth justice supervision not only were more likely to experience homelessness, but also interacted with SHS services at a higher rate than other young clients (AIHW, 2016).

Mobile apps are increasingly the point of entry to a wide range of government and everyday services. The highly publicised *Express Plus Medicare* and *Centrelink* apps, launched by the Australian government's Department of Human Services in 2012, have become an established means for interacting with public health and welfare agencies despite having received some initial criticism. The apps are now integrated with the *myGov* app and online portal from which you can, according to the department's website at the time of writing: 'access all of our online accounts—Centrelink, Medicare and Child Support—as well as other government online services in one place, with just one username and password' (Department of Human Services, 2019). By November 2016, *myGov* had a reported 11 million active accounts and the Australian government had spent A$86.7 million on its development (Australian National Audit Office, 2017).

In part because of the penetration of mobiles across all sections of society, there is excitement about apps for reaching out to vulnerable and hard-to-reach populations. The 2013 *Australian Public Service Mobile Roadmap* captured this sentiment in its statement that: 'Australian Government agencies are embracing the potential of mobile to engage more effectively with mobile users—when and where they want to' (Department of Finance, 2013, p. 1). The high rate of mobile ownership within the homeless population has been used to make a case for technology-based health and support interventions (Eyrich-Garg, 2010;

McInnes et al., 2015; Rhoades et al., 2017). In a review of health-related mobile apps in the United States, Van Ameringen et al. (2017) found that 165,000 apps had been developed and released to the public in 2015 for treating mental health. During my research, an Australian app, *Ask Izzy*, was developed to deliver targeted, geolocated information catering to the homeless. In the United States, a spate of apps have been developed in various states with similar or complementary objectives: the Dallas Christian charity app *OurCalling*, the Chicago-based app *StreetLight*, the New York City app *HelpFinder*, and the San Francisco app *Concrn* (Douglas, 2018).

According to Chen (2017), in her review of government digital transformation in Australia, service interactions are being digitised across two main fronts: the provision of information to consumers online, and the digital delivery of a service-related application, transaction, or booking. While the shift to online services is sometimes planned as an extra delivery channel, it can also be designed to replace other service access options. The Program Director of the Department of Human Services (now Services Australia) explained the main objective of their digital agenda as 'shifting the bulk of customers away from the face-to-face and telephone channel to what we call "self-management"'. Thus, while there may be an intention to provide extra or alternative points of contact, in practice users are directed to apps or centralised web portals such as the Australian government's *myGov* site, which consolidates many kinds of interactions and transactions on a single platform.

Besides using apps and web-based service portals, people who are homeless use their mobiles for a range of activities to communicate with and access government and support services. Telephone calls from mobiles remain the primary way in which support workers and clients stay in contact with one another. In the words of one support worker interviewed: 'It's probably the key contact point because to even refer to us, it's all done by phone'. SMS and free messaging services play a very important role in defraying the high cost of phone calls and providing telephone access in the face of diminishing alternatives as public payphones are replaced or left in disrepair.

What this means is that people who are homeless and other vulnerable groups are heavily dependent on a smartphone: to gain access to online

government services and to fulfil a range of reporting and compliance requirements, to contact support workers, to seek employment, to attend job interviews, to look for housing, and to carry out banking. And, as governments channel people's transactions through apps and web portals, the data needed to cover the cost of downloads and online service interactions will only increase.

Online Services and Connectivity Costs

While governments justify the shift to online servicing in terms of increased efficiencies and reaching out to more customers through digital channels, the shift to apps and web-based services reinforces the necessity of mobile internet access. This necessity comes at a cost that is transferred onto individual users through increased data usage and self-management of services previously facilitated by service personnel.

A cost analysis of mobile phone expenditure based on monthly mobile payments reported in my 2014 study showed a marked disparity between the expense of mobile services for a person on income support benefits compared to those for a person on an average monthly salary. For a young person on Youth Allowance, the proportion of costs ranged from 6.4 to 8.7 per cent of their monthly income. For a single person on Newstart,[1] it ranged from 5.2 to 7 per cent. This compared to 1.4 per cent spent on a mobile phone for someone on an average Australian monthly salary. This might not sound like a big disparity, but when total monthly income can be entirely consumed by house rental, it is a significant cost. The South Australian Council of Social Services found that two-thirds of the 523 low-income consumers they surveyed rated telecommunications in the top five items of their household budget, and 62 per cent reported 'difficulty paying, having to cut back, or having to stop using one or more telecommunications services for financial reasons in the last 12 months' (Ogle & Musolino, 2016, p. 17).

The expense of telecommunications for those on low or no incomes (as for many who are homeless) is compounded by the higher price per unit of data for prepaid mobile plans. Prepaid mobile plans allow selected amounts of data and voice minutes to be pre-purchased and are the

preferred option for many when homeless. Of those surveyed in my research, 82 per cent were on prepaid mobile plans, with many having converted to prepaid after exiting a postpaid contract. But, as Ogle and Musolino (2016) found, prepaid mobile plans typically include less call, text, or data value and provide lower value per service and per dollar compared to postpaid plans. Mobile data also continues to be more expensive than data in fixed broadband plans (Thomas et al., 2019, p. 17). This means that despite the increasing availability of low-cost mobile phone handsets and service plans, poor consumers are not only paying more as a proportion of their income; they are paying more for their access.

The cost of connectivity goes beyond financial expense; it is interconnected with health and wellbeing outcomes. Many of those in my study had prior mental health conditions that worsened because of the financial stress of mounting mobile and data bills. Vulnerable clients with complex needs were more likely to have reported difficulty paying bills and experiences of debt with their mobile phones. Of the 23 participants who reported a debt, 12, or 57 per cent, of them also reported having or having had a mental illness. This compared to 39 per cent of all participants who reported having or having had a mental illness. Within this group of 12, four also had a physical disability.

A 2018 Bankwest Curtin Economics Centre study on the digital divide in Western Australia provides further evidence of stress around the cost of digital goods and services. The study found that one in ten of the poorest families is spending at least 10 per cent of their expenditure on digital products and services, and that digital stress was most pronounced among single parents and non-elderly single women (BCEC, 2018). The expectation of personal responsibility for the financial management of digital services is an additional pressure and source of anxiety. Based on data from the 'Price of Debt' study of debt and health among 286 adults in Boston, Massachusetts, Sweet (2018) found that 'for many adults living with chronic consumer financial debt, notions of personal responsibility, shame, and failure dominate narratives about their debt experience' (p. 87). This 'self-blame' discourse, which Sweet (2018) links to a neoliberal economic context, was found to have direct health effects, leading to higher blood pressure and worse emotional and psychological health.

Exclusion from online services as a result of insufficient credit or limited data is another related connectivity cost. Many of the support workers I spoke to who worked in community homelessness centres and charities pointed out this connection in observing that some of their clients were not contactable when they tried to reach them. Mobile 'turnover', the cycling between multiple handsets, and 'churn', the swapping of SIMs or plans, were cited as key reasons for this lack of contactability:

> *Well, that affects us because if we don't get the updated number and we're trying to ring them, sometimes it will say the number is disconnected or sometimes they change it. Some of them have a couple of mobiles and don't even tell us that one is out of action and you keep leaving voicemail messages.*

'Turnover' and 'churn' are media practices particularly observed among low-income mobile media users (Roessler, 2018). While predominantly an outcome of the lack of reliable and affordable mobile internet access, such practices are compounded by sleeping rough, and transient or unsafe housing arrangements, which create considerable difficulties in maintaining a single, privately owned, charged, and operational phone safe from theft or breakage. Marler (2019) describes such practices in terms of 'accumulation', referring to his study of low-income and homeless residents of Chicago, many of whom possessed additional phones, some acquired through the US Lifeline mobile phone subsidy program. He argued that by being able to back up data, share phones and realise capacities across devices, people in poverty are able to approximate the quality of phone access experienced by those with fewer resource constraints and more stable living conditions.

Nevertheless, despite these benefits, accumulation strategies are a further cause of 'turnover' and 'churn', which in turn lead to additional service interruptions, and, as I discovered, to a reversion to more traditional means of contact. As one support worker in a Sydney community homelessness centre explained, even though they were providing services online, many of their clients were not making contact with them via the internet:

We will occasionally get a referral from a new person from the internet, or someone might email us something they want us to print or they want to print when they come to the office. They don't really do that email contact a lot. That may be because of data costs on mobile phones are quite expensive and they don't have a lot of it, so they tend to just text or phone. A lot of the time they'll ring us and say, can you ring me back, because they don't have any credit or going to run out of credit.

It is to be acknowledged that community support services, without the kind of financial and staffing resources of large government agencies, are placed in a difficult position with regard to digital transformation. Many of the community-based support workers I spoke to referred to digitisation as inevitable, as something 'they had to do', something imposed on them as much as it was on their clients. Others were decidedly more positive, adopting narratives of technologies' promise to open up and democratise access. At the same time, the cost of connectivity among their clients was high and was rarely the focus of attention unless service access was interrupted or clients were unreachable. Powerful narratives of 'digital-by-default', 'self-management', and 'personal responsibility' played into the normalisation of digital ubiquity and obscured the underlying sources of their clients' digital precarity.

Connectivity Strategies and 'Dependable Instability'

People who are homeless use a variety of tools and techniques to maintain connectivity and manage the cost of digital and data access to retain access to services. Among those I surveyed and spoke to, a key strategy is the use of prepaid mobile plans, which, compared to postpaid plans, provide more flexible payments and a physical limit on the use of credit, thereby reducing the risk of debt. Restricting internet use through mobiles to only those services deemed most essential is another common practice, meaning that public libraries, free Wi-Fi services, and computer terminals in government foyers and community centres offer a vital service in bridging access gaps. Other examples reported included using

Wi-Fi to subsidise internet access, limiting or avoiding downloads, turning off features on the mobile phone that consume data in the background, and using free messaging and callback services to avoid costly charged calls. Facebook Messenger and other free messaging apps were especially popular as a substitute for mobile calling and texting.

Sharing mobile phones to make up for lack of credit, or missing, broken, or stolen phones, was also a strategy used to stay connected and was found in other studies of homeless and low-income phone users (Gonzales, 2014; Gonzales et al., 2016; Marler, 2019). Nevertheless, though this strategy was crucial for parents in my research who had only one smartphone among all family members, I found it to be less used among young people and adults. This may have had to do with the potential risk to users that sharing represented in terms of increased usage and access to personal information by a third party, fuelling the need to switch phones ('turnover') and deal with unexpected debt ('bill shock'). Indeed, this came to pass with one of the young women I interviewed, who had purchased a new mobile phone for a friend in her own name and then became responsible for a financial debt when her friend defaulted on the payments in the contract. Similar risks of private sharing of mobile phones have been observed in other studies (Burrell, 2010; Ureta, 2008).

Thus, while many connectivity strategies are financially prudent, they can result in interrupted connectivity and further expense, leading to what Gonzales and co-authors have described as 'dependable instability' (Gonzales, 2014, 2016; Gonzales et al., 2016), referring to the cycles of disrupted access resulting from the inability to maintain regular access. The theory of 'technology maintenance' was first proposed by Gonzales (2014), drawing on her research of low-income urban residents in New York City, where she found that even after access is widely available, ongoing struggles to maintain digital access led to disrupted digital access as well as to medical and social services, employers, and other support systems. She argued that new dynamics of digital exclusion are at play in contexts where media technologies have reached saturation point in a given population. My research provides further evidence of this problem for people who are homeless, a problem whereby strategies to address access gaps lead to more costs to stay connected and new harms in the form of increased costs, financial debt, and exclusion from services.

To provide a further example to illustrate this, a young woman in my study recounted the challenge of meeting welfare eligibility requirements while living in a refuge without a payphone. Because her prepaid mobile service kept running out of credit while on hold to Centrelink, she signed up to a postpaid contract, only to end up in financial difficulty with a debt and a poor credit rating. Hers was not an isolated case. Since the consequences of not having a working phone when homeless are so adverse, people who are homeless are forced into making decisions that put them at greater risk and ultimately cost them more, an example of what Mendoza (2011) has called 'catastrophic spending'.

Although users' connectivity strategies are limited in terms of overcoming the access and affordability inequalities that people who are homeless face, they are important to recognise and understand. This is because, firstly, they challenge the notion that people who are homeless are helpless, without agency and dependent on others. Indeed, this stereotype has been very damaging in the past because of the way people have been blamed for homelessness as if it is 'their own personal, psychological failure' (Lawler, 2014, p. 88). Contrary to this false notion, people in situations of homelessness tend to be very digitally savvy and resourceful despite material and social deprivations. Such strategies are part of a broader suite of adaptations or 'digital repertoires' (Donner, 2015) developed to deal with severe resource constraints, which sociologists have studied as a phenomenon in many low-income communities, sometimes referring to them as 'coping strategies' (Reife et al., 2020).

Moreover, connectivity strategies are not solely performed for instrumental reasons but also to assert control over personal environments and experiences, which as Veness (1993) explains, is an important way in which people who are homeless 'use symbols, space, language and ritualized behaviors to define place and to empower themselves' (p. 324). One strategy that was especially striking in this regard was avoiding interacting online and using voice calls or face-to-face services where possible, as explained by this young woman at a homelessness centre in western Sydney:

> *I was having problems with Centrelink and needed to contact them and they were like, no, you've got to do it online and I was like, but it's not working*

online. I hate going online. I'd prefer to just sit in line for three hours than to deal with it.

She went on to say that she would prefer to call Centrelink to speak to someone, but this too was problematic because of the long times spent on hold. Her preference for speaking to a person underlines the ongoing value of the telephone in delivering support and health care, a value also reflected in the extraordinary uptake of 'telehealth' during the COVID-19 pandemic (ACMA, 2021). It also points to the social significance of 'the face' in daily encounters, something extensively written about by French phenomenologist Emmanuel Levinas. For Levinas, 'the face' (and by extension, we could add the qualities of voice) has the power to place us within expressive and empathetic intersubjective relations, which he described in terms of 'ethical encounters' (Levinas, 1991). Seeking out voice and face-to-face interactions in accessing services might thus be interpreted as a strategy not simply for avoiding online services when these fail, but for countering the alienating effects of the abstraction of human relations by data relations. Nevertheless, like the connectivity strategies previously discussed, these affective strategies generate other problems for accessing services in the context of diminishing in-person options, expensive wait times, and reduced frontline personnel.

Another reason why connectivity strategies are important to recognise is that they point to underlying disparities and sources of inequality that might otherwise be hard to detect. On the practices of 'turnover' and 'churn', for example, Roessler (2018) explains that these are important precisely because they demonstrate that continuous access and ownership cannot be assumed as a given, and that such practices create a vicious cycle of dependence on low-cost, second-hand mobiles that fuels more churn. Unlike householders, who exert a high degree of agency and shape their media through ownership, thereby 'domesticating' them (Silverstone et al., 1992), for those who are without stable housing and are dependent on smartphones such opportunities are severely circumscribed. Media in daily use threaten to 'stay wild' or de-domesticate at any moment, resulting in 'dependable instability' and more effort and time spent on 'technology maintenance' (Gonzales, 2014, 2016). In addition, connectivity strategies reveal that in the shift to an online service environment, new

and ongoing access and data needs arise, and those who rely on these services the most are also the most impacted by these changes. Such findings point to the kinds of issues that service providers as well as governments need to take into account in the design of new services and digital inclusion policies.

Datafication Impacts, Risks, and Harms

Data use driven up by service digitisation has been the focus in this chapter so far and is behind much of the increasing need for mobile internet access and the subsequent dependence on smartphones by homeless and marginalised groups. There are, however, new issues resulting from service digitisation that relate specifically to the impacts of datafication. Social media companies have made datafication central to their business model, capitalising on the vast pools of personal information and metadata online to repackage and sell to advertisers and third-party data brokers (van Dijck, 2013, 2014). Governments, welfare service agencies, and health industries are similarly caught up in the drive to data—not only to digitally capture and convert existing collections of data but also to create new kinds of data structures, processes, and subjects made governable through this process (Dencik & Kaun, 2020; Eubanks, 2018; Henman, 2010, 2020; Hintz et al., 2018; Lyon, 2003b). In this final part of the chapter, I examine new risks, harms, and barriers for people experiencing homelessness that emerge with datafication of government, health, and welfare services. I focus on digital identification, the commoditisation of data, and its use for targeting and profiling homeless and otherwise marginalised populations.

Digital Identification

Social media companies' plans to move to 'verifiable' identities for their users make headlines, but establishing a person's legal identity has long been a basic requirement of eligibility for welfare benefits and a wide range of other essential services. Access to identity documents, such as

birth certificates, bank account details, and passports, is a major challenge and obstacle for people who are homeless, particularly during a crisis that immediately precedes homelessness. This was starkly highlighted by one young man who described his experience of homelessness at a co-design workshop in western Sydney in 2016. Having left home after repeated instances of family violence he found himself on the streets, unable to independently receive youth allowance because of his age and a lack of identity documentation:

> *It took me about two weeks to find out (about services). I had to go through Centrelink. They didn't believe me that I was homeless and my dad kicked me out. I was 13 and my dad was getting my Centrelink money.*

While processes of identification have long been a part of welfare administration, the digitisation of identification is more than a simple change of medium. As United Nations Special Rapporteur on extreme poverty and human rights Phillip Alston explained, identification is one of the areas of welfare administration that are reconfigured through new kinds of data-driven welfare systems (2019). At a base level, in addition to access to documentation, converting identity documents into digital form and navigating online forms and interfaces requires new digital skills as well as access to the internet and a device to support these activities. For those who have had to leave their belongings behind or have had belongings damaged or destroyed in the process of becoming homeless, these access and ability demands are barriers to accessing help in a crisis. Identification of homelessness is itself a major barrier for people getting help—as the young man's story above highlights—since many health care services and government agencies fail to recognise homelessness when they encounter someone experiencing it (Miller et al., 2020).

It was on the basis of these issues, that two of the access solutions proposed by eight recently homeless young people who attended the same co-design workshop addressed the challenges of identity documentation. 'Secure Charging Lockers' was an idea that this group came up with to respond to theft of belongings, with particular mention of the risk of document loss such as key identification papers and cards. Another idea, 'Library as Catalyst', also addressed the problem of identification by

proposing a library program that would include a 'digital portfolio' service to provide help with a proof of identity, resume, and document management (Humphry & Pihl, 2016). In the subsequent stakeholder workshop, librarians noted that negotiating identification and identity systems was a real challenge for their homeless library patrons, and they strongly favoured ways of better supporting these needs. At the same time, they voiced concerns about the digital expertise and resources needed and the widening of library services to areas outside their jurisdiction.

Beyond issues of exclusion, digital identification is also tied up in the ways in which people are socially sorted into categories to determine eligibility for and receipt of particular kinds of services (Eubanks, 2018; Lyon, 2001, 2003a) such as access to emergency accommodation and social housing. In Australia as of June 2020, there were 155,100 households on the waiting list for social housing (AIHW, 2021). This is an underestimate of the actual need, since it fails to count groups who are unable to join the waitlist or who fall off it for a variety of reasons, including not having a place of residence or operational phone number. Social sorting by digital identification entails both an abstraction of the person into data form and simultaneously a way to 'open and close doors of opportunity and access' (Lyon, 2003a, p. 27). Thus, people who are homeless are regularly excluded from social housing, not because they aren't eligible but because they aren't able to prove or maintain their position on the digital waitlist.

Governments the world over are accelerating the shift to national digital identity systems, centralising many forms of identity documentation, management, and verification. In India, the biometric identity system *Aadhaar* relies on a 12-digit randomised Universal Identification Number linked to unique biometric markers such as a fingerprint or retina scan, stored digitally. Introduced in 2009, after ten years the system had registered the identities of 1.25 billion people (Chowdhry et al., 2021). Nevertheless, Rao (2013) found that despite policymakers' claims that this system would 'render legible' (p. 72) the entire population, without the assistance of social workers who laboriously gathered proof of identification papers for Delhi's urban homeless, these groups would have remained invisible to the system.

In the United Kingdom, the government has outsourced its digital identity verification processes to the private sector with its 'GOV.UK Verify' service, tasking accredited companies with assessing whether a person is who they say they are for accessing online government services (Whitley, 2018). In Australia, the federal government plans to introduce a digital identity system to access all government services, outsourcing its identity verification to a mix of public and private accreditation suppliers (Australian Government, 2022). Alongside the benefits of digital identity systems, such as not having to carry hard-copy sensitive documents and prove one's identity multiple times, the technology and data demands, the new skills needed and the centralisation of digital identification create new barriers for accessing services, and risks of exclusion and discrimination.

Commoditisation of Data

One implication of the concentration of services online and centralisation of identification in digital form is the commoditisation of people's health data. Just as social media companies build detailed databases of personal and technical information of their users, 'manufacturing customers as commodities' (Zwick & Denegri Knott, 2009, p. 221), so too has the health sector embraced health products driven by user patient data. By 2019, the global digital health market was estimated to be worth US$175 billion (Statista, 2022). Van Dijck and colleagues argue that health-related platforms as one of the growing pillars of 'the platform society' (van Dijck et al., 2018). Citing health companies like PatientsLikeMe and 23andMe as examples, they explain that privatised social media and health technology are increasingly 'being stacked onto, and interwoven with' a global industry and infrastructural ecosystem that collects, harvests, and sells people's health data (van Dijck et al., 2018, p. 98).

The sale of patient data by governments to the private health industry has come under increasing scrutiny, particularly after a spate of high-profile data breaches resulting from the re-identification of supposedly de-identified population health data (Davis, 2017; Teague et al., 2017).

For people experiencing homelessness and other marginalised groups who interact more frequently with government services than other groups, the risk of having one's health data sold or leaked is not only higher but also has potentially greater adverse consequences. The Office of the Australian Information Commissioner publishes periodic statistical information about data breaches under the Notifiable Data Breaches scheme. In its 2021 January to July report, 464 breaches were notified under the scheme for the first six months of the year, affecting thousands of people, with 55 per cent of these malicious or criminal attacks, and contact information, identity data, and finance details the most common type of data accessed (OAIC, 2021).

The datafication of health takes place across many fronts, or 'different scales and registers' (Ruckenstein & Schüll, 2017, p. 262), covering whole-of-population data as well as personal information sources for public health, clinical health, medical research, and self-care. Across all these registers there are asymmetries in the adverse impacts of health datafication. These same authors point to the rise of the 'data poor', referring to patient groups who not only have less control over exercising their own data but also suffer from a lack of medical data, which can make people vulnerable by causing them to miss out on tailored health solutions. Opportunities for engaging in 'self-care' with personal data generated using self-tracking technologies are similarly curtailed for those who are unable to afford expensive wearables like Fitbits and smartwatches (Ruckenstein & Schüll, 2017). The 'data poor' are thus locked out of any privileges that come from being a 'digitally engaged patient' (Lupton, 2013).

Data Profiling and Targeting

One of the most concerning aspects of health datafication is the capacity to use the data collected from digital tracking tools, apps, and algorithms to classify, predict, and modify people's behaviour. Real-time GPS data, for example, in combination with health data might be an exciting source of information for developing health interventions, but is also a basis for data exploitation, social sorting, and privacy invasion. In a metareview of

homelessness research using GPS technology, one cited study in Tokyo, Japan, used a flyover drone equipped with a thermal camera to identify and measure the size and proximity of homeless encampments, and to record their 'temperature' (Semborski et al., 2022). This example resembles the intense scrutiny of the poor apparent in the plan announced by the Australian government in 2017 to test wastewater in targeted areas for traces of illegal substances to determine if welfare recipients had been taking drugs. If tested positive, recipients were to be forced on to cashless welfare cards, which were being tested in remote Indigenous communities (Karp, 2017).

The use of data for profiling and targeting marginalised populations by government and welfare services is not a new risk. Eubanks (2018) points out the long history of data use as a means to discipline and punish the poor in her examination of the digital automation of welfare systems in the United States. Nevertheless, as the United Nations Special Rapporteur on extreme poverty and human rights warns, the rise of 'the digital welfare state' (his preferred term over the neutral-sounding 'digital transformation') sets this in overdrive. Governments the world over, he explains, use systems of social protection and assistance driven by digital data and technologies 'to automate, predict, identify, surveil, detect, target and punish' (Alston, 2019, p. 3).

In other countries there are numerous examples of tracking the movements of targeted groups such as refugees, migrants, and homeless populations using mobile apps, GPS, drones, and other tracking technologies. The use of certain apps and technologies can be heavily racialised as in the case of the cashless welfare cards trial, officially the Cashless Debit Card program, among remote Indigenous communities in parts of South Australia and Western Australia. The trials, which commenced in March 2016, involved quarantining government income benefit payments in order to control spending patterns deemed to result in welfare dependence and social harm. For the trial, 80 per cent of a recipient's regular benefit is paid into the debit card account, restricting purchases to consumables, and excluding alcohol and gambling. In 2019 there was an Australian Senate inquiry into a proposed Bill (The Social Security (Administration) Amendment (Income Management to Cashless Debit Card Transition) Bill 2019) to continue compulsory income management. The report by

the Senate Community Affairs Legislation Committee cited wide-ranging concerns in submissions about harms related to stigma and discrimination against cardholders and being excluded from cash-based second-hand and market goods, while also being limited to the online services that relied on digital access. In addition to access issues, there were increased costs from credit card fees and store charges and increased disengagement from the social security system. To avoid the hardship of being on the card and experiencing its punitive effects, participants were withdrawing from government income support entirely (The Senate Community Affairs Legislation Committee, 2019).

Conclusion

Analysis of the consequences of smartphone dependence and the drivers of data use provides some clues as to how we might pursue digital inequalities research and policy. Addressing the challenges of access and the skills needed to overcome inequalities is one step towards improving digital and social inclusion. Such responses need to recognise the distinctive challenges of accessing online services when smartphone dependent and those that arise from a lack of secure and safe housing. There is also a need to grapple with the new social and data harms that accompany large-scale digitisation and datafication, understanding the role that connectivity plays as the basis for new mechanisms of identifying, and then disciplining and punishing some groups.

As we saw in Chap. 3, the materiality of access is itself far from neutral, and instead is highly ordered around the delivery of differentiated devices, services, and retail experiences, resulting in a substandard form of 'second-class'. In this chapter, we have seen how marginalised and low-income groups are enrolled into the processes of digitisation and datafication in distinct and asymmetrical ways. People who are homeless and others who rely heavily on health, welfare, and government services are the most exposed to and subject to these processes. They bear more of the burden of the consequences of digitisation and datafication and also pay more for it financially, physically, and emotionally. The financial costs and pressures accompanying these changes are an onerous burden on people's

lives and lead to other adverse impacts on health and time. They may even perpetuate homelessness.

As datafication spreads to more and more spheres of life, Dencik and Sanchez-Monedero (2022) reiterate concerns raised that 'the burdens of datafication overwhelmingly fall on resource-poor and marginalised groups in society' (p. 9). They situate data harms within new forms of digital governance and citizenship that increasingly take on commercial and technological dimensions as governments outsource key infrastructures and services to private companies, demanding a response that is grounded in goals of 'data justice' (Dencik & Sanchez-Monedero, 2022).

The implications of datafication for changing regimes of governance and citizenship is a burgeoning research field, and the need to understand the role of digital connectivity in these is more important than ever. I take up and address these issues in forthcoming chapters, where I advance the argument that connectivity underpins these new regimes, just as it does the business models of social media companies that rely on the extra value that can be extracted from the exchange of personal data for 'free' access to platforms (van Dijck, 2014). These regimes are similarly modelled on neoliberal values and expectations of individual risk mitigation, self-management, personal responsibility, and 'self-care'. They rely on imperatives of connectivity, yet simultaneously obscure how connectivity relations reinforce existing structures of inequality and contribute to conditions of precarity.

Connectivity strategies are a significant feature of the everyday digital experiences of people who are homeless and a way this group negotiates precarious connectivity. Yet even when great resourcefulness is employed to stay connected, these user strategies are not enough to overcome the inequality of access structured into relations of connectivity. In Chap. 5 I examine this issue in the context of people who are homeless navigating the urban environment to meet needs for digital access, for basic survival, and to move out of homelessness, highlighting the challenges as well as the affordances of cities as sites of connectivity. I expand on the examination of connectivity strategies initiated in this chapter, proposing the concept 'survival infrastructuring' to describe how homeless media users creatively appropriate and improvise their digital access and use within urban space. Yet even with such strategies, access barriers, in combination with the design and regulation of urban space, structure the mobilities of

people who are homeless, subjecting them to new imperatives of movement, surveillance, and control.

Note

1. Newstart is the national income support allowance paid to eligible unemployed Australian citizens between the ages of 22 and 64 delivered by Centrelink, an agency of the Department of Human Services. As of the time of writing, the weekly Newstart payment was AU$275.10 for a single person with no children, a rate that has not increased beyond price indexation adjustments in over 20 years (see report by Deloitte Access Economics, 2018).

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5

Precarious Mobilities: Homelessness and Digital Access in Urban Space

Pretty much like everyone else, just walking around endlessly just trying to find a simple connection … I'm walking around and I just have my Wi-Fi open checking, trying what crops up on the page, trying to find something that works, usually you can't even find anything anywhere. It's pretty hard. (George, 18)

George was a young man who attended a co-design workshop in Sydney in 2016 with seven other recently homeless young people. Over two days, the group worked with a co-design expert and me to develop a series of solutions to problems of access and service barriers for young people in urban areas. The project also involved an exercise of mapping phone and internet access options in the places participants had visited or spent time in when homeless, mainly in the inner city and outer suburbs of Sydney. During the workshop, young participants shared stories of their homelessness experiences, building understanding and empathy within the group. These formed the basis of problem scenarios for designing new

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technologies and access solutions, which were further iterated at another workshop attended by representatives from local councils, libraries, charities, telecommunication firms, and youth services. George's words at the chapter opening quote highlight one of the key differences in homeless young people's experience of digital connectivity compared with their homed peers: the disproportionate amount of time spent wandering the streets, looking for free wireless connection. People who are homeless—and especially homeless young people—are impacted by a host of access challenges arising from the costs and contingencies of mobile connectivity and the particular forms of regulation imposed on them owing to their homeless circumstances.

Urban spaces and their design and regulation are important fronts for surfacing digital inequalities. We know that digital inequalities are complex and multifaceted, structured by pre-existing social, economic, and geographic inequalities (Ragnedda, 2017; Robinson et al., 2015; Witte & Mannon, 2010). However, very little is known about the social and spatial inequalities embedded in the infrastructures and spaces that make up the connectivity fabric of cities and that are increasingly called on to support mobile forms of digital connection. Studies of digital disparities have focused on socio-spatial differences across neighbourhoods, regions, and other kinds of places, but one place can produce different experiences of connectivity—what Crang et al. (2006) labelled 'variable geometries of connection' (p. 2551).

In this chapter, I focus on findings from my 2016 Sydney-based co-design project as well as on research I carried out in 2018 into LinkNYC, a digital kiosk network installed across New York City's five boroughs by the private company Intersection in partnership with the City of New York. I explain the role of mobile phones for different groups that are homeless and examine the challenges as well as the affordances of cities as sites of connectivity, showing how access barriers produce new imperatives of movement, which are enforced rather than chosen. This condition of being 'fixed in mobility' (Jackson, 2012, 2015) operates in stark contrast to the mobility choices of the more privileged in city spaces. At the same time, mobile communication complicates the spatial dynamics identified by Lefebvre (1991), Massey (1994) and others, who explained that space is a social production, with its own 'power-geometries'

(Massey, 1994). Mobile phones, in particular, are central to the way people's relationship to space is reconfigured in and through technology (de Souza e Silva & Frith, 2012; Hartmann, 2013; Hills, 2009; Humphreys, 2010; Ling, 2012; Wilken & Goggin, 2013), governing not only what can be accessed in those spaces but also the kind of connections made, how spaces are viewed and inhabited, and the risks and opportunities associated with those spaces.

The chapter proceeds through a series of questions: What is the role of mobile communication for groups who are homeless in urban space? How are the movements of groups who are homeless structured by the space of the city? What are the spatial politics of access and how are these experienced through mobile phones? In what ways do homeless mobile media users create their own meanings and uses within and against the spatial politics of the places they move through? In describing the strategies used by homeless groups to negotiate connectivity barriers, I propose the concept of 'survival infrastructuring' to describe the place-based strategies and creative improvisations homeless groups employ to gain access and make their media work in situations of heightened risk. Building the book's broader argument, the chapter explains how precarious connectivity is a function both of urban precarity and of the differential mobilities experienced by homeless and marginalised urban groups. I make suggestions for further research and policy to address the socio-spatial dimensions of digital inequalities, factoring in the role of design and urban governance.

Homelessness and Mediated Communication 'on the Move'

Peter had travelled to Sydney after a period of being homeless in Queensland. He'd left home when he was 16 after a series of problematic fostering experiences, and spent about three months living rough in and around his foster family's hometown in South East Queensland. For a while he slept in a dog kennel in his best friend's backyard. He explained how important his mobile phone was during this period, in part because

of the lack of alternatives: 'Where I grew up a lot of the phones don't actually work, they are already fried …'. With few support services and still homeless, Peter decided to leave behind the isolation of his coastal hometown and catch a train to Sydney. Peter lived on the street in Sydney's inner suburbs, sheltering in building alcoves and alleys for several weeks before finding the help he needed to move on from living rough. Life on the city's streets was harsh, but it was better than his home town, said Peter: 'there were more free services'.

Peter's experience and those of his peers highlight the important role of the mobile phone for people experiencing homelessness and the attraction of the city as a site for making connections (digital and otherwise). As previously noted, a mobile phone provides a way for them to find work, carry out education, and learn new skills through easier access to information, services, employment, and housing opportunities. Listening to music, game-playing, and movie-watching are also important uses for people who are homeless in coping with challenging and stressful circumstances. A point of difference between homeless young people and homeless adults is that the use of the mobile phone for entertainment is typically explained not as an activity that stems from their homeless circumstances but from the need to participate in popular culture: 'I play games all the time on it, listen to music, just the usual stuff that people use mobile phones for'. My research found—as others have identified—that social media was key to homeless young people's identity and sense of belonging, and this covered creating and as well as consuming content.

The mobile phone is also the primary means for accessing support services and complying with welfare benefit requirements. Support workers of community homelessness services identified the mobile as the primary means for communicating with their clients: 'It's probably the key contact point because to even refer to us, it's all done by phone'.

In Chap. 4 we saw how digital transformation of government, health and social services is rapidly switching front-facing human services to online portals accessible via mobile apps. This heavy reliance on smartphones is compounded for people experiencing homelessness, who have a higher level of interaction with support and government agencies compared to others (Baldry et al., 2012). The necessity of a mobile with internet to access services and meet government obligations, in combination

with its special value for homeless young people, makes this group heavily dependent on smartphones. As one young woman put it: 'They're expensive but you like, you depend on them'.

Cities as Sites of Connectivity

For the very reason that mobile internet access is unaffordable and contingent for homeless young people and other homeless groups, city centres become critical sites for their affordances of connectivity, to subsidise costs and to offer free and safer access alternatives. Affordances, in this context, refers to the materiality of urban spaces and infrastructures to constrain and enable particular kinds of connective activities. Davis (2020) defines affordances more generally as 'how objects shape action for socially situated subjects' (p. 17). Various definitions of the concept have since been developed, building on Gibson's (1979) original use of the term. Davis's (2020) account of affordances emphasises its political dimension: the way in which technical infrastructures are materially imbued with constraints and enablers that are power-laden with particular interests, values, and purposes. Wi-Fi hotspots, government self-service terminals, computers at public libraries and support services, and computers belonging to friends or family are all vital to people experiencing homelessness for their connectivity affordances. These sites are enablers of connectivity not only for the digital access they provide but for their spatial affordances, without which people who are homeless are put on the move, in search of a connection and a place to safely access and use media.

This experience of searching for Wi-Fi might sound familiar. Difficulties in staying connected and contactable is a condition shared by professionals who work on the move (see, for example, Ciolfi & De Carvalho, 2014; Humphry, 2014). For high-speed professionals, even relatively brief outages can be experienced as impediments to meeting demands of 'multitasking, always-on connectivities, the continuous interactions of multiple scales and fluid co-ordination' (Crang et al., 2006, pp. 2556–2557). Free Wi-Fi and charging stations helpfully plug a gap in connectivity for this group, supporting the corporate uses of urban space by well-connected mobile citizens.

Nevertheless, for some highly mobile groups, the time and effort spent searching for a digital connection disproportionately structures their daily lives and prospects. Homeless young people travel to city centres, sometimes from faraway places, in part because of the concentration of digital access options and the potential to get help and support. Like George in the opening account, wandering the city looking for Wi-Fi, homeless young people traverse urban spaces to secure free phone and internet access, stretching out their time using Wi-Fi in a cafe by, for example, buying a juice or a packet of fries. One of the workshop participants explained his strategy of catching a tourist shuttle bus to use the free Wi-Fi, which was available for free for the first two or three stops; then he'd hop off and do it again. Others knew all the public libraries in the local area and the train stations that had free Wi-Fi hotspots and access to electrical outlets (like Sydney's Central Station), and would organise their day to visit these sites to access the internet, charge their handsets and take refuge from the street.

Sociologist Emma Jackson, who carried out research on homeless young people in the United Kingdom, explains this phenomenon in terms of being 'fixed in mobility': the physical and political structure of the city demands constant movement to access the resources necessary to survive. She gives the example of a homeless young man who walked eight miles a day to a London emergency relief centre just to be able to get a free lunch (Jackson, 2015). Comparing homeless young people's mobility to her own as a cosmopolitan academic, Jackson (2012) points out that 'our mobilities are shaped by different forces and different kinds of choices about where we can go' (p. 726).

Similarly, options for digital connectivity and the physical design and regulation of cities shape and constrain the mobilities of homeless young people. Many Wi-Fi services found in city centres are concentrated in and around shopping centres, restaurants, and cafes. Two of the Wi-Fi services reported on as most used by the homeless young people in the co-design workshop were those provided by the ubiquitous fast-food restaurant chain McDonald's and Westfields Shopping Centre in Parramatta. At the time of the study, Westfields offered free Wi-Fi through a partnership with mobile service provider Optus Yes. To register, users were asked to sign in with their Facebook profile or email address to receive 3 h free (or 1 GB). Based on site observations, Westfields was a popular place for

young people to socialise, eat and shop, particularly in and around the food court and cinema areas, an observation corroborated by the young people at the workshop.

Yet these access points don't come without risk or strings attached. Many free Wi-Fi services involve payment after an initial free period and are dependent on consumer activities. They might demand further movement, and are usually situated in visible, high-traffic areas. In using these services, young people in particular are subject to extra scrutiny by shoppers, vendors, and security guards. They are at risk of being searched, asked for their name or banned from entry. Alongside the growth in these ostensibly free Wi-Fi hotspots is a decline in the number of alternative sites for making a phone call or accessing the internet as internet cafes and kiosks disappear, and public pay phones are repurposed or fall into disrepair. The mobilities—and immobilities—of urban groups are thus highly dependent not only on the affordances of connectivity but on the ways in which cities differentially enable groups to make material claims on urban space.

For the vast majority of mobile phone users, with a home to charge devices and access alternative platforms, these issues of access gaps might be of little concern, or at most an inconvenience. But for homeless young people, these conditions increase dependence on the smartphone and expose them to additional costs and harms. The precarious and insecure conditions of being without a home create connectivity barriers. At the same time, connectivity barriers magnify homelessness, imposing a state of precarious mobility, creating physical risks, and taking up time and energy that could be spent getting the support and assistance needed to move out of homelessness. Therefore, even though many different groups seek out free Wi-Fi and places to recharge their mobiles, the reasons for doing this, and its ramifications, are not the same, nor are they equally experienced.

LinkNYC and Its Use by New York City's 'Street Homeless'

The case of LinkNYC is illustrative of the way a promising connectivity infrastructure initiative can end up reinforcing the precarious mobilities of homeless and marginalised urban groups as a result of the socio-spatial inequalities that manifest in its design and use. The LinkNYC kiosks or

'Links' that I studied over the summer of 2018 in New York City were being installed to replace the existing public payphone network across the city's five boroughs. CityBridge, the original consortium behind the LinkNYC design, was created out of two of the winners of the 'Reinvent Payphone Design Challenge' announced in 2013 by the City of New York, Titan and Control Group, with new partners Qualcomm and CIVIQ Smartscapes (Shapiro, 2018). In November 2014, Mayor de Blasio announced that CityBridge had been granted the city-wide franchise to install the LinkNYC kiosk network, in the same year that the old payphone franchise was set to expire (Office of the Mayor of New York City, 2014). In 2016, Intersection, a new start-up that was formed from a merger of Titan and Control Group and was financed by Sidewalk Labs, a subsidiary of Alphabet, Google's parent company, took over the building and roll-out of LinkNYC, branding itself as 'a technology and media company redefining the urban experience' (Intersection, 2016).

Through July 2018, I carried out interviews, site observations and document analysis with the aim of understanding the digital inclusion outcomes of the newly installed Links. In total I interviewed 36 people: nine young people at a homelessness refuge, ten clients and two staff members of community centres that provided homelessness services, five LinkNYC users with whom I carried out vox pops, or 'street interviews' (Beckers, 2019), two representatives of Intersection, the former counsel to the Mayor of the City of New York, the co-director of the Digital Equity Laboratory at the New School, three members of Rethink LinkNYC (a community group opposed to the Links), one digital inclusion policymaker, one librarian and a former LinkNYC ambassador, hired to help members of the public understand the features of the Links. I conducted site observations of Links in the boroughs of Queens, Manhattan, the Bronx, and Brooklyn, with the aims of inconspicuously observing whether, how and who interacted with the Links, and recruiting participants for the street interviews.

Each Link provides high-speed Wi-Fi and phone calls, USB charging ports, an emergency button, and mapping and city directory services through an inbuilt tablet. The services are free of charge at the point of connection. Intersection's business plan was to yield revenue through screen advertising on the Links' twin 55-inch digital displays, creating an

extensive 'out-of-home' advertising network. The screen advertising was designed to deliver targeted content to passers-by using real-time analytics generated from aggregated and anonymised counts of mobile phone devices.

The use of the Links by New York City's homeless has been widely reported, attracting media attention shortly after its launch in February 2016. News reports at the time focused on complaints about their use by the city's street homeless, who were purportedly camping around the kiosks for long periods of time, watching movies, streaming music, and browsing porn online. *The New York Times* at the time vividly pointed out how the kiosks were being turned into 'al fresco living rooms' by the homeless, referring to the 'unsavoury side' of the new digital kiosks (McGeehan, 2016). Working with City officials, Intersection responded by removing the web-browsing capability in the inbuilt tablet seven months after the kiosks were launched (LinkNYC, 2016). In a public statement they explained that: 'The kiosks were never intended for anyone's extended, personal use' (Rivlin-Nadler, 2016).

In 2018, two years after the LinkNYC launch, my own research confirmed that visibly street homeless appeared to use the kiosks more than other groups. They especially availed themselves of the Wi-Fi, free calling, mobile charging, 911 emergency button, Google Maps, and the NYC311 city services directory. For the young adults I spoke to at a refuge for LGBTIQ+ homeless youth in Manhattan, many of whom had travelled to the 'Big Apple' from other parts of the United States, the Links were an important source of Wi-Fi. Commonly, the Links were used to support internet and phone access through the mobile phone, which was highly valued among people who were homeless. As one young woman recently released from jail explained to me: 'My mobile phone is my everything. Everybody's phone is their everything because of all the gadgets and all the things you can do on it'.

For her and the other visitors to the refuge, the Links afforded a degree of reliability that their mobile phones lacked due to the risk of theft and breakage. The Links were spread throughout Manhattan every few blocks or so and were relatively well maintained within the city centre. The same person explained that just three days previously her mobile phone had been stolen while she was travelling on the subway, and she was currently

without a phone. She regularly used one Link in particular, on the corner of 36th Street and 8th Avenue near the public shelter she was staying at, which offered its residents no internet access.

Of those I observed using the Links, many appeared to be rough sleeping or they identified as homeless. I spoke to some of them in situ, and they told me the Links were helpful for gaining access to services and gave a feeling of safety, especially at night. A recently homeless young man told me:

> *I was homeless in this city and at the end of the day, the nights I ended up sleeping on the street were the nights my phone died. Those Link kiosks solved that problem 100 per cent. The fact that I can place [voice] calls right there, the fact that I can look up city services instead of trying to ask random people on the street where the closest homeless shelter is, any of that. That's amazing. I would not trade that for anything.*

Young people in general, not necessarily homeless ones, were another noticeable group who used the Links. Tourists and visitors to the city also used them. The day after the NYC Pride March, an annual event advocating for LGBTIQ+ rights, I spoke to a young woman who was draped in a rainbow flag, leaning against a Link kiosk, and charging her smartphone. She had been celebrating since the previous day's parade and had this to say about why she used the Links:

> *Just to keep in contact with people I need to keep in contact with. My first stop would be to walk to the 7 Train because there's Wi-Fi there. Then I walk around, walk a little bit, because I don't like standing in one spot, and as I go through the kiosk, as I walk past the kiosk, I'll see what my percentage is, or my battery. If I need to charge, I'll stop and charge a little bit, connect to the Wi-Fi that's on it.*

Like those who were homeless, young people used the kiosks' charging feature and used free calling to access services, maintain contact, and check in with family and close contacts to let them know they were alright. These regular acts of 'relational maintenance' (Baym, 2010), performed to reaffirm close ties and strengthen weak ones, also played a role for this group in maintaining essential care and support networks.

The Links were one of the sources of access and power that these groups used, making up a patchwork of connectivity options that they stitched together as they moved about the city. Other sources of internet mentioned were the subway, public libraries, community centres, and, in some instances, buses. The New York City Subway was a central feature in tales young people shared about maintaining connectivity in such a fast-moving, bustling, and crowded city. These findings were strongly suggestive of a role for Links in supporting the digital inclusion of some of the most marginalised groups and visitors to NYC. However, this account would need to ignore the new risks and barriers that emerged within the urban contexts in which Links were used, and the ways that they were embedded in pre-existing spatial relations and politics.

Underserved and Over-policed

Behind the plan to upgrade the extensive but ageing phone network was a push by the City of New York to address the deep-rooted social, economic, and infrastructural inequalities of the city. In 2015, over a third of NYC lower-income households lacked home broadband, and many of these were in households living below the poverty line in neighbourhoods in south Bronx and upper Manhattan, eastern Queens, and central Brooklyn (Dinapoli, 2021). The cost of broadband was also higher in most parts of the city than in other parts of the United States, costing between $50 and $125 per month and making up to 10% of the household budgets of low-income families (MOCTO, 2020).

Bill de Blasio came to power as New York City's mayor in January 2014 on a platform that promised to transform New York City by bringing 'an end to the tale of two cities—one rich, one poor' (Office of the Mayor of New York City, 2014). The promise of digital innovation and the redevelopment of the old payphone network came together to form the basis of de Blasio's wider strategy of universal broadband, outlined in the city's strategic plan 'One New York: The Plan for a Strong and Just City' (de Blasio, 2015). In a statement announcing the competition winner, de Blasio firmly rooted LinkNYC to digital equity goals, citing the digital divide as the root cause of its socio-economic troubles:

> *This administration has been committed to expanding affordable access to broadband for all New Yorkers from the outset. It's essential for everything we need to do to be a fair and just city, because we can't continue to have a digital divide that holds back so many of our citizens*. (Office of the Mayor of New York City, 2014)

The City achieved some of its aims to build equity goals into the repurposing the public payphone infrastructure. Using a 'design-challenge' approach that originated in a Wi-Fi pilot in 2012 initiated by the New York City Department of Information Technology and Telecommunications, the competition set down criteria that needed to be met, with contenders having to respond to a Request for Proposal (Maier et al., 2018).

The former legal counsel to Mayor de Blasio who was responsible for universal broadband explained to me that the payphone infrastructure upgrade was one step towards a larger plan for expanding broadband across the city, noting that installing underground fibre and gigabit wireless connectivity provided a foundation for future possibilities:

> *From my standpoint part what was so important, as the person who was responsible for universal broadband access, was we've got to figure out how to make it interoperable and leverage it to create a network of networks*. (interview with Maya Wiley, 2018)

In 2014, the City of New York entered into a franchise agreement with CityBridge for its LinkNYC proposal, which included a revenue sharing arrangement for the City to receive 50 per cent of the money earned from advertising during CityBridge's 12-year licence. Intersection partnered with local organisations Silicon Harlem and Per Scholas to obtain community feedback on the design (Maier et al., 2018), and later to familiarise the public with the Links' features using ambassadors recruited from Per Scholas, an organisation that provides IT training to low-income communities (interview with Per Scholas, 2018). The first of the Link kiosks were installed in the commercial corridors of central Manhattan, but within the first year, Jamaica in Queens, Crown Heights in Brooklyn, the South Bronx, and Washington Heights in upper Manhattan had all

received Links. By 2018 there were about 1700 units active across the five boroughs (interview with Intersection, 2018). But notwithstanding these overtures of community engagement, in the context of the long history of underserved communities and infrastructural discrimination, the Links were initially received by the public in lower-income city boroughs with suspicion and uncertainty.

Residents and community groups in Harlem, Brooklyn, and the Bronx distrusted the early installation of the Links in their neighbourhoods, associating the obelisk-shaped objects equipped with cameras and sensors with the potential for surveillance. The civil rights organiser of a Harlem homeless drop-in centre I interviewed saw the Link kiosks as serving a purpose for street homeless, who might otherwise be excluded from places that offered free internet access to patrons. But he identified communities of colour as especially vulnerable to having their data collected via the kiosks and used against them by law enforcement agencies:

> *What's to stop law enforcement from accessing this information and using it for population control? Because there are certain populations that have more interactions with law enforcement than others, let's just put that out there. In New York City, that would be black and brown people in poorer neighbourhoods.*

Link users I spoke to, who appreciated their connectivity benefits, approached these with a degree of caution—making risk trade-offs between the access they provided and their unknown dangers, particularly around the collection and harvesting of user data. A preference by locals in Harlem to use more trusted community options for access over the Links was apparent in my visits to the same centre, which provided four free-to-use, networked desktop computers in its front reception area. On the two occasions I visited, these stations were all occupied by people carrying out a range of computing activities that were more sustained, and not readily performed on a mobile phone. At one point, the director said to me, half-jokingly, 'I wish these dudes would apply for jobs instead of watching movies'.

Around the corner, the Link kiosk was used less frequently, with many kiosks in the surrounding streets in a state of disrepair. The Links were intended for 'short-term usage', something reflected in their design and

publicity material, documented in policy statements, and further shaped through changes made to the Links, as seen in the removal of the web-browsing capability in 2016 following reports and media coverage of their misuse by the city's homeless and others who 'lingered' around these (Huber, 2016; McGeehan, 2016). With their upright, narrow, open-to-the-air form set on sidewalks, the Links afforded little to no privacy or protection from the surroundings for people interacting with the tablet to make calls or look up services or use the free Wi-Fi or charging ports. Noise was a common problem of the Links, with just about everyone I spoke to mentioning the difficulty of hearing the speaker during phone calls, an issue summed up by one: 'It's pretty noisy in New York City'. Link users not only had to perform quite tricky manoeuvres to work around these limitations, but in their interactions with these, they were also on public display and subject to further scrutiny by passers-by.

Related to the increased risk of visibility is the way the Links interacted with and were received in the context of long-term policies of discriminatory surveillance and policing of black neighbourhoods using racialised technologies. The 'location-aware' advertising and the inclusion of the two cameras mounted above the advertising panels that recorded footage of users and passers-by added to the sense that the Links could augment the surveillance apparatus of the city. When asked about how they felt about the Links' cameras, some at the refuge pointed out that these changed the dynamics and purpose of the service, which was designed to help:

> *You put these things there to help, you know people that are homeless or have no source of charging of their things, or just have a dead phone. You know what I mean? Then again you're putting them in harm's way for being caught for petty crimes.*

Citing Sharpe's book *In the Wake* about Black lives after slavery, Daniels et al. (2019) remind us that: 'every technological innovation creates a wake, and in that wake are dire consequences for racialized communities' (p. 4). In the case of the Links, even when the company's privacy policies claimed to limit access to the camera footage (LinkNYC Privacy Policy, 2017), their affordances for surveillance could not easily be divorced from the racialised policing histories that manifest asymmetric power

relations and regimes of visibility in communities of colour (Browne, 2015; Scannell, 2018).

The differing concerns of locals across the boroughs were also evident in media coverage after the initial installation of the kiosks, with those in wealthier neighbourhoods focusing on the Links' aesthetics while those in lower-income districts expressed concerns about and pointed out their surveillance potential. Legal experts similarly pointed out that because 'socio-economically disadvantaged citizens may have to use these devices more than residents with home-based broadband access' (Brooks & Schrubbe, 2016, p. 949), these same users could be negatively affected by the Links' surveillance capabilities.

Notably, it wasn't just the Harlem residents who preferred the environment and facilities of the community centre over the exposed Links. While I did observe some women using the Links, by far the majority of users were men. The gendered dynamics of homelessness were also observed in the cafes and restaurants where I conducted many of my observations. In one McDonald's in lower Manhattan, a middle-aged woman at the table next to me carefully shielded herself and her smartphone using the menu and other props to create a provisional private space where she could access the internet and have a rest. A young woman at the Sydney co-design workshop wanted me to understand that her safety was the main consideration when she tried to secure a digital connection. She drew me aside to explain how her personal experience of homelessness differed from that of the other, male, workshop participants. Rather than wander the street or parks looking for Wi-Fi, she explained how she would seek out spaces like cafes, libraries, and the foyers of public institutions, which are safer places to rest than the street, and sometimes offer free Wi-Fi.

Providing internet access and computer use is not the core business of community centres and homeless shelters but the demand for these services has grown with the large-scale digitisation of the services necessary to survive and move on from homelessness. Many community centres and public libraries have responded to this challenge, providing dedicated support for people who are homeless. Yet the public housing shelter system in New York City has not to date effectively addressed this need. In 2019, the City Bar Justice Center reported on the availability of

internet access in the NYC municipal shelter system, finding that in only 6 per cent of cases were residents able to access the internet via the shelter, with 67 per cent wanting access but unable to obtain it (City Bar Justice Center, 2020). In addition to missing out on key services, the report noted that without access to the internet, 'shelter residents are in a constant struggle to find ways to access the Internet through other means, including spending what little funds they do have on Internet access' (p. 6). The everyday dynamics and histories of underserved communities and discriminatory infrastructures shape the contexts in which Links are used, how they are received, and the different needs and gaps that they meet. Shifting the analysis towards the materiality of urban space and its connectivity affordances points to the structural conditions and inequalities that shape the differential mobilities and communication experiences of people who are homeless.

Differential Mobilities and Spatial Exclusions

The differential mobilities of marginalised urban groups have been extensively explored with particular focus on the urban homeless as well as migrants and refugees. In introducing a special issue on migrant care workers, Bélanger and Silvey (2020) refer to the need to address the immobilities as well as the mobilities that characterise the experiences of transnational care workers. Referring to Massey's concept of 'power-geometries', the authors urge us to consider the relationship between the 'particular forms of movement' of these groups and 'the regulations and disciplinary pressures that delimit that movement' (p. 3424), noting that migrant care workers' movements are highly controlled, with strict constraints on who can move, and when, how, and where.

The way marginalised groups are treated is tied to the way in which spaces are defined and delimited with reference to those they exclude, providing the basis for how space is defined, governed, and policed. Jackson's concept of being 'fixed in mobility' helps to explain the way these dynamics of differential mobilities apply to homelessness (Jackson, 2015). Kawash (1998) argues that differences in mobility are products of the ideological separation between public and private domains, and of

the exclusion of the homeless precisely because of their inability to inhabit the private, to withdraw into the home. Public space is defined in direct opposition to 'the homeless body' in her account:

> *The question of homelessness is therefore necessarily always also a question of public space—of who the public is, of who may inhabit public space, and of how such space will be constituted and controlled.* (Kawash, 1998, p.325).

As Kawash (1998) points out, technologies of spatial exclusion such as padlocked gates and bench spikes are a deliberate strategy of protecting an exclusive definition of public space, played out on the microscale of the body, with the goal not to eliminate homelessness, but to eliminate the homeless. Homelessness—especially visible street homelessness—has historically been subject to high levels of policing (Wacquant, 2009), and urban objects can be co-opted into enacting policies to remove, displace and monitor rough sleepers (Davis, 1990), a practice described as 'hostile' or 'defensive architecture' (Doherty et al., 2008).

Access barriers in this reading are more significant than being just a matter of poor organisation and design. Connectivity barriers and limitations can be seen as another mechanism or technology through which such strategies of exclusion are carried out, propelling people who are homeless into a state of perpetual movement or wandering: 'Excluded from the public places that make up the city, the homeless exist in a perpetual state of movement' (Kawash, 1998, p. 327). Even when a digital kiosk might provide needed digital services to those in homeless circumstances, and even a kind of shelter of sorts (Weaver, 2016), the same service also draws people into public spaces, making them more visible to local authorities and members of the wider public alike.

This constant imperative towards movement looms large in the stories and accounts of those who are homeless. For those participating in my research in Sydney, Melbourne, and New York City, their own physical movements were structured by the designs and affordances of each city, which provided different constraints and possibilities for a place to stop and settle for a time. It is not coincidental, nor simply about the availability of free internet access, that public transport facilities and public libraries are such vital places for people who are homeless. Public shelters

lock people in at night, then lock them out during the day, pushing them onto the streets and making it impossible to work a job outside these limited opening hours. Links and other Wi-Fi hotspots are designed for short-term use to plug temporary access gaps, promoting seamless mobile connectivity through the city. In the face of such difficulties, Snyder explains that public transport systems and the like 'offer the opportunity not to travel from place to place but to suspend the body in transit while time passes' (cited by Kawash, 1998, p. 331).

Importantly, one of the considerations that go unacknowledged in the literature on homelessness and urban space is the way in which people's uses of mobile media reconfigure the mediated spaces of the city. Hartmann (2013) captures the combination of forced or unforced movement and mediation through the mobile phone in the way urban navigation takes place in her concept of 'mediated mobilism'. There is ongoing debate on and research into how the public and private are reconfigured through mobile media, with some pointing to new opportunities to privatise the public on the move captured in the concept of 'mobile privatisation' (Williams, 2003). In contrast, others have shown the potential for mobile media to enhance sociality, creating more fluid groupings (Sheller & Urry, 2006), practices of 'micro-coordination' (Ling, 2004), and a sense of 'connected presence' (Licoppe, 2004) through regular acts of contact, which is also important for maintaining essential networks of care and support.

These mediated mobilisms are some of the many ways in which people experiencing homelessness assert a place, or are 'emplaced' in Kawash's terms, against the constant threat of being displaced and placeless. Such strategies are part of the broader suite of connectivity strategies discussed in Chaps. 3 and 4, but go beyond these to form *survival infrastructures*, responding to the need for access and a safe place for using technology in the context of a lack of place or of being displaced.

Survival Infrastructuring

Connectivity strategies have a spatial dimension, in that movement is often required in order to obtain the array of resources needed for communication access and use. But these strategies not only are directed

towards securing digital access; they also extend to place-making practices for using media meaningfully and safely, such as keeping warm, finding a comfortable spot to rest, storing belongings, protecting one's body, and finding power. It is precisely for this reason that homeless young people rely heavily on public libraries, buses, shopping centres, and subway stations in the absence of suitable places to connect. In the words of one of the workshop participants: 'It's a place to go to feel safe and secure and get connected to services'.

'Survival infrastructuring' is the term I use to describe the repertoire of place-based connectivity strategies arising from the interrelated demands of needing to save costs, to secure digital access, and to find a safe place to use media when homeless in urban spaces. The concept has parallels with the model of 'technology maintenance', which holds that even after access is available, there are disparities in the ability to maintain access, leading to ongoing repair work and 'dependable instability' for low-income and marginalised groups (Gonzales, 2014, 2016; Gonzales et al., 2016). However, survival infrastructuring also encompasses the places in which connections are made. Studies of mobile media have highlighted the myriad ways in which media experiences are bound up in, formative of, and dependent on place (Wilken & Goggin, 2013). Connections are similarly place-bound and place-making, generative of new experiences and infrastructures.

Star and Ruhleder (1996), Bowker and Star (1999), and other science, technology, and society scholars have stressed the relational and situational quality of infrastructure, and the way these become meaningful relative to work practices in their particular contexts of use. In participatory design, the word has evolved into a verb to recognise that in negotiating and overcoming barriers in everyday technology use, users carry out 'artful infrastructuring', designing-in-use rather than having technologies designed-for-use (Karasti & Syrjänen, 2004). In a similar way, the spatial practices of connections form temporary infrastructures, or what Crang et al. (2006, p. 2561) describe as a 'background assemblage of technologies and practices'.

For those without homes, survival infrastructuring thus becomes a key means for securing access and power for charging, and making connections, oftentimes working around or against the connectivity affordances

of urban space. As a set of spatial practices, survival infrastructuring has something in common with the process of media domestication by which individuals and groups appropriate, or shape the meanings and uses of media, within the spaces in which media are used. However, while for householders and other privileged mobile user groups this shaping is a matter of choice or discretion, for those with scant resources infrastructuring is a matter of survival, precipitating the need to engage in often risky behaviours and practices in order to obtain basic necessities such as access, food, and shelter (Gallant, 1991).

'Home' in this sense might be understood as a partial and precarious experience of ubiquity that is generated through the stitching together of multiple access options, akin to the 'polymedia' strategies (Madianou & Miller, 2012) used to choose between media platforms to find the best social fit within a wider media ecology. While never a substitute for a material shelter, the potential for mobile-mediated sociality, often invisible to the observer, complicates and challenges the stereotyped figure of the isolated and lonely homeless urban dweller, whose smartphone may well be the source of 'hyper-social' activities. This conception draws attention to the way in which home is as much a process and set of practices as a stable material entity (Lloyd & Vasta, 2017). The sense of ubiquitous connectivity is vital for supporting the essential relational maintenance (Baym, 2010) that we have seen in young people's use of social media and drives their need to check in with their friends and family when mobile in urban space, a need that is even more acute when they are homeless.

Survival infrastructuring draws attention to the partial way everyday practices are able to deal with these fundamental structural inequities in *the absence of home*. The value of this more dynamic definition of infrastructure, as Horst (2013) has suggested, is in exposing the relations that media consumers have with broader social, political, economic, and material structures over which they exercise limited control. These inequities are rooted in multiple forms of disadvantage. Homelessness is itself a social product of pre-existing disadvantage and is a source of new disadvantage, leading to increased physical and mental harm (Whitbeck, 2011). In a sense, by making home-making strategies more visible and legible, survival infrastructuring draws attention to some of the key

characteristics and requirements of home. Yet while many of the strategies employed by homeless media users are novel and innovative, they can also involve new limitations and risks, resulting from the imposed state of wandering, extra scrutiny, and physical exposure.

In the case of LinkNYC, my research of the kiosks revealed that they acted as a lifeline for people who were homeless as well as for young people, two highly mobile groups in urban spaces that depend on smartphones for access. At the same time, the Links drew people into public spaces, and made them more visible to local authorities and the wider public alike, reinforcing the gendered and racialised dynamics of urban spaces in which the kiosks were placed. Even when survival infrastructuring by homeless users was carried out to overcome the Links' constraints, such as using them for longer times than expected, camping out around them, and leaning against them, these practices were ultimately ineffective as strategies for addressing long-term connectivity needs or for transforming their homeless circumstances. Once again, this perspective leads us away from understanding survival infrastructuring as an individual response to homelessness, and towards a focus on the conditions that create the need for these infrastructure practices in the first place, demanding that we go beyond the question of survival to the question of justice in cities.

From Survival Infrastructuring to Justice in Cities

The imaginary of LinkNYC was in some senses an ideal of a more just city at the level of its access infrastructure. The discourse of digital equity and inclusion was embraced by the City of New York and repeated by local politicians, aligning equity goals and policies with the powerful narrative of the digital future. Maya Wiley, former legal Counsel to Mayor de Blasio exemplified this discourse in describing her vision of LinkNYC as 'a part of the foundation for ubiquity' (interview with Maya Wiley, 2018) that would bridge the access gap for those living in public housing and lower-income neighbourhoods.

However, the discourse of equity and inclusion can itself have the effect of downplaying or even neutralising attention to the longer-standing urban inequalities that have given rise to chronically underserviced low-income communities. Halegoua and Lingel (2018) concluded that 'LinkNYC' functioned as a 'public spectacle of connectivity' (p. 4636) in that its visibility shrouded the invisibility of the undelivered promise to connect all New Yorkers to broadband internet. Recognising the performative power of discourse is helpful for uncovering that which it obscures, but still does not provide a full account of why this promise has not been realised.

Examining the role of urban design and governance is important for determining whether a technology project has socially transformative effects and alters the spatial politics of a city, including the politics of access. 'Urban politics', according to urban theorist Jon Pierre, 'defines and regulates how the city should be organised, how it should allocate its resources and how—and by whom—it should be governed' (Pierre, 2011, p. 1). Urban governance is also connected to certain ideologies and projects of urban transformation, which in the last few decades have been promoted through techno-centric models expressed in visions of 'smart cities' (Sadowski, 2018). The discourse of digital equity and inclusion is inextricably tied to these patterns of urban transformation, providing a rationale for and solution to urban inequalities in the form of technological innovations and city-wide public-private partnerships.

In the case of LinkNYC, shifting attention to its design and governance illuminates some of the underlying social and political forces that delimited the extent to which its equity goals could be realised. These are powerful political processes through which spatial and, by effect, temporal relations are configured and enforced in distinctive ways for different social groups. They encompass legal, institutional, technological, social, and cultural arrangements, from their design through to their installation and use, using a wide range of regulatory and planning mechanisms such as the Request for Proposal, the public-private partnership, the data-driven advertising model, and ongoing changes to the technology, for example, with the removal of the internet browsing capability from the Links' inbuilt tablet.

As seen with LinkNYC, even when the City tried to influence the design of the infrastructure and its implementation to enhance its public benefit by addressing geographic digital disparities, the imagined users were not aligned with the actual user groups of the Links and new potential risks and harms emerged in the context of existing social and spatial inequalities. For the homeless groups who were among the main users of the Links, these symbolic and spatial inequalities were anchored to a long history of discriminatory surveillance and racialised policing that played out in everyday situated use in the form of differentiated mobilities and spatial exclusion. Meanwhile, the residents of low-income neighbourhoods did not benefit from improved home broadband access, since the underground fibre connections that supplied the Links' network were not extended to the buildings around them. That potential remained locked up (Maier et al., 2018), or dormant, as 'invisible layers of dark fiber' underground, while homeless Link users on the street were made 'hypervisible' (Halegoua & Lingel, 2018, p. 4647).

Ultimately, no single technology will solve these issues of digital and spatial exclusion. Technologies of access are themselves rapidly changing, with 5G and even 6G wireless network technologies around the corner. In the words of the co-director of the Digital Equity Laboratory in New York City: 'So, there's lots of reasons why Wi-Fi may or may not be a long-term … not just as a digital equity solution, but as an access solution'. Her words prompt us to consider that not only is there no single technological solution; the future of a technology is not determined in advance. Just as important are how a technology is shaped and developed over time, who gets to negotiate how it is used, what the opportunities are for change, and how it will be replaced or repurposed.

By late 2018, the CityBridge consortium led by Intersection had not delivered the revenue it had agreed upon in the franchise agreement with the City, and the rollout schedule for LinkNYC kiosks had stalled. The LinkNYC outdoor screen advertising model had only generated a fraction of the projected revenue in advertising sales. With the company facing financial difficulties, the City renegotiated the contract to provide more time for the company to build up its advertising revenue as the Link network was expanded (Blau & Sandoval, 2022). Yet since my

research was conducted in 2018, only 116 more Link kiosks (1841 in total as of May 2022) have been installed across the city.

Efforts to solve digital inequalities thus need to go beyond technological solutions like installing free Wi-Fi services, to address how citizens are governed in spaces (and how they are produced as 'self-governing' citizens), and to consider how to design and govern a more just and equal space (Soja, 2009). Survival infrastructuring is important to recognise because these practices highlight the unequal socio-spatial dimensions of urban spaces and the differential mobilities and visibilities experienced by homeless and marginalised groups. 'Home' is a temporary infrastructure created by people who are homeless in and through mobile-mediated spatial appropriations. It represents a contestation over a definition of public space that excludes and marginalises groups who are defined in opposition to notions of the public premised on the privilege of stable housing.

With the rise of digital economies premised on data-driven forms of value, issues relating to the socio-spatial inequalities of cities have now also become issues of data. Data is central to urban design and governance processes because these processes are inherently spatial (Taylor, 2016). Indeed, the data capabilities of LinkNYC for location-aware screen advertising, along with other potential applications, were some of the first instances of the actualisation of the smart city and represented the future trajectory of LinkNYC. As articulated by an Intersection representative: 'I feel like we've built this network that could grow with the City as a smart city'.

Chapter 6 takes up issues raised in previous chapters to explore the shift by states, institutions, and cities towards technologies of smart governance premised on the algorithmic processing of data, and the impact of these changes on people who are experiencing homelessness. Returning to the LinkNYC study, I take up and analyse the tensions in the provision of public infrastructures that adopt a private data-driven business model. Smart city technologies purport to enable city authorities to better manage the complexity of the urban environment, and promise to provide essential connectivity to urban communities, but connectivity relations underpin a regime of digital governance and citizenship that extends the policing of homelessness and allows other third parties to carry out new

forms of control, exploitation, and surveillance. Drawing on this case study and on research carried out on an automated debt recovery system for welfare recipients introduced—and later discontinued—by the Australian Government, the chapter argues that with increasing datafication, social and spatial inequalities become further embedded into the logics and infrastructures of cities and states.

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6

Policing Homelessness: Smart Cities and Algorithmic Governance

There is a long history of policing homelessness in public space. Amster (2003) traces the policing and criminalisation of homelessness back at least six centuries, where it is linked to metaphors of disease and disorderly behaviour, requiring a social order and laws to protect the property and power of the dominant group at the time. Bloom (2005) found reference to the term 'homelessness' in translations of Homer's Odyssey in 1615 with an increase in its use after 1780. Foucault (1979) famously wrote about the disciplinary systems that emerged in nineteenth-century prisons in Europe and the United States to supervise and discipline those labelled 'deviant' using a panoptic model of surveillance, which later expanded to other parts of society such as schools, workhouses, and factories. More recent studies have focused on a resurgence in the policing of homelessness in late modern societies. Gibson (2011) links the increasing policing of homelessness in New York City to the rise of neoliberal forms of urban governance in the 1980s and 1990s. She argues that 'the drive to make public spaces into optimal spaces for capital is being increasingly used to justify harsh policing and zero tolerance of minor disorders linked to the homeless, youth and minority groups' (p. 142). Researchers in a European context have likewise connected the

J. Humphry, *Homelessness and Mobile Communication*,
https://doi.org/10.1007/978-981-19-3838-2_6

resurgence in policing of homelessness in public space to a shift over the last 25 years from the 'planned' city to the 'entrepreneurial' city, which they associated with the hollowing out or dilution of public space through privatisation (Doherty et al., 2008). Drawing on evidence gathered from seven countries across Europe in 2006, they found numerous examples of restrictions to public space enforced through a tripartite of mechanisms identified as 'surveillance technologies', 'modes of governance', and 'exclusionary practices' (Doherty et al., 2008).

In these accounts, policing is a process that runs alongside criminalisation, since it is through acts of othering and enforcement of conduct in public space that certain groups without housing are constructed as criminal. Policing is also a central support for governance, defined not only in terms of the distribution and administration of resources, as in Pierre's (2011) model, but also as 'a certain modality of power' and 'form of subjection' as explained by Foucault (1979). This understanding of governance is elaborated by Foucault in his history of the rise of the prison system, in which he traces the shift away from sovereign rule to more modern systems of population control, expressed 'in systems of insertion, distribution, surveillance, observation' exercised on and through the body (p. 304). In other words, mechanisms and techniques of discipline are exercised in everyday relations and spaces, making up a network or apparatus that describes the 'the carceral texture of society' (Foucault, 1979, p. 304). An important point in Foucault's analysis is the need to regard discipline as having a 'complex social function' (p. 23) with positive benefits of inclusion that are situated in relation to the negative effects of punishment. The dyad of effects is core to the operation of surveillance as a strategy of governance.

Today, public spaces have become highly mediated by a wide range of digital surveillance technologies linked to smart city systems and infrastructures, providing new arenas and means through which homeless and marginalised groups can be surveilled, policed, and criminalised. As explored in Chap. 5, public spaces are socially produced, with their own geographies of access or 'power-geometries' (Massey, 1994). In contrast to private places, where access is exclusive, public spaces are open and accessible to people who traverse and inhabit them in multiple ways, but they are also highly differentiated and regulated. How has the policing of

homelessness changed with the digital mediation of public space, and what is the place of mobile communication in these changes? What is the role of smart cities and data in public space, and how does this relate to new methods of policing homelessness? How do connectivity relations relate to new forms of digital citizenship and governance based on datafication and the algorithmic processing of data? In this chapter, I examine the rise of smart cities and algorithmic technologies and what this means for those who are homeless. The chapter makes the argument that, with the increasing datafication of urban environments and government services, social and spatial inequalities become further embedded into the logics and infrastructures of cities and states. Moreover, in new forms of 'smart' citizenship and algorithmic governance, the mobile phone plays a special role as a proxy for the body and becomes another means through which homelessness can be policed and punished.

Returning to the LinkNYC study, I argue that while smart city technologies purport to enable city authorities and planners to better manage the complexity of the contemporary urban environment and promise to provide essential connectivity to digitally deprived communities, they also allow police and other third parties to carry out new forms of control, exploitation, and surveillance. This dynamic is explained in terms of 'the data–connectivity exchange', whereby groups that experience precarious connectivity rely on free access solutions or services that give rise to further risk and harm by subjecting them to datafication in their use of those services. The chapter then introduces some examples of algorithmic systems introduced by governments to crack down on so-called welfare cheats, which also have the potential to be used for sophisticated citizen risk profiles and exclusion from welfare services. The first of these is an algorithmic system known as SyRI, introduced in the Netherlands in 2014, and the second is an automated debt collection system popularly known as Robodebt, launched by the Australian government in 2016 to recover overpayments to welfare recipients. The chapter explores the impact of such systems on welfare recipients targeted for an unpaid debt, many of whom were in precarious situations that worsened as a result of their interactions with the system. The chapter concludes by highlighting new forms of 'smart' citizenship and algorithmic governance, and the dangers of these becoming new means to discipline and punish homelessness.

Smart Cities and Urban Policing

There is no universal definition of a smart city, and as such the idea has taken on a variety of meanings in different contexts. One idea of a smart city is to take an existing city and 'retrofit' it or augment it with existing technologies and systems. Another idea of a smart city is to build an entirely new city that is 'natively' smart. There are also cities that have 'high-tech' districts such as Silicon Valley—the tech capital of California—or 'Silicon Alley' in New York City (Mosco, 2019). Examples of similar districts include the Newcastle City 'smart' precinct in Australia and Hudson Yards in Manhattan, New York City.

What binds these versions of the smart city together is the central role of data, collected from sensors, cameras, Wi-Fi, beacons, 5G, smartphones and other real-time data-generating devices and processed through data analytics to be used in the planning and decision-making of complex urban systems. Yet while the idea of applying data-driven technologies and systems to traditional objects or processes to improve operations and enhance efficiency has come to define the smart city, 'smart' is a term that is co-opted to be associated with a wide range of ideas, technologies, and enterprises. 'Smart' has been described as a 'floating signifier'—an empty canvas of a concept, to be filled by different actors working towards different ends (Wiig & Wyly, 2016).

As a blank canvas, the smart city concept acts as an urban imaginary that brings together connotations of technology with the future of cities. These imaginaries are used strategically to shape the direction of development in particular ways. Söderström et al. (2020) describe the smart city as a form of 'corporate storytelling' designed to push urban development strategies towards particular ends and make these changes seem inevitable. In their account, the smart city is a story that is told to create an 'obligatory passage point', linking the transformation of cities to technological solutions that IT companies provide.

Central to the smart city story is the idea that technology will solve deep-seated urban problems. Mosco (2019) draws attention to the massive wealth disparities in New York City fuelled by private urban development, which prices poorer communities out of the city and drains funds from the public purse. He provides the example of the Hudson Yards

development in Manhattan (incidentally where the Intersection headquarters is located) which was supported with $5.6 billion in taxpayer dollars and $2 billion of public funds for a subway extension. As Mosco (2019) explains, 'smart city advocates like to talk about cities clogged with unmanageable traffic and demonstrate how, in the words of one, "a smart city moves past all that"' (p. 66). The emphasis is on the way in which technologies will solve the persistent and wicked urban problems of urbanisation: congestion, inequality, and decay.

Long-standing narratives of urban decay and the city in decline, promulgated by urban planners, intersect with smart city storytelling. Perhaps most famous of these is the 1930s Swiss urban architect Le Corbusier's laments that the modern city is diseased and frightening. He described Paris as 'in the grip of a deadly sickness' (p. 100) a city that is 'racked with disease…impotent and senile on all sides' (p. 99) and proposed 'The Radiant City' in response to this decrepit state: a 'vertical garden city' that was to be 'an organized, serene, forceful, airy, ordered entity' (p. 134) applying principles of efficiency and rationalisation (Le Corbusier, 1967). On his visit to New York City in 1935, he described the city as like a pack of beasts: 'the "sauvagerie"—the wild barbarity of the stupendous, disorderly accumulation of towers, trampling the living city like a herd of mastodons' (Brock, 1935).

Significantly, the discourse of smart cities and actual smart technology implementations emerge in specific political and economic contexts, often in cities (and countries) facing acute forms of urban inequality and distress. The United Kingdom is a case in point, where a confluence of trends has exacerbated housing and work insecurity, and increased the digital requirements for participating socially and economically. These trends of high rates of homelessness, whole-of-government digital transformation agendas and insecure housing and work form the backdrop of smart urban innovation and the appearance of new kinds of smart street furniture in public spaces, including a national network of digital 'street hubs' introduced by British Telecom (BT) and modelled on the LinkNYC design (Intersection was one of the three key partners in the original InLinkUK consortium, along with BT and outdoor advertising company, Primesight). LinkNYC was originally proposed as a solution to New York City's stark social, economic, and infrastructural disparities. In

2015, over a third of city households on annual incomes of less than $20,000 were without access to home broadband (Dinapoli, 2021). Indeed, many of the cities that face acute forms of urban distress embrace visions of the smart city, and the digital strategies that underpin these, to respond to these challenges.

How 'Smart' is LinkNYC?

At first sight, there is nothing overtly 'smart' about LinkNYC. The Link units themselves, which the City and Intersection refer to as 'Links' or 'kiosks' have a retro-feel, reminiscent of a digital infrastructure that is less cloud and more concrete. Despite taking up a smaller footprint on the sidewalks than the public payphone booths that they replaced, each Link asserts its material presence on New York City's sidewalks as a tall, solid monolith of metal, glass, plastic, and steel. LinkNYC was nevertheless associated with the idea of the smart city in its early design and development.

LinkNYC was the source of at least two different urban imaginaries: as a universal public access solution that would bridge the 'tale of two cities', and as a data-driven, algorithmic, city-wide advertising network. These seemingly opposing urban imaginaries, which might appear to be irreconcilable, helped to realise and embed the latter imaginary of LinkNYC at a more rapid pace, and potentially with fewer safeguards in place than it might otherwise have had. At the time of writing, the web banner of the home page for LinkNYC articulates its connection to these dual urban imaginaries, representing the way its product straddles present uses with future applications: 'Free super fast Wi-Fi. And that's just the beginning' (LinkNYC, 2022).

Beyond its discursive 'smartness', LinkNYC is already more than a Wi-Fi network. Inside its literal 'black box' sits an array of sensors, controllers, and other data-measuring technologies that support its location-aware advertising program using its two-sided 55-inch digital displays. Intersection brands itself a smart cities technology and media company, and describes its advertising system as 'reimagining how brands connect with people in urban spaces' (Intersection, 2022). After CityBridge, the consortium that proposed LinkNYC in the design competition to 'reinvent the payphone', entered into a franchise agreement with the City of

New York, Intersection was formed as a new entity in the consortium through a merger of two of the original partners, Titan and Control Group. Sidewalk Labs, the urban subsidiary of Google's parent company Alphabet, was the lead investor of the merger and the Intersection start-up (D'Onfro, 2015). Chief Executive Officer of Sidewalk Labs, Dan Doctoroff, had a vision of the future of LinkNYC and stated at the time:

> *By having access to the browsing activity of people using the Wi-Fi—all anonymized and aggregated—we can actually then target ads to people in proximity and then, obviously, over time, track them through lots of different things, like beacons and location services, as well as their browsing activity*. (in Pinto, 2016)

In numerous other cities that have initiated smart city projects, partnerships with big technology firms such as Google, IBM, Cisco, Siemens, and Amazon are competing to supply the next-generation internet technologies and networks to enable city governments to deliver on the promises of real-time and data-integrative solutions. Indeed, one key element of the smart city model is the increasing encouragement of and reliance on public-private partnerships (PPPs) to access and implement smart technology (Luque-Ayala & Marvin, 2015; Shelton et al., 2015). Caprotti et al. (2022) explain that the main actors of these smart city partnerships are municipal authorities, technology corporations and research organisations, and they are focused on the delivery of city-specific governance systems, utilities and infrastructures.

Underpinning the operation of the smart city are networks of connected sensing objects and devices known as the Internet of Things (IoT), which drives and sustains a global industry involved in its design, development, implementation, and maintenance. Technology trend papers forecast that by 2025 the installed base of active IoT connected devices will reach 30.9 billion units (Statista, 2021). The IoT is made up not just of embedded networked devices such as sensors, actuators, and controllers. It also encompasses the data interactions and movements of people with their smartphones and other mobile devices, which can double as personal media and transient connections to networks. Indeed, mobile data collected from a huge array of moving sensors embedded in wireless technology, mobile sensor networks and smartphones underpins one of

the fastest growing sectors of IoT and smart city developments (Moreno-Cano et al., 2015). Smartphones alone contain up to six separate mobile sensors including an accelerometer, digital compass, gyroscope, GPS, microphone, and camera. This burgeoning field, referred to as 'mobile phone sensing'—exploiting mobile data to develop new applications, models, and big data techniques—forms the basis of what some define as a new smart city paradigm (Lane et al., 2010).[1]

The connectivity base helps to understand the much larger set of telecommunication and network architecture companies that make up the smart city ecosystem. At its base, the smart city is defined by the new capabilities of data collection and analysis that these networks of things and people enable. Data and data analytics—the analysis, processing, and visualisation of data—are central to the new forms of value or 'immaterial assets' that are created through making sense of the vast new stores of fixed and mobile data generated in and by them (Mosco, 2019).

In many respects, LinkNYC conformed to this model of the smart city, with its data-driven, location-aware advertising system. The business plan for the Links was to pay for the rollout and services through screen advertising on its digital screens, supported by a highly directed advertising strategy based on location-specific analysis of anonymised and aggregated mobile data collected from pedestrians and Link Wi-Fi users. When Intersection first launched LinkNYC in February in 2016 (Grothaus, 2016), it responded to privacy and civil rights complaints and a campaign by the New York Civil Liberties Union by updating its privacy policies and clarifying guidelines governing the use of the internal cameras and sensing technologies in the Link units (Buttar & Kalia, 2017). For example, the original LinkNYC privacy policy allowed for personal information to be collected and stored indefinitely and there was a lack of clarity over the use and retention of camera footage from the two mounted cameras and tablet camera, including whether footage from these was to be shared with the New York Police Department (NYCLU, 2016). The updated privacy policy (March 2017) committed to not collecting personal information and detailed the length of time video footage would be stored and conditions of its use, indicating that the tablet camera would only be activated at some point in the future. Nevertheless, IoT functionality remained active to support the location-aware

advertising system, which was core to the company's revenue model, and the internal sensors collected environmental data such as temperature, humidity, ambient noise, light, pressure, and air pollutants (LinkNYC Privacy Policy, 2017). There was a clear intent to operationalise the data capabilities at some time in the future, with the system designed with a much wider capability.

The Data–Connectivity Exchange

LinkNYC created new kinds of spatialities—each Link functioned discretely in urban space, and people used the space around the Link as much as the object itself. As previously explained, people experiencing homelessness in particular used the Links and the space around them to carry out place-making activities—leaning against them, crouching to make phone calls and charge their phones, and sheltering against the wind and using them as temporary refuge from passing foot traffic. These practices were part of the 'survival infrastructuring' that this group performed in urban spaces, working against or around the Links' key affordance of short-term, transactional use, in the context of social perceptions that prolonged use of Links was a nuisance, even after the web-browsing utility was removed.

The design of the Links as a wide area network meant that the reach of LinkNYC extended to all the districts in which they were installed. At the time of my study in 2018 there were approximately 1700 units across five boroughs. The spatiality of the Links was further augmented by data sensors and Wi-Fi hotspots, creating an invisible data zone around the Links, or what Kitchin and Dodge (2011) have described as 'code/space', which defines the hybrid spatial formations that emerge through the mixing of coded software flows with physical space. Rather than understanding space as a container, or fixed, their concept of 'code/space' captures the idea of space as constantly unfolding through 'the mutual constitution of software and sociospatial practices' (p. 16). Mackenzie (2010) also wrote about the reconfiguration of space by wireless networks, developing the concept of 'wirelessness', defined as: 'entanglements with things, objects, gadgets, infrastructures and services, and imbued with indistinct

sensations and practices of network-associated change' (p. 5). Both renderings seek to emphasise a relational conception of space modulated by coded objects, processes, and connections.

Significantly, relations of space formed through wireless and fixed connections with the Links are unequal—in that some groups have fewer choices, capabilities, and protections than others at the point of and around the connection. I call this 'the data–connectivity exchange' to designate the way free connectivity services are used as the basis for enrolling users asymmetrically into systems where they become subject to new data practices that they may or may not be aware of and have little control over. Far from being a simple matter of choice, this is a result of being less well resourced, without alternatives, and suffering multiple forms of disadvantage—conditions that are potentially compounded through the use of these services, even as they simultaneously play a critical safety role by enabling connectivity in a situation of potential physical risk.

Data asymmetries have gained attention in a variety of fields including computing, media, and critical data studies. For example, Taylor (2016) has drawn attention to the importance of contextualising data socially and spatially, and others have focused on the asymmetries of data in relation to representation, discrimination, and bias (Andrejevic, 2014; Boyd & Crawford, 2012; Manovich, 2011; McCarthy, 2016; Milan & Treré, 2020). However, data asymmetries that play out through access to urban networked technologies are poorly understood. van Dijck's (2013) theorisation of connectivity in relation to social media platforms has provided a foundation for understanding the principles or logics that underpin the data exchange made at the point of connection. In her analysis of the social media ecosystem dominated by a few key corporate actors, she explains how user participation and sociality are harnessed and converted into a 'connectivity resource' in the form of the (very valuable) behavioural and profiling data that users generate through their connections (van Dijck, 2013).

The data–connectivity exchange as it applies to LinkNYC generates a similar dynamic of enrolling users into a system through the offer of free services at the point of connection, with the commercial asset being the data that can be captured and exploited through these connections for advertising and other data-capitalising avenues. However, because

LinkNYC kiosks are accessed in public space, they also create particular kinds of dynamics and effects, and as seen in Chap. 5, these are shaped by the social contexts of use and regulatory practices informed by histories of racialised policing and the gendered dynamics of homelessness.

These dynamics and effects result not only in physical security risks and discomforts but also in data-related risks and harms, including the collection of data that forms the basis of actionable knowledge (McCarthy, 2016). This is further complicated by the mobile data traces of Link users, which form part of the exploitable 'code/space' of the Links, and as Taylor (2016) has cautioned, 'carries with it the dual risk of rendering certain groups invisible and of misinterpreting what is visible' (p. 319). Indeed, once an individual or group of users are identified as problematic, this may provide grounds for certain kinds of actions to be taken by police, council officers or other law enforcers in relation to actual or perceived uses, which can compound existing regulations and treatment of homeless and racialised groups in the uses of those spaces.

LinkNYC and Policing

As seen in Chap. 5, the design, placement, and use of Links cannot be divorced from the histories of underserved and over-policed communities in New York City. Some groups are more prone to policing in public spaces, and technologies have played a central role in supporting law enforcement by making certain groups more visible. There is a long history of removing, moving on and 'sweeping' the homeless from the streets of New York City. Jefferson (2018) explains that the mass dislocations of communities and the subsequent rise of homelessness in New York City in the 1980s were a result of strategies to 'revitalise' the central business district by removing those considered to be impoverished and disorderly. This was highly racialised, with a very high proportion of people who were homeless at the time (62%) identifying as black. This is not just a matter of increased physical visibility; it also relates to new forms of data monitoring and tracking, or 'dataveillance', in public space.

Under Intersection's privacy policy, limits were placed on access to data collected by the Links, with further restrictions that were an indirect

outcome of the removal or switching off of some features such as the web-browsing capability such that data that previously had been collected ceased to be collected (LinkNYC Privacy Policy, 2017). Yet even within these parameters, the remaining data points, including the mounted cameras, Wi-Fi connections, and sensors, meant that data collected by the Links *could* be used for police and legal enforcement, commercial exploitation, and predictive policing.

The modular design of the Links, which allows for technologies to be switched on or added remotely, compounded the possibility that new forms of data would be collected at some point in the future, and it was not clear whether or how these modular additions were required to be made known to the public nor possible to access or view inside these 'black boxes'. This increased the difficulty for any user or group in accurately gauging the data and privacy risks related to the kind or extent of data collected and shared at any given time. In the words of one community member of the activist group Rethink LinkNYC, it meant: 'We have to just accept what they say is what's in there'.

Police and Law Enforcement

The Links have three inbuilt cameras (two mounted above the display panels and one in the tablet). Even though LinkNYC's privacy policy stipulates that footage is stored for only seven days, an exception is made for investigating illegal incidents through receipt of a subpoena or court order (LinkNYC Privacy Policy, 2017). This means camera footage recorded by a device in a low-income, racialised neighbourhood could be used to furnish evidence of a crime where there is already a disproportionate degree of monitoring of residents' activities and interactions in public spaces.

In addition to camera footage, there may be grounds for police monitoring of Wi-Fi use if a crime is suspected or has taken place, which might result in police accessing historical data or being present to monitor live network activity. Records of phone calls made from the inbuilt tablet can also be accessed in the assessment of potentially illegal activity. Indeed, this happened in the United Kingdom in response to reports of problem

uses of a limited set of InLinkUK kiosks in the Tower Hamlets area of London for purported drug dealing. Police and local councils, working in concert with InLinkUK, developed and implemented a call-blocking algorithm that prevented certain numbers—that had been associated with drug activities and identified using pattern-recognition algorithms—from being called from the kiosks' inbuilt phone feature. InLinkUK packaged the call-blocking technology, branding it as its Anti-Social Behaviour Management Plan (InLinkUK BT, 2019) and rolled it out to all InLinkUK kiosks across the country (Wray, 2019).

A similar concern about the strengthening of law enforcement of particular groups already disproportionately policed was raised in relation to the use of an algorithmic system in the Netherlands, known as SyRI. It shared datasets across a wide number of intergovernmental agencies under a cooperative data-sharing arrangement. An assessment of the system by the District Court of The Hague found that low-income communities were at risk of becoming the focus of further investigation as a result of SyRI, not because of any notable increase in fraud rates in those areas, but because of the availability of information about people who lived in neighbourhoods deemed 'problem areas', which drew the attention of local authorities to activities taking place there and increased the chances of finding irregularities. The court ruling remarked that this in turn:

> *confirms the image of a neighbourhood as a problem area, contributes to stereotyping and reinforces a negative image of the occupants of such neighbourhoods, even if no risk reports have been generated about them*. (Rechtbank Den Haag, 2020, 6.92)

Conversely, if certain behaviours in relation to a Link kiosk or the areas around these come to the attention of authorities, this can lead to the accessing of data that could be used as the basis for increased police presence and activity in that area. Taylor (2016) warns of the dangers of group identification through mobile phone data because of the way that these traces 'make visible the movements or network structure of a group' (p. 328), meaning that individuals don't need to be identified to still be the target of harmful acts and treatment. Moreover, limiting the type of

data collected to technical over personally identifiable information, is a somewhat false distinction, and does not prevent data from being re-identified or used in harmful ways, particularly when combined with machine learning capabilities (Green, 2019). People experiencing homelessness, who interact with Links more than the general population or even other groups in those neighbourhoods, are more likely to become a target of subsequent interventions which may not have occurred had this data not been available.

While some of the scenarios hitherto described are hypothetical, alongside actual examples, this is precisely the kind of examination that is needed to ensure that smart city systems do not reinforce these harms and add to the arsenal of policing of racialised and poor communities. Shapiro (2018) calls for this level of scrutiny in his assertion that: 'smart city systems need to [be] conceptualized at their logical extreme in order to highlight their dangerous potential' (p. xi). New urban infrastructures are woven into the spatial and social dynamics, shaping the 'actually existing smart cities' (Shelton et al., 2015) that emerge in specific locations and cities, generating new forms and flows of data. Any of this data could be used as evidence to prosecute a crime, to reimpose excessive policing, or for targeting of people who are homeless, as well as for its potential use in predictive policing.

Predictive Policing

Andrejevic (2020) in *Automated Media* explains how predictive policing draws on vast databases of big data to target crime pre-emptively. Any data collected from digital connections through smartphones, wearables, hotspots, geolocated keyrings, sensors, or beacons can be used for predictive policing. It is clear how real-time data from street furniture like kiosks, benches, and digital screens could add to these uses. Andrejevic's argument suggests there is a degree of inevitability in the use of urban data for predictive purposes. He describes the drive towards these in terms of the 'cascading logic of automation', suggesting that the need to process and respond automatically to the collection of massive troves of

data creates the necessary conditions for the development of predictive systems (Andrejevic, 2020, p. 9).

Many scholars, mainly working in the US context, have pointed out the potential for discrimination of marginalised and low-income populations using predictive policing algorithms that reinforce racially biased decisions (Brayne, 2017; Browne, 2015; Browning & Arrigo, 2021; Degeling & Berendt, 2018; Jefferson, 2018; O'Donnell, 2019). Although the data fed into such algorithms is claimed to be objective, the real risk, according to these authors, is that algorithmic decision-making cannot be divorced from the larger social and historical context of policing that has produced outcomes based on biased decisions, agendas, and policing techniques.

Browning and Arrigo (2021, pp. 304–305) refer to a 'reciprocal loop' created when biased data resulting from a history of over-policing of predominantly black communities and neighbourhoods is used to input into predictive policing software, thereby validating (or reinforcing) that data, regardless of whether it corresponds to an 'empirical truth'. Used in combination with policing techniques such as 'stop and frisk' that also embed historical biases, predictive policing, they say, will 'facilitate the continued, indefinite victimization of minority groups by police and [be] a justification for a continuance in disparate police surveillance, disparate police use of force, and disparate collection of crime data' (p. 305).

Developments in artificial intelligence have accelerated the use of predictive policing technologies, a trend pushed by software companies that already have close (and entangled) relationships with police and security providers. A new generation of AI-based algorithms that use machine learning do not just produce faster results with less human intervention; they also alter the way such algorithms work, in sometimes subtle but significant ways. One such example is the use of a neural network in a system designed by Harvard researchers to automatically detect so-called gang crimes. Using data from the Los Angeles Police Department collected from 2014 to 2016 and fed into the neural net, the algorithmic system was able to reclassify current and historical crimes as gang-related (Hutson, 2018). The extra capabilities that such a system represents mean that not only could it be used to predict future crime using biased reclassified data, which is used by police to inform disparate policing practices

in particular areas; it could also lead to increased use of biased data in current algorithmic risk models through reclassification of past crimes.

LinkNYC did not establish itself as a commercial partner working with police departments, nor has it fashioned itself as being in the business of predictive policing or risk assessments. The likelihood that Links are or will be used for crime predictions and risk assessments is unknown, but there is nevertheless the potential for these technologies to be enlisted in police activities when data that can be used as evidence is secured through legal channels. The point is not that Links are being used for predictive policing now, but that they *can* be used and that their existence supports an emerging paradigm of policing and law enforcement that uses data secured through a wide range of urban data systems to target, profile and police particular social groups.

Other notable examples of smart technologies that have been used for policing and surveillance include the San Diego smart streetlight program used by the San Diego Police Department to search for evidence to be used against protestors who attended the Black Lives Matter demonstration in May 2020 (Marx, 2020). In the Northern Territory in Australia, smart streetlights in the 'Switching on Darwin' smart cities program have been used in Indigenous communities and found by O'Malley and Smith (2020) to reproduce colonial relations while simultaneously valorising neoliberal logics of participation through technologies that are less accessible to these communities. The communities most affected are precariously connected and have fewer skills to protect themselves and less recourse for contesting new methods of data-enabled surveillance and predictive policing. The perception of problematic if not strictly illegal uses can also result in further regulation of public space, curtailing activities deemed problematic and even hobbling the technologies themselves, as in the case of LinkNYC's removal of web-browsing capability from its inbuilt tablets.

Is Using LinkNYC a Choice?

One of the main ways in which members of the public exert agency in relation to data collection and security is through the exercise of informed consent when signing up for a data service, as described in terms of use and privacy policies of vendors. Unfortunately, as many have personally experienced, these legal documents are usually impenetrable, and assessing them is especially challenging when attempted in public space. As one of the community members of the Rethink LinkNYC activist group explained:

> *Like, when you're talking about people walking down the street, how in the world can they reasonably opt in or opt out of such a thing? How do you gain consent on a city level? I think this is a major issue, and then of course it was very unclear what exactly they were capturing and collecting and doing.*

A related issue here is the difficulty of revisiting a decision once registered for a data service. LinkNYC was designed to provide a seamless sense of connectivity as users move about the city. Signing up is done through a one-time email address registration, which is then detected automatically by a mobile device whenever a user is in range of an active Link. Users are not prompted or reminded of when they are connected, and to which network. Indeed, they are encouraged to 'set and forget'. This automatic passing-off of one Wi-Fi connection to another means that these sorts of data connections and any related privacy concerns become even more removed from users' awareness.

In addition, data policies and data-sharing arrangements are often untestable without a way to verify how policies are carried out in practice, and policies vary across jurisdictions, sometimes in significant ways. Indeed, the privacy policy for the InLinkUK kiosks in the United Kingdom, though modelled on the LinkNYC design, excluded updates made to that policy in March 2017 in response to concerns raised by the New York Civil Liberties Union (Buttar & Kalia, 2017).

At the level of the design, LinkNYC adopted a modular approach (Gangneux et al., 2022), which meant that any choice was conditional, in that it could be modified at any time. New features and sensors can

easily be added to kiosks and may be enhanced through remote activation of technologies and installation of algorithms. While this plug-and-play design has many benefits in terms of flexibly responding to changed circumstances, it also makes more amenable the introduction of new data capabilities that may increase data risks and harms, and provides a means of policing poor and marginalised populations.

The option to 'opt out' of the use of services as a way of exercising consumer choice has been critiqued when it comes to social media platforms (van Dijck, 2013). Social media platforms discourage users from disconnecting and impede opting out through a range of technical and social barriers because, according to Dijck (2013), this would limit their capacity to commercially exploit these connections. Opting out of (or indeed not opting into) the Links was not hard for the vast majority of the well-connected citizens, with their ample data spend and reliable smartphones. But the groups that have been found to be the main users of Links have less of a choice to refuse to use these technologies. This is not to say that people in these groups don't make careful decisions in their use of these devices, but it does mean that data harms are traded off against more existential threats, such as lack of access to food, shelter, toilets, and a safe place to rest and store belongings. This point was highlighted by a community activist of Rethink LinkNYC who said to me: 'the trade-off is not clear all the time. We shouldn't be putting things out there that are free—we shouldn't make the most vulnerable even more vulnerable'.

This is particularly acute for people experiencing homelessness, who face multiple threats and complex life challenges. While data threats may seem low in the list of existential harms that people who are homeless must deal with, it is the compounding effects of these harms and the way they interact with existing forms of disadvantage that make them so concerning. Madianou (2015) refers to the phenomenon of 'second-order' disasters to highlight a similar dynamic in her examination of recovery efforts after Typhoon Haiyan in the Philippines in 2013, pointing to the way post-disaster digital inequalities compounded pre-existing inequalities for poor communities, leading to further delays and causing communities to languish.

It is not inevitable that smart kiosks and benches end up being used in harmful ways, but an assessment of their purpose and impact must

necessarily give attention to the ways their particular affordances are embedded in and intersect with socio-cultural contexts and histories that manifest asymmetric power relations (Browne, 2015). If they are the only options for access for some resource-poor individuals, then there is no way to opt out of using these services. In his analysis of LinkNYC, Green (2019) warns that 'opting out' is a kind of myth that helps to legitimise pervasive data collection and ultimately creates new citizen classes divided by inequalities of data privacy. Individual consumer choice plays no part in protecting from these potential data harms, with privacy policies limited and largely insufficient legal instruments for ensuring that users are informed and protected.

Smart and Algorithmic Governance

Digital citizenship and governance have become a focus of critical attention on processes of datafication. Hintz et al. (2018) argue for new approaches to digital citizenship that factor in the role data collection and analysis play not as tools, but as our social and political environment. They move away from understandings of digital citizenship that emphasise the positive benefits of digital participation, as evident in goals of digital inclusion, and call for more recognition of how the agency of digital citizens is controlled by those who control our data.

Intersecting with these debates and developments in digital citizenship is the idea of the 'smart citizen'. Criticism of the smart city for its mass surveillance and neoliberal forms of governance based on 'entrepreneurialism, efficiency, and extraction' (Sadowski, 2018, p. 23) has led to new models that are presented as more 'citizen-centric', emphasising active engagement in urban problem-solving and the potential for citizens to shape urban futures (Barns, 2020; Humphry et al., 2022; Perng, 2019). Platform urbanism is another data-driven urban model, less anchored to particular cities and instead situating urban activities within complex relational 'platform ecosystems' (Barns, 2020). This model leverages the city as a space for flexible and fluid relationships coordinated by intermediaries such as Airbnb, Uber, and Deliveroo (Caprotti et al., 2022). In this model, citizenship conforms to the neoliberal model: citizens are

rendered as consumers and labourers in practices of entrepreneurial 'platform-mediated citizenship' (van Doorn, 2020).

Given the liveliness of the discussion around digital and smart citizenship, little attention has been paid to the role of the smartphone in performing and transforming citizenship. The smartphone is itself an assemblage encompassing 'objects, practices, symbolic representations, experiences and affects' (Herman et al., 2014), providing the basis for a model of real-time 'smart' governance that enrols people into various forms of mobile data-generating participation. Smartphones are treated as proxies for people and generate a wide range of data that can stand in for the person. In outlining their model of algorithmic governmentality, Rouvroy and Berns (2013) explain that 'big data' provides the digitised traces and activities used to produce digital personas that represent and stand in for people, who are made governable through these digital proxies. When taken as living identities, these digital proxies or 'doubles' then become the subject of new kinds of actions taken on them (McCarthy, 2016).

Within this context, data asymmetries that play out at the level of the data–connectivity exchange are entangled in the digital personas generated from our everyday communication, interactions, and movements. Smart citizenship reinforces smartphone dependence for homeless and marginalised media users, who must enact practices of active digital engagement and respond to the demands generated by actions on their digital personas simply to obtain basic and essential services, and it is around these personas that ideas and categories of homelessness are constructed. Gig workers, who are often low-income workers, are similarly reliant on continuous digital access to mobile apps and platforms for making a living through mobile-mediated jobs, and it is their labour and connections that keep the gig economy going.

Additionally, new kinds of disciplinary practices are articulated through people's digital personas through the unevenly distributed penalties and rewards of digital participation in smart governance regimes. In Jakarta, Indonesia, for example, the website for the Jakarta Smart City (JSC) project in partnership with IBM engages smart citizens in collecting data and rewards them for their technological participation in 'fun-facts' and metrics of citizen engagement. One 'fun fact' displayed on the JSC home

page publicised that in 2020, 10.761 million citizens reported city problems through *Jakarta Kini* (JAKI), a freely downloadable mobile app that citizens were encouraged to use for reporting city problems (Jakarta Government, 2021).

Some groups are enrolled in these regimes as the target of disciplinary actions. Smart sensing technologies embedded into workers' environments such as cities, cars and warehouses extend existing surveillance mechanisms to monitor and discipline workers in real time. In one reported example, cameras made by the AI tech start-up Netradyne were installed in Amazon's delivery vans as a safety feature. Using the car sensors and camera footage, the company's safety system sent algorithmically generated audio alerts to drivers for 'unsafe driving' incidents. The data collected was then incentivised and used to generate performance scores that determined whether a worker would receive weekly bonuses, prizes, and extra pay. Drivers reported being frustrated at the frequency of false incidents that the system reported without a mechanism to contest these algorithmically driven decisions and distressed by the impact it had on their performance scores (Gurley, 2021).

Algorithmically Disconnected from Welfare

A similar reward and punishment regime can be seen in other examples of algorithmic systems used by governments in the delivery of a wide range of public services. Algorithmic systems are increasingly being introduced into the administration of welfare as part of whole-of-government digital transformation agendas in countries around the world. Defined as 'encoded procedures for transforming input data into a desired output, based on specified calculations' (Gillespie, 2014, p. 167), algorithms carry out sorting processes such as scoring, ranking and other metrics to support automated decision-making. Some of these systems are specifically designed to identify overpayments to welfare recipients, initiate debt collection procedures and develop citizen risk profiles to prevent future social security 'fraud'.

One such system, introduced in the Netherlands in 2014, was the System Risk Indication, known as SyRI, run by the Ministry of Social

Affairs and Employment. The Government of the Netherlands implemented this system to add to its already existing methods for identifying cases of welfare fraud and profiling citizens likely to commit fraud (Bekker, 2021). The Systeem Risico Inventarisatie (System Risk Indication, or SyRI) relied on 'big data' sourced from a variety of systems. Access to the system was made available to a wide range of public agencies and institutions, such as the employee insurance provider, the tax office, the social security bank, and the immigration authority, through a 'cooperative association' model (Algorithm Watch, 2019).

One of the most controversial aspects of this system related to the use of an algorithm designed to assess the risk of a citizen carrying out potential fraud based on a range of indicators. The 'risk report' revealed neither what indicators were used (these remain hidden), nor the risk model nor how the risk model functioned. The system was reported on in local media and was documented by Algorithm Watch as a concerning initiative within the Dutch government's Digital Government Agenda. A number of civil society interest groups came together to take legal action against the State of the Netherlands in relation to SyRI. In a landmark case in the District Court of The Hague in early 2020, the court ruled that the use of SyRI was unlawful. Specifically, it found that the legislation regulating its use 'does not comply with Article 8 of the European Convention on Human Rights' with respect to striking a fair balance between the interests the system serves and individuals' right to privacy. The ruling also referred to the insufficient safeguards in place to prevent discrimination against minority groups (Rechtbank Den Haag, 2020).

The SyRI system and the legal judgement of it have many similarities to the algorithmically determined online compliance system implemented by the Australian government in 2016 to detect welfare fraud, commonly known as 'Robodebt' (Park & Humphry, 2019). Both systems instituted a new kind of algorithmic relationship with social security systems. These not only required digital input from welfare beneficiaries, many of whom faced high digital barriers, but also used this data (or the lack of it, for those unable to digitally interact) to extend disciplinary actions to vulnerable social groups by excluding them from income support or causing them to be wrongly accused of welfare fraud.

Importantly, welfare algorithmic systems need to be understood as part of a larger administrative system of social welfare management underpinned by automated decision-making and shaped by austerity politics (Park & Humphry, 2019; Whiteford, 2021). The very purpose of algorithms within such a system, according to some critics, is to exclude or disconnect people from welfare through an automated winnowing out of those algorithmically determined 'ineligible' (Eubanks, 2018; Precarity Lab, 2020).

Algorithmic systems introduced in welfare and other sectors have been successfully challenged, in some instances even culminating in class actions and reparations. In Australia, a class action taken against the Australian government representing welfare recipients targeted by Robodebt resulted in a settlement of over A$1 billion dollars in 2020, with the government agreeing to repay to approximately 400,000 people debts it had collected from them (Whiteford, 2021). However, these early failures might be better understood as governments 'cutting their teeth', with every intention of applying such systems to new domains using advancements in artificial intelligence (Busuioc, 2021). Finally, as online algorithmic systems used by governments in the administration of welfare, health, and a wide range of other key services are further entwined with urban data systems, through network interfaces, APIs, and cooperative data-sharing agreements, the expansion of policing capabilities and imperatives becomes dizzyingly immense.

Conclusion

Digital inclusion scholars have highlighted the ways in which digital and social exclusion are interrelated and how digital exclusion can exacerbate existing inequalities. Increasingly, attention to digital and data inequalities is also revealing the ways compulsory digital participation and automated technologies can be the basis for the introduction of new kinds of harms for traditionally excluded groups.

In this chapter we have seen how in the context of a long history of policing homelessness, new kinds of smart urban and algorithmic systems reinforce rather than challenge the ways in which homeless and

marginalised groups are subject to various forms of digitally mediated surveillance and punishment. In the case of LinkNYC, we saw how tensions are articulated in the provision of public infrastructures that adopt a private data-driven business model, tensions which emerged in the context of the City of New York facing entrenched urban inequality and distress, and rising rates of homelessness. While smart city technologies purport to enable city authorities to better manage the complexity of the urban environment and provide essential connectivity to urban communities, connectivity relations underpin a model of digital governance and citizenship that extends the potential to police homelessness and allows third parties to carry out new forms of control, exploitation, and surveillance.

How might we mitigate the data risks and harms that arise through new kinds of digital urban objects and algorithmic welfare systems? How do we design different kinds of smart technologies and spaces? How do we strengthen legal, planning, and data-regulatory mechanisms? How can we include more diverse voices, life experiences, and social needs in urban and digital design processes? How can we push back against and even refuse technology-driven smart city proposals and algorithmic welfare systems, as exemplified in the successful class action against the Australian government's Robodebt system, and the well-organised community protests against Sidewalk Labs's Toronto smart city project that culminated in the project's discontinuation?

One of the powerful side effects of ideas of smart cities is that they invite us to think about what 'smart' means, but a danger is that over time, the kinds of logics and systems that they enable become increasingly normalised—and less easily questioned. For all the stop-start development and big fails of smart cities, the digital layering and 'smartification' of cities continue. During the COVID-19 pandemic, smart cities took on new meaning, adapted to apply smart technologies in public places to manage the spread of the coronavirus combined with techniques of predictive policing. In Seoul, South Korea, for example, an 'anti-virus bus shelter' was rapidly rolled out during the pandemic to check passengers' temperature before they boarded and pre-empt infection using UV rays to kill viruses (Agence France-Presse, 2020). According to media reports, an artificial intelligence voice recognition feature installed can listen in to

surrounding sounds and dispatch emergency and police services to the scene, bypassing the need to eyewitness an event (Park, 2020).

While smart street furniture might be still relatively experimental and niche, IoT capabilities will increasingly be embedded into services and into our physical environments. Their value is in the data they collect and generate as part of platform ecosystems. Similarly, despite the successful legal overturning of some automated and algorithmic welfare systems, investment in digital algorithmic transformation continues to grow and attract support from national governments, suggesting that concerns that early systems are being used as test beds might be well founded. As this develops, it generates a need for secure and safe data practices, to ensure that they don't multiply inequalities and risks for groups who are particularly vulnerable and marginalised. It also requires new approaches and responses to the way digital economies and datafication processes provide new means to surveil, police, and punish homeless and other marginalised groups.

In Chap. 7, I reaffirm my argument that mobile communication and processes of digitisation mediate people's lived experiences and meanings of homelessness in specific ways. This has implications for homelessness policy and research as well as research and action on digital inequalities. The chapter further develops a response to the question of whether digital inclusion is an appropriate framework for addressing the new kinds of harms and risks associated with current digital transformations. I suggest that while the renewed focus on digital inequalities is welcome, there is an urgent need to account not only for the unequal distribution of digital benefits but also for the way forced digital participation perpetuates and even worsens inequalities. The chapter elaborates on critiques by digital and media communication scholars and social theorists who have explored the contradictions that trouble the social inclusion paradigm and the way in which technology reproduces inequality. In concluding, I reflect on the usefulness of the concept of precarious connectivity for revealing the broader forces structuring people's communication experiences when homeless, and the interventions and imaginaries needed to tackle these. The chapter concludes with the need to centre home and home-making practices in mobile communication research in order to better understand people's choices and practices when homeless, to reveal

the effects of digital exclusion and processes of datafication, and to engage with and connect the goals of urban and data justice with those of addressing homelessness.

Note

1. A meta-literature review of the mobile phone sensing field published in 2010 by Lane et al. in the IEEE Communications Magazine was found to have 2892 citations at the time of writing.

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7

Conclusion: Is There Anyone Home?

I want to share a story about an event at a gathering of public librarians at the State Library of New South Wales in 2017, where I was invited to present my research on homelessness and digital communication. The event was held in one of the grand rooms of the colonial-style building, built in the early twentieth century shortly after Australia federated as a nation. Librarians who worked in community and public libraries across urban and regional New South Wales attended this event, interested in part because of the increasing number of their patrons who were experiencing homelessness. A homelessness policy worker who worked for a state peak body for the homelessness sector presented after me, and in his opening he offered up a remark that stayed with me and shaped my approach to this book: 'homes are places to mess around in', he said, gesticulating with his arms the shape of a space like that. These words and the image they evoked struck me as important for understanding how we can think about what people miss out on when they don't have access to a stable and safe place to live, and leads to an obvious and yet rarely made point: that the home is a basic requirement of participation and citizenship in a digital society.

J. Humphry, *Homelessness and Mobile Communication*,
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We think of homes as places that need to meet our needs for living and working, as spaces of reproduction and consumption, as capital assets, and as places for exploration and creativity. Critical attention to the meanings of home has shown that safety and security do not necessarily flow from having or being at home (Mallett, 2004), and ideals of the home as a private space and sanctuary are constituted in relation to the public realm (Dowling, 2012; Kawash, 1998). The home of today is increasingly 'hypermediated', with a growing number of media, smart sensors, and screens (Chesher & Humphry, 2019, p. 186), performing as site and support for the digital infrastructure within, a pattern that has accelerated during the COVID-19 pandemic (Maalsen & Dowling, 2020). Homes provide the contexts and conditions necessary for accomplishing many everyday activities and participating in models of active digital citizenship. Conversely, homelessness diminishes the possibilities of performing these responsibilities and positions people in a position of vulnerability, exposure, and precarity. The statement 'homes are places to mess around in' infers the daily struggles that people experiencing homelessness contend with when they attempt to negotiate their lives without one.

Mediating Homelessness

Having said that, many people who are homeless are also digital media users. While smartphones are not a substitute for the digital experiences made possible by 'home', mobile communication plays a special and vital role for a range of homeless groups, including young people, families, and adults. The mediational role of the mobile phone for people experiencing homelessness is as a lifeline, providing essential services and fulfilling distinct needs for homeless families, young people, and adults, with similarities found among other highly mobile groups, such as refugees. As a lifeline, the mobile phone is negotiated and constructed in different ways by these groups, accompanied by powerful affective qualities. It can lead to a strong sense of agency and of being 'at home', alongside extreme feelings of vulnerability and powerlessness, revealing the fragility of the mobile as a lifeline when there are no alternative options. In Chap. 2, I

explained this in terms of a dynamic of risk whereby the mobile phone provides both a degree of *independence* in circumstances of extreme precarity and *dependence* in the form of new costs, limitations, and harms associated with dependence on them. I linked this dynamic of risk to a discourse of ubiquitous connectivity and neoliberal forms of subjectivity, emphasising values and expectations of individual risk mitigation, self-management, and personal responsibility, which underpin large-scale processes of digitisation across multiple institutions and sites as well as between citizens and the state.

Precarious Connectivity

A key approach in this book has been to show how the mediation of homelessness is structured by larger processes of digitisation that are exercised through connectivity relations across multiple domains of everyday life. This definition of everyday life prioritises lived experience as multidimensional and composed of fields of practice and relations that are codified and regulated (Burkitt, 2004). Digital connectivity, I argue, is one of the key relations of everyday life within globalised and neoliberalised digital economies, giving rise to new experiences and expressions of precarity. The social fields or domains in which relations of connectivity materialise include formalised structures and institutional spaces in which people are classified, sorted, and monitored through digital processes (Lyon, 2010). In developing this thesis, I have built on formulations of 'precarity' as a life condition (Butler, 2004; Gerrard, 2017) and have engaged with its digital dimensions, including Heidkamp's and Kergel's (Kergel & Heidkamp, 2017, p. 13) heuristic of 'double precarity' and the concept of 'information precarity' by Wall et al. (2017).

The idea of precarious connectivity describes how traditionally excluded social groups unevenly bear the risks and uncertainties associated with shifts in communication patterns and processes of digitisation. This understanding has some parallels with the model developed by the authors of the *Digital Precarity Manifesto* and members of the Precarity Lab, who see precarity as an inherent function of digital economies, and one particularly experienced in the Global South (Precarity Lab, 2019;

2020). My analysis, however, focuses on the condition of precarious connectivity in Western contexts, where digitisation and datafication have reached an advanced stage of development and are deeply embedded in social and economic processes and environments. Despite the mobile's role as lifeline in the context of these large-scale processes, people who are homeless, and others struggling with various forms of precariousness, are positioned in a relation of dependence, contingency, and restricted use through their reliance on smartphones and the imposition of a 'second-class' form of access.

Chapter 2 examined the importance of mobile phones and the internet at the point of and during homelessness based on two studies I conducted in Australia from 2014 to 2016. Focusing on homeless subgroups, including parents with children, adults, and young people, the studies showed that the mobile phone has a variety of meanings and uses within the context of the participants' lived experience of homelessness. The mobile phone plays a key role in situations of heightened physical risk for these groups, through access to emergency services and support services, and for maintaining contact with friends and family members. The vast majority are accessing smartphones, which with their multifunctionality and taken-for-granted status (Ling, 2012), support a variety of uses: to make and receive phone calls, to text/SMS, to take photos, to listen to music, to access social media and apps, as well as to interact online with government, health, and support services. Older, chronically homeless men are especially vulnerable because of lack of digital access and engagement, and the compounding effects of their age and length of time on the street. Low levels of confidence and the ongoing cost of devices and plans are particularly acute problems for this group, pointing to a digital divide within the homeless population.

In Chap. 3, I examined patterns of smartphone dependence in Australia and a number of other countries, where a range of lower-income and marginalised groups rely exclusively or mostly on mobile phone for their online activities. The chapter examined these usage patterns within an analysis of the market structuring of mobile media access that focused on products, plans, and industry and retail practices. The chapter revealed

three main ways in which the market structures access to mobile phones resulting in a limited, more costly, and more contingent form of 'second-class' access: (1) through the production of cheaper, older generation handsets, with fewer features and in poorer condition; (2) by imposing 'poverty premiums' that establish and lock in pricing strategies that disadvantage the poor and homeless; and (3) through the creation of confusing retail practices and products that target and exploit vulnerable and disadvantaged customers.

The focus in Chap. 4 was on the digitisation of government, health, and welfare services in Australia and internationally. The analysis examined how people experiencing homelessness and other smartphone-dependent users 'bear the burden' of digital service reform, carrying a greater share of the cost of digital access and data use, and suffering from the negative consequences of datafication. Digital service reforms have been justified on the basis of ubiquity of internet access, even among traditionally marginalised groups, and are driven by the advancement of digital citizenship agendas and welfare austerity. The research revealed that with these changes, people who are homeless are increasingly required to access services in an online environment, compounding smartphone dependence and connectivity costs. Additionally, homeless and marginalised groups are enrolled in processes of datafication that introduce new barriers, risks, and harms in the form of digital identification, commoditisation of their data, and data profiling and targeting.

This chapter set the stage for Chaps. 5 and 6, where the argument was advanced that connectivity underpins regimes of datafication in state-based institutions and cities just as it does commercial social media platforms that rely on the value that can be extracted from the exchange of personal data for 'free' access to platforms (van Dijck, 2014). In Chap. 5, I examined how different homeless groups navigate the urban environment to meet their digital access needs, for basic survival, and to move out of homelessness, highlighting the challenges as well as the affordances of cities as sites of connectivity. Definitions of connectivity are more than just an isolated technical operation of access, and connections are practised alongside and overlap with a number of other dimensions and processes, including the physical and social environments of use and the

design and regulation of city spaces. The concept of 'survival infrastructuring' describes how homeless media users creatively appropriate and improvise their mobile media use to overcome access and spatial exclusion, but also reveals the limits of these strategies in overcoming imperatives of movement, surveillance, and control.

The case study of LinkNYC in New York City highlighted how a promising connectivity infrastructure accessible to the public can end up reinforcing the precarious mobilities of homeless and marginalised urban groups. The Links were sources—among others—of internet access and device charging for street homeless as well as visitors and young people, making up a patchwork of connectivity options that people stitched together as they moved about the city. The findings pointed to a role for LinkNYC in supporting digital inclusion, but the design of the Links also drew people experiencing homelessness into public spaces, making them more visible to the public and local authorities, and reinforced the gendered and racialised dynamics of these spaces. Even when survival infrastructuring was carried out by homeless users to overcome the Links' affordances of short-term use, these strategies could not address the sociospatial inequalities playing out in the use and regulation of urban space.

In Chap. 6, I used the case of LinkNYC to illustrate that with accelerated datafication of urban environments, social and spatial inequalities are being further embedded into the logics and infrastructures of cities and states. This dynamic was explained in terms of 'the data–connectivity exchange', whereby groups that experience precarious connectivity rely on 'free' access solutions that can give rise to further risk and harm by subjecting them to datafication in their use of these services. Moreover, with new forms of smart citizenship, the mobile phone plays a special role as a proxy for the body, and as such becomes another means through which homelessness is constructed as a category, and people experiencing it as a group to be 'acted on'. The chapter then explored examples of algorithmic systems introduced by national governments to crack down on so-called welfare cheats and highlighted how new models of algorithmic governance provide another means to discipline and punish homelessness.

From Lifeline to Leash

Mobile phones offer groups who might otherwise be digitally excluded owing to homelessness access to information and services, personal communication, and ways to counter social inequalities that result from differential resources and treatment. At the same time, mobiles are a limited form of access, and through them, people who are homeless are subject to new dynamics of risk, to processes of datafication, and to disciplinary powers that have detrimental outcomes. Models of digital or smart citizenship and algorithmic systems can intensify imperatives of movement, risks of surveillance, and the policing and criminalisation of homelessness. The mediational role of the mobile phone as lifeline gives way to its role as leash, reinforcing the ways traditionally excluded social groups unevenly bear the risks and uncertainties associated with shifts in communication patterns and processes of digitisation. Recognising homelessness as a mediated experience and category, and identifying the broader forces and relations structuring connectivity and communication when people are homeless have implications for homelessness policy and research as well as for research and action on digital inequalities.

Is Digital Inclusion Enough?

Digital access continues to be a persistent dimension of digital inequality. Despite the trajectory of research shifting away from access to issues of affordability, accessibility, ability, and the translation of use into forms of capital (DiMaggio & Hargittai, 2001; Marler, 2022; Ragnedda & Ruiu, 2017; Robinson et al., 2015; van Deursen & van Dijk, 2014), connectivity is the focus of renewed scholarly interest. This revival is largely because of the recognition that access problems persist and new ones are emerging, and that these have specific expressions in different geographical, national, and economic contexts (Gonzales, 2016; Gonzales et al., 2016; Humphry, 2019; Katz, 2017; Park et al., 2019; van Deursen & van Dijk, 2019). The model of 'technology maintenance' developed by Gonzales (2014, 2016) recognises the ongoing struggles that low-income groups in

developed national contexts experience because of unstable and unreliable access, resulting in 'dependable stability' (Gonzales, 2014, 2016; Gonzales et al., 2016). In the concept of 'survival infrastructuring' developed in this book, I have expanded on this model to include the places and contexts in which connections are made, and the creative appropriations used to mitigate not only deficits of technological access but also spatial exclusion. Through infrastructuring, people experiencing various forms of homelessness make claims on space, and this extends to the objects and technologies that make up those spaces and define their affordances. Lack of attention to the complex expressions of digital exclusion is in part to blame for the misrecognition of the ongoing problem of access (Chan, 2013; McShane, 2005). False assumptions of connectivity are also fuelled by universalist narratives of digital ubiquity and the misapprehension of access as a fixed condition rather than as an achievement, with access always precarious for some: a perpetual struggle that is only ever partially achieved.

The COVID-19 pandemic has greatly accelerated the process of digital transformation across a range of fields (Barraket & Wilson, 2020), magnifying the precarious connectivity of groups more likely to experience homelessness, such as female partners exposed to violence in the home. Other groups experiencing homelessness are similarly disadvantaged by limits on the quality and availability of digital access (Lai & Widmar, 2021), at a time when, as Beaunoyer et al. (2020) assert, 'digital inequalities represent a major risk factor of vulnerability for exposure to the virus itself' (p. 1) as well as in the society-wide repercussions of the crisis. These authors refer to the 'unequal distribution of vulnerability' (p. 3) suggesting that the pandemic has intensified existing digital asymmetries while simultaneously accelerating the imperative of digital connectivity, prompting observations of a worldwide digital dependency in which 'the status of virtual digital spaces have switched from an amenity to a necessity' (Beaunoyer et al., 2020, p. 2).

The pandemic has highlighted the urgency of tackling issues of digital exclusion and developing new approaches, while also expanding our understanding of the ways in which these issues play out differently for groups shaped by lived experiences of intersecting inequalities and processes of digitisation. So, for example, the growth in domestic violence

during COVID-19 has created a particularly urgent situation in regard to ensuring that mobile phone access—one of the few ways to seek help away from home—is not disrupted through the inability to pay service providers. At the same time, increasing rates of domestic violence and the extended reach to individuals that mobile phones enable mean that the potential for technology-facilitated violence is greatly magnified, a phenomenon demanding further attention and mitigation measures.

Recognition of the distinctive needs and challenges of digital precarity experienced by unstably housed groups thus provides opportunities to develop new approaches for responding to homelessness through targeted policies and programs. Moving from a perspective that understands digital equality as central to the design of homelessness services and programs does not need to displace or deprioritise issues of housing, education, and health. It is important to avoid the kind of technological solutionism that would have it that complex problems stemming from entrenched inequality can be solved technologically, a form of 'magical thinking' referred to by Greene (2021) as the 'access doctrine' (p. 5). As evidenced in the case of the City of New York's embrace of LinkNYC, the discourse of equity and inclusion can itself have the effect of downplaying or, even neutralising, attention to longer-standing urban inequalities. The starting point for this undertaking, therefore, is that rather than treating digital access as a standalone issue isolated from these other needs, digital access is dependent on and conditioned by these needs, which are, in turn, essential for living, working, and participating in societies that require active digital citizenship. This definition of home as a prerequisite and condition of digital access is suggestive of a range of interventions and policy approaches building on the research findings detailed in this book.

The finding that chronically homeless, older men are significantly less likely to have access to a mobile phone and find digital services relevant, for example, has implications for how information is delivered and services coordinated for this group. For this group, addressing issues of digital ability and relevance might be more of a priority than issues of access and affordability, although these issues are linked and influence one another (Gonzales, 2016). In addition to providing further evidence that the digital divide is deepening within certain subgroups (Ewing & Thomas, 2012), more work needs to be done to explore what inclusion

means for groups for whom access to technology by itself doesn't guarantee social inclusion (Buré, 2005).

Likewise, the finding that clients of homelessness services who had a prior mental health issue or who were living with a disability were more likely to have reported difficulty paying bills and to have experiences of debt with their mobile phone, points to the need to incorporate perspectives of disability and intersectionality in framing the agenda and approaches to digital inclusion and homelessness (Goggin & Soldatić, 2022).

The cost of accessing a wide range of essential services online and via apps, covered in Chap. 4, points to the need to be cautious about making a case for technology-based health and support interventions. Groups who are homeless or otherwise marginalised pay for the cost of digital reform through increased data usage and self-management of services; shifting services online without an alternative can create new costs and barriers. It follows that removing or reducing face-to-face services should also be reconsidered, given the added cost burden. Retaining personal encounters with clients of services is justified for other reasons too, such as for reducing the alienation of abstracted data relations.

A more systematic approach is needed to address digital exclusion among smartphone-dependent populations, and to acknowledge that the market might exacerbate, rather than solve, these problems. As part of this, the baseline for access for digital inclusion needs to be formulated to include not just home broadband and mobile data and voice subsidies, but also secure and safe housing, with the potential for spatial appropriation, recognising that digital access is inseparable from the social, spatial, and material contexts that condition and sustain it.

Existing subsidies should be expanded and made accessible in a variety of ways, for example, through a nominated mobile service provider or as a top-up on welfare payments, and should include data allowances and devices that account for changing standards of data usage and the need to support more data-intensive activities like movie watching, game playing, and content creation. The continued reliance on the public payphone by people experiencing homelessness points to the need for the provision of this most basic of services and is an important consideration in the repurposing of ageing payphone networks and infrastructures.

Public libraries need to be acknowledged as more than just offering public digital access and a safe space for people experiencing homelessness to access the internet, but also as 'peopled infrastructures' (Simone, 2004). Library staff provide essential support for accessing digital resources and online services, which is particularly challenging for people who are homeless. As the Director of Digital Policy at New York Public Library explained, libraries have been providing a place for people to get online for the last 20 years and are aware of the gaps in access and how these change over time. There are staffing repercussions that accompany the changing use and patronage of libraries, and not all libraries embrace this role. Because of this, dedicated training, resourcing, and support for libraries are needed as they expand their operations and missions to become a 'local sanctuary for communities' (Swist et al., 2022). The case of LinkNYC represents a missed opportunity to involve public libraries as key partners and to better align efforts to address homelessness; instead, it placed the onus on a self-service kiosk model that drew users into public spaces. The point was eloquently made by Mattern (2016), who suggested that libraries are best equipped to be the stewards of urban public information infrastructures. 'What works in the library can work for the street' (n.p., para 2).

Notwithstanding these propositions for better aligning digital inclusion goals with homelessness policies, there is still the question of whether digital inclusion is an appropriate framework for addressing the new harms and risks associated with current digital transformations. While the renewed focus on digital inequalities is welcome, there is an urgent need to move away from an emphasis on digital benefits for citizenship and, as Hintz et al. (2018) have suggested, to address how digital citizenship perpetuates and even worsens inequalities. Increasingly, attention to digital and data inequalities in critical data studies (Dencik & Kaun, 2020; Hintz et al., 2018) and media studies (Couldry & Mejias, 2019; Madianou, 2019; Watkins & Cho, 2018) is revealing the ways in which compulsory digital participation and automated technologies can be the basis of new kinds of harms for traditionally excluded groups.

How might we mitigate against data risks and harms that come about through new kinds of media devices and services, digital urban objects, and algorithmic systems? How do we design different kinds of smart

technologies and spaces? How do we strengthen legal, planning, and data-regulatory mechanisms? How can we include more diverse voices, life experiences, and social needs in urban and digital design processes? How can we push back against technology-driven smart city proposals and algorithmic welfare systems?

Homelessness has only relatively recently come to the fore as a distinct area and subject of mobile communication research, in part because of the rise of mobile-only populations in developed nation contexts and recognition that mobile technologies are inadequate to bridge—and are potentially widening—the digital divide. But as a subset of the mobile-only population, while there are commonalities with and overlaps between people who are homeless and other mobile-only groups, such as young people, migrants and refugees, Indigenous communities, people living with disabilities, seniors, and people on low incomes, there are also important factors that make their situation distinct, both empirically and conceptually.

Approaching the study of mobile communication in terms of its 'mediational role', as I have done in this book, has enabled an understanding of these particularities and the ways in which communication and connectivity relations are part and parcel of how homelessness is itself socially constructed (McNaughton, 2008; Ravenhill, 2012). This approach facilitates a critical engagement with homelessness as a category and label that itself has potentially harmful effects, being instrumentalised to target and profile particular groups. This has been shown in this book in the way a market and user base were created for mobile phone products designed and developed to provide a lower-quality and more costly form of mobile communication. It was revealed in the redesign and delivery of online government, health, and welfare services accompanied by datafication that created not only new data structures and processes but also data subjects. It was shown in the way LinkNYC, a free-to-the-public connectivity infrastructure, operated as a mechanism by which groups who rely on free access solutions were enrolled into new systems and processes that could give rise to further risk and harm to them, both within public space and as subjects of datafication. Moreover, it was shown in new forms of smart citizenship and algorithmic governance for which the mobile phone acts as a proxy for the body, such that it becomes

another means through which homelessness is constructed and groups are rendered visible (Taylor, 2016) to be 'acted on' and policed.

Taking up Shapiro's (2018) demand that 'smart city systems need to [be] conceptualized at their logical extreme in order to highlight their dangerous potential' (p. xi), I suggest there is scope to carry out this suppositious examination with other cases and sites, to identify some of the anticipatory justifications for specific smart city and algorithmic systems and reveal how these might reinforce harms and add to the arsenal of policing of poor and racialised communities. This speculative method of enquiry can help to better understand the challenges of datafication and to anticipate particular controversies and impacts that have not yet surfaced or not yet galvanised collective support, as well to envisage different imaginaries and approaches.

Imaginaries are not fixed or settled, and are open to change as well as contestation. Reflecting on LinkNYC, the co-director of the Digital Equity Lab in New York City explained to me that one of the real gains of the network was the potential represented by the fibre installed beneath the city's streets:

> *What I think is important about LinkNYC is modernising that invisible under-the-ground infrastructure … So even leaving aside the kiosks and everything else, a lot of fiber has been laid for this. So that's really an amazing gain from that project.*

It is no mean feat that this has been achieved in a city such as New York, where building an infrastructure of this size is immensely expensive and complex. However, the promise to connect the last mile of households in the poorest areas of New York City currently remains unrealised, in the form of 'dark fiber' lying dormant under the city's sidewalks (Halegoua & Lingel, 2018). Imaginaries can be directed at repurposing, adapting, or even re-engineering technologies. What might be required to connect or turn on this infrastructure and make it available to the people who need it most? What else could a public payphone be and how could it be designed differently with its actual users in mind, without subjecting them to invasive data collection?

An examination of urban design, regulation, and governance illuminates the underlying social and political forces that delimit the extent to which equity goals can be realised within neoliberal urban governance frameworks (Caprotti et al., 2022; Pierre, 2011; Sadowski, 2018). These are powerful political processes through which spatial and by effect, temporal relations are configured and enforced in distinctive ways for different social groups. The discourse of smart cities is one such powerful force and is, as Green (2019) has suggested, a 'seductive logic', but not one that is well equipped to dealing with urban inequalities, because it ultimately directs attention away from what is needed to create more democratic and equitable cities.

Connected to this is the potential for learning from the connectivity strategies and survival infrastructuring that takes place within and against existing forms of urban regulation and smart governance; these are revealed through research and listening to the needs and stories of people experiencing homelessness. These imaginaries and place- and home-making practices, used to assert control over personal environments and experiences (Veness, 1993), are often creative and resourceful ways in which people who are homeless challenge harmful stereotypes and labels, and reveal the underlying disparities and sources of inequality that might otherwise be hard to detect. Such strategies have an affirmative role for 'strategically and assertively foregrounding' the politics of space (Soja, 2010, p. 629) and for challenging definitions of homelessness set in opposition to notions of the public (Kawash, 1998).

Paying attention to survival infrastructuring can also show ways that technologies can be designed to meet the needs and imaginaries of their actual users. Like the young people in Sydney who attended the co-design sessions, many of the young people at the Manhattan refuge had ideas for how to improve the Links drawing on their lived experiences that were feasible and widely beneficial. Some of these suggestions were: a way to notify a repair operator when a Link needed servicing; increasing the size of the inbuilt tablet to make it easier to search for services; adding mobile phone charger ports to accommodate more users; allowing call backs to be made to a messaging service to support two-way communication and providing a fold-down seat to the unit and fold-out side flaps on either side of the tablet for comfort and better audio quality. But the most popular idea was to cover the kiosk to provide protection from the weather and enhance privacy:

I think they should have it covered. Especially for the winter, nobody wants to stand there in the winter in the cold. I think it should be like a nice little—like the little booths in London. You sit there with the door closed and there's privacy.

Critical research on digital citizenship and datafication has led to new research and policy agendas centred on goals of 'data justice', which shift from an emphasis on issues of digital inclusion and individual privacy towards questions of social, political, and economic justice (Dencik et al., 2019). Data justice refers to 'fairness in the way that people are made visible, represented and treated as a result of their production of data' (Taylor, 2017, p. 1), and as such is grounded in an analysis of structural inequalities that give rise to these data injustices. In this way, data justice is a framework well positioned to identify and address the ways in which groups who have been subject to racism and discrimination in the past are re-targeted and re-racialised with new data processes that render these groups visible in new ways (Taylor, 2016). There are opportunities for combining or aligning goals of data justice with goals of urban justice that factor in the specific challenges for homeless and marginalised groups when locational discrimination, the political organisation of space, and the unequal redistribution of resources (Soja, 2009) come together with the asymmetric datafication of urban space, giving some groups fewer choices, abilities, and protections than others at the point of and around the connections they make.

Conclusion

This chapter has reflected on the contribution of this book to an understanding of homelessness as a mediated condition and has suggested that this approach also provides new opportunities for action and research of homelessness and digital inequalities. The concept of precarious connectivity, which refers to the way features of communication access create or exacerbate structural inequalities, making it insecure, expensive, and poor quality for segments of the population, is important for revealing the broader forces and relations structuring people's lived experience of homelessness. The need to centre home and home-making practices in

mobile communication research is necessary to better understand people's choices and practices when homeless, and to reveal the effects of digital exclusion and processes of datafication. I suggested that developing the interventions and imaginaries needed to tackle these effects and processes requires engagement with goals of urban and data justice. Linking spatial justice goals and principles with those of data justice will also enable responses that address the effects of new spatial formations and dynamics produced through the mediation and datafication of cities and public spaces by coded objects, processes, and connections. In conclusion, I want to make some final comments on the limitations of this research and make suggestions for avenues and directions of research in the future.

Limitations and Further Research

One of the important principles I adopted in my research and methodological approach was to ask participants about how they felt about the label of homelessness, providing opportunities to contest this identity, and to use methodologies such as ethnography and co-design to prioritise the voices of participants and include participants in the research process and outcomes of the projects. The mixed methods approach, which included ethnographic and co-design methods as well as a survey and document analysis, allowed me to identify larger patterns and to situate the findings within larger developments and trends. A limitation in research on homelessness in general, and in this book, is the reliance on homelessness services to reach people who, owing to their circumstances of vulnerability, may have less autonomy to resist or challenge the categorising and labelling that homogenises participants' homeless experiences within service paradigms. In carrying out future research into datafication of services and into digital citizenship more broadly, it is imperative that the voices of people who are homeless are foregrounded, to reveal the effects of digital exclusion and processes of datafication. In addition to pursuing more research on homelessness and mobile communication, and expanding the field to make new disciplinary connections, there is a need to give more attention to the role of the smartphone

in performing and transforming citizenship. Data asymmetries tied to the production of mobile digital personas have the potential to create new demands of digital engagement that reinforce smartphone dependence and generate new kinds of risks and harms for groups for whom these personas, and the ideas and categories they generate, form the basis of responses to homelessness. A focus on data and urban justice in the context of addressing homelessness and prioritising the provision of affordable and supported housing has the potential to prevent these harms and provide the foundations for more just, inclusive and equitable digital futures.

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Index[1]

[1] Note: Page numbers followed by 'n' refer to notes.

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