CHAPTER 34

CITIZENSHIP AND TECHNOLOGY

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Introduction

Technological developments have complex, ambiguous, and sometimes contradictory effects of on the institutions, norms, and practices of citizenship. From the ages of the discovery of fire and the invention of the wheel to today's Internet and the Human Genome Project, technologies have incessantly shaped peoples' lives and nourished their hopes and fears. The development of information and communication technologies (ICT) and advances in biotechnologies, such as assisted reproduction technologies (ART)[1] and genetics, in the second half of the twentieth century have imbued public imagination with both utopian visions of technological self-enhancement and social progress as well as with dystopian scenarios of

[1] ART refers to technologies used to induce pregnancy through procedures such as in vitro fertilization, artificial insemination, and surrogacy.

self-destruction and totalitarian control. With regard to citizenship and politics, technologies promise to revitalize participation, increase political accountability, and reimagine membership and solidarity. While the jury is still out on the political benefits of recent technologies, there are important concerns about persistent inequalities, increased social control, and exacerbating exclusion and discrimination.

This chapter investigates the relationship between technology and citizenship by exploring the tensions between inclusion and emancipation, on the one hand, and exclusion and control, on the other hand. It discusses inclusionary and exclusionary aspects of developments in the areas of digital and biotechnologies in respect to access to legal status, political participation, and identity. It also examines the emancipatory potential of technologies at the level of citizenship practices and issues related to social and political control, which are triggered by increased and pervasive surveillance.

As both citizenship and technology cover vast conceptual and empirical grounds, this discussion remains inevitably limited and selective. The various social implications of technologies can be studied from a number of disciplinary perspectives. Sociologists and economists look at the implications of technologies on social structures and socio-economic inequalities (digital divide, technological unemployment, demographic impact); lawyers and legal scholars deal with challenges related to the regulation of technologies and citizenship status (data protection, regulation of artificial intelligence, statelessness as a consequence of ART); political scientists analyse the role of technologies on political competition and participation (political mobilization, electronic voting); anthropologists and social psychologists study the effects of technologies on social norms and identities (kinship, solidarity, perceptions of self), etc. While many of these aspects and perspectives can be linked to citizenship, in this chapter I work with a more restricted concept of citizenship, which focuses primarily on political aspects of membership such as legal status, political rights, and national identity.[2] How does technology shape citizenship's inner tension between inclusion and emancipation,[3] on the one hand, and exclusion and social closure,[4] on the other hand? Is technology conducive to more formal inclusion, better political participation, and more inclusive identities? Does technology reinforce exclusion, social control, and parochial nationalism? By looking into key aspects of the relationship between citizenship and technology, the chapter aims to raise a number of questions that are more broadly relevant across the sub-field of citizenship studies. The second section discusses implications of digital technologies on political participation, social surveillance, and state borders.

[2] Joseph H. Carens, *Culture, Citizenship and Community: A Contextual Exploration of Justice as Evenhandedness* (Oxford: Oxford University Press, 2000); Bauböck in this volume.

[3] Thomas H. Marshall, *Class, Citizenship and Social Development: Essays* (New York: Doubleday, 1965).

[4] Rogers W. Brubaker, *Citizenship and Nationhood in France and Germany* (Cambridge: Harvard University Press, 1992), p. 21.

The third section examines the impact of ART and genetic technologies on formal membership, immigration control, and national identity. A final section reflects on the main points discussed in the chapter and puts forward several ideas for future research in the area of citizenship and technology.

Digital citizenship

There are various ways in which digital technologies are expected to affect citizenship and political participation. On the one hand, digital technologies may increase participation, efficiency, safety, and comfort; on the other hand, they may exacerbate social inequalities, intensify social control, and discriminate between insiders and outsiders. Isin and Ruppert identify three key dimensions of 'digital citizenship': the political impact of citizens' access to Internet; the use of digital technologies by the government in order to inform and engage citizens; and the political mobilization of citizens through digital means.[5] This section discusses the opportunities for political participation offered by new digital technologies, as well as problems related to widespread surveillance within society and at the borders. Does technology enhance political participation? Is surveillance compatible with citizens' rights? Does technology reinforce social control and exclusion?

After initial enthusiasm in the early 1990s about the democratizing effect of the Internet, it soon became apparent that a new 'digital divide' was in the making, namely a divide between those who had access and benefited from Internet and those who did not.[6] At a closer look, this gap comprises of at least three divides. The first divide refers to access to information technologies. High Internet penetration rates in Western countries have diminished (but not eliminated) the gap in access to information. The second divide is about unequal levels of knowledge and skills that separate the interacting and the interacted[7] in the electronic sphere. Having access to information means little in the absence of comprehension skills. For example, it is estimated that 'the average government Web site … requires an eleventh-grade level of reading comprehension, even though about half of the U.S. population

[5] Engin Isin and Evelyn Ruppert, *Being Digital Citizens* (London: Rowman & Littlefield International, 2015).

[6] James McConnaughey, Timothy Sloan, and Cynthia Ann Nila, *Falling through the Net: A Survey of the 'Have Nots' in Rural and Urban America* (Washington: National Telecommunications and Information Administration, 1995).

[7] Manuel Castells, *The Rise of the Network Society: The Information Age: Economy, Society, and Culture,* volume 1 (Oxford: Blackwell Oxford, 1996).

reads at an eighth-grade level or lower.'[8] A third divide is a global one and parts the developed countries from the developing world. While the Internet is gradually reaching most parts of the world, sometimes by means of ingenious technological solutions such as Google's solar-powered balloons, there are still significant differences between developed and developing countries in terms of number of users and the quality of service (bandwidth).

It is argued that digital technologies enable citizens to gain access to public information and to participate in formal and informal political processes and arenas.[9] Many national and local governments have launched e-government initiatives in order to provide easy access to public information and services (e.g. access to public documents, use of electronic ID, filling taxes online). These tools are seen as modern solutions to increase administrative efficiency and enhance political accountability. Technology has also made it possible for citizens, journalists, or specialized organizations to gain access to and publicize classified government information.[10] Such unauthorized (illegal) ways of information sharing may be driven by the desire to enhance transparency and government accountability but they do so at the price of undercutting the work and credibility of law enforcement agencies.

Apart from access to information, digital technologies also allow citizens to engage politically via formal channels, such as electronic voting and public consultations, or informal channels, such as online forums and campaigns. With political participation and civic engagement continuously decreasing in most democracies, information technologies have been seen as having a potentially invigorating role. The evidence about the role of technologies in boosting political participation is, however, mixed. While some found that, in the US context, the Internet promotes voting, transfer of political knowledge, and deliberation,[11] others argued that the Internet weakens social connections, reduces social trust, and discourages civic engagement.[12] Evidence from Estonia—a country that champions e-citizenship—shows that political participation remains limited even when backed by a complex e-government infrastructure (e.g. digital ID cards for all citizens). While the percentage of electronic votes increased significantly since the introduction of electronic voting in 2015 (when under 2 per cent of the votes were cast electronically), it only amounted to about one third of the votes in the 2015 parliamentary elections.[13]

[8] Karen Mossberger, Caroline J. Tolbert, and Ramona S. McNeal, *Digital Citizenship: The Internet, Society, and Participation* (Cambridge: MIT Press, 2007), p. 14.

[9] Pippa Norris, *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide* (Cambridge: Cambridge University Press, 2001).

[10] In 2010 Wikileaks released about 400,000 leaked documents under the tag 'Iraq War Logs'.

[11] Norris (n 9).

[12] Robert Putnam, *Bowling Alone, the Collapse and Revival of Civic America* (New York: Simon and Schuster, 2000).

[13] Sandra Särav and Tanel Kerikmäe, 'E-Residency: A Cyberdream Embodied in a Digital Identity Card?', in Tanel Kerikmaë and Addi Rull, eds., *The Future of Law and eTechnologies* (Cham, New York: Springer, 2016): pp. 57–79, p. 58.

Estonia also introduced an e-residency card allowing interested foreigners to use the Estonian public electronic infrastructure without taking residence in the country. While the policy explicitly delinked e-residency from formal citizenship, the government justified the scheme by appealing to a normatively strong language commonly associated with citizenship, for example 'link with the country' and 'contribution'.[14] The Estonian e-residency makes for an over-inclusive form of transactional and non-territorial membership, which is at odds with conventional views on citizenship as participatory and territorial political membership.[15]

If in established democratic states digital technologies have at least the potential to enhance political participation, in less democratic states, these technologies can enable civic and political mobilization against political power. As Reagan quipped in June 1989, 'the Goliath of totalitarianism will be brought down by the David of the microchip'.[16] The widespread use of Internet and social media are believed to have played key roles in recent protests and revolutionary movements from the Arab spring to Moldova's twitter revolution. Virtual spaces provide activists and citizens with alternative means of communication and engagement that escape traditional forms of censorship and control. However, repressive governments have been quick to adopt new technologies in order to clamp down on freedom of expression and launch indoctrination campaigns. When not blocking the Internet altogether, governments have acquired sophisticated spyware technology to monitor citizens' online activities. The more diffuse nature of the Internet makes it a less malleable ideological tool for governments than the radio and television. Yet, the governmental control of access to Internet and technologically enhanced forms of censorship undermine significantly the capacity of digital technologies to mobilize citizens and challenge political power.

For from being only a characteristic of non-democratic countries, the spread of surveillance has become a fundamental feature of contemporary societies. While surveillance has been an element of modern societies ever since the eighteenth century,[17] it is only recently that it became a fundamental feature of everyday life.[18] The widespread use of Closed Circuit Television (CCTV) cameras is a harbinger of a contemporary regime of ubiquitous and undiscerning surveillance. For example, it is estimated that in London a person is caught by CCTV cameras up to 300 times

[14] Lehte Roots and Costica Dumbrava, 'E-Citizenship Opportunities in the Changing Technological Environment', in Tanel Kerikmaë and Addi Rull, eds., *The Future of Law and eTechnologies* (Cham, New York: Springer, 2016): pp. 45–56.

[15] Bauböck in this volume; Shachar in this volume; Spiroin this volume; Walker in this volume.

[16] 'Caught in the Net', *The Economist*, 23 January 2003, online http://www.economist.com/node/1534249.

[17] Kerstin Gooas, Michael Friedewald, William Webster, and Charles Leleux, 'The Co-Evolution of Surveillance Technology and Surveillance Practices', in D. Wright and R. Kreissl, eds., *Surveillance in Europe*, (Abingdon: Routledge, 2015): pp. 51–100.

[18] David Lyon, 'Everyday Surveillance: Personal Data and Social Classifications', *Information, Communication & Society* 5, no. 2 (2002): pp. 242–257.

a day on average.[19] The enhanced computing capacity has facilitated the replacement of the 'dossier society',[20] characterized by filling cabinets and limited analytical capacity, with the 'surveillance society',[21] which is defined by the networked database and powerful data mining capabilities. The 'new surveillance'[22] is to a great extent 'dataveillance'[23] because it relies heavily on sophisticated technologies of data collecting, sharing, and processing.[24]

The ubiquitous character of surveillance distinguishes today's 'networked society'[25] from the earlier model of 'disciplinary society',[26] where different governance techniques were employed in particular social institutions and sites (school, factory, prison) in order to discipline and construct 'docile' citizens. In contrast, the new 'societies of control'[27] are based on a 'dispersal of discipline'[28] and a generalization of social control. Whereas Foucault's Panopticon enclosed and disciplined 'abnormal' or deviant citizens, contemporary 'ban-opticon' regimes encircle 'normal' citizens and exclude the 'abnormal'.[29] Conventional moralizing accounts, such as Orwell's Big Brother metaphor, fail to capture the regime of contemporary surveillance because they focus on a clearly distinguishable, centralized and evil power that seeks to oppress individuals. Or, much of contemporary surveillance is not repressive but constitutive, meaning that it is 'the outcome of the complex ways in which we structure our political and economic relationship in societies that value mobility, speed, security and consumer freedom'.[30]

There are obvious advantages with using new surveillance technologies, as they permit 'new levels of efficiency, productivity, convenience, and comfort that many

[19] David Wright, Michael Friedewald, Serge Gutwirth, Marc Langheinrich, Emilio Mordini, Rocco Bellanova, Paul De Hert, Kush Wadhwa, and Didier Bigo, 'Sorting Out Smart Surveillance', *Computer Law & Security Review 26*, no. 4 (2010): pp. 343–354, p. 344.

[20] Greg Marquis, 'Private Security and Surveillance: from the "Dossier Society" to Database Networks', in David Lyon, ed., *Surveillance as Social Sorting: Privacy, Risk and Digital Discrimination* (New York, London: Routledge, 2003), pp. 226–248.

[21] David Lyon, *Surveillance Society: Monitoring Everyday Life* (Buckingham: Open University Press, 2001).

[22] Gary T. Marx, 'Ethics for the New Surveillance', *The Information Society 14*, no. 3 (1998): pp. 171–185.

[23] Roger Clarke, 'Information Technology and Dataveillance', *Communications of the ACM 31*, no. 5 (1988): pp. 498–512.

[24] These data technologies include image recognition, advanced biometrics (iris scan, DNA tests), geotracking, radio tagging, and neuroimaging.

[25] Castells (n 7).

[26] Michel Foucault, *Discipline and Punish: the Birth of the Prison* (New York: Random House, 1975).

[27] Gilles Deleuze, 'Postscript on the Societies of Control', *October 59* (Winter 1992): pp. 3–7.

[28] Clive Norris, 'From Personal to Digital: CCTV, the Panopticon, and the Technological Mediation of Suspicion and Social Control', in David Lyon, ed., *Surveillance as Social Sorting: Privacy, Risk and Digital Discrimination* (London, New York: Routledge, 2003), pp. 249–281.

[29] Didier Bigo, 'Globalized (in) Security: The Field and the Ban-Opticon', in *Illiberal Practices of Liberal Regimes: The (In) Security Games* (Paris: L'Harmattan, 2006), pp. 5–49.

[30] Lyon (n 18), p. 2.

in the technologically advanced societies take for granted'.[31] Digital surveillance allows for better law enforcement, more effective protection against crime, terrorism, fraud, etc. However, these technologies have negative consequences for individual freedom and social inclusion. Increased surveillance shrinks the space of individual freedom and renders individuals more vulnerable to interference and control. This is particularly visible in the widespread phenomenon of 'surveillance creep',[32] in which personal data are collected, transferred, and used for purposes different than those initially envisaged. For example, administrative data, medical records, banking transactions, and even shopping patterns are increasingly used for law enforcement and security purposes. In 2006 the UK introduced a national ID card to serve as an instrument for fighting fraud, combating terrorism, and controlling immigration. The card was eventually abandoned after criticism of 'being too expensive and an infringement of civil liberties'.[33] It is telling that initial efforts to develop biometric technologies were driven by eugenic objectives of identifying criminal types and races.[34] DNA data are used nowadays for an increasing number of purposes, including identification,[35] establishing family relationship, and immigration control.[36] For example, Kuwait announced recently that it would require DNA samples from all its citizens, as well as visitors and expatriates, in order to 'facilitate in solving crime and terrorism cases'.[37] As shown in the next section, DNA testing is routinely used in the context of migration policies in order to ascertain claims of preferential admission on grounds of family reunification.

Apart from limiting individual freedom, surveillance technologies can also reinforce 'social sorting'[38] when prejudices and social stereotypes are built into practices and techniques of surveillance. As a consequence, certain individuals and groups are singled out and excluded on the basis of institutionalized, technology-enabled prejudice. For example, research has shown that CCTV operators tend to focus on certain categories of people, such as the young, male, and ethnic minorities.[39] These

[31] Lyon (n 21), p. 18.

[32] Dorothy Nelkin and Lori Andrews, 'DNA Identification and Surveillance Creep', *Sociology of Health & Illness 21*, no. 5 (1999): pp. 689–706.

[33] 'Identity Cards Scheme will be Axed "Within 100 Days"', *BBC*, 27 May 2010, online http://news.bbc.co.uk/2/hi/8707355.stm.

[34] Mark Maguire, 'The Birth of Biometric Security', *Anthropology Today 25*, no. 2 (2009): pp. 9–14.

[35] Nelkin and Andrews (n 32).

[36] Janice D. Villiers, 'Brave New World: The Use and Potential Misuse of DNA Technology in Immigration Law', *Boston College Third World Law Journal World 30*, no. 2 (2010): pp. 239–271.

[37] Seung Lee, 'Kuwait Becomes First Country to Collect DNA Samples from all Citizens and Visitors: Report', *Newsweek*, 19 April 2016, online http://europe.newsweek.com/kuwait-becomes-first-country-world-collect-dna-samples-all-citizens-and-449830?rm=eu.

[38] David Lyon, *Surveillance as Social Sorting: Privacy, Risk, and Digital Discrimination* (New York, London: Routledge, 2003).

[39] Clive Norris and Gary Armstrong, *The Maximum Surveillance Society: The Rise of CCTV* (Oxford: Berg Publishers, 1999).

practices and algorithms generate biased categories of risk, which serve to justify the exclusion of individuals or groups from particular services or spaces.[40]

Mobility is one particular aspect of contemporary society that has both benefited of and suffered from technological development. The expansion of ICT and of cheap travel opportunities in the second half of the previous century has facilitated the unprecedented flow of people within and across international borders. Immigration has led to a partial delinking of citizenship status from territory by creating significant numbers of non-citizen residents, as well extra-territorial citizens. This phenomenon was accompanied by a partial dissociation of citizenship rights from formal status, as long-term immigrants in Western countries have come to enjoy a number of (post-national) rights[41] that were previously associated exclusively with citizenship. Apart from facilitating the physical movement of people across borders, ICT also made possible the creation of virtual transnational communities by enabling migrants to maintain connections with family and friends and to engage more broadly with their countries of origin. ICT also played an important role in various diaspora engagement strategies adopted by a growing number of states in order to keep contact with emigrants (e.g. official websites, on-line campaigns, electronic voting from abroad).

Mobility has become increasingly securitized as a consequence of a series of terrorist attacks in Europe and the US. Together with measures aiming at 'hardening' the borders in order to keep out uninvited immigrants—for example through increased capacity and the erection of physical walls—states have also moved towards 'smartening' the borders by resorting to information and surveillance technologies. A growing literature on borders focuses on how the technologization of borders and mobility has lead to a gradual 'debordering' of borders,[42] in the sense that borders have extended beyond their geopolitical locations and sprawled over 'a multiplicity of sites for the surveillance of movement'.[43] The new 'iborders'[44] are digital, automated, networked, and de-territorialized systems used to sort out good from bad mobility and to distinguish between wanted and unwanted people.

The capacity to identify and classify people is instrumental to the modern state, which has become concerned primarily with governing populations.[45] Authorities

[40] Mireille Hildebrandt and Serge Gutwirth, *Profiling the European Citizen* (Dordrecht: Springer, 2008).

[41] Yasemine N. Soysal, *Limits of Citizenship. Migrants and Postnational Membership in Europe* (Chicago: University of Chicago Press, 1994).

[42] Mathias Albert and Lothar Brock, 'Debordering the World of States: New Spaces in International Relations', *New Political Science 18*, no. 1 (1996): pp. 69–106, doi: 10.1080/07393149608429765.

[43] Louise Amoore, Stephen Marmura, and Mark B. Salter, 'Smart Borders and Mobilities: Spaces, Zones, Enclosures', *Surveillance & Society 5*, no. 2 (2002): pp. 96–101, p. 99; Ayelet Shachar, 'The Shifting Border of Immigration Control', *Stanford Journal of Civil Rights & Civil Liberties 3*, no. 2 (2007): pp. 165–193.

[44] Holger Pötzsch, 'The Emergence of iBorder: Bordering Bodies, Networks, and Machines', *Environment and Planning D: Society and Space 33*, no. 1 (2015): pp. 101–118, doi: 10.1068/d14050p.

[45] Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France 1977-1978*, volume 4 (Basingstoke: Palgrave Macmillan, 2009).

need to be able to identify the person in order to determine whether he or she belongs to the state. The development of modern identification technologies, such as the passport, served to ensure that the state maintained the monopoly over 'legitimate means of movement'.[46] As technologies of identification became more complex and accurate, they expanded gradually from cataloguing static characteristics (physiognomy) to capturing behavioural patterns (mobility) and from reading superficial biometrics (fingerprints) to recording deeply rooted biological codes (DNA).

In the immigration context, the governance of mobility relies heavily on a digital infrastructure built through 'the collection, processing, storage and sharing of digital personal data for risk profiling'.[47] Digital data are amassed and analysed using data-matching and data-mining algorithms in order to construct digital personae or personal profiles for the purpose of identity checking and risk assessment. For example, smart IDs have been adopted in order to store and link personal data and to allow distinguishing between insiders and outsiders.[48] The collection and sharing of travellers' data is a widespread technique of border control and digital surveillance. The ongoing debate in the EU about the sharing of Passenger Name Records (PNR), i.e. personal data of flight passengers entering or leaving the EU, is indicative of the legal and political difficulties generated by digitalization of borders. For example, in 2006 the European Court of Justice annulled a time-limited agreement between the EU and the US for the provision of PNR. While the terrorist attacks in Paris and Brussels in 2015 and 2016 have given new impetus to reinforce PNR, disagreements persist about how to reconcile security imperatives with concerns about data protection and preventing abuse (what data, to whom, for what purposes).[49]

Smart technological solutions often rely on a selection of conventional, not-so-smart data (e.g. administrative records) and on human input that is susceptible to bias. Algorithms and risk profiles can be affected by 'discrimination by design',[50] in which particular groups of people, such as persons of certain national, ethnic, or racial origin, become the prominent targets of surveillance and control. This leads to a border regime in which the mobility of some is achieved with the price of the 'immobility and exclusion for others'.[51] Together with becoming more digital, borders are also being increasingly externalized and automatized. Immigration control

[46] John C. Torpey, *The Invention of the Passport: Surveillance, Citizenship, and the State* (Cambridge: Cambridge University Press, 2000).

[47] Quirine Eikjman, 'Digital Security Governance and Accountability in Europe: Ethical Dilemmas in Terrorism Risk Management', *Journal of Politics and Law 6*, no. 4 (2013): pp. 35–45, p. 35, doi: 10.5539/jpl.v6n4p35.

[48] David Lyon, 'The Border is Everywhere: ID Cards, Surveillance and the Other', in Elia Zureik and Mark Salter, eds., *Global Surveillance and Policing: Borders, Security, Identity* (Cullompton, Portland: Willan, 2005), pp. 66–82.

[49] Eikjman (n 47).

[50] Keith Guzik, 'Discrimination by Design: Predictive Data Mining as Security Practice in the United States' "War on Terrorism" ', *Surveillance & Society 7*, no. 1 (2009): pp. 3–20.

[51] Maguire (n 34), p. 14.

in Europe and the West has been gradually externalized by means of visas, extra-territorial immigration checks, and asylum processing.[52]

Apart from increased efficiency and analytical capacity, the resort to computing and automation in the context of immigration and border control is triggered by attempts to avoid thorny political and moral issues. For example, an EU official recently justified the proposal to use computers for determining the distribution of refugees across EU countries by arguing that the issue was 'too complex and required too many lengthy debates with national governments'.[53] The increased automation of decision-making in the immigration context tends to remove possibilities for political contestation and to silence more fundamental moral questions about the fairness of borders and admission.

Biological Citizenship

The concept of biological citizenship was developed in relation to the emergence of new forms of subjectivities and collective action among patient groups and people sharing particular medical conditions or biological traits.[54] This 'new kind of citizenship … in the age of biomedicine, biotechnology and genomics'[55] was seen as an emancipatory development that challenges bio-nationalist, eugenicist predispositions build into the model of national citizenship. Biological citizenship is also linked to a growing trend towards the democratization of biomedicine, as in the emergence of personalized medicine, such as self-tracking biomedical applications. Notwithstanding their emancipatory and democratizing effects, biotechnologies provide new tools and modes of 'surveillance, exclusion, and denial of citizenship rights on a "biological" basis'.[56] In this section I discuss the impact of key developments in the areas of ART and genetic technologies on citizenship, immigration, and national identity. In what ways do ART affect the institutions and norms of

[52] Ruben Zaiotti, ed., *Externalizing Migration Management: Europe, North America and the Spread of 'Remote Control Practices'* (New York: Routledge, 2016); Bernard Ryan and Valsamis Mitsilegas, eds., *Extraterritorial Immigration Control: Legal Challenges* (Boston, Leiden: Martinus Hijhoff, 2010).

[53] Nikolaj Nielsen, 'Computer to Make EU Asylum Decisions', *Euobserver*, 4 May 2017, online https://euobserver.com/migration/133341.

[54] Adriana Petryna, *Life Exposed: Biological Citizens After Chernobyl* (Princeton: Princeton University Press, 2002).

[55] Nikolas Rose and Carlos Novas, 'Biological Citizenship', in A. Ong and S. J. Collier, eds., *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems* (Oxford: John Wiley & Sons, 2008): pp. 439–463, p. 439.

[56] Ilpo Helén, 'Biological Citizenship across the Borders: Politics of DNA Profiling for Family Reunification', *Distinktion: Scandinavian Journal of Social Theory 15*, no. 3 (2014): pp. 343–360, p. 344.

citizenship? What problems arise from using DNA testing for the purpose of immigration control? How does the increased geneticization of social life shape narratives about national identity?

The rapid and global spread of ART generates problems related to children's access to citizenship and raises questions about normative models of (birthright) citizenship. A multi-million global market for ART—involving 'the movements of assisted reproduction professionals, egg and sperm donors and surrogates'[57]—has developed partly as a consequence of uneven regulation of ART among countries. Many children born through cross-border surrogacy are under the risk of becoming parentless and stateless.[58] This is because people seeking assisted reproduction care abroad, often in order to avoid legal restrictions in their own countries, face difficulties in securing the recognition of paternity and citizenship for their children. The problem of statelessness arises when a child born to a surrogate mother cannot acquire the citizenship of the intended parents, such as in cases when the law follows strictly the principle *mater semper certa est,* according to which the woman who gives birth is always the mother. If the country where surrogacy arrangements take place does not grant *jus soli* citizenship (in virtue of birth in the territory) and does not recognize the surrogate mother as the legal mother, as it enforces surrogacy contracts that recognize only the intended mother as the legal mother, the resulting child falls in between citizenship regimes and becomes stateless. [59]

Beyond the issue of inadequate regulation and coordination of ART policies, citizenship debates in the context of ART are also a result of diverse and conflicting politics of reproduction. All human societies seek to ensure continuity over generations through establishing norms on the physical and normative reproduction of membership. In modern times citizenship regulations play a key role in ensuring the intergenerational continuity of the national community. They do so by relying heavily on birthright entitlements; most children nowadays acquire citizenship through descent from citizens (*jus sanguinis*) or due to birth in the territory (*jus soli*).[60] The recent development of ART challenges these two mechanisms of birthright citizenship because it (partly) alienates individual reproduction from the conventional models of heterosexual family and territorial citizenship.

[57] Zeynep B. Gürtin and Marcia C. Inhorn, 'Introduction: Travelling for Conception and the Global Assisted Reproduction Market', *Reproductive Biomedicine Online* 23, no. 5 (2011): pp. 535–537, p. 535, doi: 10.1016/j.rbmo.2011.08.001.

[58] E.g. 'Australian Couple Abandon Surrogate Down's Syndrome Baby', *BBC News*, 2 August 2014, online http://www.bbc.com/news/world-asia-28617912.

[59] Costica Dumbrava and Rainer Bauböck, eds., 'Bloodlines and Belonging: Time to Abandon Ius Sanguinis?', EUI Working Paper no. 80 (Florence: RSCAS, 2015), online http://cadmus.eui.eu/bitstream/handle/1814/37578/RSCAS_2015_80.pdf;sequence=1.

[60] Ayelet Shachar, *The Birthright Lottery: Citizenship and Global Inequality* (Cambridge: Harvard University Press, 2009); Maarten P. Vink and Gerard-René De Groot, 'Birthright Citizenship: Trends and Regulations in Europe', EUDO Citizenship Comparative Report (Florence: European University Institute, 2010), online http://eudo-citizenship.eu/docs/birthright_comparativepaper.pdf.

While ART open new avenues for forging and imagining social relations, they also contribute to the reassertion of conventional and essentialist ideas about gender relations, genetic relatedness, and ethnic descent. By delinking reproduction from the conventional family, ART challenge the traditional societal model based on 'the heterosexual, co-resident nuclear family unit'.[61] However, ART also reinforce traditional biological conceptions of the family since 'the very existence of IVF pays testament to people's desire to have their "own" children'. [62] Legal procedures for the recognition of family relationship and citizenship for children born through ART often explicitly require proof of biological relationship (DNA tests). For example, children born through ART abroad can acquire Canadian derivative citizenship only if they are genetically related to Canadian parents.[63]

Contemporary legal and political controversies about ART should be viewed in the light of current family and fertility 'crises' in the West generated by high levels of divorce, separation, cohabitation, and persistent low fertility rates.[64] Feminist research has shown how gendered ideologies about the nation shape discourses and policies on family, reproduction, and citizenship.[65] In the past states have used various positive and negative reproduction policies in order to promote 'stratified reproduction',[66] i.e. to encourage the reproduction of certain groups of the population while discouraging others (e.g. immigrants, ethnic, racial, or sexual minorities). The selective access to ART and to the recognition of legal parenthood in the context of ART raises concerns about (assisted) stratified reproduction. Countries such as France and Germany restrict access to ART to heterosexual couples only. As a recent case in the UK shows, even when access to ART is not restricted to heterosexual couples, single parents still cannot apply for parental orders in order to establish parental relationship with 'their' surrogate-born children.[67] In certain cases the

[61] Beatrice Halsaa, Sasha Roseneil, and Sevil Sümer, *FEMCIT—Gendered Citizenship in Multicultural Europe: The Impact of Contemporary Women's Movements—Final Report* (University of Oslo, Birkbeck University and University of Bergen, 2011), p. 56, online http://wpms.computing.uni.no/femcit/wp-content/uploads/sites/16/2015/11/WP7_WorkingpaperNo5.pdf.

[62] Tabitha Freeman and Martin Richards, 'DNA Testing and Kinship: Paternity, Genealogy and the Search for the "Truth" of Our Genetic Origins', in Fatemeh Ebtehaj, Bridget Lindley, and Martin Richards, eds., *Kinship Matters* (Oxford: Hart, 2006), pp. 67–95, p. 82.

[63] Lois Harder, 'Does Sperm Have a Flag? On Biological Relationship and National Membership', *Canadian Journal of Law and Society 30*, no. 1 (2015): pp. 109–125.

[64] Jay Winter and Michael Teitelbaum, *The Global Spread of Fertility Decline: Population, Fear, and Uncertainty* (New Haven, London: Yale University Press, 2013).

[65] Nira Yuval-Davis, *Gender and Nation* (Cambridge: Cambridge University Press, 1997); Sasha Roseneil, Isabel Crowhurst, Ana Cristina Santos, and Mariya Stoilova, 'Reproduction and Citizenship/Reproducing Citizens: Editorial Introduction', *Citizenship Studies 17*, no. 8 (2013): pp. 901–911; Volpp in this volume.

[66] Faye Ginsburg and Rayna Rapp, *Conceiving the New World Order: The Global Politics of Reproduction* (Berkeley: University of California Press, 1995).

[67] Antony Blackburn-Starza, 'Single Father Wins Surrogacy Human Rights Ruling', *Bionews 852*, 23 May 2016, online http://www.bionews.org.uk/page_651129.asp.

rules of legal parenthood apply differently to men and women. For example, in Norway a man can claim legal parenthood and transfer citizenship to a surrogate-born child if the two are not genetically related, but this possibility is not available to women who, although genetically related to the child, have not given birth to the child.[68] Differentiated access to reproduction also occurs when states leave ART to the markets. As long as ART procedures remain costly and not covered by basic insurance packages, the beneficiaries are most likely to be the middle to upper classes, despite the fact that infertility affects more drastically persons belonging to less well-off minorities.[69]

The development of ART provides an additional layer to the nexus between reproduction and national identity. Interestingly, nationalist responses to ART can go in diametrically opposed directions. For example, in predominantly Catholic countries such as Ireland and Poland, ART are predominantly seen as a threat for the nation. In Poland, the Catholic Church staunchly opposes in vitro fertility (IVF) procedures, which it regards as a form of 'sophisticated abortion'.[70] At the other extreme, ART can be regarded as opportunities for demographic and ethno-national revival. In Romania and Bulgaria the governments defended public IVF programmes putting forward claims about the significant contribution of ART to the demographic revival of the countries.[71] In the Bulgarian context, the debate included explicit eugenic arguments as it was suggested to use ART in order to 'counteract the outnumbering of Bulgarians by the minorities' and to 'give Bulgaria back to the Bulgarians'.[72] The development of such version of in vitro nationalism is indicative of a resilient and versatile nationalist ideology in the context of disruptive socio-demographic and technological changes.

The genetic revolution triggered by the discovery of deoxyribonucleic acid (DNA) and bolstered by the recent mapping of all human genes (the Human Genome Project) has raised hopes about treating diseases, improving life, and even defeating death. However, the rapid development of genetic technologies also prompted concerns about the 'geneticization' of social life,[73] as human behaviour and social

[68] Kristine S. Knaplund, 'Baby Without a Country: Determining Citizenship for Assisted Reproduction Children Born Overseas', *Denver University Law Review 91*, no. 2 (2013): pp. 335–367.

[69] Marcia C. Inhorn, Rosario Ceballo, and Robert Nachtigall, 'Marginalized, Invisible, and Unwanted: American Minority Struggles with Infertility and Assisted Conception', in Lorraine Culley, Nicky Hudson, and Floor van Rooij, eds., *Marginalized Reproduction: Ethnicity, Infertility and Reproductive Technologies* (London, Sterling: Earthscan, 2009), pp. 181–197.

[70] Elżbieta Korolczuk, *IVF as a Threat to the Nation: The Debate on Assisted Reproduction in Contemporary Poland* (Berlin: Heinrich Boell Foundation Dossier on Overcoming Gender Backlash, 2013), p. 10.

[71] Costica Dumbrava, 'Reproducing the Nation: Reproduction, Citizenship and Ethno-Demographic Survival in Post-Communist Romania', *Journal of Ethnic and Migration Studies*, early view (2016), doi: 10.1080/1369183X.2016.1221335.

[72] Ina Dimitrova, *Populism and Pronatalism: The Assisted 'Rebirth' of the (Bulgarian) People* (2013) (unpublished manuscript, on file with author).

[73] Abby Lippman, 'Prenatal Genetic Testing and Screening: Constructing Needs and Reinforcing Inequities', *American Journal of Law & Medicine 17*, no. 1–2 (1991): pp. 15–50; Kaja Finkler, *Experiencing*

interactions are increasingly viewed through the lens of genetics. The worry is that population genomics studies will contribute to legitimizing and 'naturalizing' inequality and to the designation of new vulnerable groups based on arbitrary patterns and statistical correlations.[74]

While genetic technologies may allow for new ways of imagining identities and social relations (e.g. rediscovering and reinterpreting one's origin), they also tend to reiterate essentialist views about genetic relatedness, race, and nation. The commercial success of personal DNA testing kits indicates a renewed interest in linking personal identity with genetic 'truths'. The use of these tests has expanded across different areas to include paternity checks, immigration control, and ancestry search. While promising to provide accurate measures of biological relatedness, these instruments acquire a truth revealing function that may collide with established legal and cultural norms about social relatedness (e.g. family, paternity, race, and ethnicity).

States have begun to use DNA tests to check family relationships for the purpose of immigration control. With family reunification becoming the primary legal channel of immigration in the West, efforts to restrict immigration have focused on combating fraud and detecting 'fake' family ties (including marriages of convenience). Parental DNA testing in the immigration context has become a standard procedure in many countries.[75] Although these measures have been justified within a human rights frame, for example providing claimants with reliable proofs, combating child trafficking, they are often driven by and reinforce a 'rationale of suspicion'.[76]

There are a number of problems with using DNA tests for immigration purposes. DNA tests tend to reinforce a narrow biological concept of the family, which is often at odds with family norms prevalent in the immigrant's country of origin and even in the country of immigration. Social ties, as opposed to biological ones, form the basis of family institutions in many cultures.[77] Moreover, while many countries of immigration recognize family relationships regardless of the genetic connection between parents and children, testing such connection in the context of immigration establishes a double standard applied to native citizens and immigrants.[78] There

the New Genetics: Kinship and Family on the Medical Frontier (Philadelphia: University of Pennsylvania Press, 2000).

[74] Herman T. Tavani, 'Genomic Research and Data-Mining Technology: Implications for Personal Privacy and Informed Consent', *Ethics and Information Technology* 6, no. 1 (2004): pp. 15–28.

[75] Torsten Heinemann and Thomas Lemke, 'Suspect Families: DNA Kinship Testing in German Immigration Policy', *Sociology 47*, no. 4 (2013): pp. 810–826.

[76] Villiers (n 36). [77] Helén (n 56).

[78] Tera Rica Murdock, 'Whose Child is This: Genetic Analysis and Family Reunification Immigration in France', *Vanderbilt Journal of Transnational Law 41* 2008): pp. 1503–1534.

are also concerns that current DNA testing procedures violate the applicants' informational privacy and self-determination.[79]

By putting emphasis on genetic and biological ties DNA tests lead to a 'geneticization of the family'.[80] It is true that certain genetic applications, such as personal DNA-based ancestry tests,[81] may provide resources for enriching and diversifying personal identities.[82] DNA.ancestry.com, for example, invites potential clients to 'uncover [their] ethnic mix, discover distant relatives, and find new details about [their] unique family history'. However, such identity-making exercises often reinforce ethno-racial classifications and stereotypes that are built into these applications.

At the collective level, genetic science becomes instrumental for (re) constructing the nation as an 'imagined genetic community'.[83] Weaving genetic evidence into narratives of group distinctiveness contributes to a biologization and essentialization of national, ethnic, and racial identities.[84] References to genetic 'truths' lend support to claims of ethnic or racial distinctiveness, similarity or continuity. This leads to a return of racial and biological determinism, which is embodied in the belief that 'race is anchored in a person's genes and, thus, racial inequality is largely the result of biological predispositions'.[85] In Mexico the state invested considerable efforts and resources in order to identify the 'indigenous DNA', which could be moulded into the official narratives of Mexican national identity.[86] Israel has attempted to use genetic tests to determine the 'Jewishness' of certain groups of people claiming Jewish heritage.[87] In the UK the media warned against a 'Viking Baby Invasion' caused by the widespread use of sperm from Danish donors in British ART procedures.[88] While 'blood' has long been a marker and symbol of nation belonging (e.g.

[79] Martin G. Weiss, 'Strange DNA: The Rise of DNA Analysis for Family Reunification and its Ethical Implications', *Life Sciences Society and Policy 7*, no. 1 (2011): pp. 1–19, doi: 10.1186/1746-5354-7-1-1.

[80] Heinemann and Lemke (n 75), p. 811.

[81] One can order online lunch-box sized DNA laboratories, e.g. https://www.bento.bio.

[82] Catherine Nash, 'Genetic Kinship', *Cultural Studies 18*, no. 1 (2004): pp. 1–33.

[83] Bob Simpson, 'Imagined Genetic Communities: Ethnicity and Essentialism in the Twenty-First Century', *Anthropology Today 16*, no. 3 (2000): pp. 3–6, doi: 10.1111/1467-8322.00023.

[84] David Skinner, 'Racialized Futures Biologism and the Changing Politics of Identity', *Social Studies of Science 36*, no. 3 (2006): pp. 459–488, p. 462.

[85] Carson W. Byrd and Matthew W. Hughey, 'Biological Determinism and Racial Essentialism: The Ideological Double Helix of Racial Inequality', *The Annals of the American Academy of Political and Social Science 661*, no. 1 (2015): pp. 8–22, p. 10, doi: 10.1177/0002716215591476.

[86] Ernesto Schwartz-Marín and Irma Silva-Zolezzi, '"The Map of the Mexican's Genome": Overlapping National Identity, and Population Genomics', *Identity in the Information Society 3*, no. 3 (2010): pp. 489–514.

[87] Ian V. McGonigle and Lauren W. Herman, 'Genetic Citizenship: DNA Testing and the Israeli Law of Return', *Journal of Law and the Biosciences,* early view (2015), doi: 10.1093/jlb/lsv027.

[88] An article in the newsletter *Glasgow Herald* suggested that the origins of the sperm didn't matter as long as it came from a nation that could play football (Simpson (n 83), p. 4).

jus sanguinis), the wide appeal of the gene may soon replace the blood as the true repository of identity.[89]

These new 'ideologies of genetic inheritance'[90] are, nevertheless, contested and flexible. Genetic evidence can be 'mobilised or ignored depending on the particular political and social objectives'.[91] For example, despite evidence that Lemba Bantu tribesmen from Southern Africa overwhelmingly shared the Cohen haplotype, which is believed to link back to the first Jewish priest, Israeli authorities have been reluctant to acknowledge the Jewishness of the tribe.[92] Moreover, genetic evidence can also be used in order 'to repair and recast the past'[93] by supporting claims for redress, conciliation, and solidarity. Forensic DNA technology has been used by international criminal tribunals and in transitional justice processes in order to identify bodies and missing persons. For example, DNA technology was employed in order to identify children who were kidnapped by the military during the Argentinian dictatorship, thus enabling 'to reconstruct and reconnect multiple levels of social life: the individual, the familial, and the national'.[94] Apart from reinforcing surveillance, biological determinism, and visceral nationalism, biotechnologies can also serve to attest and vindicate personal identities and to support projects of collective reconciliation.

Conclusion

The development of digital and biotechnologies has the potential to reshape the institutions and norms of citizenship as political membership. Digital technologies offer new opportunities for individual and collective public engagement, political participation, and mobilization. However, they also provide governments and other actors with effective tools for tracking, policing, and excluding people. While a growing literature on surveillance has dealt with key citizenship issues, such as individual exclusion and social control, citizenship scholars have been slow to investigate

[89] Simpson (n 83). [90] Finkler (n 73).

[91] Barbara Prainsack, Yael Hashiloni-Dole, and Lock Margaret, 'Religion and Nationhood: Collective Identities and the New Genetics', in Paul Atkinson and Glasner Peter, eds., *The Handbook of Genetics and Society: Mapping the New Genomic Era* (New York: Routledge, 2009), pp. 404–421, p. 412.

[92] Ibid.

[93] Keith Wailoo, Alondra Nelson, and Catherine Lee, 'Intruduction: Genetic Claims and the Unsettled Past', in Keith Wailoo, Alondra Nelson, and Catherine Lee, eds., *Genetics and the Unsettled Past: The Collision of DNA, Race, and History* (New Jersey: Rutgers University Press, 2012), p. 8.

[94] Adams L. Smith, 'Identifying Democracy Citizenship, DNA, and Identity in Postdictatorship Argentina', *Science, Technology & Human Values* (2016): pp. 1–16, p.4, doi: 0162243916658708.

the implication of increased digitalization of social and political life on citizenship. While widespread surveillance has a negative impact on individual freedom and social inclusion, it also triggers various forms of everyday resistance.[95] From the perspective of citizenship as practice, digital technologies offer new opportunities for 'acts of citizenship', as they enable individuals to advance various 'digital rights claims'.[96] Thus the tensions between citizenship and technology are not inherent but rather derived from the circumstances in which technologies are adopted, the ways in which they are used, and the ongoing political struggles over citizenship. Further research will need to do more in order to make sense of the various aspects of digital citizenship that include both citizen resistance to oppressive surveillance and the appropriation of technologies for the purpose of political action.

The success of assisted reproduction technologies and genetics has stretched the boundaries of human possibilities and rekindled ideas about scientific progress and the continuous improvement of the human condition. However, with the spectre of eugenics still looming in the background, biotechnological advancements have been easily hijacked to serve exclusionary institutions and ideologies. Conflicting politics of national reproduction leading to different approaches to ART have generated problems with regard to access to citizenship. Ideologies of ethnic, racial, and national distinctiveness have benefited from the new language of genetics by moving the boundaries of group identity further into the body. This geneticization of national identity challenges the thesis of the gradual de-ethnicization of citizenship in the West.[97] More needs to be said about the transformation of citizenship and national identity in the genetic era. The widespread use of DNA testing in the context of immigration and citizenship seems to suggest a concern with preserving the genetic boundaries of the nation. However, as in the case of digital technologies, biotechnological devices and vocabularies also serve to create and recover personal identities and to build inclusive societies.

From citizenship's perspective technology is both a blessing and a curse. The increasing complexity of contemporary societies makes technological innovations both inevitable and unpredictable. Uncertainties about our technological future only aggravate worries about the future of citizenship in a global yet local, mobile yet static, virtual yet material world. While technological solutions can provide the necessary infrastructure for reorganizing citizenship and membership, they cannot answer to normative question about what kind of boundaries of political membership are suitable for increasingly complex and mobile contemporary societies.

[95] Gary T. Marx, 'A Tack in the Shoe: Neutralizing and Resisting the New Surveillance', *Journal of Social Issues* 59, no. 2 (2003): pp. 369–390.

[96] Isin and Ruppert (n 5).

[97] Christian Joppke, *Selecting by Origin: Ethnic Migration in the Liberal State* (Cambridge: Harvard University Press, 2005).

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