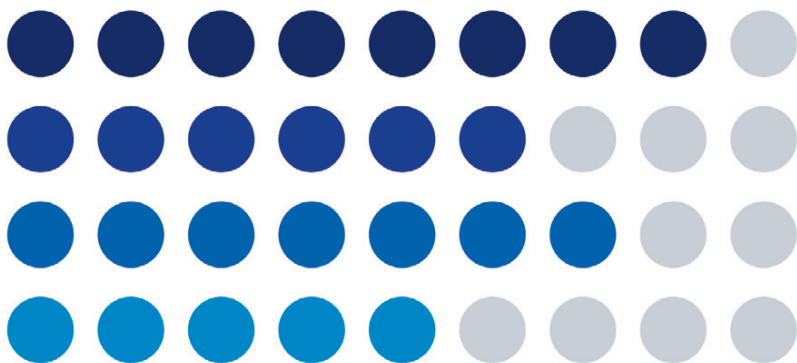
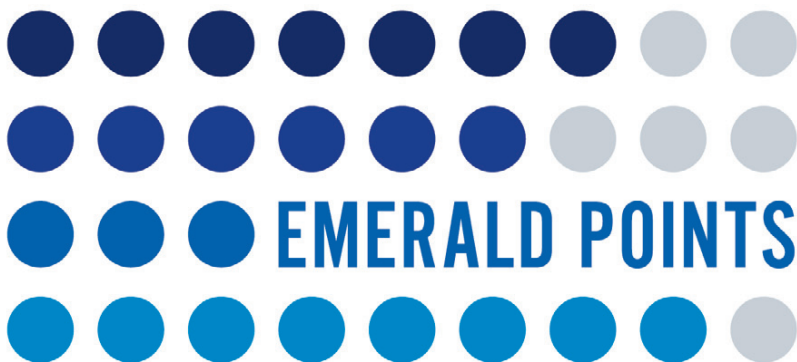




DIGITAL CAPITAL

A Bourdieusian Perspective
on the Digital Divide

Massimo Ragnedda and Maria Laura Ruiu



DIGITAL CAPITAL

Praise for *Digital Capital*

As digital communications becomes ever more central to everyday life, work and leisure, their impact on inequality becomes increasingly profound. Is there a new ‘digital capital’ acquired by those who gain most from these technologies? The authors, established experts in this field, address this problem with a thorough and informed analysis of the concept, and its implications for policy and understanding.

Peter Golding, Professor, Northumbria and
Newcastle Universities, UK

Taking their inspiration from Bourdieu’s analysis of capital, Ragnedda and Ruiii extend the concept theoretically to the digital. Digital capital is operationalised through the creation of an index that accounts for differences in digital skills and competencies. Digital capital is then related to other forms of capital – economic, social and cultural – showing how digital capital works as a bridging capital allowing those with economic and cultural resources to use the digital to acquire ever greater advantage. This speaks to an important new wave of research on the ‘third level of the digital divide’ that seeks to measure outcomes. This is a highly cogent and important book both theoretically and empirically that should be of interest

to sociologists of class and inequality as well as communication scholars seeking to understand the digital divide.

John Downey, Professor of Comparative Media Analysis and Head of Communication and Media, Loughborough University; Vice-President, European Communication Research & Education Association

Ragnedda and Ruiu build the field of Bourdieusian analysis of digital inequalities in their timely scholarship that speaks to key issues in the emergent field of digital divide studies: theory, methodology and implications. The authors push the field forward by conceptualising and operationalising digital capital, thus integrating important theoretical insights with replicable empirical examination. Meeting this challenge allows their work to make real impact concerning the implications of digital inequalities for theorists, academics, policy-makers and practitioners.

Laura Robinson, Associate Professor,
Santa Clara University

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INVESTOR IN PEOPLE

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INTRODUCTION

What is digital capital? How can it be measured? And what impacts might it have on policy-makers working to reduce digital inequalities? The attempt to discuss both the theoretical and empirical implications of these questions is at the very heart of this book. More specifically, the aims of this book are threefold. First, to dig deeper into the concept of Digital Capital and clarify its theoretical framework and critical contribution, and second to propose a model to measure digital capital and third to discuss some policy implications of this theoretical and empirical tool. In order to fulfil these aims we first need to shed light onto the overall questions surrounding this work: is there a need to introduce a new capital in our theoretical baggage? Is not the plethora of capital commonly used by social scientists and media scholars sufficient to describe the different resources/materials used in our everyday life to achieve specific goals? In fact, someone could question the necessity to introduce a new specific capital, instead of including both the digital or technological components to existing 'capital' such as, e.g. economic (that might help explain different access to the ICTs) or cultural capital (different technological skills). Furthermore, even if we introduce a new capital in our research toolkit, can we empirically measure it? Finally, what would be the impacts of this theoretical and empirical model for policy-makers and stakeholders who monitor citizens' digital inclusion level?

This book proposes both a deeper conceptualisation of digital capital as a specific capital and its operationalisation for empirical exploration and measurement. By conceptualising and providing some guidelines for future research on the measurability of digital capital as a specific capital, we are contributing to the lively debate on digital technologies and their impacts on our everyday life. Furthermore, this book also provides policy-makers with a tool that might facilitate the development and monitoring of initiatives addressed to tackle both digital and social inequalities. As we shall see throughout the book, the theorisation of this new concept is based on a preliminary definition provided by Ragnedda and Ruiu (2017) and further reinforced by Ragnedda (2018). However, this book will show some advances in terms of combining both empirical and theoretical approaches to answer the above-mentioned questions about the legitimacy of using a new capital in an extra economic way and contextualising its theoretical contribution in a Bourdieusian perspective. Measuring digital capital means taking into account its multidimensionality, which is not only represented by the material resources that enable the physical access to ICTs but also by the interiorised competences and attitudes that contribute towards increasing the individual level of digital capital. As we shall see, the individual level of digital capital influences both qualities and types of online activities and also the benefits and tangible outcomes we get from accessing and using the Internet. This interpretation also suggests that digital capital can become a valuable tool to explore and tackle the multidimensionality of digital inequalities and their related levels of digital divide (Ragnedda, 2017). As highlighted throughout the book, given its bi-dimensionality (which includes both physical access and digital competences), digital capital interacts with the inequalities in accessing (first level of digital divide),

inequalities in using (second level) and inequalities in terms of benefits and tangible outcomes (third level). In this vein, this book shows how the constitutive elements of digital capital dialogue with the first two levels of digital divide by facilitating/hampering access to and use of ICTs. Furthermore, it also highlights the bridging nature of this capital that is also connected to the third level of digital divide by producing different tangible outcomes deriving from the interaction between digital capital, different digital experiences and off-line capitals. In this direction, this book suggests that the identification and quantification of digital capital is essential to understanding how the individual level of digital capital can contribute towards expanding (or by contrast narrowing) digital inequalities, which in turn play a role in (re)producing social inequalities. Therefore, the utility of this capital is expressed not only in terms of providing scholars with a tool for investigating the intertwined relationships between social and digital inequalities but also informing policy-makers about the digital accumulated experience of people in society and how this could impact individuals' everyday life. This is particularly important in policy-making that aims to address digital/social inequalities through inclusive initiatives that are tailored upon individuals' needs. In fact, in order to both enhance a high-quality online experience (shrinking the second level of digital divide) and foster users' capacities to benefit from the use of ICTs (mitigating the third level of digital divide) the investigation of both competences or access is vital to increase citizens' life chances and, in the long run, to reduce social inequalities.

The digital age has triggered the rise of inequalities that are in part a reflection of the traditional offline inequalities. This book shows the need to introduce a new capital as a theoretical tool to shed light onto the inequalities in the digital age. This is supported by the need for developing a model to

measure both the quality and quantity of digital experiences and the benefits that users can earn from accessing and using the Internet. In order to fill this gap in the literature, we are also attempting to operationalise digital capital as a cumulative and transferable capital, simultaneously specific and intertwined with the other five forms of capitals, namely social (Bourdieu, 1983; Coleman, 1990; Putnam, 1995), political (Mouzelis, 1995; Syed & Whiteley, 1997), economic (Bourdieu, 1983), personal (Becker, 1996; Dei Ottati, 1994) and cultural capitals (Bourdieu, 1983). This work provides, then, both a theoretical and an empirical tool for measuring digital capital, which can be applied for replication and comparison in different social, cultural and geographical contexts. Both the theorisation and operationalisation of this new capital are essential to understanding its interaction with other capitals and its contribution towards digital and social inequalities.

As shown by the first chapter of this book, the theorisation of this new capital is drawn from the definition of digital capital as a set of both digital competencies and digital technologies. In this book we move one step forward by operationalising digital competences by using the European Digital Competence Framework for Citizens (Carretero, Vuorikari, & Punie, 2017), and digital technologies, by referring to the literature with a focus on the way users access and use ICTs. Chapter one takes into account the bi-dimensionality of digital capital, which is not only represented by the physical and material access to digital devices (Van Deursen & Van Dijk, 2019) but also by those digital competences that facilitate the digital experience and, in turn, transform such experience into externally observable outcomes. The two constitutive elements of digital capital – digital competences and digital accesses – can be accumulated and transferred from one arena to another, to increase what Max Weber (1949) defined as individual life chances. Cumulability and transformability are,

according to Bourdieu, constitutive components of any capital (Ignatow & Robinson, 2017: 952). For this reason, the Bourdieusian capital lens adopted in this book provides a framework for conceptualising and measuring digital inequalities. Digital capital, therefore, can be at the same time accumulated over time (thanks to the cumulability of both technologies and competences) and converted into social, political, economic, personal and cultural capitals (thanks to the outcomes deriving from the digital performance). The results of this accumulation are visible both on the online realm, by influencing the second level of digital divide, and in the offline realm, by increasing the third level of digital divide. In this vein, one of the driving ideas of this book is that in a digital reliant society, where an increasing number of services and resources have moved online, the level of digital capital is vital to confidently use the Internet and to be able to capitalise the use of ICTs for improving life chances. What this book argues is that in order to efficiently operate and move in the information age (Castells, 2011) or information society (Feather, 2013) and be both digitally and socially included, individuals need a certain level of digital capital. In Bourdieusian terms, therefore, digital capital is required to inhabit and operate successfully within the digital arena and to get the most out of it. However, since the difference between online and offline is blurring and since social and digital inequalities are so firmly intertwined, digital capital is increasingly important in individual everyday life, where, first, the access to ICTs and, then, the competences in using them are vital elements to operate in a digital enabled society. Digital capital, therefore, sounds particularly relevant in several specific fields of human life, such as job-related activities, social networking, leisure and welfare services, in which digital access and digital competences are increasingly a necessity, and not a simple option. Digital capital, as we shall see, like other kinds of

capital, is unequally distributed and, as such, tends to reinforce and influence social inequalities. It is a concept that will become vital for digital sociologists and for those scholars who investigate digital inequalities and their effects on the society and everyday life. Digital capital is a concept usurped by economic studies to highlight the nature of ‘assets’ physical/intangible to invest in everyday life, to foster individuals’ capacity to move up on the social ladder by confidently and properly using digital technologies. The conceptualisation here proposed, moved away from the ‘economic’ theorisation proposed, among the others, by Tapscott, Lowy, and Ticoll (2000) and Roberts and Townsend (2015) who have used the notion of digital capital to describe the resources upon which the development of new products and services rely in the digital economy. In our approach, digital capital is an important notion that helps shed light onto the multidimensionality and intersectionality of digital inequalities and offers an important conceptual and empirical tool to measure digital divide.

However, both the conceptualisation and its operationalisation/applicability require a deep analysis and discussion. In order to respond to these questions and shed light onto the measurability of digital capital as a specific capital, the book is structured into three chapters that respond to three different necessities. First, the need to provide scientific support to the theorisation and conceptualisation of this new concept. Second, the need to operationalise digital capital by developing a model that could be replicated in different contexts. Finally, the need to reflect upon its implication for policy-making. More specifically, the first chapter presents the relevant literature that contributed towards defining the concept of digital capital, thereby extending Bourdieu’s field theory. This chapter digs deeper into the theorisation of this concept, by explaining how and why digital capital should be conceived as a specific capital, and not as a mere subset or

special category of other capitals. The proposed notion of digital capital should be seen as an attempt to integrate the existing approaches of ‘capitals’ into one comprehensive conceptualisation which can enable to better grasp the intertwined relationship between social and digital inequalities. After providing a definition of digital capital, the methodological approach is described. In the second chapter, we shall look at its constitutive components, by explaining and discussing the reasons why specific components are essential to measuring digital capital. Furthermore, in this chapter we report and discuss some empirical data that were used to test the validity of the Digital Capital Index. Finally, the third chapter discusses the implications of this new concept and its related empirical application on policies and initiatives (both public and private) addressed to tackle digital inequalities. We shall specifically pay attention to policy-making approaches in dealing with digital inclusion and why this model might be useful to tackle both digital and social inequalities. This chapter envisages policy-makers to use this model for monitoring the level of digital inclusion, both at micro and macro level. At the same time, it might be used to develop policies tailored on those who need them the most. Finally, the conclusions highlight future directions for research in this field. This conclusive chapter shall reflect upon the major findings as a whole, and points towards the future needs of the field. It will draw together the comparative points not otherwise articulated in the different chapters.

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DEFINING DIGITAL CAPITAL

The book's aims (conceptualising-measuring-policy implication) are based on two assumptions. The first one is that digital capital should be conceived as a specific capital and not a mere subset of other capitals and, therefore, can be isolated. The second assumption refers to the partition of digital capital in sub-components that can be quantified and measured. In this chapter we attempt to fulfil the first aim, by clarifying this concept and providing the theoretical framework against which we are proposing the empirical model to measure digital capital. In order to clarify the importance of conceptualising this new capital, we will first advocate the need for introducing a new capital in our theoretical toolkit in Bourdieusian terms. We will then clarify the reasons why digital capital should be considered as a distinct capital and not, as many scholars argue, a subset of other capitals. We shall argue that digital capital, as other forms of capital, such as Economic, Cultural and Social, is a specific capital, and as such should be theorised and operationalised. Furthermore, as we shall see, digital capital is also a bridge capital, vital to connect first the offline experiences and resources with the online realm (determining both quality and types of online

experience) and then to capitalise and transform the digital experience into tangible benefits and outcomes, externally observable. The bridged nature of this capital is also vital to better understanding digital inequalities and, more specifically, the three levels of digital divide.

It is proposed that the conceptual framework might prompt some insights into the necessity to add this new capital into our theoretical toolkit as well as specifically shine further light on the importance of using this concept for both media scholars and social scientists. We shall start the first chapter, aimed at conceptualising and define digital capital, by briefly introducing the concept of capital through the Bourdieusian lens, and explaining why the Bourdieu perspective is useful in understanding and explaining digital inequalities.

1.1 THE CONCEPT OF CAPITAL IN BOURDIEUSIAN TERMS

Bourdieu (1986) interprets the concept of capital as any resource that gives an advantage to those who own it, and who can also be accumulated and perpetuated over time. More specifically, in Bourdieusian terms, capital must be understood as a cumulative resource that one possesses and whose possession empowers social agents within specific fields in which they are active, thus becoming a form of power (Bourdieu, 1984). The power, understood as the capacity to act and produce effects or advantages for a social agent, manifests itself in the form of capital (Swartz, 2013). To fully appreciate Bourdieu's conceptualisation of capital we need look at its intertwined relationship with two fundamental concepts: *field* and *habitus*. The *habitus* links the socialisation processes to individuals' actions.

This is because the *habitus* constitutes provisions, projects of action or perception that an individual acquires through their social experience. Therefore, following the course of their social trajectory, individuals slowly incorporate a set of ways of thinking, feeling and acting, which are at the origin of individuals' future practices. However, the *habitus* is more than a simple schema that enables to mechanically reproduce what has been experienced. It is the internalisation of a system of dispositions, which allow the individual not only to produce a set of new practices but also to adapt them to the social context. To the extent that these provisions form a system, the *habitus* is at the origin of the unity of the thoughts and actions of each individual or social class. Specifically, the *habitus* is 'the way society becomes deposited in persons in the form of lasting dispositions, or trained capacities and structured propensities to think, feel and act in determinant ways, which then guide them' (Wacquant, 2005: 316). At the same time, Bourdieu defines society as a superimposition of fields: economic, cultural, religious fields, etc. Each field is organised according to its own logic, determined by the specificity of the cards that each subject can play with. The interactions are structured in function of the resources or capital that each agent mobilises. Therefore, the concept of field could be considered both as a relational space where social agents adapt their social practices to a system which is modelled by external forces (Bourdieu & Wacquant, 1992: 46). In every field, the position of social agents depends on the quantity and structure of the capital they own (inherited or accumulated). Moreover, each field is characterised by the prevalence of a specific capital; however, all types of capital are present in different degrees. The notion of capital, therefore, becomes vital in Bourdieu's narrative. It derives from an economic approach, as

it is evident in the properties attributed to capitals in terms of accumulation, transferability and profits. In fact, a capital can be accumulated through investment operations, it can be transmitted through inheritances, and it allows to gain profits (which can be monetised). More specifically, Bourdieu (1986) identified three basic types of capital: 'economic', 'social' and 'cultural', each of them characterising a specific field. Alongside the economic capital, interpreted as a set of material riches, Bourdieu defines social capital as a network of personal relationships, and cultural capital as the intellectual capacities, the cultural assets possessed, and the educational qualifications acquired throughout the course of people's life. In addition to these three forms of capital, there emerges a meta-capital (symbolic capital), which is transversal to the other forms of capital because it embodies the level of recognition that people have in society. This means that the symbolic capital might be interpreted as a 'mediating capital' that simultaneously facilitates the acquisition of other capitals, and depends on the capitals already possessed by individuals. Cultural, social and symbolic are types of capital, resources which, according to the social configuration, are assigned more or less value and play a key role in individuals' everyday life and in producing/reproducing social inequalities. According to Bourdieu (1989), individuals are positioned in society based on the volume and breadth of their economic, cultural, social, symbolic capital resources. Individuals, as well as social groups and organisations, have at their disposal these four forms of capitals to a different extent. These capitals are partially convertible, according to the power dynamics and structure of a specific field in which individuals/groups/organisations operate (Bourdieu, 1986).

The idea that there are different forms of capital enabled Bourdieu, among the others, to construct a model of social

space that is capable of accounting for differences that the Marxian notion of capital cannot grasp. Extending the use of the concept of capital also in other social fields (beyond the economic arena), Bourdieu breaks with Marxism, by providing an explanation for social practices. Bourdieu (1986) argues that none of these forms of capital – material, cultural, social or symbolic – are dominant a priori. The theory of surplus appropriation embedded in the Marxist idea of capital (Beasley-Murray, 2000: 103–105) cannot efficiently explain the notion of economic capital in Bourdieusian theorisation. In fact, in Bourdieu's view, the economic capital is only one example of market forces. In fact, there are several forms of capital, often immaterial and hidden beyond a mask of disinterestedness, that influence an individual's social status. In this vein, echoing Weber, Bourdieu points out that all individuals' actions are interest-driven, and the self-interest is the leading force of human behaviour. Individuals tend to capitalise and accumulate resources under the four different capitals (social-cultural-economic-symbolic), and this in turn reinforces both social inequalities and social hierarchies. In other words, individuals tend to mobilise and invest resources (their social-cultural and economic stocks) to reinforce their position and prestige in the social order (symbolic capital). In turn, these resources generate capitals when they become objects of social struggles (increase of social-cultural and economic tangible outcomes). In Bourdieusian terms, therefore, the concept of capital has no a purely economic connotation, but it is extended to any kind of goods susceptible to accumulation and that can be consumed and converted. The economic logic is therefore extended to all goods and services (including the symbolic and immaterial ones) that are rare and worthy of being sought after in a given social context. Hence, it is not the good itself that functions as capital, but the way this good is socially perceived. Therefore, a good must first be appreciated,

wanted, and if necessary, must produce interest for its accumulation. More specifically, Bourdieu, as argued by Ignatow and Robinson (2017: 952), intended capital as the 'stocks of internalized ability and aptitude as well as externalized resources which are scarce and socially valued. Like the more traditional form of capital, they can be transformed and productively reinvested'. For Bourdieu all forms of accumulated capital guarantee a 'profitability' not only in the specific field in which it has its greatest value but also in other fields through forms of 'conversion'. The forms of capital identified by Bourdieu can be produced by using different strategies and resources, accumulated over time and exchanged with other forms of capital. Capital has, indeed, the property of changing over time not only quantitatively but also qualitatively, by converting itself into something else.

The idea of digital capital is based on the conceptualisation of capital provided by the French sociologist. In fact, as it shall become clear in the next sections, digital capital encompasses all the attributes listed by Bourdieu in terms of accumulation, conversion and profitability. In the Internet-driven society, digital capital becomes a key component, together with the Bourdieusian capitals, for interpreting social stratification and its related inequalities. More specifically, digital capital should be interpreted as the stocks of internalised ability and aptitude (digital competences) as well as externalised resources (digital devices), which can be accumulated, but also transformed and productively reinvested and converted into other forms of capital. Although Bourdieu was reluctant to consider media technologies as a specific and autonomous subject of study (Sterne, 2003), the fact that they have become embodied into the social texture of contemporary society makes his perspective, concepts and questions vital to understanding the rise of inequalities in the digital age. Therefore, the Bourdieusian lens offers an opportunity to investigate the role of

digital capital in explaining social inequalities. However, someone can object that the fact that we are legitimated to use the Bourdieusian concept of capital does not necessarily mean that we need a new capital. In fact, even though the literature has recognised the need to analyse the digital or technological innovation brought by the advent of Information Communication Technologies (ICTs), previous research tended to consider the digital component as an attribute of other capitals. In this vein, for instance, a line of researchers have uniquely focused on the inclusion of the digital experience into the Bourdieusian cultural or social capital. The following section will attempt to clarify why there is a need to define a new capital in theoretical and empirical terms.

1.2 DO WE NEED A NEW CAPITAL?

The introduction of new theoretical concepts in the literature has shown to frequently be a long and controversial process in which the concept can be rejected, partially accepted and finally shaped through scientific debate. This is particularly evident in the context of introducing a new capital different from the traditional one. For example, Hodgson (2014), among others, strongly criticised the abuse of the notion of capital by social scientists who tend to apply this concept well beyond its original meaning. Hodgson pointed out that in the last few decades there have been a proliferation of capitals and that we are using the notion of capital inappropriately. Moreover, Baron and Hannan (1994: 1123) underlined that in the last decades ‘a minor sociological industry’ gave rise to ‘a plethora of capitals’ with a proliferation and abuse of this notion, such as, e.g. Intellectual capital (Edvinsson & Malone, 1997), Celebrity Culture (Driessens, 2013), Media meta-capital (Couldry, 2003) and Erotic Capital (Hakim, 2011).

Scholars' concerns are mainly related to an over-use of this concept, which might in turn undermine its validity. This proliferation of capitals, within social sciences debate, has been strongly criticised by not only economists but also sociologists who recognise the validity of this concept only in the economic field.

Therefore, the first question one can raise is why we need a new 'capital' to interpret the digital skeleton of our social systems and its dynamics. The second question relates to how this capital should be different from the existing and valid theoretical approaches, commonly used by social scientists and media scholars to investigate digital society. Moreover, what the concept of digital capital can add to the already existing similar concepts, such as informational capital, information capital and technological capital? However, before answering these theoretical questions, another point at the core of our approach relates to the possibility of interpreting the digital experience as a result of economic capital, especially in relation to the different types of access to technologies that economic backgrounds can provide. The following section addresses these points by starting with this question. In fact, there is a need to clarify why we are using this unorthodox, extra-economic concept of capital. The introduction of a new capital sparks concerns among theorists and scholars who believe this concept must be used in its original way. Bowles (1999: 6), for instance, strongly criticises the term social capital by stressing that 'Capital refers to a thing possessed by individuals [...]. By contrast, the attributes said to make up social capital – such as trust, commitment to others, adhering to social norms and punishing those who violate them – describe relationships among people'. On the same line, Hodgson (2014) asked himself what usage of the term *capital* is legitimate and if the abusive use of the term beyond the economic field is useful for social scientists. He

concluded that this notion should be used only in relation to its everyday monetary meaning. These critics, in sum, emphasise the possibility of abusing the concept of capital, and of using it in non-orthodox ways beyond the economic field. To avoid it, Hodgson suggests that social scientists should use more appropriate and valuable notions and concepts such as ‘trust’, ‘culture’, ‘networks’ and ‘institutions’ (Hodgson, 2014: 1078). The simple answer to this objection is that the concepts of ‘digital trust’, ‘digital culture’ or ‘digital networks’ have a completely different meanings and are not useful in explaining the accumulation of internal and external resources at the base of digital inequalities. For this reason, and despite being aware of these legitimate criticisms, we need to introduce, in our theoretical toolkit, a new capital able to shed light onto the unequal accumulation of interiorised and external digital resources. The concept of digital capital, therefore, moves well beyond the economic sphere and its orthodox meaning, to embrace the more immaterial and intangible goods and values. A parallelism might be represented by the development of the concept of social capital. This notion has been discussed, theorised and questioned since the very beginning of the advent of sociology. In fact, the founding fathers of this discipline, Durkheim, Marx, Weber and Tönnies, have used, though in different forms, the notion of social capital (Bankston & Zhou, 2002; Portes, 1998: 7–8; Quibria, 2003: 1) to describe intangible forms of capital that produce benefits and measurable outcomes. There is, therefore, a long tradition in social sciences, and sociology in particular, of using the notion of capital well beyond the strictly use limited to the economic and financial arena. More specifically, Hanifan (1916) made clear, more than a century ago, the use of capital concept to describe social capital. More specifically, he argued that by using the phrase social capital he did not ‘refer to real estate, or to personal property or to

cold cash, but rather to that in life which tends to make these tangible substances count for most in the daily lives of a people, namely, goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit' (Hanifan, 1916: 132). By using the concept of capital in a figurative sense, Hanifan meant to underline the tangible benefits, outside the economic sphere, which play a vital role in people's everyday life. Hanifan's conceptualisation of social capital underlines that when an individual comes into 'contact with his neighbour, and they with other neighbours, there will be an accumulation of social capital, which may immediately satisfy his social needs and which may bear a social potentiality sufficient to the substantial improvement of living conditions in the whole community' (Hanifan, 1916: 134). Two elements, identified by Hanifan in this theorisation, are particularly useful in our discussion. First, the fact that this non-economic capital may satisfy individuals' social needs and improve their life chances and, second, that this capital can be accumulated. As further discussed in the next sections, these two features are common to all different kinds of capital, including digital capital. In this vein, the meaning of capital should neither be reduced to the money investible in production nor should it be intended as only the money value of owned, alienable, collateralizable assets that are used in production. The notion of capital should, therefore, take into account not only the economic assets and values but also other features that are socially valuable and that become important in the daily life of people. Furthermore, we qualify digital capital as capital because, as other forms of capital, it requires some investment of effort and time (Grootaert, 2001; Grootaert & Van Bastelaer, 2002; Krishna & Uphoff, 2002) to achieve what Bourdieu (1986: 244) defines 'self-improvement'. Therefore, digital capital, as shall become clearer in the following sections, encompasses

some of the key features that characterise any types of capital. In fact, as a form of capital (a) it produces social benefits; (b) it can be accumulated; (c) it requires some investment and effort and (d) it can be converted into other forms of capital.

However, despite the presence of these four elements, a number of scholars still reject the need to develop a new specific capital, by contrast attributing both the technological or digital component to the already existing capitals. In other terms, these elements should be embedded into other forms of capitals rather than be seen as vital and constitutive elements of a new capital. This is the reason why, the next section will focus on justifying the reasons why the adoption of a new specific capital is appropriate to explore the digital experience of people, which in turn is embedded into a digital structure of society.

1.3 DIGITAL CAPITAL AS A SPECIFIC CAPITAL

A line of research, directly or indirectly, questions the necessity to introduce a new capital related to the digital component of society, given the existence of a multiplicity of concepts used to describe the technological nuance of already existing capitals. In fact, several researchers refer to a technological component of the four capitals identified by Bourdieu. Emmison and Frow (1998), for instance, refer to information technology as an attribution of the cultural capital. They focused on the positive attitude towards the use of technologies, by arguing that such disposition can be interpreted as an expression of cultural capital. Emmison and Frow refuse to recognise the digital resources as a new capital, but they add the technological component to the cultural capital. Their interpretation suggests that the cultural capital adapts to the new social and technological evolution by making the

ICTs an integral part of the cultural context (1998). However, if this might be convincing in terms of explaining the acquisition of the competences needed to profit from the digital experience, it cannot explain the digital experience as a whole (competences + access) and how this relates to the three levels of digital divide. By contrast, both the cultural inputs invested in the digital experience and the outputs deriving from these experiences might be interpreted in terms of convertibility of capitals. This means that cultural capital can be transferred to the digital one, which in turn can be converted into cultural accumulation. This attitude towards the use of technologies is also central in the analysis proposed by Paino and Renzulli (2013). They interpret the different levels of digital engagement by expanding and including into Bourdieu's concept of cultural capital a digital dimension. Applying Bourdieu's cultural capital theory to young people's use of digital devices, Paino and Renzulli (2013: 126) argue that 'students who possess knowledge of computers and other digital devices [...] are presenting themselves as culturally competent members of our information-age society'. Similarly, O'Keeffe (2009: 39) refers to the term 'technocultural capital' as a kind of Bourdieusian cultural capital that 'exists in embodied form in the attitudes and dispositions of individuals to technologies, and in the competencies, knowledge and abilities of those who embody it, having invested time and effort with a view to achieving [...] self-improvement'. Furthermore, Maitland and Obeysekare link cultural capital to competence and skills, including ICT skills, which can become embodied capital (2015), while Hatlevik, Guðmundsdóttir, and Loi (2015) stress the idea that social background and cultural capital predict secondary school students' digital competences. In a similar way, concepts such as techno-capital (Rojas, Roychowdhury, Okur, Straubhaar, & Estrada-Ortiz, 2004; Straubhaar, Tufekci, Spence, & Rojas, 2012), information

capital (Hamelink, 2000), information habitus (Robinson, 2009) and informational capital (Prieur & Savage, 2013: 261–262) are often used to describe the technological component of the already existing social or cultural capital. While considering a constitutive component of the digital experience, represented by the skills and competences needed to take advantages from the digital context, all these approaches neglect one constitutive component of capitals, which is their convertibility. This means that what they interpret as an outcome of cultural capital might be a result of investing part of this capital to be converted into another form of capital, which is the digital one. Some approaches have moved some steps towards this direction. Selwyn (2004), e.g. argues that the ‘technological capital’ is intertwined with three different capitals: economic, social and cultural. These three capitals are needed in order to develop a positive attitude and the right abilities to use technologies. According to this approach, individuals need a network of support (social capital) such as friends, family members and online community to develop their own technological capital. At the same time, individuals need economic resources (economic capital) to access ICTs and knowledge, skills and competences (cultural capital) to properly use ICTs. However, following this interpretation, technological capital is not a specific capital, but the result of the interaction of three different capitals. Consequently, this capital cannot be isolated and empirically measured.

Furthermore, some studies also suggested that a ‘technological capital’ can be used to tackle digital inequalities (Calderón Gómez, 2019; Carlson & Isaacs, 2018; Correa, 2015; Gonzales, 2016; Selwyn, 2004). At the same time, while these approaches implicitly suggest that digital inequalities need the development of a specific measure to be tackled, they cannot justify the emergence of a new capital. These

approaches neglect the interconnections between a measurable capital that simultaneously depends on and produces inequalities. In turn, this implicitly suggests that the definition of a digital concept might help develop an empirical tool to measure digital inequalities and, consequently, address policies that might contribute towards alleviating their effects. The idea of digital inequalities implies and assumes itself that inequalities can be measured in relation to the ‘digital baggage’ and based on previous social inequalities.

Another line of study has underlined how socio-economic and cultural factors influence the way we familiarise and use digital technologies and how this could influence digital inequalities. A common approach in the literature assumes that the way in which we interact and engage with technologies is shaped by multiple elements. Economic, cultural, political, personal and social capitals (5Cs from now on) shape the way we access, use and engage with digital technologies. Van Dijk (2005), for instance, in his resources and appropriation theory (RAT) pointed out that categorical inequalities (both personal and positional) produce an unequal distribution of resources, which in turn causes an unequal access to digital technologies in societies. In this vein, a line of research shows that the existing background shapes our online accesses and experiences. These approaches interpret material inequality (income and wealth) as a primary driver in the digital divide, which in turn produces consequences for conditional citizenship (Golding, 2017). This suggests that digital inequalities are rooted in a primary level of material inequality. Along the same line, several studies support the interconnections between digital inequalities and economic and cultural capital (Tondeur, Sinnaeve, van Houtte, & van Braak, 2010; Villanueva-Mansilla, Nakano, & Evaristo, 2015). This means that owning digital devices and accessing to ICTs relate to economic capital, whereas using

and engaging with these technologies relate to cultural capital. This interpretation tacitly implies that the economic capital influences the first level of digital divide (inequalities in accessing), whereas the cultural capital influences and determines the second level of digital divide (inequalities in digital skills and Internet usage). Gilbert (2010: 1005), on the other hand, reduces technological capital to 'the actual or potential collective resources related to access to, use of, and knowledge related to ICTs'. Similarly, Park underlines how socio-economic and cultural factors enhance digital readiness, which is 'necessary for digital engagement' (Park, 2014: 141). Digital readiness can be interpreted as a precursor to digital media literacy that requires, as other forms of capital, an investment in terms of both time and effort to learn about digital technologies. In some ways, those who cannot invest neither time, effort and money are disadvantaged in terms of acquisition of digital skills in using the Internet and, therefore, they are also disadvantaged in the social arena. The literature has recognised that those who are suffering from a low position in society tend to also be excluded and marginalised in the digital realm (Helsper & Reisdorf, 2017; Van Deursen, Helsper, Eynon, & Van Dijk, 2017). These approaches emphasise an essential point: those who approach and use ICTs with a poor socio-economic and cultural background tend to have a limited digital experience, given the reduced number and types of activities they can carry on online.

This is a key point in the conceptualisation presented in this book, since people do not access and use technologies as a *tabula rasa* (clean slate), but they use previous experiences and resources. In other terms, individuals' background influences the way they access and use technologies. However, this shows only one side of the coin. In fact, what these approaches are missing is the fact that a solid socio-economic and cultural

background is necessary but not a sufficient condition to profit from the Internet. Metaphorically, this represents only a first section of the bridge (see Fig. 1.1) that connects online and offline realms. This is the moment when individuals are due to approach and use ICTs. Digital capital is essential to enable the efficient use of these previous capitals in the digital arena. However, it is not a mere sum of the existing capitals, but it interacts with the other 5Cs by pointing the online experience towards certain directions. To put it differently, a high level of digital capital allows individuals to use and transfer into the digital arena capitals accumulated offline. However, increasing levels of digital capital do not necessarily correspond to high levels of economic capital, at least in a preliminary phase. Take the example of children who are educated at school about using digital technology. Even though their families cannot provide the necessary technologies at home due to limited economic resources, this does not necessarily mean that children's digital capital cannot increase. They might use the technologies at school, but also in other contexts (e.g. library). Moreover, digital capital cannot be reduced to a mere component of the cultural capital because it concerns a specialised (digital) expertise that not necessarily requires high levels of offline cultural resources. This might be the case of someone who needs access to ICTs and digital competence that can facilitate or improve daily life activities

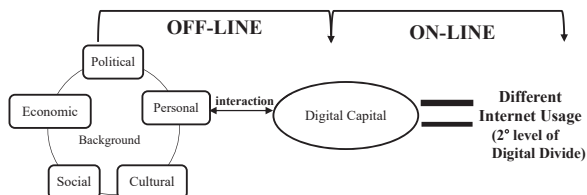


Fig. 1.1. First Section of the Bridge between Offline and Online Experience.

such as e.g. home banking or sport activities through apps and smart watches. However, this does not mean that the quality and types of users' digital experiences and activities cannot be influenced by the relationship between the 5Cs and digital capital. By contrast, digital capital interacts with the other capitals in a circular way by triggering the accumulation of other capitals, and simultaneously being triggered by the pre-existing capitals. In this direction, [Fig. 1.1](#) shows the bridging character of digital capital, which, by interacting with the other offline 5Cs, influences the types and quality of activities carried on online. Therefore, this interaction influences the second level of digital divide, which relates to the different usage of the Internet in terms of types and quality of activities. In fact, having a low level of digital capital means missing the opportunity to use and exploit previous capitals in the digital arena. For example, a person with a high level of social capital but with a low level of digital capital using ICTs misses the opportunity to exploit technologies for social capital-enhancing activities. In other terms, although individuals have a high level of social capital, they cannot further enhance this capital by using technologies because they have a low level of digital capital. Digital capital is, therefore, needed to exploit online individuals' previous capitals or, to use the metaphor of the bridge, is needed to confidently walk on the highway of information (the actual bridge) by using previous experiences and resources (previous capitals). The way in which individuals walk on the bridge (navigate the web) is, therefore, given by the interaction between previous capitals and digital capital that allows to capitalise previous resources and expertise and use them online, hence determining the quality and types of online experience.

Therefore, without a high level of digital capital individuals might not be able to either invest their offline resources into the digital realm or earn social benefits and advantages

deriving from the use of ICTs. There is a missing link in all the above-mentioned researches and approaches, which is represented by the fact that they underline the importance of the digital and technological experience, but they do not find sufficient arguments to support the specificity of this capital and its vital role in determining the types and qualities of online experiences. In fact, as we have mentioned, even though all these approaches point out that our pre-existent ‘traditional capitals’ determine how we access and use new technologies, they do not provide a clear-cut definition of digital capital. These approaches, while useful to shed light onto the production and reproduction of digital inequalities, do not clearly isolate digital capital and, above all, do not offer any attempt to operationalise it. However, rather than conceptualising and isolating digital capital and applying this concept to interpret its relationship with the three levels of digital divide, previous research focused on the intertwined relationships between social, cultural or economic capital and digital inequalities. By contrast, it is the interaction between digital capital and the other forms of capitals that generate outcomes not only in terms of types and quality of online activities (as shown by the first section of the bridge in Fig. 1.1) but also in terms of benefits. In fact, as shown in Fig. 1.2, the second section of the bridge concerns the second passage in which the online experience reconnects with the offline

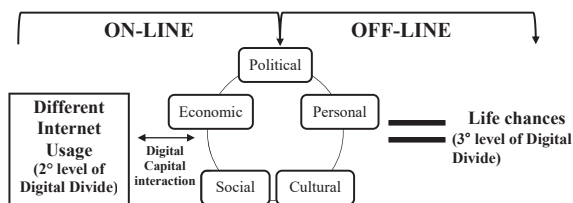


Fig. 1.2. Second Section of the Bridge.

realms by producing concrete benefits. This is directly connected to the third level of digital divide that relates to the advantages deriving from the digital experience in particular in terms of enhancing life chances. The benefits and the tangible outcomes individual get from using the Internet are given by the interaction between digital capital and offline capitals. Metaphorically speaking, we are on the second part of the bridge, when individuals are capitalising from the use of ICTs and ‘transforming’ into externally observable outcomes the digital experiences. Digital capital, therefore, is needed to transfer into the social fabric the online activities. It is, for instance, because of the interaction between a high level of digital capital and economic capital that an individual can get a better job, an increased salary or expand their business, thus exploiting in social fabric the chances offered the digital technologies.

The possibilities of interaction between the digital capital and the 5Cs can be countless, as well as the potential outcomes. Fig. 1.3 describes a basic scenario in which Digital Capital interacts with the 5Cs on a scale of low (empty bag), medium (half-empty bag) and high level (full bag).

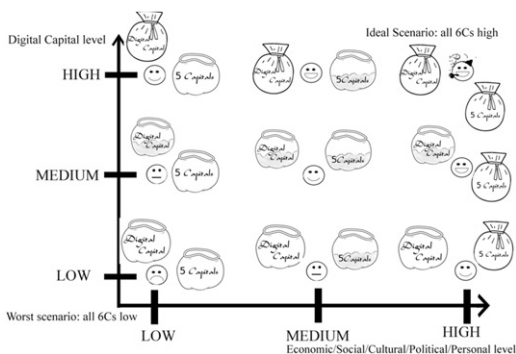


Fig. 1.3. Examples of Interaction between Capitals.

However, since the level of each capital could vary enormously, they can be positioned in multiple intermediate points (e.g. the quantity of capitals that each bag can contain can largely vary). Fig. 1.3 shows ideal types' scenarios in which at the two extremes are located the digital elite (with high levels/full bags of all six capitals) and the digital under-class (with the lowest levels/empty bags of all capitals). Between these two extremes, different combinations generate more or less benefits in terms of both quality of online activities and life chances. This is directly connected to both the second and third levels of digital divide. For example, those who own a full bag level of digital capital but still have low levels of other capitals (see Fig. 1.3) might be advantaged in terms of investing that digital capital to fill the other bags with other forms of capitals (smiling face). Moreover, those who are located at the high scale of digital capital and already have medium levels of other capitals can afford to smile with their mouth open because their starting resources make accumulation possible.

The introduction of this bridge capital and the operationalisation of this concept, fill a clear gap in the literature. Indeed, so far, these are the two main points missing in the discussion about digital divide and digital inequalities: first, some scholars who analyse digital inequalities have only focused on previous people's background without considering the possibility of using a (bridging) capital that enable both to transfer and use these capitals online and to capitalise from the use of the Internet and get some tangible outcomes. Second, to the best of our knowledge, this is the first attempt to isolate and measure digital capital. In fact, previous studies either ignored or rejected the development of a capital that enables to reinvest the existing capitals in the digital realm. Moreover, even when they recognise the potentiality of this new concept in explaining the digital experience, they reduce it to a sub-capital resulting from other capitals (or their

interaction). In contrast, the next section shows that advantages deriving from analytically separating the digital component from cultural, economic or social capital. Digital capital, resulting from both the accumulation of digital competences and digital devices, is not reducible to other capitals and as such must be perceived and analysed.

1.4 DEFINING DIGITAL CAPITAL

The previous sections reviewed the main approaches present in the literature around the application of Digital Capital as a specific capital that includes all the attributes described by Bourdieu, especially in terms of accumulation, conversion and profitability. Amongst the few attempts to define the concept of digital capital, Morgan (2010: 222) refers to the concept, but he does not provide theoretical justifications of the reasons why it should be interpreted a specific and autonomous capital. Even though he mentioned this concept, the ways he applied it tends to reduce it to a subcomponent of cultural capital. In fact, he argues that digital capital ‘has a relation with the three forms of cultural capital: the embodied, the instrumental, and the institutional’. Similarly, Seale, Ziebland, and Charteris-Black (2006) use the concept of digital capital, but again not as a specific capital, but to investigate the association between disabled students and usage of learning support technologies. These approaches, despite the reference to the concept of digital capital, insist on incorporating it into other forms of capital or to use it as an evaluative tool for educational purposes. One of the first attempts to specifically define digital capital has been provided by Park (2017: 27) who refers to digital capital as ‘a predetermined set of dispositions that influences how people engage with digital technology’. This definition suggests the specificity of digital

capital because it can mobilise resources to achieve specific goals, and this echoes the interest-driven interpretation provided by Bourdieu to explain social stratification. However, this approach does not sufficiently embrace the complexity of this capital because it reduces digital capital to pre-existing conditions and factors that influence and shape individual's digital engagement and capacity to use digital technologies to achieve their goals. Furthermore, this approach does not offer an attempt to operationalise and measure digital capital. As such we cannot measure it and understand how (if any) it could influence both the way in which users access and use the Internet and what they gain from it. In this way, digital capital cannot be used to understand and further explain the three levels of digital divide and how they could be tackled.

By contrast, the starting point adopted by the present work to define digital capital is that provided first by Ragnedda and Ruiu (2017) and further developed by Ragnedda (2018), who define digital capital as 'the accumulation of digital competencies (information, communication, safety, content-creation and problem-solving), and digital technology'. Digital capital is not only the result of individual digital competences but also a set of both 'digital competences' and 'digital technology' that can be accumulated and transferred from one capital to another. From a Bourdieusian perspective, therefore, this capital can be interpreted as the accumulation of 'internalised' digital competences in relation to the availability of 'external' digital technologies. Bourdieu, indeed, intended capital as both the internalised abilities or attitudes and externalised resources individuals can mobilise to achieve specific goals and that can be transferred to other arenas improving people's life chances. Furthermore, Bourdieu suggested that capitals, exactly as the economic capital, can be accumulated over the years, but also transformed into other capitals. The economic capital is the easiest way to metaphorically represent capitals.

We can indeed accumulate (but also diminish, squander and even get lost) economic capital over the years and we can use this capital to achieve some goals. In the same way, social capital can be interpreted as our network of relationships that are accumulated and expanded over the years and that can be transformed into other forms of capitals such as economic capital (thanks to my social capital I can get a better job, higher salary or a more prestigious position etcetera) and cultural capital (I can use my reputation or my contacts to acquire educational qualifications or access prestigious clubs). The transferability from one arena to another and the accumulation are both present in the conceptualisation of digital capital that we are here proposing. Bourdieu has extensively written about the convertibility of capital. Not only economic capital into social and cultural capital (Swartz, 1997: 80–81) but also social and cultural capital may engender or foster economic capital. The same applies more or less to digital capital. Those who have a high level of Digital Capital can convert the digital experiences into economic capital as money, into social capital as valuable contacts (e.g. through expanding their networks), into cultural capital (e.g. attending online courses), into political capital as political power (e.g. by using ICTs for political activities) or into personal capital, (e.g. by enhancing personal interests and lifestyles). However, the conversion of digital capital into another kind of capital does not always go smoothly. Users may, indeed, fail to get tangible outcomes from using ICTs, so the conversion of digital capital into cultural, political or social capital might be not necessarily successful. Furthermore, digital capital, as all other capitals, is not static but accumulated over time. Since digital capital is needed to convert offline capitals into digital experiences and, at the same time, such digital experiences and online activities into other resources, there is a constant pressure to keep it updated.

Digital capital is, therefore, the ‘historical accumulation’ of both digital competencies (internalised abilities and attitudes) and digital devices (external resources), which in turn enhance the development and application of such knowledge to transform/transfer it to other forms of capital. This process involves a double loop that implies investing and transferring the existing offline capitals into digital capital, and in turn cumulating digital capital to be invested in the offline realm. This, evidently, has important consequences on individuals’ social position and social status by increasing life chances.

Therefore, digital capital may be interpreted as a mediating capital that plays a vital role in transforming previous offline capitals (economic, social, cultural, political and personal) into digital activities and, in turn, in transforming these activities into other capitals. This definition and re-conceptualisation of digital capital is necessary because one of the main limitations shared by current definitions of technological/techno/digital/information capital is their lack of explanatory power of the convertibility of digital capital into other resources, such as economic, cultural, social and political capital. In fact, by using a Bourdieusian approach it is possible to classify digital capital as a producer of valuable resources and, therefore, as a form of capital. Conceptualising digital capital as valued resources, means abandoning ‘the economic/non-economic dichotomy’ (Bourdieu, 1990: 122) and empirically investigating how both the accumulation of digital capital and its transferability can create distinct forms of hierarchies and power. An example of this could be an Internet user who wants to become an influencer on social media platforms (such as e.g. Instagram) to advertise makeup products, as described in [Fig. 1.4](#). The pre-existing capitals should enable this user to access the Internet (through technologies such as, e.g. phone, tablet or PC) and to take high-quality pictures and videos. Therefore, in this case the user

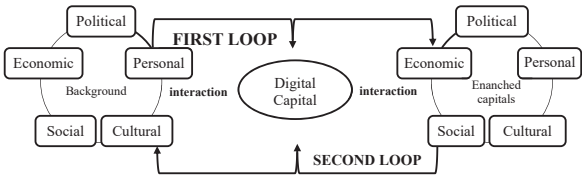


Fig. 1.4. Double Loop Process.

cannot count on the external resources (e.g. a library PC) to accomplish his/her aim. Instead, he/she needs a constant access to his/her own technology. This also means that the user not only needs economic capital but also at least two different types of knowledge. One relates to the content to be published on the platform; another to the devices used. These competences are not a mere cultural knowledge, but an expertise in how social media mechanisms work (digital competences). The user also needs a starting social capital to invest in the platform as the basis to create a wider network. Finally, a personal capital is needed in terms of personal interests (e.g. in the makeup products). Once these capitals are invested online through both appropriate access and competences (digital capital), they can be translated into social benefits. For example, the user can enlarge his/her social network by following and in turn being followed by other users. This might also generate incomes, when cosmetic businesses become interested in the influence that the user can exercise upon his/her followers and propose advertisement-related jobs. This in turn might increase the personal knowledge related to the cosmetic sector, social media mechanisms, and how to do business. Finally, new personal interests can be generated from the experience, e.g. related to similar products (e.g. hair products).

Fig. 1.5 shows an example of how digital capital multiplies the effects of other forms of capital in order to improve their

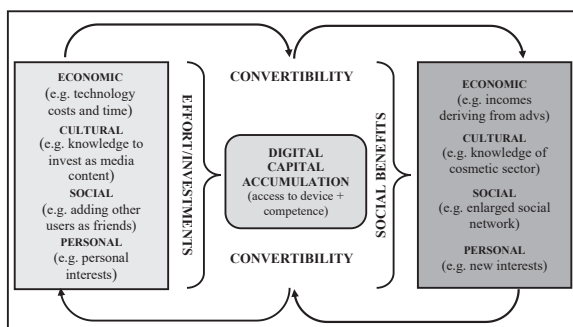


Fig. 1.5. Convertibility, Effort, Accumulation and Benefits of Digital Capital.

profitability. In this specific case, although not all five capitals were involved in this process, it is possible to observe the presence of all the elements that characterise capitals as defined by Bourdieu, such as effort, investment, convertibility, accumulation and social benefits. Digital capital, therefore, encompassing all these features should be considered as a specific capital, and as such, conceptualised, and operationalised. Furthermore, as the following section underlines, digital capital is an important conceptual and empirical tool to investigate the multidimensionality and intersectionality of digital inequalities.

1.5 THE INFLUENCE OF DIGITAL CAPITAL OVER THE THREE LEVELS OF DIGITAL DIVIDE

The introduction of digital capital both as a theoretical and empirical tool, can help shed light onto further understanding digital inequalities and explore the so-called three levels of digital divide and namely the inequalities in accessing ICTs (first level), inequalities in Internet usages (second level) and

inequalities in tangible outcomes deriving from Internet's use (third level) (Ragnedda, 2017). Over the years, indeed, the phenomenon of digital divide has moved from the simplistic dichotomic division between those who can access the Internet and those who are excluded (Ragnedda & Muschert, 2016). Initially, researchers and policy-makers focused on the gap between those with access to ICTs and those without (Hoffman & Novak, 1998; Katz & Aspden, 1997), defining digital divide as a form of inequality in accessing new ICTs (Besser, 2004). This simplistic approach to analyse digital inequalities, based on a binary division of 'have' and 'have-nots' (known as first level of digital divide) (Attewell, 2001), while is still important to understand the inequalities related in Internet access, cannot be applied to the evolving complexity of digital divide (Warschauer, 2002). In fact, reducing digital inequalities to a matter of physical access to ICTs and, in so doing, defining those who were excluded (Dewan & Riggins, 2005; Mehra, Merkel, & Bishop, 2004) as being on the wrong side of the digital divide (Newhagen & Bucy, 2004), means that with the spread of technologies the digital divide would disappear, at least in developed countries (Hargittai & Hinant, 2008; Peter & Valkenburg, 2006). However, recent research conducted by Van Deursen and Van Dijk (2019) show how this first level of digital divide still represents an obstacle, not only in developing countries (Pearce & Rice, 2013; Zhang, 2013) but also in the advanced ones. This suggests that the digital divide should be interpreted as a complex phenomenon that does not uniquely result from disparity in the access to ICTs. Furthermore, the binary division between those who access and those who are excluded does not capture the complexity and multidimensionality of digital divide (Ragnedda, 2019). In fact, accessing the Internet does not necessarily mean having (profitable) access to its content (Newhagen & Bucy, 2004). In fact, the literature has

increasingly recognised that, in addition to the access to ICTs, digital inequalities might depend upon different skills, capabilities and know-how in using ICTs. In other terms, once the gap in accessing ICTs has been bridged by the possession of both a device and an Internet connection, a second level of digital divide emerges, which is related to disparities and differences in using ICTs (Hargittai, 2002; Selwyn, 2004). Scholars and policy-makers have often analysed inequalities in Internet usage among different groups, by focussing on different levels of digital literacy (Buckingham, 2007) and digital skills (Litt, 2013) and on how these are related to different socio-economic and socio-demographic factors. In this vein, the first wave of studies interested in this ‘usage gap’ (van Dijk, 2004) focused on age (Bonfadelli, 2002; Fox & Madden, 2005), education level (Hargittai & Walejko, 2008), race and ethnicity (Howard, Rainie, & Jones, 2001) and socioeconomic status and gender (Livingstone & Helsper, 2007; Madden, 2003). All these research studies show how socio-economic and socio-demographic features determine different capacities, skills and digital literature, and in turn, influence inequalities in the way individuals use ICTs. These findings might be interpreted as the reasons why previous approaches, as noted in the previous sections of this work, considered digital capital as a result from specific existing capitals or their combination. Lately, a new line of research has introduced a third level of digital divide (Ragnedda, 2017; van Deursen & Helsper, 2015; Wei, Teo, Chan, & Tan, 2011), which focuses on inequalities in terms of social benefits that individuals can gain from accessing to and using ICTs. In digital reliant societies, where an increasing number of people access and use ICTs (almost bridging the first level of digital divide), it is increasingly important to analyse the consequences and social implications of inequalities in Internet usages (Van Deursen & Van Dijk, 2013) and the uneven

distribution of benefits and tangible outcomes in accessing and using ICTs (Ragnedda, 2018). This approach to inequalities confirms what was noted when describing the double loop process in which digital capital plays the role of mediating capital. In fact, similarly to some considerations already emerged when reviewing the Bourdieusian symbolic capital, digital capital might be interpreted as a form of transversal capital. This means that it results from both specific characteristics (such as digital expertise and technological access) and the investment of existing capitals. However, the conversion of these offline capitals generate further accumulation of digital capital, which in turn can be converted in offline benefits (by transferring the digital material and immaterial benefits into the offline realm). This means that the second loop of digital capital helps understand the third level of digital inequalities and related scarce/abundant life chances. At the same time, the third level of digital capital itself supports the existence of digital capital that is specifically characterised by a bridging nature between offline and online experiences.

To sum up, defining digital capital as both externalised resources (access) and internalised ability (competences) means that by dialoguing with the first two levels of digital divides (inequalities in access and Internet usages), digital capital determines the third level of digital divide, which is related to the inequalities in terms of outcomes of the Internet experience. More specifically, the concept of digital capital proposed here interacts with the three levels of digital divide. In fact, as the following chapter further shows, the components related to access directly interact with the first level of digital divide, whereas the digital competences dialogue with the second and third levels. Inequalities in accessing ICTs, in terms of equipment used, type of connectivity, time spent online and support available, contribute towards forming the

digital access component of digital capital, underlining inequalities in accessing as well as in using the Internet. In addition to this, individual digital competences are interconnected with the second level of digital divide, by defining the quality of the online experience and types of Internet usage. In fact, digital competences contribute towards determining the type of information users can safely access/create/interpret in relation to their literacy and their problem-solving capacity. In turn, digital capital – seen, in a holistic way, as the result of digital access and digital competences – determines not only the quantity and quality of online activities but also the tangible outcomes achieved from ICTs usage, thus influencing the third level of digital divide.

Furthermore, as noted, digital capital can be defined as bridge capital because it is influenced by pre-existing offline capitals (that determine individuals' competences, skills and accessibility), which in turn are combined into an Internet experience that produces measurable outcomes in terms of social, cultural, economic, political and personal benefits. This means that this bridge enables translating the Internet experience into new opportunities and life chances in both the online and offline arenas. Digital capital is, therefore, needed not only to access and enjoy the digital experience but also to capitalise on Internet use to acquire benefits that could improve the quality of life.

In the following chapter we shall attempt to move one step forward by operationalizing this theoretical concept and proposing an empirical model that can be replicated in different contexts.

2

OPERATIONALISING DIGITAL CAPITAL

The first chapter of this book reviewed the main approaches adopted by previous studies to interpret digital-related experiences, by showing controversial positions sustained by scholars in relation to the development of a digital capital concept. The previous chapter also highlighted that some steps have moved towards considering some potentialities and concrete attributes of digital capital in explaining digital inequalities. However, these approaches sparsely take into consideration some specific traits of this new capital. What was missing in the literature is a holistic approach that considers and includes in a unique concept all the characteristics of this capital. In this direction, the first chapter fills this gap by providing a comprehensive and nuanced definition of digital capital, which excludes the possibility of considering this capital as a subset of other capitals. This second chapter aims to provide an operationalisation of digital capital in order to develop a tool that might be used in different socio-cultural contexts in a comparative perspective. In this direction and against the theoretical background described in

the first chapter, this chapter proposes a set of indicators of digital capital that can be used as an empirical model to measure the individual level of digital capital. Evidently, theory and method are intertwined and tied to empirical data (Cohen, 1989), and, as per other forms of capitals, several methods and set of indicators can be used.

2.1 IDENTIFYING AN EMPIRICAL MODEL

Operationalising and measuring a capital might be complicated and might end up with different results and outcomes. These differences depend both on the different conceptualisations of the capital and different approaches proposed to operationalise it. In fact, different theoretical frameworks used to hold or support a research design, influence both the way in which scholars transform a concept into an empirical model and the way in which scholars might interpret the result. Furthermore, also the way scholars interpret or adapt these theoretical concepts to a new social, cultural and economic scenario may influence the way in which these concepts are operationalised. For example, the attempts, over the years, to operationalise social capital have produced a multiplicity of diverse results. For instance, scholars using the Bourdieusian approach have proposed a different way to operationalise and measure social capital (Eloire, 2018), compared to those following Coleman's or Putman's approaches (Lochner, Kawachi, & Kennedy, 1999). The same applies to other theoretical concepts such as cultural, political, personal, and economic capital.

This is the reason why the Digital Capital Index (DCI) here proposed, combines, integrates and consolidates the variety of approaches adopted in the literature to identify the benefits deriving both from digital access and digital competence, and

by operationalising digital capital as a specific capital. The aim is to offer a valid model that would make replication possible in different socio-cultural contexts. The identification of its structural components helps understand how these can contribute towards reducing the different levels of digital divide and, therefore, reduce both social and digital inequalities. In our attempt to operationalise digital capital, we are also considering the fact that digital inequalities are both consequences and triggers of other types of inequalities (Robinson et al., 2015).

As emerged throughout the definition of digital capital, the conceptual model proposed defines digital capital as a bridging but specific capital that encompasses both elements related to access and competences (Ragnedda, 2018). The challenge, now, is to move one step forward and propose an empirical model able to capture and quantify these elements. In this direction, our model, based on an extensive literature review, integrates aspects related to the material and physical access to digital technologies (externalised resources) with the digital competencies (internalised ability) identified by the 'DigComp 2.1. The Digital Competence Framework for Citizens' (Carretero, Vuorikari, & Punie, 2017). More specifically, the different indicators of digital access were identified by reviewing the literature on the first level of digital divide, which relates to inequalities in access and their impact on digital experience (see [Fig. 2.1](#) and [Table 2.1](#)). As we shall see in the next section, the digital access is, therefore, split into four sub-components such as digital equipment (Akiyoshi & Ono, 2008; Gonzales, 2016; Mossberger, Tolbert, & Hamilton, 2012; Murphy, Chen, & Cossutta, 2016; Napoli & Obar, 2014; Van Deursen & Van Dijk, 2019; Van Dijk, 2005), connectivity (Kyriakidou, Michalakelis, & Sphicopoulos, 2011; Peter & Valkenburg, 2006; Riddlesden & Singleton, 2016), time spent online (Hargittai, 2003, 2010),

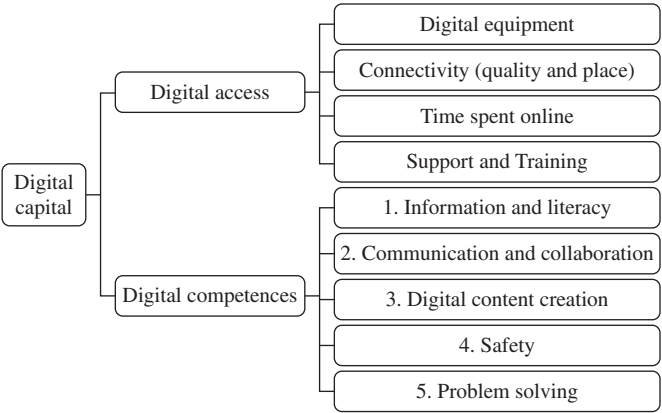


Fig. 2.1. Constitutive Components of Digital Capital.

and support (DiMaggio & Hargittai, 2001; Ruiiu & Ragnedda, 2017; Selwyn, 2004).

On the other side, the digital competences are defined following the classification proposed by the ‘DigComp 2.1’ that has become a reference for the development and strategic planning of digital competence initiatives at both European and Member State level. DigComp 2.1 is also the focal point of the European-wide indicator called ‘Digital skills’, used to monitor the digital economy and society. Moving from the conceptual reference model for the Digital Competence Framework, our proposed model captures, on top of the types of physical and material access, five areas of digital competences, namely (1) information, (2) communication, (3) safety, (4) content-creation and (5) problem-solving (see Fig. 2.1 and Table 2.2). Overall, DigComp 2.1 includes 21 different competences. In our model, we followed these competences, but some of them were merged such as, e.g. the competences relative to ‘Engaging in citizenship’ and ‘collaborating through digital technologies’ in the second macro-area, and the competences related to the protection of health, well-being

Table 2.1. Types of Access Included in Digital Capital.

Access Type (Sub-component)	Access Operationalised (Operational Definition and Description)
Digital equipment (see, e.g. Gonzales, 2016; Mossberger et al. 2012; Murphy et al., 2016; Napoli & Obar, 2014, 2017; Van Deursen & Van Dijk, 2019; Van Dijk, 2005)	
Devices used to access the Internet	• Mobile phone or smartphone • Laptop or notebook • Tablet computer • Desktop computer • Media or game players • Smart TV • Other devices (e.g. e-book reader, Smartwatch)
Connectivity (see, e.g. Kyriakidou et al., 2011; Peter & Valkenburg, 2006; Riddlesden & Singleton, 2016)	
Quality of access	In which setting do you mostly access the Internet?
Time spent online (see e.g. Hargittai, 2003, 2010)	
Cumulative experience in using ICTs	How old were you when you used the Internet for the very first time?
Support (see, e.g. DiMaggio & Hargittai, 2001; de Haan, 2004; Kling, 2000; Ruii & Ragnedda, 2017; Selwyn, 2004)	
Request for help	I have looked/asked for help in the past 3 months

and the environment in the fourth macro-area (Table 2.2). This set of variables seems to be comprehensive and efficient in capturing both the externalised resources (digital access) and interiorised abilities (digital competences).

Finally, first the components and sub-components and then a questionnaire was defined and commented by a team of 10 experts (five researchers in the field of digital inequalities,

Table 2.2. Competences Included in Digital Capital.

Competence Area	Competences Operationalised
<i>Information and data literacy</i>	
Browsing, searching, filtering data, information and digital content	I am confident in browsing, searching and filtering data, information and digital content
Evaluating data, information and digital content	I regularly verify the sources of the information I find
Managing data, information and digital content	I regularly use cloud information storage services or external hard drives to save or store files or content
<i>Communication and collaboration</i>	
Interacting through digital technologies	I actively use a wide range of communication tools (e-mail, chat, SMS, instant messaging, blogs, micro-blogs, social networks) for online communication
Netiquette	I have developed strategies to address cyberbullying and to identify inappropriate behaviours
Engaging in citizenship through digital technologies	I actively participate in online spaces and use several online services (e.g. public services, e-banking, online shopping)
Collaborating through digital technologies	
Sharing through digital technologies	I know when and which information I should and should not share online
Managing digital identity	
<i>Digital content creation</i>	
Developing digital content	I can produce complex digital content in different formats (e.g. images, audio files, text, tables)

Table 2.2. *(Continued)*

Competence Area	Competences Operationalised
Integrating and re-elaborating digital content	I can apply advanced formatting functions of different tools (e.g. mail merge, merging documents of different formats) to the content I or others have produced
Copyright and licences	I respect copyright and licence rules and I know how to apply them to digital information and content
Programming	I am able to apply advanced settings to some software and programs
<i>Competence area 4: safety</i>	
Protecting devices	I periodically check my privacy setting and update my security programs (e.g. antivirus, firewall) on the device(s) that I use to access the Internet
Protecting personal data and privacy	I use different passwords to access equipment, devices and digital services
Protecting health and well-being	I am able to select safe and suitable digital media, which are efficient and cost-effective in comparison to others
Protecting the environment	
<i>Problem-solving</i>	
Solving technical problems	I am able to solve a technical problem or decide what to do when technology does not work
Identifying needs and technological responses	I can use digital technologies (devices, applications, software or services) to solve (non-technical) problems

Table 2.2. *(Continued)*

Competence Area	Competences Operationalised
Creatively using digital technologies	I am able to use varied media to express myself creatively (text, images, audio and video)
Identifying digital competence gaps	I frequently update my knowledge on the availability of digital tools

Source: Carretero et al. (2017).

three researchers in methodology, one researcher in statistics and one professional in digital marketing). In this first round of the survey, we aimed to elicit perceptions and gather collective opinion of this group of experts (De Villiers, de Villiers, & Kent 2005). By using the experience, knowledge and opinions of the participants, we elaborated a second and more specific survey in which the results of the previous round were given as feedback. As a result, our participants answer under the influence of their colleagues' opinions and in the light of collective findings of the group's ideas (Kennedy, 2004). This helped us redefine the survey, reduce the number of variables to be included and propose a more specific range of questions that was able to capture the constitutive components of digital capital.

2.2 MEASURING DIGITAL CAPITAL

The following sections operationalise digital capital by adopting the definition proposed by Ragnedda (2018) and further developed in the first chapter of this book, as a set of 'digital competencies (information, communication, safety,

content-creation and problem-solving), and digital technology' (p. 2367). The operationalisation of digital capital and its related sub-components focuses on the attributes included in this definition by combining existing but fragmented pieces of research that try to understand the relation between digital and social inequalities. In fact, the proposed definition of digital capital incorporates and integrates several approaches to the study of the digital experience, as well as its interaction with the offline realm. As noted, the digital resources and outcomes should be cumulative and transferable to be defined as a capital (Bourdieu, 1986). Such accumulation and transferability of the digital competences is also recognised by the European Union as one of the eight basic requirements for 'personal fulfilment and development, active citizenship, social inclusion and employment' (European Union, 2006). This indicates that both digital benefits and resources can be accumulated and invested in other forms of capitals, which in turn increase and improve life chances. Therefore, taking into account both requirements of accumulation and transferability, the two key macro-components of this 'new capital' are identified in digital access and digital competences. These two components are further split into several variables able to capture the multidimensionality and intersectionality of digital divide. These two constitutive elements are, as discussed in the previous chapter, connected to the different levels of digital divide. In fact, the digital access is directly connected to the first level of digital divide (Attewell, 2001; Selwyn, 2004), whilst the digital competence elements investigate the second level of digital divide. The combination of both elements determines the level of digital capital, which is vital to understand the third level of digital divide. More specifically, in order to capture the complexity and multidimensionality of digital divide, we need to emphasise that the 'access' refers to the possibility to access the ICTs and it is not used as a direct

synonym of inclusion in the information society (Servon, 2002) and it is not itself sufficient to determine digital inclusion (Van Dijk, 2005). Furthermore, as noted in the previous sections, the evolution of ICTs is associated with an evolution of digital inequalities. In turn, this suggests a need for developing a model that might be able to capture not only the different ways of accessing ICTs but also the competence/skills needed to perform a successful and valuable digital performance. In fact, as suggested by the literature, multiple layers of access and use exist, which depend not only upon socio-economic and demographic factors but also on physical, psychological, cultural and ecological elements (Min, 2010: 24). For this reason, the present model includes variables that capture both inequalities in material access (Table 2.1) and inequalities in ‘quality’ of access. Table 2.1 and Table 2.2 show the specific variables adopted and the related literature that support their reliability in identifying those factors that have an impact on the relationship between ICTs’ usage and digital inequalities. More specifically, the first component of digital capital, here defined as digital access, is not reduced to the binary question ‘do you access the Internet’, instead it also includes elements that might play a role in influencing the quality of access. For this reason, the digital access component was split into four variables that capture the (1) *digital equipment* used to access the Internet, (2) *place of connectivity* used to access the digital realm, (3) *historical time spent online* and (4) *support* received to access the Internet. Such division in sub-components gives the possibility to investigate the multidimensionality of access in relation to time and space dimensions, physical equipment and support (material and immaterial) to facilitate the access. The choice of these specific sub-components was motivated by the literature that sparsely shows how these elements influence the quality of access and consequently the value of the experience. For example, Napoli

and Obar (2014) found that smartphones and tablets offer limited content availability, and Akiyoshi and Ono (2008) and Mossberger et al. (2012) argue that they negatively influence the level of digital engagement or offer less support (Murphy et al., 2016). This suggests that the type and the number of devices used to access the Internet contribute to the quality of access. Indeed, the ‘mobile underclass’, intended as those who only use smartphones or tablets (Napoli & Obar, 2014), usually has a limited range of opportunities compared to those who use a combination of different devices to access the Internet (Napoli & Obar, 2017). Therefore, based on those scientific findings that show how the use of different devices to access the ICTs may increase the quality of the internet experience (Donner, Gitau, & Marsden, 2011), this element was included in the DCI. A second sub-component is related to the place from which users access the Internet. Several research studies showed how the access from multiple locations can influence both the quality (Hassani, 2006) and the types of activities (DiMaggio et al. 2004; Horrigan & Rainie, 2002), in turn positively influencing Internet skills and usage (Hargittai & Hinnant, 2008). Given the influence of the so-called ‘ubiquitous internetting’ (Peter & Valkenburg, 2006), the location of use was included as a variable that contributes to the access component of digital capital. Moreover, within the frame of digital access, the historical use of the Internet was included in relation to those studies that show how experienced Internet users tend to use the Web in prolific and multifaceted ways (Gil-Garcia, Helbig, & Ferro, 2006; Hargittai & Hinnant, 2008; Livingstone & Helsper, 2007; Peter & Valkenburg, 2006). For example, Hargittai (2003, 2010) found that the time spent online is associated with levels of efficiency and effectiveness that determine the quality of the digital experience. However, rather than focussing on the daily time spent online, the framework includes a variable that

captures the historical time spent online, corresponding to the number of years of Internet usage. In fact, digital capital, following the Bourdieusian idea of capital, is accumulated through a process of assimilation and inculcation that, by definition, needs investment both in effort and time (Brock, Kvasny, & Hales, 2010). For this reason, the 'historical time' spent online is considered more appropriate than 'how many hours a day do you use the Internet'. Moreover, given that nowadays the use of ICTs, such as, e.g. smartphones (and their related apps, see, e.g. WhatsApp), is blurring the boundary between online and offline dimensions, the daily time spent online might be difficult to be quantified (since users tend to be 'always connected' to the Internet). Finally, within the frame digital access, this model includes a variable related to the kind of support received. This is motivated by the fact that social support is identified by the literature as a trigger for acquiring digital technologies and, therefore, accessing the digital realm (DiMaggio & Hargittai, 2001; Selwyn, 2004). In this direction, social support has been considered vital for users to access and take full advantages of ICTs (Kling, 2000). More specifically, the social support might be important in determining the level of digital capital such as, e.g. in the case of someone that relies on the help from more experienced users to create a better qualitative access to the Internet.

These four elements included in the 'digital access' component contribute towards informing on the types and quality of access, which in turn can influence the accumulation of digital capital. However, as noted, the quality of access is fundamental but not sufficient to determine the level of digital capital. This is the reason why a more comprehensive model aimed at measuring the level of digital capital should also include abilities/skills in using, understanding and elaborating data retrieved online. Therefore, this second

macro-component was included as an integral part of digital capital. Digital competence has been increasingly catalysing the attention of digital inequality researchers, also considering that the gap between those who access and those who do not access has been significantly reduced, in particular in advanced countries. As noted, this aspect led several scholars to focus on the inequalities in Internet usage, moving towards a second level of digital divide. These forms of inequalities have been found to be affected by several features such as education, training, family support, attitudes and jobs. Skills/abilities in accessing and using the Internet play a relevant role in dialoguing with these factors, being themselves both trigger of and triggered by this interaction. The result of these bidirectional influence might be interpreted as being at the base of digital disparities, which in turn are connected to social inequalities. The literature, over the years, have used several concepts, such as digital skills (Gui & Argentin, 2011; Hargittai, 2002), Internet skills (van Deursen & van Dijk, 2011), digital literacy (Erstad, 2010; Gilster, 1997; Sefton-Green, Nixon, & Erstad, 2009) or operational skills (Van Deursen, Helsper, & Eynon, 2016) to analyse the inequalities in the Internet usages. Moreover, several scholars identified a range of skills/abilities that are considered essential for educating the twenty-first century digital ready workforce (Huijser, 2006; Morgan, 2010; Voss et al., 2009). All these concepts are legitimate and help understand the qualities and types of online activities. This is the reason why the digital competence component here proposed incorporates the set of skills and knowledge needed to use ICTs as an opportunity to learn, socialise, enjoy the spare time, perform tasks, solve problem and work (OECD, 2010; Punie, 2007; Sefton-Green et al., 2009). More specifically, the choice of these sub-components was supported by the findings reported by the Organisation for Economic Co-operation and Development

project, which show how individuals' ability to use the Internet properly and confidently requires 'more than just knowledge and skills' (OECD, 2005: 41). In this sense, competence should be intended as the capacity to mobilise psychological resources (skills and attitudes) to facilitate the achievement of personal goals in complex contexts. Given the variety of definition of Internet skills and digital skills (Jones-Kavalier & Flannigan, 2008; van Deursen & van Dijk, 2009), the concept of digital competence seems to be more appropriate, since it incorporates not only these aspects but also emotional and social features involved in the use of digital devices (OECD, 2005). Moreover, it includes attributes related to a confident and critical use of ICTs for problem-solving, leisure, learn and work (Punie & Cabrera, 2006). Finally, the majority of these elements have been included in the DigComp 2.1 developed by the European Union to measure the digital capabilities of European citizens. Following the DigComp 2.1, the model here proposed adapted and operationalised these elements through two sets of questions (nine items per each set). [Table 2.2](#) shows the operationalisation of the variables included in the competence component. Since it might be difficult to objectively measure the level of competence, in particular when considering abilities such as, e.g. users' capacity to navigate the Web with specific goals, the questions were based on self-estimation scales. In fact, the mere possession of qualifications might not reflect the real picture of users' capabilities, who might have learnt to successfully use the Internet on their own or thanks to their social support. Therefore, the use of a self-estimation scale from 1 ('not at all true of me') to 5 ('very true of me') is considered appropriate for capturing respondents' abilities and skills in achieving their goals through the Internet.

Digging deeper into the five competence areas, the 'Information and data literacy' sub-component was operationalised

through a set of three questions on a five-point Likert scale. These questions capture the skills and abilities needed to browse, search, store, retrieve and manage data found online. These skills are fundamental in a digital enabled society, where people need to access (by finding information), evaluate (by assessing the value of information retrieved) and manage information and data (Ahmad et al., 2016; Snow & Katz, 2009). Since digital capital also means having the material and cognitive resources to efficiently navigate the Internet, it is vital to investigate individuals' abilities in accessing, understanding and filtering information and digital content. More specifically, these questions look at the individuals' competences in browsing, searching and evaluating information. These competences are particularly important in an era characterised by an overload of information, and in which the ability to find the right information and verify their validity is essential. Furthermore, this first competence area also aims to evaluate the ability to correctly store information retrieved online. Indeed, while searching and verifying information retrieved online are per se fundamental, they might not be valuable if users are not capable to safely store information.

The second competence area was labelled, following the DigComp 2.1, as the 'Communication and collaboration' sub-component. It is operationalised as a set of four questions that capture the attitude and abilities in using the digital arena to engage with public services, e-banking activities and other forms of support to daily activities. Indeed, since public services have been increasingly migrating online, the capacity to engage and use online tools is an important feature required to operate in and take advantage from digitalised systems (Kahne & Sporte, 2008; Zaff, Malanchuk, & Eccles, 2008). Within this competence area, it is also vital to explore people's ability to use different communication tools to communicate

information and ideas effectively and use ICTs to collaborate, create social networks and work in team (Choy, Deng, Chai, Koh, & Tsai, 2016; Claro et al., 2012; Siddiq, Scherer, & Tondeur 2016). Furthermore, users' capacity to understand what pieces of information should and should not be shared on the digital arena and protect their own online reputation is an appropriate indicator of the level of digital capacity. Finally, in evaluating the individual level of digital capital, the ability of developing strategies to address cyberbullying and to identify inappropriate behaviours tend to be generally considered important to defend people's identity (Giumetti & Kowalski, 2016; Hutson, 2016).

Furthermore, the third area of competence, labelled as 'Digital content creation', was operationalised as a set of four variables that capture the abilities and skills in developing, integrating and programming digital content. Specifically, this area focuses on individual competences in creating content by using different formats and in editing existing content. These questions are intended to capture the capacities to develop digital content by using different formats and, more in general, to actively participate on the online arena. This macro-area also includes items aimed at addressing users' capacity to understand limits and rules imposed by copyright and licence on digital content. These elements constitute an important part of digital capital, since they relate to people's capacity to develop and frame their own contents respecting the 'rules of the game' (Hinrichsen & Coombs, 2013; Lee, Parsons, Kwon, Kim, & Petrova, 2016; Mengual-Andrés, Roig-Vila, & Mira, 2016).

The fourth area of competence captures safety-related aspects through four sets of questions. Safety is considered an integral part of digital capital given its role in protecting both users' identity and devices used, as well as well-being and personal information (Dodel & Mesch, 2018; Livingstone &

Helsper, 2010). For this reason, it is useful to understand if and how individuals set their privacy settings and use/update their security systems (e.g. anti-virus software and use of different passwords to access both digital services and devices). Finally, safety also focuses on the capacity of individuals to properly evaluate the impact of digital technologies on everyday life and select safe and suitable digital media.

Finally, the last area of competence relates to ‘Problem-solving’, and it is operationalised by using four different questions. This competence area captures the capabilities of using digital technologies to solve technical problems. Furthermore, it captures individuals’ creativity in expressing themselves by using digital technologies, and their capacity to identify gaps in competence and update knowledge regarding digital tools (Greiff, Wüstenberg, Holt, Goldhammer, & Funke, 2013; Scherer & Gustafsson, 2015).

These five macro-areas of competences should be able to capture and provide an accurate overview about the capacities, abilities and skills in using ICTs for different purposes, thus contributing in determining the level of digital capital. In order to create the ‘Digital Capital Index’ that provides the level of digital capital each individual possesses, these five macro-areas are combined with the four sub-components of ‘digital access’. Evidently, given the bridge nature of digital capital, this index must be analysed in relation to socio-demographic and socio-economic patterns and in relation to offline capitals.

2.3 HOW TO USE DIGITAL CAPITAL INDEX TO INVESTIGATE DIGITAL INEQUALITIES

Throughout the book, digital capital has been often defined as ‘bridge capital’, which can simultaneously be isolated (being it

independent from other capitals), and transformed in other forms of capitals (given its interactive and transferability nature). As noted, digital capital enables to transfer the pre-existing resources or capitals used offline on the online realm. Therefore, this first section of the bridge (see Fig. 1.1) results from the interaction between the 5Cs (or offline capitals) and digital capital, which in turn determines differences and inequalities in terms of how individuals use their offline resources in the digital arena (second level of the digital divide). At the same time, digital capital is also vital to transfer digital resources (what individuals do online) in the offline dimension. This second section of the bridge (see Fig. 1.2) is the result of the interaction between digital capital and the 5Cs, which determines differences and inequalities in terms of concrete outcomes that are externally observable (third level of digital divide).

For this reason, the adoption of a Bourdieusian field perspective suggests that digital capital can be measured as the dominant form of capital in the digital field, which, however, interacts with the other five capitals. It simultaneously depends on individuals' digital history (through the accumulation of digital technologies and digital competence), but it also bridges the pre-existing offline social, economic, cultural, political and personal capitals and the reproduced forms of them after the digital experience. This happens through a double-loop process (see Fig. 1.4) in which the original accumulated five capitals are invested and transferred into digital capital, which in turn is re-invested to increase and transform the pre-existing offline capitals. This means that the measurement of digital capital and its components can facilitate the development of *ad hoc* policy intervention to alleviate some types of social inequalities, which in turn are aggravated by the possession of a scarce digital capital. Since individuals' actions are defined and moulded by the social space in which

they live and grow up (Bourdieu, 1986), the proposed index should be analysed against the personal and social background of individuals, but also in relation to the types of online activities and tangible outcomes. More specifically, since the interaction with the other capitals is essential to understand the interplay between digital and social inequalities, alongside the digital capital-related components and the socio-demographic variables, it is important to capture both (1) offline capitals and (2) tangible outcomes.

The questionnaire reported in Appendix reports an example of how the aforementioned elements might be operationalised. It results from a confirmatory study carried out in the UK by Ragnedda, Ruiu, and Addeo (2019) aimed at empirically applying the digital capital concept. Therefore, Appendix reports the model that has been modified and adapted after testing the real value of the variables for capturing the elements that play a role in the interaction between digital capital and offline capitals, as well as digital inequalities and social inequalities. It includes socio-demographic aspects that might influence the access to ICTs, such as gender (Katz & Rice, 2002; Wilson, Wallin, & Reiser, 2003), race (Hoffman, Novak, & Schlosser, 2001; Jones, Johnson-Yale, Millermaier, & Pérez, 2009), socio-economic status (Mardis, 2013; Ragnedda & Muschert, 2013), education (Clark et al. 2001; Clark & Gorski, 2002), countries (Pearce & Rice, 2013; Zhang, 2013) and any further variables that in a specific context might influence social inequalities. As the literature shows, these patterns and elements, which are at the basis of social inequalities, influence and determine Internet usage and proficiency (Stern, Adams, & Elsasser, 2009). The second section directly refers to the DCI, about which we have already discussed, and we are going into the details in the following paragraph. Finally, given the bridging nature of digital capital, it includes two additional sections

that capture both the pre-existing offline capitals (the capital each individual possesses in the offline realm) and the post-digital experience accumulated offline capitals (the so called tangible outcomes). Both these sections are in turn split into five sub-areas related to each capitals, in order to see first how (if any) each capital interacts with digital capital and secondly, which online activities may be enriched and improved to enhance capital's benefits. The fifth section specifically looks at the social benefits individuals may get from using ICTs. This last part is particularly important for policy-makers involved in digital inclusion initiatives, since they can monitor the uneven distribution of benefits and tangible outcomes and which capital-enhancing activities (political-cultural-social-economic-personal) need interventions. This full survey may be useful to monitor how social and digital inequalities are intertwined and which area needs attention the most.

2.4 TESTING DIGITAL CAPITAL INDEX

In order to test the tool developed to capture the level of digital capital, in a previous work, the DCI survey was tested with a representative sample of the UK population (Ragnedda et al., 2019). Both sub-components (digital access and digital competences) were combined into a unique index able to provide the individual level of digital capital. Evidently, this level, like any other capital, can vary over time and in relation to different factors. Ragnedda et al. (2019) research represents the first attempt to identify and measure digital capital. The aims of this previous study were twofold: first to validate the model construct and secondly to explore if this model is 'in line' with other research studies on digital inequalities. More specifically, an exploratory factor analysis (EFA) was

performed to extract a unique variable from each of the two constitutive components (access and competence), thus creating two different indexes. The results of this empirical research shows a statistically significant correlation between these two indexes, which have also the same 'weight' in determining digital capital in determining digital capital (Ragnedda et al., 2019). The Digital Access Index and the Digital Competence Index were synthesised through a further extraction through FA of a single factor representing the DCI and then, to simplify its interpretation, converted to a range from 0 to 100, where 0 is the lowest level of digital capital, while 100 is the highest.

The level of digital capital was then explored and 'tested' in relation to demographic and socio-economic patterns. The aim was to provide further support to the validity of the DCI by comparing the results of the interaction between DC and the 5Cs with previous research studies that show how the main axes of social inequalities are at the centre of the digital divide and digital inequalities studies. More specifically, several studies found that digital inequalities are related to five socio-demographic and socio-economic variables, which are age (Loges & Jung, 2001), gender (Davaki, 2018), level of education (Poushter, 2016), income (Barrantes & Galperin, 2008) and place of residence (Wilson, 2006). In other terms, following the literature, we assumed if digital inequalities (both in terms of access and competence) are tied and influenced by socio-demographic and socio-economic features, so should be digital capital (Ragnedda et al., 2019). The differences in terms of gender, age, education, incomes and geographical area of the sample allowed us to test the socio-demographic and socio-cultural hypotheses. More specifically, in line with several studies that showed a negative effect of age on the level and types of digital engagement and activities, we expected that age negatively

Table 2.3. Digital Capital per Age Cohort.

Age Cohort	Mean	Standard Deviation
18–24	78.4	16.1
25–34	83.6	12.8
35–44	76.0	15.9
45–55	72.9	16.8
55+	64.6	16.7
Total	72.8	17.4

Source: Elaboration of data from Ragnedda et al. (2019).

contributes to the level of digital capital. In fact, as [Table 2.3](#) shows, the level of digital capital is on average higher in younger people, and this is in line with previous studies that demonstrated how age negatively influences digital inequalities. However, it is worth noting that the cohort aged between 25 and 34 years has the highest level of digital capital. Since digital capital is interpreted as historical accumulation of digital competences and digital technologies, it is reasonable to suggest that this cohort is young enough to be updated with the latest technologies and to have more resources (economic, social and cultural) to accumulate digital competences (Ragnedda et al., 2019).

Another element that shows the interaction between digital capital and social inequalities relates to the incomes. Since the very beginning of digital inequality studies, incomes have been associated with digital divide. Plenty of research have shown how incomes influence both components competences of (Aesaert & Van Braak 2015; Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014; Litt, 2013) and access (Martin & Robinson, 2007). As [Table 2.4](#) shows,

Table 2.4. Digital Capital per Annual income.

Annual Household Income after Taxes	DC Mean	Standard Deviation
Under £10k	67.7	17.7
£11–25k	70.6	17.3
£26–50K	73.0	17.4
£51–100	77.0	16.0
Over £100k	81.6	15.8
Total	72.8	17.4

$F = 5.347$; sig. < 0.000 .

Source: Elaboration of data from Ragnedda et al. (2019)

in line with these studies, digital capital is positively associated with incomes. In other words, Table 2.4 shows how digital capital increases in correspondence of an income increase. This might be influenced by a number of elements, such as better job or even better education, but it provides a further support that the proposed model is in line with previous research.

Furthermore, the level of education has been often associated with digital inequality studies. Specifically, the level of education is positively related to both access to ICTs and digital skills (Blank & Groselj, 2015; Van Deursen & Van Dijk, 2013; White & Selwyn, 2013). Table 2.5 shows that the model is in line with these research studies, since the level of digital capital increases with higher level of education. Furthermore, since income is often associated to the level of education and are at the base of the socio-economic status (Benabou, 2000; Blau, 1977), we can argue that, more broadly, digital capital is associated with social class. Once again, this model seems to be

Table 2.5. Digital Capital per Education Level.

Education level	Mean	Standard Deviation
Some high school, no diploma	64.0	21.6
High school graduate	70.6	17.4
Some college credit, no degree	73.9	16.2
Bachelor's degree	74.4	16.2
Master's degree	78.3	13.2
Doctorate degree	84.3	13.3
Total	72.8	17.4

$F = 8.859$; sig. <0.000 .

Source: Elaboration of data from Ragnedda et al. (2019).

in line with the literature that has proven how socio-economic status influence digital inequalities.

Moreover, several studies showed that urban users are more likely to have better access and better digital skills than rural users (Ashmore, Farrington, & Skerrat, 2015;

Table 2.6. Digital Capital Index per Residential Area.

Are You Currently Living In:	Mean	Standard Deviation
Urban areas	75.2	16.2
Small towns	72.1	17.2
Rural areas	68.6	19.6
Total	72.8	17.4

$F = 4.745$; sig. <0.003 .

Source: Elaboration of data from Ragnedda et al. (2019).

Table 2.7. Digital Capital per Gender.

	<i>N</i>	Mean	Standard Deviation	Standard Error					
<i>M</i>	355	74,014	17,235	,915					
<i>F</i>	353	71,594	17,412	,927					
	Levene's Test	Sig.	t-test						
	<i>F</i>		<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean Difference	Standard Error Difference	95% Confidence	
								Lower	Upper
Equal variances assumed	,245	,621	1,858	706	,064	2,419	1,302	-,137	4,976
Equal variances not assumed			1,858	705,823	,064	2,419	1,302	-,137	4,976

Source: Elaboration of data from Ragnedda et al. (2019).

Crang, Crosbie, & Graham, 2006; Foster, Goodman, Osiakwan, & Bernstein, 2004; Philip, Cottrill, Farrington, Williams, & Ashmore, 2017; Townsend, Sathiaselan, Fairhurst, & Wallace, 2013). Digital capital (see [Table 2.6](#)) is on average higher among individuals who live in urban areas (75.2) than those who live in small towns (72.1) or rural areas (68.6). Again, [Table 2.6](#) shows that the DCI further supports this line of research.

Finally, the DCI was explored in relation to gender by hypothesising that male would have, as average, higher digital capital compared to women. However, based on the bivariate analysis, we found only a small difference, not statistically significant ([Table 2.7](#)). However, this does not necessarily indicate that gender inequalities, especially in terms of digital competences, are bridged. A multiplicity of elements can contribute (in a more or less marked way) to increase this gap, such as, e.g. frequency (Wasserman & Richmond-Abbott, 2005) and intensity of use (Hargittai, 2010), Internet skills (Hargittai & Shafer, 2006). Therefore, this suggests that different levels should be simultaneously taken into account when considering the relation between gender and digital inequalities. In fact, even though the overall level of digital capital does not differ significantly, several elements can still contribute (each one having different degrees of influence) to distinguish these two groups.

As anticipated, the reason why we explore these relationships was to test the validity of a model construct aimed at measuring digital capital. Evidently, we are aware of the limitations of a bivariate analyse that, by definition, includes only two variables and do not consider other elements/variables that may influence the results. However, the aim, at this stage, was to further validate of the construct validity of the DCI. The idea was to relate it to the principal axes of social inequalities and see if this model was in line with the literature. Overall, the questionnaire used to measure the level

of digital capital resulted to be reliable, given the correlation between the factors and the result of the reliability measure. Furthermore, the DCI seems to capture the constitutive components of digital capital and interact with individual socio-demographic and socio-economic backgrounds.

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3

IMPLICATIONS

One of the criticalities that should be addressed when defining a new concept relates to its concrete application to solve social problems and facilitate intervention (e.g. through policy-making). Therefore, this chapter discusses how the proposed Digital Capital Index (DCI) might be used by policy-makers in order to tackle social inequalities through digital inclusion strategies. To better understand how this work can be useful to policy-making, we shall reconsider some of the points highlighted in the introductory sections of this book. In fact, when introducing the concept of digital capital, we proposed a reflection on the utility of distinguishing digital capital from other forms of capital, such as economic, political, social, personal and cultural capital. At the same time, throughout the book, we discussed how digital capital is strongly intertwined with the five capitals.

This chapter provides an overview of the implications of the DCI for policy-makers and some guidelines and indications that digital inclusion initiatives might consider both to reduce digital inequalities and to tackle social inequalities.

3.1 FOSTERING LIFE CHANCES: THE IMPORTANCE TO MONITOR DIGITAL CAPITAL

The need to define a capital that is directly connected to our digital experience has become evident since the process of ‘digitalisation’ of society is increasingly permeating our everyday life. The introduction of this book highlighted that the academic debate around the definition of capital, in general, and the potential dependence of digital capital on other forms of capital (especially the economic one) are still under discussion. Following Bourdieu, this book has defined the concept of capital as an accumulation of resources (material and immaterial) that can be used to achieve specific goals and that can be converted into other resources or capitals. At a first glance, as discussed in Chapter 1, the definition of an additional capital might result confusing and superfluous. However, from both a societal and a policy-making point of view, the introduction of a toolkit that enables to isolate and synthesise the digital accumulated experience of people in society might be particularly useful to tackle digital/social inequalities and propose digital inclusive initiatives tailored upon individuals’ needs.

Digital capital is, therefore, needed to foster individuals’ life chances and help those suffering from a low social position and a risk of social exclusion to be included. In fact, as mentioned in Chapter 1, several studies show that those who approach and use ICTs with a poor socio-economic and cultural background tend to have less digital experience and carry on limited types of activities (Bonfadelli, 2002; Peter & Valkenburg, 2006; van Dijk, 2005). In turn, this means less possibility to use ICTs for capital enhancing activities. This approach suggests that those who are already advantaged in the social realm, because they are richer (economically, but also socially, politically, personally, culturally and politically),

tend to better exploit the Internet compared to others who occupy a lower socio-cultural position (Selwyn, 2005). However, what this approach is missing is the fact that having a strong socio-economic and cultural background is necessary but not a sufficient condition to make the Internet experience 'profitable'. In fact, without a high level of digital capital, users might not be able to maximise and exploit their offline resources into the digital realm.

Secondly, in order to use the digital experience and transform it into concrete and tangible benefits, individuals need both a certain level of digital capital and high level of 5Cs. This 'positive relation' (ideally because all the interacting capitals are high) results into tangible outcomes, externally observable and measurable. In fact, digital capital can be converted into economic components, as well as into the cultural, social, political and personal ones. However, we highlighted throughout this book that the pre-existing personal accumulation of offline economic, cultural and social resources does not necessarily produces digital capital. In other words, a simple example of this situation might be represented by a wealthy and well-educated older couple without children who has lived and worked in a small village for their entire life. This couple either might or might not need to accumulate digital capital to deal with their daily routine and increase/satisfy their personal, social, cultural, political and economic needs. By contrast, when digital capital is high, it might contribute towards reinforcing the other capitals. This means that the digital accumulation can be invested in other forms of capital also generating new gaps between those with a high starting offline capital and those with a high online capital (and in turn reinforce offline capitals). However, both the 'independence' and 'dependence' of digital capital from the others, is also testified by the non-linear relation between high levels of all capitals and a high level of digital capital. The

variety of possibilities deriving from the interconnections between capitals does not make it possible to analyse all the potential situations. However, an example of such ‘independent dependence’ of digital capital might be represented by a young person who becomes popular on the Internet, thanks to a viral video without any specific cultural, political, economic or social background. A concrete example might be found in the case of Gian Daniele Calbini, a young shepherd from Perfugas, a small village (around 2400 people) located in Sardinia (Italy), who in 2016 published a homemade video on Facebook (and shared it on the right existing channels/groups) representing him with one of his sheep (Desolina). The video received around 27 millions of visualisations from all over the world, thanks to a funny representation of the sheep that seems to chew a gum. This video achieved such a popularity that has been awarded by national magazines and radio (<https://www.assaparte.net/gian-daniele-calbini/>). Gian Daniele and Desolina’s videos have increased their influence on the Web over time to the point of becoming testimonials for an energy company and appear in TV shows. This simple example shows that digital capital concretely contributes towards creating new and totally different life chances and increasing at least social and economic capitals. In fact, thanks to Gian Daniele’s digital access and digital competences, he was able to exploit the Internet despite the pre-existing scarce resources available. However, it should be noted that a high level of digital capital might only partly overcome the initial social inequalities and limitation of resources or capitals. To follow up with the previous example, if Gian Daniele had a stronger social, political, cultural and economic capital, he would have probably gotten more from the use of the Internet, being able to maximise and capitalise these resources and transform this ‘digital experience’ into valuable outcomes. For example, in addition to his increased social and cultural

capital (enlarged network), he would have invested his influence in building political capital (use it for increasing his political power in lobbying, for instance, to foster animal/environmental rights), cultural capital (e.g. investing in learning other languages to translate his videos and make them internationally accessible) and above all economic power (e.g. investing more in selling the image of his sheep not to just one business but to several ‘environmentally friendly’ businesses). To make this example clearer, imagine substituting the actor (Gian Daniele) with the son of any politically or economically powerful person who could enjoy from greater resources. Evidently, the initial background and previous capitals would influence both qualities and types of online activities (second level of digital divide) and their capacities to reinvest in the social realm digital resources and capital (third level of digital divide). Concretely, a billionaire’s son would have much more chances to capitalise (because of their higher economic, political and social capital) on this experience, getting the most out of it. In other words, what we get from ICTs’ access and uses is influenced by previous background, but also by the interaction of digital and previous capitals.

Since policy-makers, charities and foundations working to reduce digital inequalities cannot directly intervene in levelling social inequalities, they can work in increasing individual digital capital in order to minimise the unequal outcomes and benefits from using ICTs. For this reason, knowing individuals’ level of digital capital and the areas in which individuals need help the most might be useful to tailor digital inclusion initiatives upon their needs. By improving digital capital, in the long run, the indirect consequences may reflect upon social inequalities by reducing digital inequalities and enhancing competence that helps individuals to gain advantages from the use of the Internet. As mentioned, indeed, those who are

socially advantaged also tend to be part of the digital elite. By contrast, those who are socially disadvantaged tend to be also part of the digital underclass, suffering both from social and digital inequalities. However, by monitoring individuals' level of digital capital, policy-makers may propose specific and tailored digital inclusion initiatives aimed at improving digital capital, thus counterbalancing social inequalities by providing the necessary instruments to capitalise from ICTs.

The second implication relates to the scientific literature on digital capital. Throughout this book, we highlighted that some attempts to define the process of 'digital accumulation' has been proposed, but not yet well established in the literature. This work proposed a set of indicators that summarises and integrates the variety of concepts and their related properties into a unique index. This means that digital capital is not only useful for policy-makers to identify the digital gaps in society but also for scholars who want to further develop this concept. This is also important in a comparative perspective. In fact, the use of the same index can facilitate comparison between countries, but also time-periods and different segments of the society. As mentioned in the last section of Chapter 1, an additional contribution in this direction is represented by the possibility to use digital capital concept in understanding the evolution of the three levels of digital divide and try to anticipate/tackle potential new forms of inequalities.

3.2 DIGITAL INCLUSION POLICIES

This book fulfilled the need for conceptualising the digital accesses and competences in terms of a specific digital capital, by proposing an integrated approach that could be used to capture both the cumulative and transferable components of

this capital. These characteristics also show one key aspect of this capital, which is its transversal capacity of enabling the acquisition of other resources through a double loop process. In fact, the key role played by both digital technologies and digital competences in increasing life chances and, therefore, improving people's 'employment, personal development and social inclusion', is supported by the European Union investments. This suggests that identifying the constitutive elements of digital capital is fundamental for the implementation of those policies aimed at reducing social inequalities as suggested by the EU (2006). In fact, the identification of specific indicators of the multidimensionality of digital capital facilitates the identification of specific areas of intervention, such as, e.g. in the case of the European Digital Competence Framework for Citizens, which invested in researching what kinds of digital skills are necessary for improving people's lifestyles and develop *ad hoc* policies (Carretero, Vuorikari, & Punie, 2017). For policy-making aimed at implementing digital inclusion initiatives, the development of a DCI might help design policies intervention tailored upon citizens' characteristics and features. In fact, monitoring and measuring the DCI along with the other two component (offline capitals and tangible outcomes) can help monitor citizens' digital competences and access, support citizens in using ICTs on a wide array of fields, such as job seeking, sociability, savings, familial relationships, accessing online services and so on. In this way, policy-makers might help citizens to be socially/economically/culturally/politically included by using digital technologies, thus tackling both digital and social inequalities.

Digital inclusion projects can also help tackle some of the problematics connected not only to the first and second levels but also to the third level of the digital divide by providing the assistance necessary to efficiently use ICTs in order to enhance digital capital accumulation and get some tangible results.

This book suggests that digital inclusion projects need to focus more on the outcomes that could enhance their life status, rather than on the simple access to technology or basic digital skills. Digital inclusion projects should provide training to citizens on how to take advantage of the economic, personal, political, cultural and social opportunities available on the online arena. If barriers (intended as both access and competence) to digital inclusion are not addressed, the digital divide will further increase inequality by cementing existing social divides. Therefore, this implies that policy-making aimed at narrowing digital gaps should focus not only on providing physical access to the technology (first level of digital divide related to physical access to the Internet). This was the main approach, influenced by technological determinism, in the late 1990s and early 2000s when both scholars and policy-makers (Chowdary, 2002; Hartviksen, Akselson, & Eidsvik, 2002; James, 2002, 2003; Lentz & Oden, 2001; Meng & Li, 2002; Moss, 2002) predicted that access to digital technologies would result in closing the digital divide. However, it is well known today that the mere access to the Internet, which, e.g. appears to be provided in almost all North Globe countries, does not correspond to a closure of such digital inequalities. What becomes relevant in a context in which people have more or less the same possibilities to access the Internet relates the ways communication technologies are used, the type of online activities carried out and the outcomes that are consequently generated. This book suggests that the provision of a digital capital measure might facilitate the identification of types of activities and abilities required to take advantage of the Internet.

One might counterclaim that given the deep interconnections between digital capital and other forms of capital, it cannot be defined as a specific capital. This is directly connected to the second implication related to the convertible and

bridging nature of digital capital frequently mentioned by this book. As we noted in the previous section, digital capital, as well as other forms of capital, is convertible and generates other kinds of advantages (both material and immaterial). However, policy-making cannot deal with social inequalities as a whole, by, e.g. neglecting the importance of individuals' cultural, social, political, personal and digital background. By contrast, all these components need to be isolated and specific intervention should be oriented to specific targets. This suggests that the use of digital capital as an indicator of individuals' 'digital status' in society can help map and focus on filling those social gaps that contribute towards cementing/enlarging inequalities. As a capital, however, its intrinsic property of convertibility should be considered. In fact, the accumulation of digital capital might also produce positive effects in narrowing social, cultural, political and economic disparities. We mentioned that some scholars only focused on existing socio-economic backgrounds that enable to navigate the Internet. For example, those who have economic resources, cultural and social capital have more opportunities to buy efficient technology, use the Internet to increase their social and cultural needs. However, such an approach does not take into account the double loop described throughout this book. Socio-economic backgrounds are important to generate digital opportunities, which in turn are seized, thanks to the personal digital capital and then reinvested into new offline socio-economic opportunities. The fact that intervening on digital capital can also produce changes in socio-economic terms does not indicate that digital capital should be reduced to a mere component of other capitals (especially economic and cultural, as highlighted by the literature review proposed in this work). By contrast, it interacts with these capitals simultaneously being generated by and generator of other forms of capital. And this is also valid for all other capitals,

suggesting that neither the economic capital can be considered purely independent from other components such as social, cultural, political and personal orientation, plus nowadays digital experience. Those studies that contested the use of technological accumulation as a specific capital mainly referred to the dichotomy 'digital access/no access'. However, as this work suggested, this definition needs to be expanded and include a variety of aspects such as the competence component, which in turn makes the Internet access and experience useful for improving individual life chances. This suggests that policy-makers that want to enhance digital capital should not only focus on providing access to the technologies and the Internet. By contrast, the understanding of what competence and where the gaps are located in society can be investigated by using digital capital concept and the DCI.

CONCLUSIONS

This book showed that the literature on digital divide often focuses on specific aspects that contribute towards inequalities, and on specific levels of digital divide. However, the fragmented nature of these studies that consider different and sparse elements of the digital experience does not allow to define a specific digital capital. By contrast, this book proposed an integrated approach to reconcile the variety of approaches by first adopting a new conceptualisation of digital capital and then by proposing a standardised measurement that can be used to compare different contexts. In fact, the theoretical and empirical frame here proposed to incorporate digital capital into Pierre Bourdieu's field theory. In this sense, digital capital is understood as accumulated digital competences (internalised abilities) and digital devices (externalised resources). As we argued throughout the book, the adoption of a field perspective that looks at the digital experience as independent social field requires to separate digital capital from other forms of capital. However, as noted, the literature has frequently neglected the possibility to theorise digital capital as a specific capital and never proposed a way to measure it. In this vein, this book tried to fill this gap by proposing a theoretical framework (and its empirical operationalisation) to isolate and measure digital accumulation as a specific capital, and taking into account its potential

convertibility in other forms of capital. More specifically, this book suggested that the identification and quantification of digital capital is essential to shed some insights into the development of digital inequalities, which in turn play a role in producing and reinforcing social inequalities. This can be only understood if, after measuring how the individual digital capital contributes towards digital inequalities, its interaction with other capitals is further explored to see how it serves as a bridge for increasing people's life chances and improve their social status.

To capture the complexity of digital inequalities and understand how digital capital can be used to shed light onto the three levels of digital divide, it is important to consider the main axes of social inequalities. In fact, scholars found that digital inequalities are in particular related to socio-economic and socio-demographic variables such as age (Loges & Jung, 2001), gender (Davaki, 2018), level of education (Poushter, 2016), income (Barrantes & Galperin, 2008) and place of residence (Wilson, 2006). These features, at the base of social inequalities, are also associated with inequalities in accessing (first level of digital divide), using (second level of digital divide) and getting benefits from the use of Internet (third level of digital divide). However, these aspects can only explain a part of the process of generation of social/digital inequalities. Several other factors need to be employed to improve the understanding of inequalities in the digital realm and to analyse the intertwined relationship between social and digital inequalities. Digital capital incorporates these features by focussing both on the way individuals access the Internet and on the abilities and skills they use. We need to keep in mind that digital inequalities are intersectional, meaning that the social and economic disadvantaged positions of specific social groups/individuals are the result

of different types of inequality (Anthias, 2013; Carbin & Edenheim, 2013; Walby, Armstrong, & Strid, 2012; Winker & Degele, 2011).

While this book does not pretend to provide a universal model to account for all forms of digital inequalities and how they are intertwined with social inequalities, the Digital Capital Index provides some steps forward this direction. It provides a useful and practical tool to monitor digital capital level and how it is interrelated with offline capitals and tangible outcomes. This model was built upon previous studies that explored digital inequalities by investigating the relation between specific components of digital capital and socio-economic and demographic backgrounds. Furthermore, it ensures replication, which might be useful to further develop and calibrate the instrument in contexts characterised by different socio-economic and demographic traits.

Finally, this book offers insights into how this theoretical and empirical framework can be used to address digital inclusive policies. The empirical tool provided might, in fact, point policy intervention towards specific directions by, e.g. identifying those gaps that might be filled through enhancing specific components of digital capital. In turn, given its bridging nature, the intervention on specific elements of digital capital can contribute towards reducing some types of social inequalities, by identifying both those who are the most likely to benefit from digital inclusion initiatives and what competences need to be implemented. These are, e.g. related to the need to increase digital capital for basic needs such as accessing job opportunities, social benefits and welfare services. In other words, investing in digital capital can contribute towards increasing people's life chances and improving their daily life.

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APPENDIX: MEASURING DIGITAL CAPITAL

Internet is believed to be an important means in our everyday life, but further research is required to understand how it influences our life. This survey will help researchers in understanding why, when and how we use the Internet and Information Communication Technologies (ICTs) and how these uses are influenced by our previous social, economic, cultural and political backgrounds. All data will be stored securely, anonymously and not shared with anyone else.

SECTION 1: PERSONAL INFORMATION

Q1. Gender

- (1) M (2) F (3) Prefer not to say

Q2. What is your age?

- (1) [...]

Q3. Your educational level

- (1) Some high school, no diploma
(2) High school graduate

- (3) Some college credit, no degree
- (4) Bachelor's degree
- (5) Master's degree
- (6) Doctorate degree

Q4. Are you currently living in (adapt to your context)

- (1) City centre
- (2) Periphery
- (3) Outside the city
- (4) Not sure

SECTION 2: USES OF THE INTERNET

Q5. Devices used to access the Internet (more than an option is possible)

- (1) Mobile phone or smartphone
- (2) Laptop or netbook
- (3) Tablet computer
- (4) Desktop computer
- (5) Media or game players
- (6) Smart TV
- (7) Other devices (e.g. e-book reader, Smartwatch)

Q6. In which of the following settings do you most frequently access the Internet? (More than an answer is possible)

- (1) Library or other setting open to the public
- (2) At home
- (3) At a friend's home
- (4) Café
- (5) Free Wi-Fi anywhere

Q7. Have you ever had any formal training in using Internet?

- (1) Yes
- (2) No
- (3) I don't remember

Q8. When you first used the Internet for the very first time?

- (1) [...]

Q9. If you needed help, would there be someone who could help you with using the Internet?

- (1) Yes
- (2) Maybe
- (3) No

[If previous was Yes or Maybe] **Q10. Who of the following could help you?**

- (1) Friends
- (2) Partner
- (3) Family members
- (4) Co-workers
- (5) Librarians
- (6) Internet cafe employees
- (7) Help desk
- (8) Online communities/people
- (9) Another person

Q11. Have you looked or asked for help to use the Internet in the past three months?

- (1) Yes
- (2) No
- (3) I don't remember

Q12. How often do you use the Internet for?

	Never (1)	Very Rarely (2)	Rarely (3)	Occasionally (4)	Frequently (5)	Very Frequently (6)
1. Start new friendships						
2. Search or apply for jobs						
3. Practice using a new language						
4. Use social media						
5. Keep in touch with friends						
6. Keep in touch with family						
7. Purchase products or services						
8. Play game						
9. Pay bills						
10. Keep up with current events						
11. Make travel arrangements						
12. Work/ Business						
13. Studies						
14. Downloading or listening music, etc. (e.g. iTunes, Spotify)						

(Continued)

	Never (1)	Very Rarely (2)	Rarely (3)	Occasionally (4)	Frequently (5)	Very Frequently (6)
15. Watching movies (e.g. Netflix, Amazon Prime)						
16. Taking part in political discussion						

99. Other...

Q13. To what extent do you agree or disagree with the following statement. I use the Internet because...

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)	Don't have an Opinion (6)
1. It offers an entertaining way to pass the time						
2. It helps me to stay updated around the world and get valuable information regarding anything						
3. It enables me to maintain a connection with family and friends						

(Continued)

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)	Don't have an Opinion (6)
4. It helps me in my study or job						
5. It allows me to share my ideas and thoughts with friends						
6. It allows me to share my ideas and thoughts with unknown people						

Q14. To what extent do you agree or disagree with the following statement. I use the Internet because...

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)	Don't have an Opinion (6)
1. My family and friends encourage me to use technologies such as the Internet and mobile phones						
2. I feel that people pressure me to be always connected.						

(Continued)

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)	Don't have an Opinion (6)
3. What I upload online about myself (posts, pictures, events) will impact my future opportunities						
4. If I do not keep up with the development of technologies, I feel left behind						
5. Knowing how to use technologies is beneficial in my everyday activities						

Q15. Please indicate how accurate the following statements are when thinking about how you use the Internet

	Not at All True of Me (1)	Not Very True of Me (2)	Neither True nor Untrue of Me (3)	Mostly True of Me (4)	Very True of Me (5)	I Don't Know and/or Not Applicable (9)
1. I am confident in browsing, searching and filtering data, information and digital content						

(Continued)

	Not at All True of Me (1)	Not Very True of Me (2)	Neither True nor Untrue of Me (3)	Mostly True of Me (4)	Very True of Me (5)	I Don't Know and/or Not Applicable (9)
2. I regularly use cloud information storage services or external hard drives to save or store files or content						
3. I regularly verify the sources of the information I find						
4. I actively use a wide range of communication tools (e-mail, chat, SMS, instant messaging, blogs, micro-blogs, social networks) for online communication						
5. I know when and which information I should and should not share online						

(Continued)

	Not at All True of Me (1)	Not Very True of Me (2)	Neither True nor Untrue of Me (3)	Mostly True of Me (4)	Very True of Me (5)	I Don't Know and/or Not Applicable (9)
6. I actively participate in online spaces and use several online services (e.g. public services, e-banking, online shopping, etc.)						
7. I have developed strategies to address cyberbullying and to identify inappropriate behaviours						
8. I can produce complex digital content in different formats (e.g. images, audio files, text, tables)						
9. I can apply advanced formatting functions of different tools (e.g. mail merge, merging documents of different formats) to the content I or others have produced						

Q16. Please indicate how accurate the following statements are when thinking about how you use the Internet

	Not at All True of Me (1)	Not Very True of Me (2)	Neither True nor Untrue of Me (3)	Mostly True of Me (4)	Very True of Me (5)	I Don't Know and/or Not Applicable (9)
1. I respect copyright and licence rules, and I know how to apply them to digital information and content						
2. I am able to apply advanced settings to some software and programs						
3. I periodically check my privacy setting and update my security programs (e.g. antivirus, firewall) on the device(s) that I use to access the Internet						
4. I use different passwords to access equipment, devices and digital services						

(Continued)

	Not at All True of Me (1)	Not Very True of Me (2)	Neither True nor Untrue of Me (3)	Mostly True of Me (4)	Very True of Me (5)	I Don't Know and/or Not Applicable (9)
5. I am able to select safe and suitable digital media, which are efficient and cost-effective in comparison to others						
6. I am able to solve a technical problem or decide what to do when technology does not work						
7. I can use digital technologies (devices, applications, software or services) to solve (non-technical) problems						
8. I am able to use varied media to express myself creatively (text, images, audio and video)						
9. I frequently update my knowledge on the availability of digital tools						

Q17. What is your annual household income after taxes?
(Change here as you wish)

Total income for you/spouse/significant other

- (1) Under £10k
- (2) £10–25k
- (3) £25–50k
- (4) £50–100
- (5) Over £100k

SECTION 3: YOUR ONLINE ACTIVITIES IN THE PAST
12 MONTHS. INTERNET HAS ENHANCED MY
CAPACITIES TO...

Q18. Thinking about your online activities in the past 12 months, how much do you agree or disagree with the following statements? Internet has improved my capacities to...

	Strongly Disagree	Disagree	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	Not Applicable (9)
1. Look for information about national government services						
2. Look for information about an MP, local councillor, political party or candidate						
3. Ask a representative of a public institution for advice on public services						

(Continued)

	Strongly Disagree	Disagree	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	Not Applicable (9)
4. Organise a claim and/or protest						
5. Launch or sign a petition						

Q19. Thinking about your online activities in the past 12 months, how much do you agree or disagree with the following statements? Internet has improved my capacities to...

	Strongly Disagree	Disagree	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	Not Applicable (9)
1. Sell something I own						
2. Expand my business activities						
3. Look for information on insurance policies						
4. Look for information on interest rates						
5. Look for a better job						
6. Find information on the price of a product or service						

(Continued)

	Strongly Disagree	Disagree	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	Not Applicable (9)
7. Compare different products or services						

Q20. Thinking about your online activities in the past 12 months, how much do you agree or disagree with the following statements? Internet has improved my capacities to...

	Strongly Disagree	Disagree	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	Not Applicable (9)
1. Find a course or course provider						
2. Interact with and understand other cultures						
3. Check others' opinions about a course or place to study						
4. Learn or practice a new language						
5. Read new books or articles						
6. Organise my holiday and/or travel						
7. Music						

Q21. Thinking about your online activities in the past 12 months, how much do you agree or disagree with the following statements? Internet has improved my capacities to...

	Strongly Disagree (1)	Disagree (2)	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	Not Applicable (9)
1. Keep in touch with family who live further away						
2. Keep in touch with friends who live further away						
3. Enlarge my network and meet new friends						
4. Look for information on clubs or societies						
5. Interact with people who share my personal interests and hobbies						
6. Comment about a societal issue						

Q22. Thinking about your online activities in the past 12 months, how much do you agree or disagree with the following statements? Internet has enhanced my capacities to...

	Strongly Disagree (1)	Disagree (2)	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)	I Do Not Understand What You Mean by That (6)
1. Improve and change my lifestyle						
2. Improve my fitness						
3. Ask others about a training program						
4. Improve my understanding about problems or issues that interest me						
5. Consult others' opinions on problems or issues that interest me						

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