

Global Trends to 2030: Identities and Biases in the Digital Age

2018

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The scenarios included in these ESPAS Ideas Papers are hypothetical situations aiming to provoke discussions about possible futures, and are by no means prescriptive.

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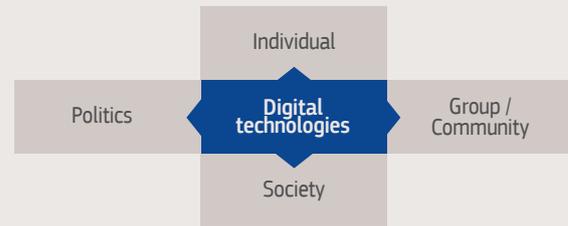
Introduction

Digital technologies have opened up ways of discovering the world, creating an unprecedented access to knowledge and information. Fostering vast communication and connection opportunities, they came with the promise of furthering free and open democratic deliberation. And they have initially delivered: facilitating freedom of expression, enabling easier and faster access to information and greater transparency, boosting media diversity, and creating broader opportunities for civic engagement and political participation. Social media in particular now allow for unparalleled connectivity of a truly interactive nature. They help people stay in touch with friends and family, and find people who share the same passions, interests or beliefs across borders, facilitating new groups and communities of interest to form and grow.

There is nevertheless growing concern that digital technologies may be impacting in unforeseen ways on human behaviour and social interactions: from how we work, study and play, to the social and emotional relations we form, who or what we trust, how we see or present ourselves, or even how we raise our children. Digitisation and its associated technologies are affecting all aspects of social, cultural and civic life, and they are impacting politics and governance (Figure 1) – often boosting identity politics, amplifying biases and intensifying existing cleavages in public attitudes to the detriment of democracies and societal cohesion. There is indeed increasing evidence that digital and especially social media may be used to shape and even sway opinions, and that these tools are being skilfully appropriated by actors with vested interests, extremist views, to promote divisive narratives, to intentionally misinform, to recruit and radicalise online, or simply to make profit with little regard for the consequences. Although there are regional and demographic differences in the relative penetration and accessibility of different digital technologies, **the societal impacts of digital transformation are a global phenomenon.**¹ The direction of these human, societal and political transformations underway is not pre-determined. **The ways in which digital technologies are used and the effect they have on our personal identities, our societies and politics can be shaped by public policies and the everyday choices we make.**

Against this backdrop, this ESPAS Ideas paper aims to highlight trends that merit further understanding. It zooms in to the intersection between identity, bias and digital technologies – and social media in particular. The following questions are put forward for discussion:

Figure 1: Technology's impacts on identity



Source: European Political Strategy Centre

- How are digital technologies and the internet affecting our societal 'glue'?
- In what ways do digital technologies enhance or undermine freedom of speech?
- Digital technologies can be used to both empower and control; how will they affect human behaviour both online and off?
- If digital technologies can be used by actors with specific vested interests to influence the behaviour of citizens in representative democracies, what policy responses need to be developed?
- Are our institutions fit for emerging digital societies?
- What implications do digital societies have for the EU project?

PART 1. KEY TRENDS

TREND 1. A proliferation of identities

- **The birth of the online identity:** Identity enables individuals or groups to organise information about themselves, as well as understand and respond to the world around them. As social interactions have become intertwined with information technologies and social networking sites/apps that people use, online activities are no longer separable from their real lives, but an integral part of them. Beyond mere communication tools, digitisation and its associated technologies provide **context and content** to people's individual and group identities and have expanded the opportunities for socialisation and identity development and creation on a global scale.²
- More people around the world are going online (Figure 2), and more time is spent online (Figure 3), and the internet is increasingly used for a wide range of social activities.

- The **intense frequency** with which people actively engage with their smart phones or connected devices throughout the day and night to check email and social media (Figure 4), creates constant exposure to wide public approval or judgment and instantaneous feedback loop that affects how individuals present and define themselves to others.
- **Core self and 'performed' self:** While in the early days of the internet, online behaviours did not reveal much about people's real-world personas, at present, social media accounts have become a means of self-expression and broadcasting of opinions, thoughts and emotions. They simultaneously both **blur** the lines between the private and the public (with implications for our understanding of privacy), and **sharpen** them through the shelter of anonymity and avatars.
- The **augmented world and exoselves:** the constant connectivity offered by digital technologies and social networks; the fact that location services make everything findable; and the capacity to store, monitor and broadcast every aspect of one's everyday life are providing new dimensions to 'never being alone, lost or forgotten'. The resulting extended memory of these developments is likely to have significant effects on personal identity: parts of identity will reside in a persistent 'exoself' of information and software, while life recording or 'life-logging' together with social networking will likely push the limits of privacy and privacy protection into new directions.³
- While until recently having a **legal identity** was considered essential for the functioning of modern societies, increasingly, it is **online identities that enable access to fundamental resources and are becoming prerequisites to access critical services and participate in modern economic, social and political systems.** Those without access to digital technologies risk becoming excluded from these services and systems and increasingly marginalised.
- **Finally, identity is no longer just a human affair:** the digital identity of devices is critical in conducting transactions in a secure and trusted network where each entity can be identified and authenticated, especially as devices will be able to transact relatively independent of humans with the development of AI and new technologies.⁴

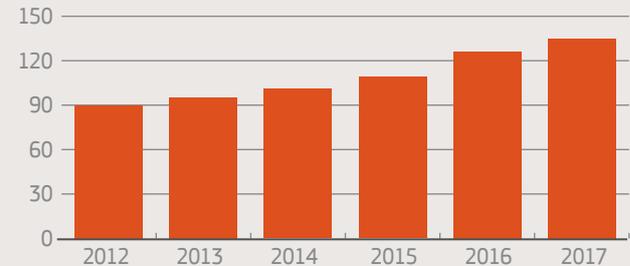
Figure 2: Recent, present and projected number of social media users worldwide
in billions



Source: Statista, 2018

Figure 3: 135 minutes a day on social media

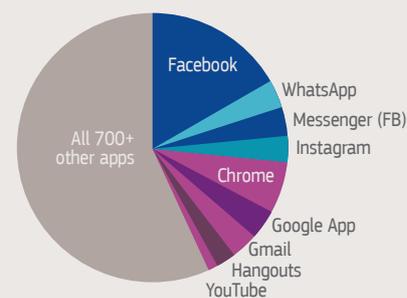
Daily time spent on social networking by internet users worldwide, 2012-2017



Source: Statista, 2018

Figure 4: Phone obsessed

Share of app touches on phones



Heavy user

5,427

average daily touches

225

average daily minutes

Average user

2,617

average daily touches

145

average daily minutes

Round the clock phone usage : Average vs. heavy user



Source: Winnick and Zolna, 2017

TREND 2. A 'cogni-tech' revolution

- Exposure to unreal and hyper-stylised virtual experiences and the **overload in terms of the sheer quantity of information, as well as the constant streaming of data** are a tough match for people's cognitive ability to tap into this information, digest the available knowledge, and reflect on it.
- Amid this complex digital environment, the public's ability to parse through factual statements and opinions varies greatly (Figure 5), with a majority unable to differentiate between opinion and fact.
- Moreover, the **effects of networking technology on human development include can range from** changes in attention spans affecting learning, to changes in risk-taking behaviour; altered personality development (e.g. narcissism, conduct disorder); changed views of nurturing and authority roles; likelihood of exhibiting lack of self-control under stress, etc.
- Impact on psychological and social identities:** As the intermeshing of the 'virtual' with the 'real' become part of everyday life and even contemporary culture, research has been increasingly prodding into the **effects of technology on cognitive development, learning and interpersonal skills development.** The impacts – both positive and negative – on identity formation and social interactions are thought to be particularly important among children and adolescents as they go through critical development and self-exploration stages.⁵
- Furthermore, current research is indicating that the tendency to rely on the internet rather than one's own memory as an aide-mémoire, increases after each use, a phenomenon described as '**cognitive off-loading**'. Given the importance of **memory** in defining personal (for example childhood memories) and creating communal identities (for example references to the common history of a specific group of people), the ways in which technology use will impact memory construction will be significant for identity formation, representation and verification processes.⁶

Figure 5: Differentiating between fact and opinion is more complex than ever

% of U.S. adults who correctly classified...

		All 5 factual statements	All 5 opinion statements
	All adults	26%	35%
Political awareness	High political awareness	36%	44%
	Low	17%	29%
Digital savviness	Very digitally savvy	35%	44%
	Not savvy	13%	21%
News trust	A lot of trust in news media	39%	43%
	Not much/no trust	18%	30%
News interest	Very interested in news	32%	36%
	Not interested	24%	39%

Source: Pew Research Centre, Survey conducted Feb. 22-March 4, 2018

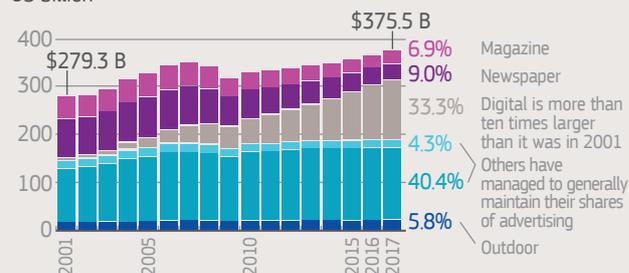
TREND 3. Paradigm shift in the way information is produced, distributed and consumed

- Internet penetration, the open-source economy and the proliferation of search algorithms have completely overhauled **the way data, information, science, and opinions are assessed, evaluated, trusted and scrutinised.**
- The use of the internet has created a **paradox.** It has facilitated the **diversification** of the media environment, permitting individuals to access novel information that they would otherwise not be easily exposed to through offline interactions.⁷ Indeed, people have tapped into this wealth of choice and use multiple media to access and even cross-check news and political information. At the same time, it has led to extreme **concentration** suggesting that 'more' might sometimes be 'less'. Information abundance provides individuals with an unprecedented number of options, **shifting the function of curating content from newsroom editorial boards to individuals, their social networks, as well as manual or algorithmic information sorting.** People's exposure to news and civic information that is **mediated through online social networks and personalisation has grown.**
- 68 percent of online news is accessed through the two main **news aggregation services** – Google and Facebook – against just 32 percent accessed directly via the original news publishers themselves.⁸ The algorithms these platforms use are shown to be influencing the news and opinions that users are exposed to. At the same time, their ability to scrape extensive data about the identities of their users' enables them to hyper-target their audiences with advertising – be it commercial or political.

Figure 6: Media shifts

Newspaper declines in print advertising are accelerating, shrinking their share of media spending.

Global ad spending, divided by media share, inflation-adjusted US billion



Source: Group M via The Wall Street Journal

Figure 7: Analog meets digital politics



Source: European Political Strategy Centre

- **This type of micro-targeting, combined with tailored news-feed algorithms, can create parallel universes, with users' perceptions of the real world becoming distorted through the lens of social media.** This is very far from the lens of the TV and the nation-wide '9 o'clock' news broadcasting programme of just a couple of decades ago, which offered a narrative that made the world look 'more or less the same' to everybody.
- Furthermore, while traditional publishers – including some tabloids – typically subject their authors to editorial **fact-checking and journalistic professional standards** – notably due to the rich legal framework that exists to protect **freedom of speech** while also **protecting people from libel, slander, defamation or hate speech** – similar rules and standards have so far not been applicable to online publishers and platforms. Combined with online economic models that give value to the highest number of clicks, this has enabled the mass sharing – and consumption – of selective, distorted, misleading or simply untrue information. In such a context, **diverse, but also extreme perspectives can far more easily enter mainstream political debate as there are fewer information 'gatekeepers'**.

PART 2. UNCERTAINTIES, RISKS and OPPORTUNITIES

1. Digital media - bias amplifiers and polarisation drivers?

- Political polarisation and an increasingly divisive debate in the public sphere have been intensifying in most representative democracies.⁹ And **there is increasing evidence that the internet and social media have become an amplifier of social trends and extreme biases that can have immediate impact on everyday culture and politics** (Figure 7).
- Media overall, and social media in particular have been identified as factors that have contributed to the left becoming 'more left', and the right 'more right' in politics as participants on both sides of the debate even **use different lexicons, hash tags and URLs**.
- The business models of social media sites are designed to maximise user engagement. **Cognitively, outrage (i.e. the emotion that moral norms have been violated) generates more engagement than simply liking or retweeting content** (Figure 8).¹⁰ This leads to algorithms prioritising content that generates strong emotional responses. The algorithms automatically identify the content that generates more reactions, then elevate it in the news feed and

Figure 8: The online moral outrage process



Source: Based on Chaudron, S. and Eichinger, 2018

prioritise the creation of similar content. The emotion of outrage tends to deepen polarisation by establishing the moral strength of an in-group and the incursion of an out-group.

- Moreover, given that individuals tend to consume news and political information in a patterned way, this leads to two general outcomes: The first is diversification and **taking advantage of the high-choice information environment that is available to access different sources, opinions and data.** The second leads to **homophily and reinforcement of pre-existing preferences.**¹¹ People turn to sites, people or sources that they already know and interact in 'safe spaces' (with people who think and act like us). This, together with the fact that online content is (algorithmically) curated to fit the user's preferences, interests and personality, has led to **speculation about the role of the internet – and of social media in particular – in enhancing existing biases through the creation of partisan 'echo**

Freedom of speech – enhanced or undermined?

Social media has reignited the debate on freedom of speech, testing its legal boundaries. Online spaces and the design and business models of social media sites have increasingly been identified as posing a serious danger to liberal democracies. The lack of rigour in journalistic standards and hands-off attitude of platforms, has led to a situation where in the name of **'freedom of speech'**, virtually anyone can say anything. Any kind of quality control was – at least initially – largely omitted or discounted in favour of clicks, shares and advertising revenue. The online space has been left open to people and organisations with an interest in using disinformation to spread extremist views and hate speech with a view to exacerbating existing biases and divides – often using anonymous or fake accounts, trolls, and bots.

chambers' (in which people are exposed only to information from like-minded individuals) and **'filter bubbles'** (in which content is selected by algorithms according to a viewer's previous behaviors).¹²

Following from this, exposure to limited attitude-challenging information is associated with the adoption of **more extreme attitudes over time and even misperception of facts about current events**, with 'serious risk that moral outrage in the digital age will deepen social divides'.¹³

- **People's anxieties relating to the rapid pace of change in the 'real', physical world are being exploited online** and enhanced by technologies underpinning social media sites and techniques developed by extremists, thereby feeding political polarisation and provoking shifts in behaviours, opinions and emotions that have the potential to determine elections and referenda.¹⁴

Cultural anxieties being targeted online

Threats to identity generally evoke strong reactions and sharply delineate the boundaries of an 'us' in-group by defining a 'them' out-group, which poses the threat¹⁵ – a process also referred to as 'othering'.¹⁶ While these processes have been a constant feature of individual and group identity formation throughout human history, they have taken on different dynamics through the internet and social media. Anonymity and the looser regulatory context that the internet has provided, has widened the available space for 'online othering' to develop, in the way in which content is posted, or material and opinions are shared.

Figure 9: Example of a pro-Leave message targeting specific audience on Facebook without identifying itself as a pro-Brexit campaign ad



Source: BBC News

2. Will AI entrench bias?

- Artificial Intelligence increasingly powers the technologies that have been rapidly becoming the **essential communicational, analytical, and even legal, infrastructure for our societies**. Algorithms are affecting more and more domains of our lives: the hiring process, employees' surveillance, online dating, shopping, communication between smartphone applications, and also what content users see on the internet and their social media newsfeed. Yet **these technologies often reflect the background and bias of the people who programmed them and reproduce bias inherent in the data they have been trained on**.
- **There have been many examples where artificial intelligence fed back to heighten human bias**. For instance, in October 2017, Israeli police arrested a Palestinian worker who had posted on Facebook a photo of himself by a bulldozer that appeared with the caption in Hebrew saying 'attack them'. As a matter of fact, his original post in Arabic said 'good morning' which is very similar to 'attack them' in this language, and Facebook's automatic translation algorithm chose the wrong interpretation. The Palestinian was interrogated for several hours before someone realised the mistake.¹⁷ In a similar vein, Google's sentiment analysis attaches a neutral value to words such as 'straight' but a negative value to 'homosexual', because it draws from the environment in which those words are placed, and it seems it is more likely that negative connotations are attached to minorities on online chats.¹⁸ Microsoft's Tay chatbox 'became' racist a few hours after its launch, because it *learned* to do so from interacting with other users on Twitter.¹⁹
- **Deliberative and proactive attention is called for particularly on the part of tech companies and programmers, given that AI, algorithms and big data hold the potential to seriously aggravate already existing power asymmetries and biases**, in effect challenging the very fundamentals of our societies that anti-discrimination regulatory frameworks and targeted public policies have been trying to address.

3. Digital technologies to empower or control?

- While digital identity offers major potential benefits, it also comes with new risks. Governments, businesses, and other institutions are already awakening to the **possibility of using new technologies and digital identity schemes to exploit, surveil and control, rather than empower**.²⁰
- Research suggests that, through mass collection of data and the exploitation of psychological processes to condition people, it might be possible to utilise social media to influence people's actions, not only their beliefs, sense of identity and belonging.²¹ This information, via **'big nudging'**, could be exploited to manipulate people to make choices that they would otherwise not make.²²
- In the case of authoritarian governments, they will be able to draw data from the multiplicity of devices someone interacts with during their daily life and combine it with information from tax returns, medical records, criminal records, health clinics, bank statements, genetic screenings, physical information (such as location, biometrics, and CCTV monitoring using facial recognition software), and feed this into a **'social credit system'**. The mere existence of this kind of **predictive control** and 'assessment system' could work as a **Panopticon effect**:²³ people will know that the omnipresent monitoring of their physical and digital activities will be used to predict undesired behaviour, even actions they are merely contemplating. In order to prevent the system from making negative predictions and negative social credit evaluations, people may begin to mimic specific behaviours.²⁴ This can result in unprecedented **capacity for social control – not only by forcing people to act in certain ways, but also by changing the way they think, their preferences, and thereby also affect their identities**.
- **Finding the appropriate regulation and social norms for a nearly totally identifiable society will be a major process between now and 2030.**

PART 3. IMPACT ON EUROPE:

Issues for discussion

In many European countries, debates about national identity issues – including those concerning immigrants, refugees, cultural values, national traditions, and particularly the control of borders – have gained prominence, reflecting anxieties related to economic insecurity, cultural and demographic change, real security threats and a weakening of trust in institutions and other members of society. Social media have played an important role in the elevation of these debates, and actors with specific interests have been adept at reaching target audiences who are most susceptible to these concerns.

- **How can the EU and national governments better navigate widening social fractures and deepening polarisation of attitudes around profound issues of identity and belonging in today's digital societies?**
- **What more can be done on the European level to maintain, or even re-boost societal cohesion and inclusion?**

Online platforms and social media have become central to democracy. European governments have in recent years demonstrated a willingness to lead on measures to address issues arising from new technologies, such as data protection and antitrust. There is similarly a potential leadership role in addressing ways in which social media are contributing to polarisation and disseminating divisive narratives.

- **What can the EU do to ensure that tech companies consider the social impacts of their technologies in their design, and that citizens are better equipped to navigate social networks and new technologies and resist efforts to manipulate them?**
- **In what ways does online behaviour and interaction between individuals, commercial entities, state and non-state actors need ethical codes of conduct or regulation to be developed?**
- **How can freedom of expression be preserved in emerging digital societies?**

Digital technologies and online interactions have also rendered global affairs and international relations more complex. Social media have facilitated transnational affiliations and connections between individuals and groups, and they are also in the process of reshaping the means of communication between states. Diplomats and political leaders are ever more reliant on social media to reflect and frame state identity, project how a state wishes to be recognised by others, as well as to communicate with their counterparts and signal intentions.²⁵

- **How might digital technologies sharpen or reframe national identity?**
- **In what ways can digital diplomacy impact on European identities and on the EU project, and in turn how can these tools be used to frame and project European identities in the global sphere?**

FORESIGHT EXERCISE

Scenario 1: Fragmented societies, declining democracies²⁶

- Labour markets of advanced economies are severely disrupted by Artificial Intelligence and robotics, with effects on employees across all industries. The most negative impacts are on those with mid-level skills who are less able to retrain for jobs in growing sectors perhaps because of age, location outside of growth areas or other personal circumstances.
- This contributes to a growing number of disaffected people who attribute responsibility for the loss of jobs and opportunities to globalisation and immigration, and as a result are increasingly resentful of both immigrants and those who are prospering from continuing economic change. This group is large enough to cause major political disruptions.
- Authoritarian populists continue to refine their narratives and their mobilisation tactics, while far-right and alt-right extremists strengthen their ability to cooperate across borders. Larger numbers of young males are recruited and radicalised online, resulting in more frequent violent attacks and acts of terrorism targeting minorities, refugees and groups that challenge extremist organisations. This intensifies the atmosphere of fear resulting from terrorist attacks inspired by extreme Islamist groups.
- Artificial Intelligence is employed to micro-target those who are disaffected. Algorithms based on exploiting psychological vulnerabilities diminish people's ability to be outraged, dismantled social sanctioning as a mechanism of regulating undesirable behaviours, and actions that were previously deemed unacceptable become the new normal. Extreme-right groups with funding from external actors conduct increasingly frequent misinformation campaigns to undermine confidence

in traditional media, elected representatives and government agencies. Other institutions of liberal democracy also come under attack including the judiciary and ultimately, the rule of law and democratic systems.

- In response to increased perception of threats, support shifts further to radical voices of the far left and far right. Many in conflicted middle groups eventually drift to these as identity-based narratives offer a sense of pride and power—typically, on the basis of exclusionary ethnic or national identities.
- This deepening polarisation is reflected in election outcomes. A sense of social crisis is magnified as political parties are less prone to consensus building and governments increasingly hampered in their ability to address structural economic and social problems, causing democratic reversals in multiple countries.

Scenario 2: Socially responsible technologies, empowered and united citizens²⁶

- The seriousness of the threat of social fracturing and extremist attacks on democracy spur a collective determination to overcome this threat.
- Policy initiatives become focused on the revitalisation of local economies in cities, towns and regions undergoing economic transitions. Governments re-focus a wide range of economic and social policies with the goal of fostering community and meaningful connection across lines of difference. In fact, research on digital inequalities has led to recognition of the phenomenon of ‘emotional poverty’²⁷ triggering responsive public policies; through the use of sophisticated data analytics funding and targeting social schemes to people and communities that are particularly vulnerable. Public attitudes towards governments begin to shift and trust levels improve, in response to a perception that decision-makers are acting less in their own interests, and more in the interests of the whole community.
- Although terrorist attacks continue, strengthen connections in local communications are sustained. In the face of the growing threat of climate change impacts, communities rally together and become more unified also through the use of new technologies and social media.
- In response to increasing pressure from citizen initiatives – investors, and governments lead social media companies to make large scale investments in changing their business models and

develop creative, large-scale collaborations in local communities across lines of difference to address collective challenges and pursue collective interests.

- Social media play a powerful role in overcoming othering narratives and promoting social cohesion, resilience and narratives that embrace patriotism, community pride and the celebration of what communities and nations have in common.

Scenario 3: Digital authoritarianism on the rise

- In light of the growing polarisation of politics and the challenges posed by the spread and immersion of new technologies into all aspects of society and citizens’ life, moderate forces in support of upholding liberal democracy and the enlightenment tradition find themselves undermined by extremist views from all sides of the political spectrum. Reforms of the education system, strengthening of independent media and civil society forces, and stricter requirements for online platforms have not had the desired effects and instead fueled anti-establishment tendencies and made democratic institutions and norms prone to further attacks and cynicism even amongst the traditionally supportive forces.
- Certain political parties consider that societal peace in digital societies requires organised expansion of the surveillance of citizens, the passing and enforcement of new restrictive libel laws, and the implementing a social credit system to incentivise ‘constructive citizenship’.
- While many despise the measures for fears of an Orwellian ‘Big Brother’ state or parallels to the versions of the social credit system that have already been developed under authoritarian regimes in other parts of the world, proponents argue that a ‘liberal, ethical approach to societal engineering and behavioural improvements’ is the only way of effectively thwarting extremist voices online and offline.
- Government and major tech companies collaborate to share data and through the support of sophisticated AI systems try to anticipate protests, repress critical voices online, and promote targeted advertisements to ‘encourage citizens’ to support the measures. These measures spark strong reactions by large parts of the population both on-line and off.
- Digital resistance groups collaborate across borders to develop encryption systems and distributed ledger technologies to create networks for alternative ideas and opinions to be shared, as well as jamming devices to create ‘safe’ off-line spaces where people cannot be monitored or surveilled.

Notes

1. INGSA (2018), Understanding wellbeing in the context of rapid digital and associated transformations: implications for research, policy and measurement. A discussion paper. Available at: <https://www.ingsa.org/wp-content/uploads/2018/09/INGSA-Digital-Wellbeing-Sept18.pdf>
2. Chaudron, S. and Eichinger, H. (2018), Eagle-eye on Identities in the digital world , EUR 29044 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-79-77689-2, doi:10.2760/48837, JRC110266.
3. Bostrom N. and A. Sandberg (2011), The Future of Identity, Report Commissioned by the UK's Government Office for Science, Future of Humanity Institute, Oxford University, <https://nickbostrom.com/views/identity.pdf>
4. World Economic Forum (2018), Digital Identity. On the Threshold of a Digital Identity Revolution, available at: http://www3.weforum.org/docs/White_Paper_Digital_Identity_Threshold_Digital_Identity_Revolution_report_2018.pdf
5. Bavelier, D., Green, C. S., & Dye, M. W. G. (2010). Children, wired – for better and for worse. *Neuron*, 67(5), 692–701. <http://doi.org/10.1016/j.neuron.2010.08.035>; Kardefelt-Winther, D. (2017) How does the time children spend using digital technology impact their mental well-being, social relationships and physical activity? An evidence-focused literature review. Innocenti Discussion Paper 2017-02, UNICEF Office of Research, <https://www.unicef-irc.org/publications/pdf/Children-digital-technology-wellbeing.pdf>; Canadian Paediatric Society, Digital Health Task Force, Ottawa, Ontario; Screen time and young children: Promoting health and development in a digital world, Paediatrics & Child Health, Volume 22, Issue 8, 27 November 2017, Pages 461–468, <https://doi.org/10.1093/pch/pxx123>
6. Benjamin C. Storm, Sean M. Stone, Aaron S. Benjamin. Using the Internet to access information inflates future use of the Internet to access other information. *Memory*, 2016; 1 DOI: [10.1080/09658211.2016.1210171](https://doi.org/10.1080/09658211.2016.1210171)
7. http://pablobarbera.com/static/barbera_polarization_APSA.pdf
8. European Commission, 'Social Media and Networks: Issue paper on fake news and disinformation online', released in relation to EU Multi-stakeholder Conference on Fake News in Brussels on 14 Nov 2017, DG CNECT
9. Pew Research Center (2017), The Partisan Divide on Political Values Grows Even Wider, available at: <http://www.people-press.org/2017/10/05/the-partisan-divide-on-political-values-grows-even-wider/>
10. Chaudron, S. and Eichinger, H., Eagle-eye on Identities in the digital world , EUR 29044 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-77689-2, doi:10.2760/48837, JRC110266.
11. Dubois E. and G. Blank (2018), The echo chamber is overstated: the moderating effect of political interest and diverse media, in *Journal of Information, Communication and Society*, 21:5, <https://doi.org/10.1080/1369118X.2018.1428656>
12. <http://education.biu.ac.il/files/education/shared/science-2015-bakshy-1130-2.pdf>
13. Crockett M.J. (2017), Moral outrage in the digital age, *Nature Human Behaviour*, Macmillan
14. Disinformation and 'fake news': Interim Report (2018), UK Parliament, <https://publications.parliament.uk/pa/cm201719/cmselect/cmcmds/363/36307.htm>
15. T. Dixon and M. Juan Torres, Is the Internet Eroding Europe's Middle Ground? Public Opinion, Polarisation and New Technologies, ESPAS.
16. Taylor, Kathleen, (2009). *Cruelty: Human Evil and the Human Brain*. Oxon: Oxford University Press.
17. *The New Scientist*, 'Discriminating algorithms: 5 times AI showed prejudice', 12 April 2018. See <https://www.newscientist.com/article/2166207-discriminating-algorithms-5-times-ai-showed-prejudice/>
18. *The Inquirer*, 'Google's AI is already associating ethnic minorities with negative sentiment'. See <https://www.theinquirer.net/inquirer/news/3019938/googles-ai-is-already-associating-ethnic-minorities-with-negative-sentiment>
19. *The Verge*, 'Twitter taught Microsoft's AI chatbot to be a racist asshole in less than a day'. See <https://www.theverge.com/2016/3/24/11297050/tay-microsoft-chatbot-racist>
20. <https://medium.com/positive-returns/digital-identity-can-be-the-rails-for-a-new-revolution-98c6538afb8a>; Emburay-Dennis T. (2018), China installing QR codes on Uyghur Muslim homes as part of mass security crackdown, *The Independent*, <https://www.independent.co.uk/news/world/asia/china-uyghur-muslims-xinjiang-province-qr-codes-security-crackdown-hrw-a8532156.html> ; <https://www.innovationiseverywhere.com/this-is-aadhaar-indias-750-million-biometric-and-online-identity-database-and-its-future-as-an-ecosystem-of-innovation/>
21. For more on nudging, see research by authors Richard Thaler and Cass Sunstein.
22. D. Helbing et al., (2017). 'Will Democracy Survive Big Data and Artificial Intelligence?'. *Scientific American*. Available at: <https://www.scientificamerican.com/article/will-democracy-survive-big-data-and-artificial-intelligence/>
23. Panopticon refers to the system of control designed by the 18th century philosopher Jeremy Bentham
24. Wright N. (2018), How Artificial Intelligence Will Reshape the Global Order, *Foreign Affairs*, <https://www.foreignaffairs.com/articles/world/2018-07-10/how-artificial-intelligence-will-reshape-global-order>
25. Duncombe C. (2017), Twitter and transformative diplomacy: social media and Iran–US relations, *International Affairs*, available at: <https://academic.oup.com/ia/article/93/3/545/3077244>
26. Scenarios 1 and 2 draw from T. Dixon and M. Juan Torres, Is the Internet Eroding Europe's Middle Ground? Public Opinion, Polarisation and New Technologies, ESPAS Foresight Report
27. For more on the concept of emotional poverty see research underway by the JRC in the context of the Community of Practice on Fairness