



Harmful internet use

Part II: Impact on culture and society

STUDY

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Abstract

It is increasingly recognised that the internet, in spite of all its benefits to society, can also be correlated with significant harmful effects on individuals and society. Some of these harmful aspects have been studied extensively, particularly harm to privacy, harm associated with security and cybercrime, and harm resulting from digital divides. This study covers less studied but equally important effects: harm associated with the quality of social structures and institutions.

In Part II of this study, following a review of facts and statistics relating to internet use in the European Union, eight significant harmful social and cultural effects associated with internet use were identified, and a review was performed of theoretical and empirical literature concerning these aspects.

The harmful effects that were reviewed are: internet addiction, harm to cognitive development, information overload, harmful effects on knowledge and belief, harm to public/private boundaries, harm to social relationships, harm to communities and harms to democracy and democratic citizenship. This review is followed by policy options for preventing and mitigating these harmful aspects.

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AUTHORS

Philip Brey, Stéphanie Gauttier, Per-Erik Milam at the University of Twente.

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STOA ADMINISTRATOR RESPONSIBLE

Gianluca Quaglio
Scientific Foresight Unit (STOA)
Directorate for Impact Assessment and European Added Value
Directorate-General for Parliamentary Research Services
European Parliament, Rue Wiertz 60, B-1047 Brussels
E-mail: gianluca.quaglio@europarl.europa.eu

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Executive Summary

The internet has been on the receiving end of much negative news coverage in recent years. The focus has been on major privacy scandals and security breaches, the proliferation of fake news, rampant harmful behaviours such as cyberbullying, cybertheft, revenge porn, sextortion, the exchange of child porn and internet predation, internet addiction, and the negative effects of the internet on social relations and social cohesion. While the social and economic benefits of the internet cannot be denied, some people now feel that due to some of these developments core European values such as equality, respect for human rights and democracy are under attack. Tech companies are under increasing pressure to mitigate these harmful effects, and politicians and opinion leaders are advocating drastic measures.

Whereas part I of the Harmful internet use study focuses on one specific harmful effect, that of internet addiction, this report reviews a range of harmful aspects for individuals and society that are associated with internet use. It concludes with policy options for their prevention and mitigation. The report does not cover all societal harm relating to the internet. Some harmful aspects have already been discussed extensively in other studies and already have a history of policy action. These include harm to privacy, harm related to cybersecurity and cybercrime, and harm resulting from digital divides. This report, in contrast, covers less studied but equally important harmful effects that concern the health, wellbeing and functioning of individuals, the quality of social structures and institutions, and equality and social inclusion.

1. Internet use in the European Union

After introducing the topic of the report and describing the methodology and resources used, the report begins by reviewing facts and statistics relating to internet use in the European Union. It is found that 87 % of European households have internet access at home, and 65 % use mobile devices to access the internet. Daily use increases from 33 % amongst those over 55 to 90 % amongst 15-24-year-olds. Internet use is heavy amongst adolescents, with a United Kingdom (UK) study showing that 12-15-year-olds spend an average of 21 hours per week online, next to 18 hours on a mobile phone. Europeans aged 16-24-year-old spend 168 minutes per day on mobile internet, dropping to 30 minutes for 55-64-year-olds.

Social media is used by 88 % of 15-24-year-olds, 80 % using it daily, and daily use is 59 % for 25-39-year-olds, 36 % for 40-54-year-olds, and 11 % for those aged over 55. Other popular internet uses are emailing, making telephone or video calls, listening to radio and podcasts, reading news, watching videos from shared content sites, finding information about goods and services, travel and accommodation, internet banking and online gaming. Some 4.4 % of European adolescents show pathological internet use that affects their lives and health, while 13.5 % of adolescents engage in maladaptive internet use behaviours. Similar numbers have been reported for adults.

2. Harmful social and cultural effects associated with internet use

Next, eight significant harmful social and cultural effects associated with internet use are identified, and a review is performed of theoretical and empirical literature concerning these harmful aspects. These eight effects are:

- Internet addiction;
- Harm to cognitive development;
- Information overload;
- Harmful effects on knowledge and belief;
- Harm to public/private boundaries;
- Harm to social relationships;
- Harm to communities;
- Harm to democracy and democratic citizenship.

For each of these eight categories of harmful aspects, their characteristics are described, empirical studies are reviewed that provide evidence for their existence and extent, and the results of these studies are summarised. It is concluded that for most if not all of these categories, the evidence points to the occurrence of significant harmful effects on individuals and society.

Internet addiction

Internet addiction is a harmful lack of control over one's internet consumption that can lead to a decrease in physical and psychological wellbeing, with associated symptoms of distress, anger, loss of control, social withdrawal, familial conflicts, and others. It can accentuate co-morbid symptoms and push people towards isolation. Internet addiction reinforces inequalities: vulnerable populations, in particular people with co-morbid symptoms, have greater risks of suffering from internet addiction. It is shown that internet addiction is a serious condition that likely affects more than ten million Europeans, and possibly tens of millions.

Information overload

Information overload is the condition of having too much information to adequately understand an issue or make effective decisions. Information overload is associated with loss of control, feelings of being overwhelmed, reduced intellectual performance, diminished job satisfaction, damaged personal relationships, and harms to health. Particularly at risk are managers, consumers and social media users. Studies show that information overload affects up to 20-30 % of people, and therefore needs to be taken seriously as a significant harm resulting from internet use.

Harmful effects on social relationships

Studies have shown the various significant harmful effects of internet use on social relations. Extensive internet use, particular social media use, is correlated with loneliness and social isolation. Romantic relationships can be degraded by internet use, particularly because of online pornography. Malicious online behaviour, particularly cyberbullying, cyberstalking and online predation, affects millions of children and adults. There are therefore quite serious harmful effects of the internet on social relationships that deserve more policy attention.

Harmful effects on public/private boundaries

Harm is done by the way in which the internet and smartphones blur the distinction between private and public, and between the spheres of life, including work, home life, leisure and travel. The blurring of these boundaries creates new risks and vulnerabilities, such as people's private lives becoming public goods due to them being exposed on social media, and work activity invading home life through internet and smartphone use, and many users find it difficult to navigate these boundaries as they dissolve. Harm that can result from such permeations includes loss of quality of life, harm to privacy, decreased safety and security, and harm to social relations – when friends and family members feel left behind when they lose out in the competition between spheres of life enabled by electronic media. These harmful aspects possibly affect the majority of EU citizens.

Harmful effects on knowledge and belief

Significant harm is also done by false information and disinformation on the internet, and by the phenomenon of echo chambers, where ideas are reinforced through repetition in a closed system that does not allow for alternative viewpoints. Empirical evidence suggests that the internet contains much false and misleading information, and that users have difficulty distinguishing accurate from inaccurate information. Fake news poses a particular problem. Misinformation can cause significant harms to the health and wellbeing of individuals and to the proper functioning of society, including the functioning of democratic institutions. Echo chambers appear to be more pervasive, and may separate those with more extreme and partisan political and

ideological positions from the rest of society, thereby undermining possibilities for civil discourse and tolerance, and supporting radicalisation.

Harm to cognitive development

Empirical evidence suggests that internet use can have both positive and negative impacts on cognitive development, depending on the person and the circumstances. As far as harm is concerned, there is evidence that children can be harmed in their cognitive development by prolonged internet use, including harm to the development of memory skills, attention span, abilities for critical reasoning, language acquisition, reading, and learning abilities. More research is however needed to draw more reliable conclusions.

Harm to communities

The internet can benefit existing offline communities, and can enable the creation of new, online communities. However, there is significant evidence that the internet can also harm communities, which are important to a flourishing and functioning human society. Many offline communities are being harmed because of the partial migration of many human activities (shopping, commerce, socialising, leisure activities, professional interactions) to the internet. Online communities sometimes extend offline communities and sometimes replace them. As replacements, they are often not adequate, since they often do not possess some of the valuable qualities of online communities, and do not possess some of the strongest qualities of offline communities, and may also suffer from impoverished communication, incivility, and lack of trust and commitment.

Harm to democracy

Empirical evidence suggests that on the whole, the internet has positive implications for democratic citizenship and engagement and the functioning of democratic institutions. Some online activities, however, appear harmful to democratic deliberation and decision-making. These include (1) the incivility of much online (political) discourse, (2) ideological and political polarisation that is correlated with internet use, (3) misinformation, particularly 'fake news', and (4) voter manipulation through profiling based on harvested social media information. These four activities pose an increasing threat to the functioning of democracies.

3. Policy options

Following this review of eight harmful societal effects associated with internet use, eight broad policy options are identified for preventing and mitigating these effects. They are summarised below.

Policy option 1. No action

Policy option 2. Promoting technology that better protects against self-harm

This policy option is to stimulate or require technology companies to modify their designs and policies to better support individuals. They are to introduce design features, products and services and corresponding user policies that support internet users in avoiding usage patterns that cause harm their health, wellbeing and normal functioning, particularly by combating internet addiction, information overload, harm to cognitive development, and the blurring of public/private boundaries.

Policy option 3. Promoting technology that better protects social institutions

This policy option involves stimulating or requiring tech companies to introduce design features, products and services that better protect social institutions, equality and social inclusion. For example, they can introduce technologies that prevent or flag fake news, strengthen offline communities, and prevent political manipulation of users.

Policy option 4. Education about the internet and its consequences

This policy option involves strengthening education about the internet, as early as the elementary school stage, to teach pupils and students about the social, economic, technical and cultural aspects of the internet, its potential benefits and harms for individuals and society, and critical digital skills and skills for self-aware internet use.

Policy option 5. Information campaigns that target internet users

This option involves initiating and stimulating information campaigns to create awareness in internet users and their social circle regarding the possibilities offered by the technology, the risks that are involved, and the potentially harmful impacts on themselves and others. Campaigns can for example focus on internet addiction, information overload, or harm to social relations.

Policy option 6. Strengthening social services support for internet users

Some internet users need professional help to prevent or mitigate harm to themselves or others, and such help is not always available. This policy option involves strengthening social services that are dedicated to preventing or mitigating such harm, including internet addiction, antisocial online behaviour, information overload, and others.

Policy option 7. Stimulate or require employers to develop policies and initiatives that protect workers against harms of work-related internet use

Work-related internet use is a large part of overall internet use. Employers are in a position to help employees develop healthy internet habits and prevent harm to themselves and others. This policy option is to stimulate or require employers to take measures to protect users against harm caused by work-related internet use, such as information overload and the blurring of lines between public and private.

Policy option 8. Establish governmental units, governmental programmes, multi-stakeholder platforms, etc., to address the problems of internet use that causes social and cultural harm

Some of the European Commission Directorate-Generals could institute such units and programmes, including the Directorate-General for Communications Networks, Content and Technology (DG CONNECT), the Directorate-General for Research and Innovation and others. The EU could also stimulate the development of global forums, platforms and initiatives. An option is to expand current units and initiatives that focus on internet privacy and security issues to include internet use that causes social and cultural harm.

The report concludes with a summary of results.

1. Introduction

The internet offers many benefits to society. First of all, it constitutes an incredible source of information. Almost any publicly available information that anyone would like to have can be found on the internet. Moreover, this information can be accessed 24 hours per day, and at most locations in the world. The internet is also an extremely powerful communication medium, offering email, social media, internet telephony, video conferencing and many other possibilities to enable any person or organisation to communicate with almost any other person or organisation at any time. The internet moreover offers powerful emulations and extensions of our social institutions and social practices, including education, government, business, finance, civil society, entertainment, and others.

In spite of these benefits, the internet has been mired in controversy from the beginning. Worries about privacy and security, crime and lawlessness, negative effects on communication and civility, commercialisation of the public sphere, loss of community and others were already voiced at an early stage. In recent years, however, criticism of the harmful social and cultural implications of the internet has skyrocketed. There is a constant flood of media reports on harmful effects and scandals and those that are responsible for them. Headlines scream about major breaches of privacy and security, the proliferation of fake news, harmful actions like cyberbullying, revenge porn, sextortion, the operation of child porn rings and internet predation, the proliferation of crime on the dark web, internet addiction, and the negative effects of the internet on social relations and social cohesion.

A tipping point seems to have been reached. Many people now worry that the dark and harmful aspects of internet use are starting to outweigh its benefits. People feel that core European values such as human dignity, equality, respect for human rights and democracy are under attack. Many tech companies, social media companies especially, are under strong pressure to take responsibility for harmful effects that are potentially under their control, such as those due to fake news, privacy, security breaches and harassment, and, as well as manipulations of democratic processes. Politicians and opinion leaders are advocating drastic measures, such as stronger regulations, or even nationalisation of tech companies, to ensure accountability and democratic control.

The purpose of this report is to review the scientific literature on harmful internet effects on society and culture, and to provide policy options for mitigating these. For the remainder of this section, we will further elaborate on the scope of the report.

First, the focus of this study is on harmful effects on society and culture. We define 'harmful effects on society and culture' to include (1) harm to the interests, wellbeing, health, social status or civil rights of large groups of people in society; and (2) harm to the proper functioning and flourishing of social structures and practices, such as communities, cultural practices, and social institutions. Excluded from consideration are harmful economic effects, unless the harm corresponds directly to harmful social or cultural consequences. Also excluded are harmful environmental effects that result from the development and use of internet hardware and software.

Second, our focus on harm incurred will not be mirrored by an equally strong focus on the benefits of the internet for culture and society. The internet clearly has great benefits of this sort (see, e.g., Brey, 2006), but our focus in this report is on harm caused. Benefits will however be discussed where appropriate to better understand the harm that we are discussing and the extent to which it is accompanied by relevant benefits.

Third, we will not cover several important types of harmful social aspects that are sufficiently well-known and have been covered extensively in other studies.

We exclude privacy and (cyber)security, and consideration of social harms that result from cybercrime, especially those resulting from financial crimes, cyberterrorism, cyberextortion and cybervandalism. These

harmful social phenomena are also well-documented and are mainly a challenge for law enforcement. To the extent that we do discuss cybercrime, this will be cybercrimes that occur in the context of other social harm that does not necessarily result from criminal activity. For example, we will discuss revenge porn and cyberstalking under the category 'harm to social relations'. We also exclude consideration of the digital divide, which has been investigated extensively since the early 1990s. In addition, we will be selective in our review of harmful effects on particular social institutions, such as healthcare, education, and law. While we discuss internet harm to some key social institutions, a comprehensive review of harm to social institutions is beyond the scope of this study.

Fourth, the internet is as complex as human society, and it would be impossible for this report to cover every conceivable harm resulting from its use. We have selected eight broad categories of harmful effects that we have found to be the most important resulting from internet use in terms of their scale, scope and negative impact on society. Other, lesser harm beyond these eight categories will therefore not be discussed.

The STOA study 'Harmful internet use' is divided in two parts. While part I (entitled 'Internet addiction and problematic internet use) focuses on the clinical aspects of internet addiction, this report covers internet addiction from a societal point of view, as one of the eight harmful effects reviewed in this report.

The report is structured as follows (see Figure 1).

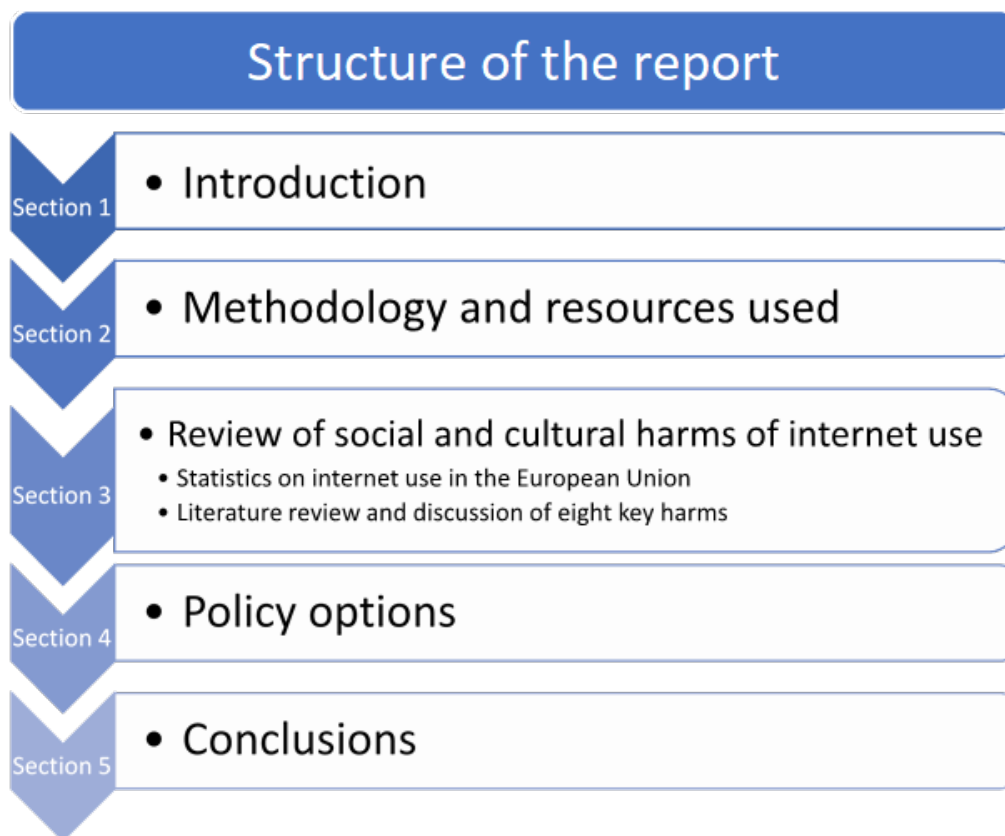


Figure 1. Structure of the report.

In section 2, we discuss the methodology that has been used to compile this report and the resources used. In section 3, the heart of this report, we provide an extensive literature review of harmful internet effects on culture and society. We will start this section with a review of internet use in the European Union and will then proceed with a discussion of eight categories of harm to society and culture. In section 4, we will discuss potential policy options. The concluding section 5 summarises our results.

2. Methodology and resources used

This section will outline the methodology use for the synthesis of the research work and findings, and the methodology for arriving at policy options. The aim of the synthesis is to arrive at a narrative literature review of major harm caused by the internet to society and culture that has been identified in scientific studies. Our methodology for arriving at this review was as follows. First, we developed a theoretical model of harmful effects on society and culture that is specified in section 3.1. This model defines different subjects of harm (individuals and supra-individual units, like communities and social institutions) and different types of harm that could befall them.

A narrative literature review was subsequently undertaken of scientific and humanistic studies that identified any of these harmful effects as resulting from the internet, including harm directly and indirectly correlated with internet use and the impact of the internet on society and culture (see Figure 2 for an overview of steps taken). For our literature search, we used Web of Science and Scopus. We used combinations of keywords, pairing on the one hand terms like “internet” and specific applications and practices like “social media”, “gaming” and “”, with terms relating to either harms or subjects of harm or both. Terms used for harm included “internet addiction”, “information overload”, “cultural fragmentation”, “disinformation”, “cognitive impairment”, “harm to communities” and others. “Terms for subjects of harm included “internet users”, “data subjects”, “communities”, “cognitive development”, “democracy” and others. We also used reviews of social and cultural aspects of the internet and harm caused by the internet to locate relevant studies.

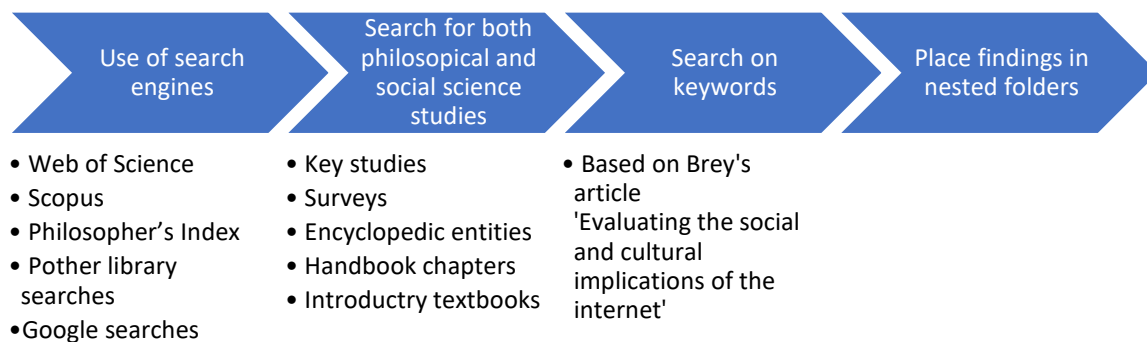


Figure 2. Steps in literature search.

Our review yielded over 160 publications that we categorised according to the categories of harms that were defined by our theoretical model. This was an iterative process, in which findings from our literature search prompted refinements of our theoretical model, which then prompted new literature searches. We subsequently studied these publications and identified those that were most relevant to this review. After completion of our literature search, we proceeded to do our narrative literature review, ensuring for each category of harm that we reviewed, we covered the following: definition and characteristics of the harm, causes and drivers of the harm, and possible ways of preventing or mitigating the harm.

Our methodology for policy options, finally, was as follows. We first studied the extent to which there were any common features in the eight categories of harm that we reviewed, their causes, and our proposals for mitigating them. Regarding causes, we located them in technological design, individual behavior of users, and larger social arrangements and cultural practices in which internet use is situated. We subsequently identified actors who are in a position to affect these causes, and defined possible responsibilities that these actors might adopt in affecting these causes in a positive way so as to mitigate harm, as well as possible actions that the EU and individual Member States might take to affect these causes and help other actors affect them in a positive way.

3. Synthesis of the research work and findings

3.1 Introduction

In part 3 of this report, we document our findings regarding internet harm to society and culture, based on a review of the academic literature. In this introductory section, we provide a first description of the eight types of harm that we have identified and explain how we arrived at them. In section 3.2, we then proceed to provide a factual background on internet use in the European Union. We do so because the harmful effects we identify result from internet use. It is helpful, therefore, to know more about internet use in the European Union: how often is the internet used, for what purposes is it used, and by whom? In sections 3.3 through 3.10, we then identify and review eight key harmful effects on society and culture that studies show to be associated with internet use.

The eight types of harm that we have identified are the following: internet addiction (3.3), harm to cognitive development (3.4), information overload (3.5), harmful effects on knowledge and belief (3.6), harm to public/private boundaries (3.7), harm to social relationships (3.8), harm to communities (3.9), and harm to social cohesion and democracy (3.10). We have identified these harmful effects by combining a theoretical model for identifying potential harm with a broad search of the literature. Our theoretical model showed us what potential harm might occur, and we then looked in the literature which harm was documented to occur. This was an iterative process in which we refined our theoretical model based on feedback from our literature searches. We then clustered the harmful effects that we identified into eight categories.

Our theoretical model of internet harm operates as follows. We first distinguished different types of subjects (recipients) of harm and different types of harm that can occur to these subjects. Subjects of harm include individuals and supra-individual units. We identified three broad classes of individuals: internet users, data subjects (people about whom personal information is located on the internet), and third parties (people who are indirectly affected by internet use by others). Supra-individual units include elements of society beyond the individual level, such as social relations (including friendship, love, family), social groups, communities, cultural beliefs and practices, and social institutions. For individuals, we identified the following types of harm that can conceivably happen to them: harm to wellbeing, health (mental and physical), physical and mental abilities, civil rights, wealth and income, and reputation and social status. For supra-individual units, the harm can vary, but generally pertain to the proper functioning of these units, either for the welfare of those individuals directly involved with the unit, or for the contribution of the unit for the greater good of society.

We then identified categories of harms of these types discussed in the literature, and classified them on a scale of importance, dependent on (a) the scale and pervasiveness by which the harm is theorised to occur in the literature, and (b) our admittedly subjective assessment which types of harm can be considered a greater problem to the functioning and flourishing of society and its citizens. After the literature review, this has led us to the identified eight types of harm, of which the first four (sections 3.3 to 3.6) pertain mostly to harm to individuals, and the last four (3.7 to 3.10) mostly to supra-individual units. However, harm to individuals is also a problem for society when such harm occurs on a large scale, and harm to supra-individual units ultimately harms individuals as well. See Figure 3 for an overview of harm covered, as well as the harm and benefits of internet use not covered in this report. For each category of harm, we review the following: definition and characteristics of the harm, causes and drivers of the harm, and possible ways of preventing or mitigating the harm.

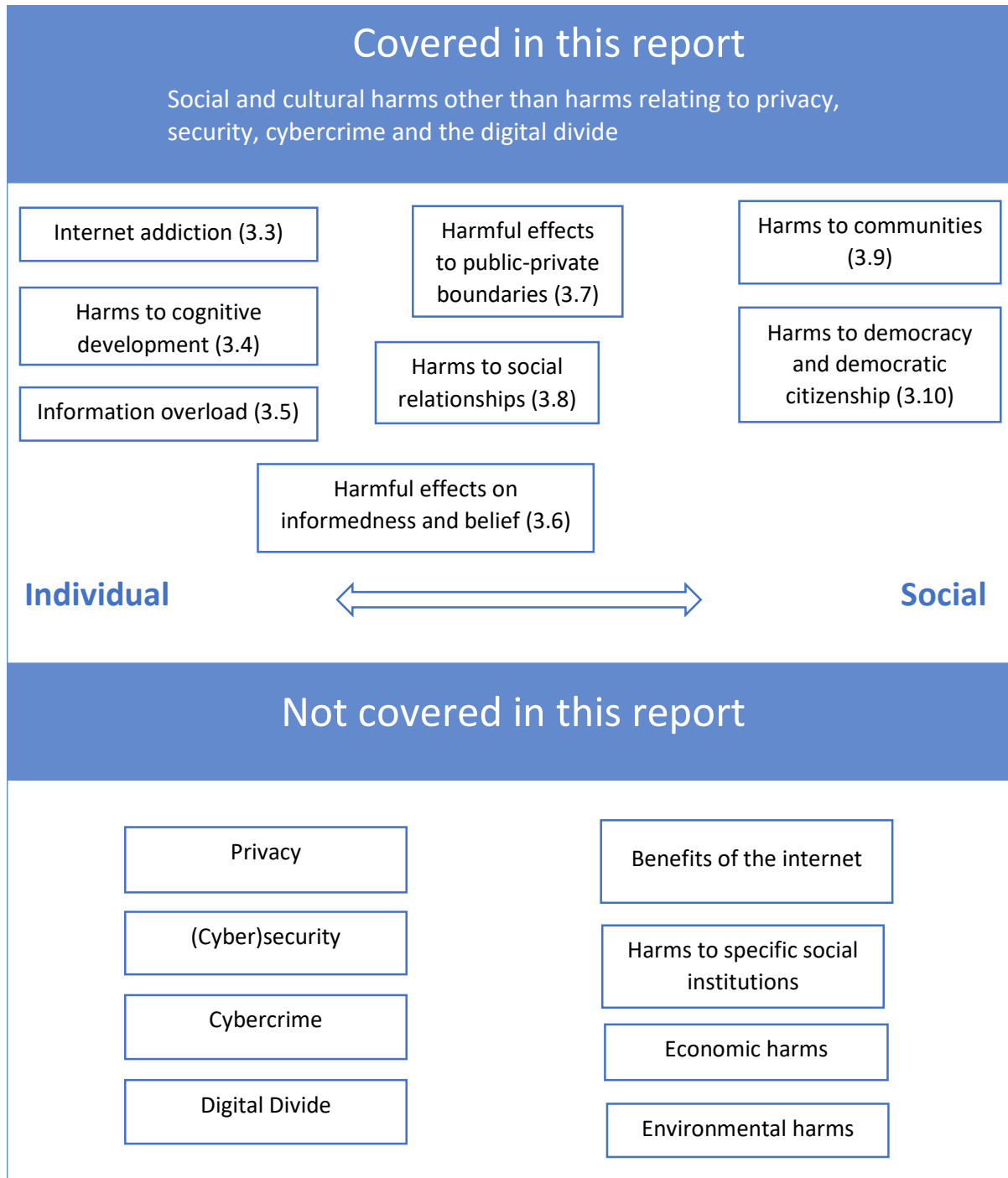


Figure 3. Harm covered in the report.

3.2 Internet use in the European Union: facts and statistics

This section presents an overview, with statistical information, of internet use in the European Union, and associated attitudes and behaviours regarding the internet. First, the approach and databases consulted are briefly described. Second, data concerning internet access is analysed. Third, statistics concerning the main online activities and potential harm stemming from them are detailed. Fourth, insights concerning children's exposure to inappropriate content are presented. Finally, values shared by Europeans regarding the internet are presented.

3.2.1 Approach

Whenever possible, the figures we chose are representative of the population in the 28 EU Member States and stem from databases and studies performed by the European Union, such as Eurostat and Eurobarometer. However, and in order to cover topics not yet included in those surveys, we also consulted statistics available from the biggest survey companies and portals such as IPSOS, TNS, Global Web Index, and aggregated data by Statista. Statistics found in mainstream media were included only when they were coming from studies that could be consulted for verification and with large sample sizes. Besides, a few figures are given concerning the population worldwide or focusing on specific Member State when no statistics were available for the 28 EU countries.

3.2.2 Internet access and use are part of all populations' group daily lives

The statistics available allow to describe who are internet users, and how much time they spend online.

Internet as a widespread and highly time-consuming daily activity

According to Eurostat data, internet is part of the daily life of the majority of individuals living in Europe, with 72 % of individuals aged from 16 to 74 across the EU using it every day. Access to internet is growing rapidly: 87 % of European households had access at home in 2017 vs 76 % in 2012, and 65 % use mobile devices to access the internet. As a consequence, internet users can be found across all population groups. The statistics for daily internet use are as follows:

- 64 % of men and 57 % of women;
- 90 % of those between 15-24 years old, 84 % of those 25-39 years old, 69 % of those 40-54 years old, and 33 % of those over 55 years old;
- 78 % of those finishing their education after age 20 years, 59 % of those finishing their education between 16 and 19, and 93 % of those still gaining education use the internet every day;
- 45 % of stay-at-home parents, 63 % of unemployed people, 66 % of manual workers, 72 % of self-employed people, 76 % of white collars, 89 % of managers use the internet every day.

The risks posed by a potential impact of a digital divide between those who have access to it and those who do not are no longer topical, as only 3 % of individuals claim not to have access to the internet (Eurobarometer, 2016) and do not represent one specific population group that would need to be protected by policy. What is clear, however, is the big usage gap by age, with 90 % of 15-24-year-olds engaging in daily usage, as opposed to only 33 % of over 55-year-olds.

The time spent online via mobile only was between 30 and 168 minutes daily in 2015. The younger the individual, the more time they spend using mobile internet (see Figure 4).

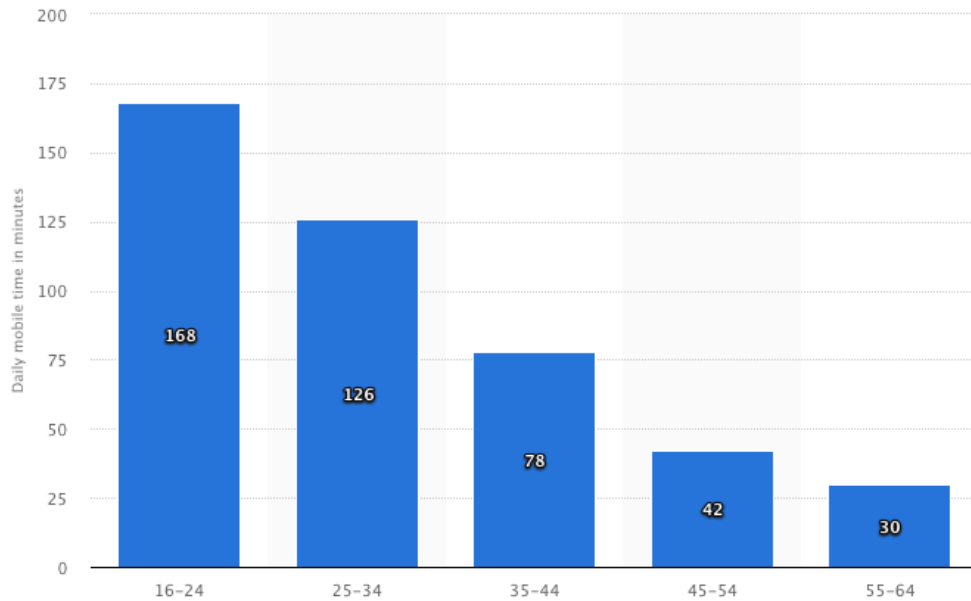


Figure 4. Time spent daily on mobile internet, divided by age categories (Statista, 2015).

At the same time, an Ofcom study conducted in the UK in 2016 shows that one in three adult internet users (34 %) has sought a period of time offline, with one in ten (11 %) doing so in the last week alone. One in four spent up to a day without using the internet, one in five disconnected for a week. Being willing to spend more time doing other things (44 %) and having more time to enjoy friends and family (38 %) were the biggest motivations (Ofcom, 2016).

Most children are internet users, and a wide share accesses the web from their own devices. An Ofcom study conducted in the UK reports that children increasingly have their own mobile devices to access the web: of 3-4-year-olds, 21 % have their own tablet and 1 % their own smartphone; of 5-7-year-olds, 35 % have their own tablet and 5 % their own smartphone; of 8-11-year-olds, 52 % have their own tablet and 39 % a smartphone, and of 12-15-year-olds, 55 % have a tablet and 83 % a smartphone (Ofcom, 2017).

Time spent online grows to addictive levels for both children and adults

Many Europeans use the internet extensively. The amount of time spent online varies across population groups. Use becomes increasingly heavy as children become adolescents. A recent survey shows that 53 % of 3-4-year-olds go online for at least 8 hours a week, 79 % of 5-7-year-olds go online for at least 9 hours a week, 94 % of 8-11-year-olds go online at least 13.5 hours a week, and 99 % of 12-15-year-olds go online for at least 21 hours a week (Ofcom, 2017).

A study by Durkee et al shows that 4.4 % of adolescents in 11 European countries show pathological internet use, i.e. use the web in a way that affects their lives and health, while 13.5 % of adolescents engage in maladaptive internet use behaviours. The time spent online disappears to the detriment of other activities such as sleep, face-to-face social interactions, and studying. While a high number of hours spent online is characteristic of many population groups, it is noteworthy that adolescents with psychological problems (depression, anxiety, ADHD) are more likely to show problematic or addictive uses of the internet (Durkee et al., 2012).

This issue does not concern adolescents alone. Adults are also engaging in addictive or maladaptive internet use. A study conducted in the UK shows that adults spend an average of 8 hours 41 minutes a day on screens, which is more than the time spent on sleep (Ofcom, 2016). A 2012 study showed that 66 % of UK smartphone users reported being victims of the fear of being without their phone and checking constantly that they have it with them (SecurEnvoy, 2012). At the same time, 62 % of polled UK adults say they 'hate' how much time

they spend on their phone. Current patterns of use cause distress. While there are no figures available concerning the number of individuals trying to reduce their internet use, steps have been taken in different countries outside the EU to fight against internet addiction. For instance, an inpatient facility to treat internet addiction opened in 2013 in the USA and China opened bootcamps to impose a digital detox to teenagers (Tinker, 2013).

3.2.3 Online activities

We now move to the particular activities that Europeans engage in online. First, key statistics concerning online activities are presented. Then, the most prevalent activities are singled out: social media use, media consultation (for information and news), and gaming.

Repartition of online activities

Figure 5 shows that the most common online activities that Europeans engage in are related to communication (emails and social media). Other major activities undertaken online are consulting media, searching for information, watching videos. Additional data from Eurostat shows that despite the high share of internet users among students, a low share of people uses the web to take courses (7 % in 2017).

Time spent on social media keeps increasing

As per Eurobarometer data, those who use social networks every day are mostly young people: 80 % of those aged between 15 and 24 years, 59 % of those between 25 and 39 years, only 36 % of those between 40 and 54 years, and 11 % of those over 55 years. Eurobarometer shows that in quarter 3 of 2016, 38 % of individuals used online social networks every day, 16 % several times a week, 6 % several times a month, 36 % never use it, 3 % have no access, 1 % do not know. The average time spent daily on social media is increasing year after year and reached 135 minutes in 2017 worldwide, up from 126 the previous year (Statista, 2018).

At the same time, an Ofcom study conducted in the UK showed that 31 % of internet users missed out on spending time with friends and family. Texting family members and friends through social media is a daily activity for 58 % of UK adults, even though the majority say they would prefer to use richer media to be in touch with others (67 % would prefer face to face meetings and 10 % would prefer to speak on the phone). It should also be noted that individuals also communicate online together while being in the same room, and that online communications can appear as an interruption to other ongoing online interactions, resulting in a feeling of not being heard by one's interlocutor (Ofcom, 2016).

Children are also using social media very early on: 3 % of the 5-7-year-olds surveyed by Ofcom in 2017 have a social media account, a number which increases significantly for those 8-11-year-olds, reaching 23 %, and 74 % for those aged 12 to 15 (Ofcom, 2017). It is noteworthy that the regulations to open social media accounts set the entry barrier at 13 years old. However not all parents are aware of this fact. Social media have mechanisms that entice children to use them on a frequent basis, such as the Snapstrikes in Snapchat: users must continue to send each other pictures via the social network in order to keep their strike up.

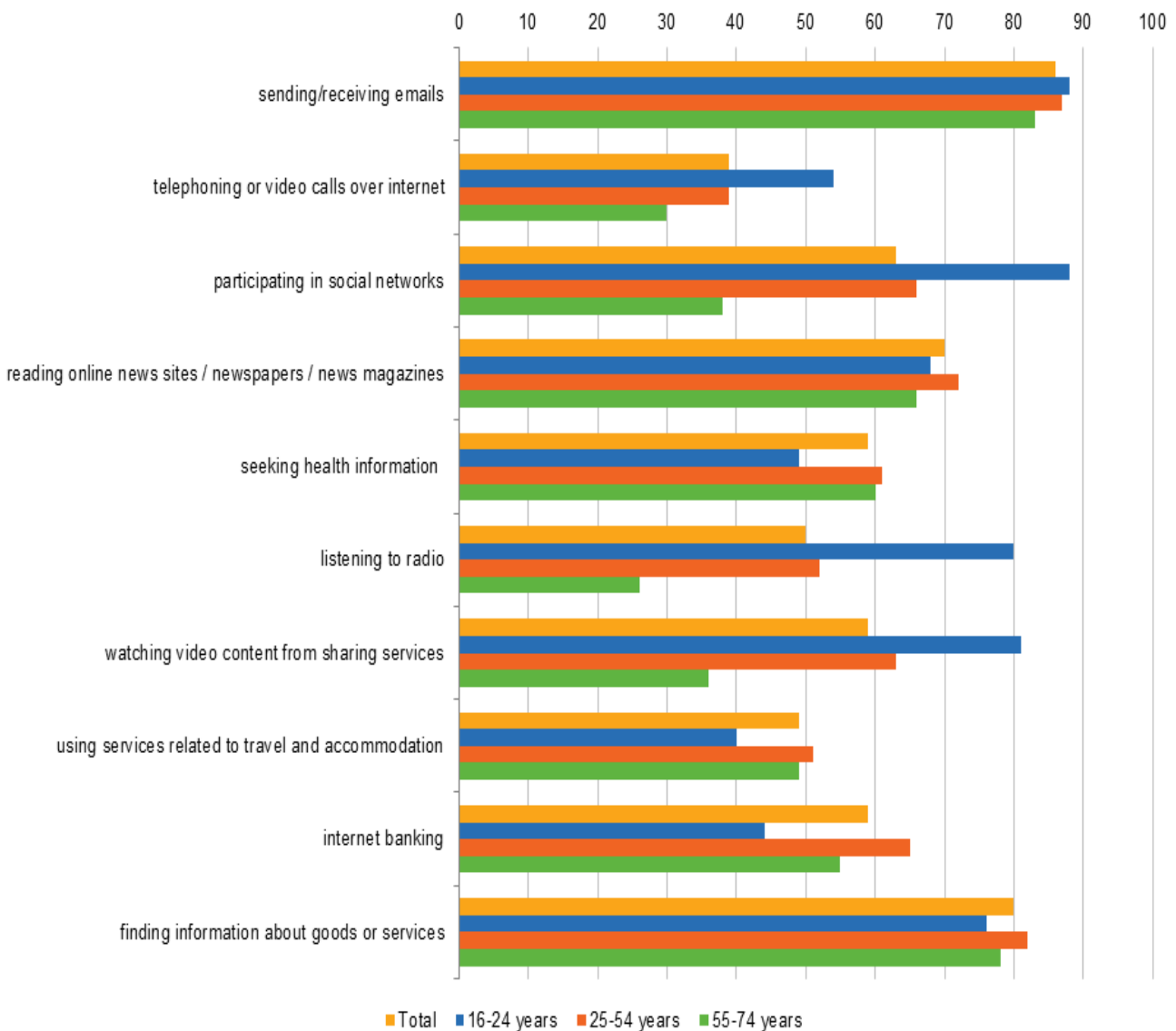


Figure 5. Internet activities in the past three months by age group EU-28, 2016 (Eurostat).

Online media are consulted, yet not always trusted

Eurobarometer data (Eurobarometer, 2016) allows a characterisation of the level of trust of information on the web and social media in comparison to other media. Europeans are rather skeptical of media (TV, radio, newspapers, online media, social media): 41 % have medium trust towards it and 38 % have low or no trust. Only 21 % claim high trust in the media. Trust towards the internet is lower than for other media: 36 % of individuals trust the internet and 21 % trust online social networks, while 59 % trust the radio, 50 % trust the TV, and 46 % trust the written press.

The internet and online social media are also not trusted by a large share of individuals, 48 % and 59 % respectively. Distrust towards online social media grew in a year from 55 to 59 % when the share of people who didn't know whether they trust the media diminished by 5 %. Distrust towards the web is rising too, from 45 to 48 %.

That being said, the internet has become the second source of national political news after TV (40 % vs 77 % on average for the EU), especially among those still studying. Social networks are not a widespread source of political news (16 %).

The profile of those who trust the web is not significantly different from those who trust other forms of media: they are found across all age groups, although their share diminishes as people get older: 47 % of 15-24 years old trust the web vs only 1 in 5 people over 55 years old.

Trust in information found online has increased between quarter 3 of 2015 and quarter 3 of 2016 in 19 Member States, especially in Western Europe, while it decreased at the same time in 16 Member States and particularly so in Eastern Europe. Online social networks are distrusted across Europe with levels of distrust ranging from 36 % in Bulgaria to 75 % in Sweden, while trust ranges from 8 to 36 %.

When it comes to children, consulting the news or media online is a complicated activity: according to the Ofcom 2017 report, nearly half of the 12-15 years old who use social media to keep up with the news find it difficult to say whether a news story is true, and two in five saw something they thought was fake news. Children develop strategies to check the trustworthiness of news by checking if a story appears in different places, looking at the comments, and paying attention to the news brand. 25 % would look whether the source was trustworthy or whether they had heard about the organisation behind it.

Online gaming is a time-consuming activity

According to Eurostat (2018), 40 % of Europeans downloaded games in 2014. An IPSOS study of 2016 shows that gaming is popular among all age groups. 27 % of individuals between 6 and 64 years old played games on a smartphone or a tablet in the third quarter of 2016 vs 18 % for the same period in 2012. The same IPSOS study also shows that online gamers are both men and women (44 % of women play online games), and that men between 18 and 24 years old increasingly play online games (40 % in quarter 3 of 2016 vs 27 % in quarter 3 of 2012). They play for 3.7 hours a week on average. Gaming is a time-consuming activity: people between 25 and 35 years old spend 6.2 hours playing online games per week, while people aged 45-64 play for 7.5 hours. This number is even higher if offline games are included.

3.2.4 Exposure to harmful content

Children spending time online are at risk of encountering 'harmful' content, i.e., hateful, violent or sexually-laden content that they do not know how to deal with. According to Ofcom data, most 8-11-year-olds and 12-15-year-olds say they have been told how to go online safely. Yet, 17 % of 8-11 and 29 % of 12-15-year-olds said they have already seen things online that they found worrying or nasty. Of 12-15-year-olds, 45 % say they saw hateful content and 10 % sexual content that made them feel uncomfortable. Most children say they would report the content to someone, usually a family member. Three-fourth are aware of the option to report something as inappropriate online, and 1 in 8 already used that option. 12 % of 12-15-year-olds were bullied on social media, which is a number equal to those having experienced face-to-face bullying (Ofcom, 2017).

3.2.5 Shared values to guide future policies about the internet

According to the Next Generation Internet Initiative consultation (Overton, 2017), European citizens find it important that the internet ensures their sovereignty over their own data and protects privacy (75 %); ensures diversity, pluralism, and a right to choose (66 %); and avoids the concentration of data in a few proprietary platforms (65 %). These were the top three picks in a survey on qualities of the internet.

The emphasis on privacy and data protection might be linked to the share of individuals who have experienced security issues when using the internet for private matters (40 % in 2015) and who have prevented themselves from doing things online due to security concerns (24 % in 2015). Awareness of how technology functions is however low. For instance, Eurostat data shows that only 26 % of individuals know that cookies can be used to track activities.

The consensus on pluralism and the right to choose seems to find some representation in reality. Indeed, according to Eurobarometer (2016), social networks can get people interested in European affairs (56 % of participants), are a modern way to keep ahead of political affairs (56 %), and a good way for people to have their say on political issues (54 %). However, users do not see the web as a place to exercise their rights: Eurostat data shows that only 9 % participated in online consultations or voted electronically in 2017, and those who consult the webpages of public services contact them through another means than the internet half of the time.

3.3 Internet addiction

3.3.1 Prevalence, symptoms and treatment

Internet addiction, also called internet addiction disorder, is the first of eight categories of harm to society and culture that were identified for this study. It is also the topic of Part I of this study. That report focuses on the harmful effects of internet addiction at an individual and clinical level, while this section focuses on harm to society, including harm to addicts and to those related to them.

Internet addiction can be defined as the compulsive use of the internet in a way that interferes with normal living, and cause impairment, distress, and stress on family, friends, loved ones, and one's work environment (cf. Cerniglia et al., 2017). Internet addiction is not included in official lists of diseases used by health professionals. However, its inclusion is currently a topic of debate. For instance, there is currently an intense debate on its inclusion in the American Diagnostic and Statistical Manual of Mental Disorders (DSM). Since July 2018, gaming addiction is recognised by the World Health Organization in its International Classification of Diseases (ICD), under the label 'gaming disorder', but internet addiction currently is not. There is nevertheless a case to be made, based on the available evidence, for recognising internet addiction as a behavioural addiction alongside others like gambling.

Definitions of internet addiction that merely define it in terms of to the amount of time spent online are seen as invalid because of the entanglement of internet with daily life, but also because of the subjective conception of time. Johnson and Keane (2017), therefore, suggest that a judgement on a state of internet addiction is bound to be subjective or arbitrary if it's based on time and volume of internet consumption. Such a judgement implies that time can be misused, meaning that the time spent online could be better spent elsewhere, which conveys the assumption that there are more valuable activities. The value of activities could be discussed with respect to the impact they have on one's wellbeing. Such approach opens the possibility that, internet addiction might improve some aspect of quality of life in individuals with social disorders. For others, rather than the consequences of internet addiction, it is the mere excess of internet use that is to blame as not virtuous, and by itself a threat to wellbeing (Jin & Spence, 2016).

Internet addiction is better conceptualised as 'problematic internet use' or 'compulsive internet use' (Ainin et al., 2017). It is then defined as the inability of a user to control their use of the internet, which causes distress and some functional impairments in their daily life (Shek et al., 2013; Yao & Zhong, 2014). The concept of autonomy is deeply embedded in addiction as addiction interferes with the individual's ability to pursue life independently. Jin & Spence (2016) show that from both a daoist and a stoic perspective, internet addiction is a threat to wellbeing. Both of these philosophical streams do not approve of things in excess. According to their understanding, excess leads to a loss of freedom and form of enslavement. Individuals have then no control over their behaviour.

Dau et al. (2017) draw on Davis (2001) to suggest a distinction between general and specific form of internet addiction. In specific forms, the addiction is linked to the activity carried out online, and the internet is only a means to fulfil the addiction: it is a means to view pornographic material, to play video games, to gamble, etc. However, for many such addicts the internet gives easy access to these addictive goods, and becomes their primary source (Starcevic & Aboujaoude, 2017). The general form of internet addiction is the addiction to being online in general.

The policies and treatments recommended for internet addiction overlap largely with those for other addictive pathologies. Speaking of general internet addiction, therefore, allows to cover the key aspects of the problem. This section does not discriminate between different forms of devices used to access the internet even though a recent stream of research calls to pay attention to 'smartphone addiction' (Lin et al., 2016; Duke & Montag, 2017), a pathology that overlaps with internet addiction but is not entirely synonymous with it. Research in that area is burgeoning and needs to be monitored.

Internet addiction is a topical issue, with the number of individuals addicted to the internet rising (Randler et al., 2014). A global study of internet addiction shows that 6 % of users can be considered addicts, with an average of 2.6 % in Northern and Western Europe and 6.1 % in Southern and Eastern Europe (Cheng & Li, 2014). Durkee et al. (2012) found that 4.4 % of European adolescents can be considered internet addicts. Other studies show percentages ranging from 2 % to as high as 14 %. Internet addiction can be seen as a public health issue given that it presents a threat to mental health. It can prove to be especially damageable with adolescent populations due to their neurodevelopmental plasticity (Cerniglia et al., 2017). Internet addiction involves the same neural circuiting in the brain as substance abuse and other addictive behaviours (Jin & Spence, 2016).

In adolescents, internet addiction manifests itself through distress, anger, a loss of control, social withdrawal, dishonesty, familial conflicts, etc. It is also proven that people with severe mental disorders develop internet addiction disorders more easily, and some studies suggest that internet addiction can enhance severe clinical conditions such as becoming dysthymic, bipolar, having a social-anxiety disorder or a major depression (Cerniglia et al., 2017). It has a negative impact on neurological, psychological, and emotional development in general (Adalier & Balkan, 2012). Internet addiction also has negative consequences on school performance and social functioning (Brezing et al., 2010). Internet addiction in adolescents also leads to a higher risk of developing gambling-related problems (Philips et al., 2012).

Internet addiction has been shown to correlate with a number of psychopathological issues: depression, self-destructive behaviour, anxiety, attention deficit, hyperactivity, hostility and aggression, obsessive-compulsive symptoms, relational problems, disordered eating, poor academic achievements, personality disorders, maladaptive behaviour, depressed mood, poor self-control, and elevated impulsivity (Cerniglia et al., 2017). Whereas it is too early to draw causal relations, individuals with internet addiction have mental disorders twice as often as other populations.

3.3.2 Characteristics, drivers of and harm caused by internet addiction

Internet addiction involves four elements (Ainin et al., 2017):

- 1) excessive use, which leads to a loss of sense of time and neglect of basic drives;
- 2) withdrawal, i.e. a feeling of anger, depression, tension, when the computer is withdrawn;
- 3) tolerance, i.e. the need for more advanced equipment;
- 4) negative social repercussions, linked to the feelings of anger, depression, and tension that are present.

It is, therefore, deeply linked with co-morbid symptoms. Predictors of internet addiction are psychological and emotional states like shyness and loneliness (Ang et al., 2012; Odaci & Celik, 2013; Tokunaga & Rains, 2010). Shy people tend to spend more time on Facebook than others (Ryan & Xenos, 2011). For stressed people, the internet offers a way to escape from their situation and relieve the feelings associated with it (Zou et al., 2015).

Internet addiction can be seen as a dissociative response to painful emotional states (Tao et al., 2010) or a way to escape dysphoric mood (De Michele et al., 2013). However, such symptoms are not exclusively related to internet addiction, which makes it more difficult to establish the correct diagnosis. What appears true, though, is that internet addiction fosters a model of 'rich gets richer' (Kraut et al., 2002) where the internet offers benefits to populations that are already well adjusted while fostering higher depressive symptoms in those who are not.

There is no conclusive evidence that age is a predictor of internet addiction. For example, Randler et al. (2014) did not find any special correlation between those two elements in their research, whereas Tonioni et al. (2012) did. Some research results suggest that males run a greater risk of suffering from internet addiction than females (Wallace, 2014).

It is difficult to characterise the impact of one's occupational position on internet addiction since most studies have focused on students, whereas the investigation of internet addiction in adults started only recently (Ainin et al., 2016). The study by Ainin et al. (2016) shows that middle age individuals (21-39-year-olds) and people occupying middle management positions are more likely than others to suffer from internet addiction. Leung & Lee (2012) show that internet literacy, especially in its dimension of publishing literacy (ability to publish and edit text online) and technology literacy (competences in using internet technology) increases the likelihood of getting addicted to the internet.

Most of the literature investigates causes for internet addiction in the form of pre-existing conditions or behaviours in internet users. It is, however, recognised that external factors also contribute to internet addiction. Studies have shown that some internet companies try to 'hook' users to their services by making them addictive. This applied, amongst others, to online gaming sites and social media services. For example, a 2017 article in Slate magazine by Will Oremus suggests that the functions and interface of Facebook are meant to be addictive and exploit vulnerabilities of individuals by including systems for generating social validation feedback loops through 'likes' and similar feedback.

Some studies have shown that internet addiction is related to internet penetration rate and GDP per capita. Cheng & Li (2014) show that internet addiction is more prevalent in countries with greater traffic, pollution, and dissatisfaction with life in general. The underlying assumption of this study is that individuals who are not enticed to spend time outdoors (because they have a 'negative' environment), tend to stay at home and spend more time online.

Behaviours linked to internet addiction can also have positive impacts on individual's quality of life. For example, Cerniglia et al. (2017) explain that adolescents who suffer from different types of social withdrawal and tend to overuse the internet can find similar people online and thus improve the quality of their life.

In summary, Internet addiction is a condition that was found to affect a significant percentage of European adolescents and adults, with studies putting the number of affected internet users between 2 % and 14 %. Internet addiction is a harmful lack of control over one's internet consumption that can lead to a decrease in physical and psychological wellbeing, with associated symptoms of distress, anger, loss of control, social withdrawal, familial conflicts, and others. It can accentuate co-morbid symptoms and push people towards isolation. Internet addiction reinforces inequalities: vulnerable populations, in particular people with co-morbid symptoms, have greater risks of suffering from internet addiction. Internet addiction is exacerbated by some internet companies trying to 'hook' users by making their services addictive.

3.4 Harm to Cognitive Development

Section 3.4 considers the impact of the internet on cognitive development, i.e., on the evolution of skills related to perception, thought, memory, language, reasoning and intellectual development of individuals. The internet has introduced important changes in the way in which people process information. It makes up-to-date information accessible at any time on almost any topic. It also presents texts in a non-linear way on separate web pages, stemming from a plethora of more or less identifiable sources. It, therefore, requires new patterns in the development and execution of mental processes for learning and making decisions. The internet introduces a new form of organisation and memorisation of information: whereas biological memory is organised in an integrative way, building on itself and establishing links between objects, computer memory only allows for information retrieval (Heersmink, 2016).

3.4.1 How the internet affects cognitive development

Over the last ten years research about the impact of the internet on cognition has especially focused on children, given that new generations are indulging in extensive use of the internet from a young age, that may structurally alter the way in which their cognitive capabilities develop. Researchers in cognitive development have focused on the following three topics:

- 1) Investigations of how children develop abilities to understand and react to the consequences of internet use;
- 2) Studies of the process of online decision-making;
- 3) Studies of how the internet shapes cognitive skills, in particular memory and attention.

Understanding the internet

Children do not seem to be cognitively equipped to understand the concept of the internet along with the consequences it might have onto real life. Children experience difficulties in understanding the concept of the internet because they cannot perceive it through a sensory-motor perspective, as they would be able to do with a physical object (Bordoff & Yan, 2018). They also have difficulty coping with the consequences of harmful internet use. For example, Haddon & Livingstone (2017) show that children experience difficulties in developing coping responses in case of cyberbullying.

Making decisions online

The literature concerned with decision-making looks at the behaviours of users who are addicted to the use of internet. Such studies show that individuals addicted to the internet make decisions that can maximise immediate rewards in spite of the probability of yielding a net loss (Loh & Kanai, 2016). This maximisation of reward is a risky behaviour. Self-control mechanisms are poorer in individuals addicted to the internet, even if

more evidence is required to characterise the relationship between poor cognitive skills and the internet in that sphere (Loh & Kanai, 2016). In their review, Loh & Kanai (2016) show that individuals with addiction to the internet and online gaming manifest different brain activities in response to games-related cues than to others. The grey matter is being concentrated in parts of the brain linked to enhanced dopaminergic release, while they have poorer grey matter in areas linked to cognitive control. Comparative research on a healthy population has yet to be conducted.

Development of cognitive skills

Human cognition has always adapted to change, including changes brought about by the use of new technologies. Cognitive skills of children and adults also adapt to the use of the internet. While there is research showing that internet use, including specific uses such as gaming, can enhance certain cognitive skills, other research suggests that there are negative consequences, including ones that involve structural changes in the brain (Loh & Kai, 2016). A widespread argument is that the internet diminishes our abilities to read, remember, and concentrate (Carr, 2011). Consequently, human beings are becoming cognitively lazy and superficial thinkers (Greenfield, 2011).

The accusation of laziness is backed up by studies showing that fewer efforts are put into storing information in memory when using the internet (content), but instead one memorises where to retrieve the information (access) (Sparrow et al., 2011). For instance, when one lacks certain information, one looks for it online. When one knows that the information looked for is available externally, one puts less effort into encoding the information internally, while if one knows the information will not be available, then one puts more effort into encoding it and has a better recall of the information (memory). Development researchers speak of a symbiosis between human cognition and computers that regulates what is memorised or not and is becoming a form of external memory. Through the use of the internet as an external memory source, people become more dependent on it, and often need to access the web for information to make a decision or take action.

The issues are not linked to memory only, but also to analytical thinking. Carr (2011) pursues the argument that the use of the internet, i.e. the permanent access to information, leads to a shallower information processing, which is essentially more rapid, non-linear, including reduced contemplation and decreased information retention. Liu (2005) and Nicholas et al. (2009; 2011) show that browsing and scanning behaviours lead to keyword spotting, non-linear reading and decreased sustained attention. One could say that learning is impaired because of the reduced attention, memory, and processing of information (Loh & Kanai, 2016).

Other studies have shown that whether learning is impaired or improved depends on the learner. Some studies show that the characteristics of the learner mediate the effect of hyperlinks (Niederhauser et al., 2000; Shapiro & Niederhauser, 2004), such as one's cognitive style, prior knowledge on the topic, better meta-cognitive abilities, motivation, all of which can *increase* learning performance with hypertexts. Loh & Kai (2016) have also shown that supported navigation can compensate for the potential negative effects of hyperlinks, thus resulting in improved learning performance.

Heavy claims have been made regarding to the internet's impact on the human attention span. A 2015 Microsoft study indicating that the human attention span had decreased from twelve to eight seconds since the mobile revolution has caught much media attention (Microsoft, 2015). This study has however been discredited, and there are studies that show the opposite. For example, a study by Green & Bavelier (2003) that show that habitual gamers have better attentional abilities than non-gamers. Possibly, the internet diverts one attention, but not necessarily due to inherent characteristics of the medium but by content providers and advertisers who are abusing techniques to capture the user's attention.

Internet users also tend to engage in multitasking, and a study by Loh & Kanai (2016) shows that multitasking is associated with increased distractibility and decreased classroom learning and academic performance, as

well as with negative impacts on executive control abilities (see also Ophir et al., 2009). It also has a negative impact on adults' performance.

Dreyfus (1999) highlights the phenomenon of 'hyperlearning', which is the possibility for anyone to learn anything at any time because of the access to knowledge the internet provides. At the same time, he criticises the lack of commitment to that type of learning, which results, in his view, from information becoming a decontextualised consumer product that is digested whenever people want to. On the internet, relevance and significance are no longer made clear by context, and every bit of trivial information is treated the same as more meaningful information. The type of learning this produces may, according to him, prevent individuals from turning the information they have access to into meaningful skills. This hypothesis has however not yet been tested empirically.

The changes brought about by the use of the internet could have long-term consequences for the development of cognitive skills, some studies show. According to Wolf, Barzillai & Dunne (2009), one of the dangers of cognitive laziness and shallow information processing is that it can prevent the development of deep reading skills (e.g., inferential reasoning, critical analysis, reflection, etc.). Loh & Kanai (2016) argue that if one indulges in shallow information processing, as may happen in internet use, there is a risk that these skills and their corresponding brain structures will not develop properly.

The internet has an impact on how one reads and writes. Studies aimed at testing whether typing or writing had an impact on how information is learnt and read have shown that writing by hand leads to higher performance in terms of language acquisition and reading (Kiefer et al., 2015).

On the positive side, for certain population groups such as the elderly, the internet can lead to improved cognitive skills (Klimova, 2016) by giving them easier access to means of cognitive training. For younger audiences, specific formats of online text presentations have been proven to lead to better reading, comprehension and academic performance (Walker et al., 2005), which highlights the potential of transforming the internet into a positive tool. A framework by Johnson (2006) also postulates that playing online video games can result in improvements in terms of visual memory, attention and simultaneous processing; web browsing can help enhance meta-cognitive abilities through the development of search strategies, in addition to visual perception, knowledge base, and language related skills. Finally, Johnson (2006) links the use of the internet for communications purposes to improvements in processing speed – as the instantaneous nature of the conversations requires prompt answers – as well as in language skills. Social media users may develop better social competences, even as communication in online environments involves social cues that are different from those present in real life (Mills, 2016).

3.4.2 Assessing harm to cognitive development

The value of different cognitive skills

There is a methodological problem with evaluating what kinds of cognitive abilities are more important than others (Heersmink, 2016). The value of cognitive abilities is in part intrinsic and in part instrumental. It can be argued that in an information society, having skills to navigate, evaluate, compare, and synthesise information online are more valuable than being able to keep these facts in one's biological memory. Such a perspective assumes that what is desirable in terms of cognition is dependent on the task at hand, and it treats cognition as a positional good. Yet, the tasks at hand today and in a decade from now might differ, and one needs to have developed the skills that will be required in the future as well. There is a friction between a cultural-historical approach of cognition, whereby one is sensitive to the changes in the environment and accepts cognitive changes as an adaptation mechanism, and a biological and cognitive approach that can lead one to see these changes as detrimental, i.e., leading to the loss of skills.

In order to assess the value of specific skills, it may be necessary to take into consideration the future technological landscape. For instance, Heersmink (2016) mentions that the development of more embedded and interconnected technologies such as the Internet of Things (the emerging network of everyday things that are connected to each other through embedded software) will accentuate and bring up new challenges for cognition.

Harm related to cognitive development

It is difficult to assign harmful effects to information and communication technologies because of their multifunctional character: different functions and uses of one and the same technology do not have the same potential benefits and harmful effects, and it is difficult to generalise their impact on cognition (Heersmink, 2016). Moreover, different designs of internet technology (for example web pages and texts) can have different effects on learning and cognitive development, and as stated, individual differences can also play a role in whether cognitive development is impaired or aided. There is thus considerable complexity and uncertainty regarding the impact of internet use on cognitive development, and based on current evidence, it seems reasonable to conclude that internet use can have both positive and negative effects on cognitive development and cognitive functioning. More research is needed to draw more definitive conclusions.

Nevertheless, there is some evidence that at least some children can be harmed in their cognitive development by prolonged internet use. There are several cognitive capacities that could potentially be harmed, including memory skills, attention span, abilities for critical reasoning, language acquisition, reading, and learning abilities. There is reason for caution before children are given extensive access to the internet at a young age, and before it is made into a key learning instrument in primary and secondary education.

In summary, empirical evidence suggests that internet use can have both positive and negative impacts on cognitive development. On the positive side, under proper circumstances, internet use can enhance reading and comprehension, visual memory and processing, and other cognitive skills in children and adults. On the negative side, there is evidence that children can be harmed in their cognitive development by prolonged internet use, including harm to the development of memory skills, attention span, abilities for critical reasoning, language acquisition, reading, and learning abilities. More research is however needed to draw more reliable conclusions.

3.5 Information overload

Information overload is the condition of having too much information to adequately understand an issue or make effective decisions. Alternatively, it has been defined as the condition in which 'an individual's efficiency in using information in their work is hampered by the amount of relevant and potentially useful information available' (Bawden & Robinson, 2009), or the condition in which 'a person cannot process all communications and information inputs which results in ineffectiveness or terminated information processing' (Rogers & Agarwala-Rogers, 1975). Information overload often involves being burdened with a large supply of unsolicited information, only some of which may be relevant (Edmunds & Morris, 2000; Butcher, 1998). It is also at issue when information becomes a hindrance even though it is potentially useful, making individuals less performant at their task. Information overload has synonymously been described also as 'infostress' and 'information obesity', indicating the negative implications for mental and physical health. Other terms to describe information overload are 'analysis paralysis' (Stanley & Clipsham, 1997) and 'information fatigue syndrome' (Oppenheim, 1997).

While no reliable data could be found that details information overload in Europeans, a 2016 survey in the United States found that 20 % feel overloaded with information, going up from 13 % in 18-29 year-olds to 31 % in those 65 and older (Horrigan, 2016). A 2013 U.S. report found much higher numbers from millennials (18-32 years), with 41 % of them reporting that they suffer from information overload, compared to 31 % for older generations (Cornerstone OnDemand, 2013). As these studies are based on subjective self-reports, more research is needed using objective criteria to determine the true extent of information overload in populations.

The concept of information overload has not come into existence with the internet: its traces can be found back in literature from the 19th century, although with the internet it has gained a contemporary meaning: the internet is an environment in which one can access great amount of information in great variety of formats and resources which are accessible through more channels (Bawden & Robinson, 2009). This multiplicity of formats and resources reinforces the phenomenon of information overload. Bawden & Robinson claim that at the same time, the homogenisation that the internet imposes on communicated information can enhance information overload, information which in digital form lacks the diverse look and feel of traditional print media, such as that of books, hand-written diary entries, journal articles, and photographs.

Eppler & Mengis (2004) state that internet-related information overload can occur at the time of: i) information retrieval, organisation, and analysis; ii) decision-making and iii) communication. At all three points, individuals can experience too great a quantity of potentially useful information. In decision-making processes, information overload is time-bound and related to tasks to be performed. It implies an active attitude from the individual who is bound to perform a task. This form of information overload is particularly salient in business contexts, as well as in consumer contexts, although not necessarily in relation to internet use. Oppenheim (1997) shows more generally that managers have difficulties controlling the amount of information they need. They are simultaneously being torn between a feeling of not having enough information and simultaneously being overwhelmed by it.

Edmunds & Morris (2000) suggest that the problem of information overload in decision-making consists of identifying the information one needs in order to make the decision. In the processing of consumer information, information overload is produced by the complexity and ambiguity of the information, the range of brands available, and is correlated with one's motivation (Li, 2017).

Information overload stemming from communication can be the result of a permanent flux of messages, emails or information, which happen in the background of the individual's tasks. This form of information overload is perhaps the most frequent. It can be the result of business emails but also of social media use (Sasaki et al, 2015; Bucher et al., 2013; Chen & Lee, 2013; Bawden & Robinson, 2009). Cross-posting the same information on different platforms (Douglis, 2010), confronting users with the same message several times and

confronting them with messages relevant only for users of an associated platform can all contribute to information overload.

3.5.1 Causes of information overload

Eppler & Mengis (2004) classify the determinants of information overload as the information itself (quantity, frequency, intensity, and content characteristics), the tasks to be performed, characteristics of the person, organisational elements, and the information technology involved. Other authors distinguish objective (or extraneous) and subjective (or intrinsic) elements of information overload (Carlson, 2003). Information overload is influenced by intrinsic factors dealing with information itself, extraneous factors pertaining to the individual and his or her feelings and perception (i.e., more subjective factors), and the interplay between these intrinsic and extraneous factors (Jackson & Farzaneh, 2012). Intrinsic factors include the complex and ambiguous character of information (Li, 2017), its uncertain character (Eppler & Mengis, 2004), the diversity of formats and perspectives according to which information is delivered (Bawden & Robinson, 2009), and the quantity of information and its qualitative aspects (Eppler & Mengis, 2004). For instance, Bawden & Robinson (2009) explain that information overload is often associated with changes in the informational environment that make navigating and assessing information more difficult, such as: 1) the loss of authorship information and other identifying aspects of the informational sources; 2) the impermanence of information that can be updated at any given time; and 3) the shallow novelty of information, where one needs to find pretexts to publish and update information.

Extraneous factors are linked to information processing styles but also motivation to process the information (Li, 2017; Jackson & Farzaneh, 2012; Muller, 1984), to process contextual factors (Eppler & Mengis, 2004), and the time available (Eppler & Mengis, 2004). According to Kirsh (2000), cognitive overload occurs when information overload is combined with multitasking and interruptions, i.e. when it is induced by the context. Information can itself come as a form of interruption (notification). The issues stemming from a system interface can also lead to information overload (Li, 2017).

Some characteristics of the way in which one uses the internet and social media are also correlated with information overload. Beaudoin (2008) has found that the greater the use of internet, the less information overload is experienced. Previous literature on information overload has showed that individuals make an assessment of whether they can handle information, and then based on this assessment decide whether to process the information (Hiltz & Turoff, 1985). Beaudoin (2008) suggests that frequent internet users have developed strategies to handle the information and have greater skill in doing so.

Sasaki et al. (2015) have shown that having a higher number of friends on Twitter increases the risk of information overload, whereas a higher number of tweets in one's newsfeed is not significantly correlated to information overload. Having many friends online leads to a high number of potential sources of information and people to keep up to date with.

The way that social media services are designed to work can also be seen as causing overload: social media services are premised on the idea of a continuous stream of news and other content that individuals have to keep up with. In practice, the controls offered to users for unfollowing or muting some content sources appear to be difficult to use: organising one's newsfeed may require one to go through hundreds of friend profiles and liked pages.

3.5.2 Harm associated with information overload

Turning now to its harmful consequences, information overload frequently results in omission (i.e., in selecting information for cognitive processing, one passes over the more difficult aspects, even when they are relevant) or error (Vickery & Vickery, 1987). Information overload is also associated with a loss of control and a feeling of

being overwhelmed, both of which may have a negative effect on one's wellbeing. This perception of overload is linked to 'technostress' since it induces a correlate perception that one is being controlled by technology.

Information overload can lead to continuous partial attention, i.e., a focus on being in touch and connected that causes stress. It can also lead to attention deficit disorder, i.e., distractibility and impatience as a result of too many mental stimuli. It can lead to reduced intellectual performance, diminished decision-making ability and poor judgement, as well as a random use of technologies (Carlson, 2003). Ultimately, it can cause harm to one's psychological character. Studies reviewed by Bawden & Robinson (2009) also show that information overload can result in diminished job satisfaction, damaged personal relationships, and harms health.

Different strategies aimed at reducing information overload have been identified in the literature. First, one can adopt a strategy of information withdrawal, which entails minimising the number of informational sources used, while adopting more nuanced filter strategies (Savolainen, 2007). Second, one can practice information avoidance. Third, one can adopt a strategy of satisficing information, i.e., defining in a rational manner the levels where one has just enough information to make a decision. This strategy is difficult to put to practice as it requires that one is rational about one's search for information. A lack of rationality could lead to an avoidance or random selection of information, potentially introducing a bias that will negatively impact the quality of one's decision-making.

Information overload be combated by conditioning one's subjective responses to information, but it can also be combated by managing the information environment itself. Technologies that help one better select, organise and process information can also be part of the solution. Artificial intelligence can potentially be used to automate part of the information processing task. Fundamentally, however, cultural changes may be needed in how people produce and communicate information, stemming the flow of messages and information that people receive on a daily basis.

In summary, information overload is the condition of having too much information to adequately understand an issue or make effective decisions. Information overload is associated with loss of control, feelings of being overwhelmed, reduced intellectual performance, diminished job satisfaction, damaged personal relationships, and harms health. Studies suggest that 20-30 % of the population suffers from information overload. Particularly at risk are managers, consumers and social media users. Experienced, frequent internet users appear to be less at risk, since they may have developed effective strategies to handle information.

3.6 Harmful effects on knowledge and belief

The internet does not only serve to inform people better, it also misinforms (*'the problem of misinformation'*) and informs selectively so as to reinforce beliefs and opinions that people already have (*'the problem of selective exposure'*). We will review studies of these two interconnected problems, analysing their nature, their prevalence and their causes.

The *problem of misinformation* concerns the factual correctness of information on the internet. Much information on the internet is factual in nature: it concerns statements and other types of information that are verifiably, objectively true or false. This includes, for example, information about the chemical properties of sodium, the age and marital status of the singer Beyoncé, the causes and symptoms of heart failure, and the number of murders in the state of Texas in 2017. We will consider how much false information there is on the internet, how false information spreads, how difficult it is for people to recognise false information, how easily and how often people are lead to believe false information on the internet, and what harm results from (belief in) false information on the internet.

The *problem of selective exposure* concerns the phenomenon that the information and opinions that people are exposed to on the internet tend to be congenial to their existing beliefs, opinions and interests. They often do not challenge, threaten or expanding them but instead reinforce them. Selective exposure has been associated with two pervasive online phenomena: filter bubbles and echo chambers. *Filter bubbles* are conditions of information bias and intellectual isolation brought about by personalised search and information retrieval algorithms that selectively guess what information a user would like to see based on personal features like their search history, past click-behaviour, and location. *Echo chambers* are online discussion forums which contain like-minded individuals that reinforce and amplify each other's beliefs by communication and repetition, thus creating a closed system. We will consider the prevalence of selective exposure on the internet, its main causes, how it affects people's beliefs and opinions, and what harm can result.

3.6.1 Misinformation on the internet

The internet is an impressive source of information. The Web contains billions of indexed pages of information, and many billions more that are not indexed. It contains thousands upon thousands of websites designed to provide up-to-date and accurate information about all kinds of topics, from kitesurfing techniques to maritime history to the latest political developments in Zimbabwe. Yet, it has also been observed, the internet also contains an enormous amount of false, inaccurate and misleading information.

To our knowledge no studies exist that make a comprehensive quantitative assessment of the percentage of online information that is false or inaccurate. There even do not appear to be scientific studies that assess the accuracy of online news (although there are many that assess *perceptions of accuracy*). In the field of medicine, however, many studies have been published that assess the accuracy of health information about particular diseases. Most of these studies show that most of the websites that contain health information contain information that is low in quality, accuracy and completeness (Mathur et al., 2005; Venkatraman et al., 2016).

It is undoubtedly true that in other areas much of the information that can be retrieved is inaccurate, incomplete and of poor quality. This does not necessarily make the internet a poor source of information: an advantage of the internet is that it offers multiple sources of information about any subject, and that most likely at least some of these are reliable and of high quality. Users that are able to discriminate therefore will be able to find good and reliable sources of information on the internet.

The main cause of misinformation online lies in the ease by which anyone can post information online without any accountability. The internet allows anyone to post information without qualifications, peer review, and backup documentation to account for its veracity or accuracy. The normal editorial standards for publishing are not observed for internet information. Also, search engines tend not to distinguish between reliable and unreliable information, or true and false information. The low bar for posting information online means that many unqualified and misinformed individuals post incorrect information that is not corrected through some subsequent process of quality assurance. In addition, there are individuals and organisations that engage in deliberate campaigns of misinformation, for various personal, financial, political and ideological reasons.

The problem is further exacerbated by the fact that many users of the internet then go on to believe the false information that they find online and distribute it to others. Studies have shown that many users of internet information do not know how to properly distinguish between reliable and unreliable information that they find online. For instance, a study by Wineburg et al. (2016) showed that American students had an inability to reason about information they see on the internet, to distinguish advertisements from news articles, or to identify where information came from. A 2017 study by MindEdge of students and recent graduates showed that most were not able to distinguish fake from accurate news (MindEdge, 2017). Internet users are not sufficiently aided by search engines and other online tools to assess the reliability of information, since search engines do not rank for reliability or quality of information, and there are hardly any other tools available to users to make such assessments.

A particular problem is so-called *fake news*: false stories that appear to be news that are spread on the internet or over other media to influence political views or as a joke. Fake news is often political, but can also concern other topics, such as health issues, the woes of celebrities or the stock market. The internet has been plagued by fake news stories from its beginnings, but the problem has deteriorated in recent years, particularly by the large-scale proliferation of fake news through social media and certain popular alternative news sites. Many fake news stories spread quickly and is believed by large parts of the population. A study of 126,000 news stories shared by 3 million people on Twitter from 2006 to 2017 found that false news was 70 % more likely to be retweeted than true news (Vosoughi, Roy & Aral, 2018).

The proliferation of fake news seems to have three causes: diminished trust in traditional mainstream news media (even though traditional media often employ higher standards of journalistic accuracy than other media); the inability of many people to distinguish accurate from inaccurate news, and the presence of agents (fringe groups, foreign agents) that actively and deliberately distribute false news stories for political or ideological gain. A recent Eurobarometer report on fake news shows that 85 % of Europeans perceive fake news as a problem in their country and 83 % perceive it as a problem for democracy. 66 % trust television news, 63 % trust print news, and 47 % trust online newspapers and magazines (Eurobarometer, 2018). The proliferation of fake news has been linked to the decline of trust in expert authority in modern society (politicians, scientists, news media) and the emergence of post-truth politics, which are populist forms of politics in which appeals to emotion and personal belief are more successful in shaping opinion than reasoned discourse with reference to objective facts.

The harm that comes from this spread of misinformation is myriad and depends on the type of misinformation and how believers act on it. False health information can cost lives, false information about the stock market can cause financial losses, and false political information can deceive voters and sway elections. The proliferation of fake news, in particular, has been identified as a threat to democracy by many, including by the European Union, since it misleads voters, undermines and discredits serious media coverage, and tends to discredit governments and politicians. Combating misinformation and fake news has to be undertaken with caution, though, because removing it could be considered an abrogation of free speech.

3.6.2 Selective Exposure to Information and Opinions

Selective exposure to online information and opinions through filter bubbles, echo chambers and other information biases is widespread. A *filter bubble* is an online information environment which is personalised to a user based on website algorithms guessing what information a user would like to see based on information about the user, such as location, search history, and past click-behaviour. The concept was introduced by Eli Pariser (2012). Filter bubbles separate users from information that disagrees with their viewpoints and interests, thereby isolating them in their own cultural, political or ideological bubbles. Most internet users are caught in filter bubbles to some extent because they make use, often unknowingly, of personalised information services like Google Personalized Search and Facebook's personalised news-stream. Filter bubbles can be reinforced by users selectively seeking information that already confirms to their viewpoints or interests, which is then subsequently picked up on by personalisation algorithms that bolster this orientation. Filter bubbles strengthen an already existing trend on the internet of people on the internet breaking up into groups of like-minded individuals, which has been called cyberbalkanisation.

Filter bubbles are especially harmful when they reinforce existing political and ideological beliefs. They isolate the user against alternative viewpoints and tend to expose him or her to the views that are like-minded or more extreme, thereby potentially reinforcing political and ideological polarisation and undermining civil discourse, which requires exposure to, and engagement with, alternative viewpoints.

Echo chambers are online communication spaces in which like-minded people communicate beliefs and ideas that are then reinforced through repetition in a closed system that does not allow for alternative or competing beliefs and ideas. In echo chambers, methods tend to be used for expelling or silencing messages that are not

appreciated by the group. Echo chambers can be driven by political ideology, party identifications, political issues or causes, national or ethnic identification, religious identification, and other shared orientations. Echo chambers are believed inflict harm similar to that caused by filter bubbles, namely the reinforcement of polarisation and the undermining of civil discourse. Echo chambers and filter bubbles can also reinforce each other, since online communication spaces may include personalisation algorithms, and filter bubbles may direct users to echo chambers that reinforce their beliefs.

While filter bubbles have caused major worries in society, with politicians and tech leaders voicing concern, the empirical evidence for their pervasiveness has been mixed or negative. In a review of the empirical literature, Zuiderveen Borgesius et al. (2016) conclude that the filter bubble effects of either self-selected or pre-selected personalisation are not strong. In a study of personalisation for Google News, Haim, Grafe & Brosius (2017) also only found moderate effects, and in a study of social media use, Flaxman, Goel & Rao (2016) found that while social media use is correlated with increased segregation, the overall effect of filter bubbles seems to be limited.

There is stronger evidence for the pervasiveness of echo chambers. Studies have demonstrated that many communication environments with an ideological or political orientation function as echo chambers (Quattrociochi, Scala & Sunstein, 2016; Lasny, Waggle & Fisher, 2015). However, evidence suggests that only a minority of internet users are confined to echo chambers, and that most users have exposure to multiple news sources and communication channels of different ideological persuasions. This is a finding of Flaxman, Goel & Rao (2016), who also found that left-wing and right-wing partisans use a variety of news sources within their political ideological spectrum, but very few others, including mainstream sources. In a study of Twitter, Boutyline and Willer (2016) found that more conservative and more politically extreme individuals tend to associate online with others similar to oneself in political ideology, whereas moderate and liberal individuals tend to have more politically and ideologically diverse associations. In addition, Huey (2015) has found that echo chambers may support radicalisation and resulting terrorist acts.

In summary, empirical evidence suggests that the internet contains much false and misleading information, and that users have difficulty distinguishing accurate from inaccurate information. Fake news poses a particular problem, as it is often distributed intentionally, and widely distributed and believed. Misinformation can cause significant harm to the health and wellbeing of individuals and to the proper functioning of society, including the functioning of democratic institutions. The empirical evidence for filter bubbles suggests that this phenomenon may be overstated. Echo chambers, however, appear to be more pervasive, and may particularly work to separate those with more extreme and partisan political and ideological positions from the rest of society. In doing, so, they may undermine possibilities for civil discourse and for fostering tolerance and agreement, and thereby, ultimately, undermine democracy itself. In addition, echo chambers may support radicalisation leading to terrorist acts.

3.7 Harm to public/private boundaries

3.7.1 Potential harm

There is a widespread sense that the ways in which we use the internet and social media are increasingly blurring the boundaries between the public and private spheres. More people are sharing more information about more of their experiences on public platforms like Facebook and Twitter. Our private lives are increasingly open to the public and our expectations about what others can know about us are, or should be, changing. For example, employers are able to know much more about their current or potential employees, including information that they are not legally allowed to ask about. In addition to concerns about data mining,

surveillance, and targeted advertising by governments and corporations, the blurring of our public and private lives also raises the possibility of more prosaic, but still significant, harm.

It is noteworthy, in this respect, that early scholarship on the internet recognised it as a public space with distinctive properties. It was quickly recognised that the internet was not simply a digital marketplace or public forum, but a new kind of space with unique affordances for simultaneity, permeability, and exclusivity (Camp & Chien 2000). Much of this scholarship was concerned with its ability to function as a useful public space, but also with the ways in which its unique characteristics allow and force users to redraw the boundaries between private and public (Gabbard et al., 2011; McDonald & Thompson, 2016). It is now increasingly becoming clear that the internet also permeates private spaces, and is also a platform for information, communication and services that people consider private.

Related to the blurring of public/private boundaries, there is a sense that internet and smartphone use also blur the boundaries between what Van Dijk (2012) calls the spheres of living. The spheres of living are the activity domains in which people segment their lives. They traditionally include spheres of work, home, travel, and leisure, as well as a distinction between the private and public sphere. The spheres of living are traditionally bounded by time and space: work traditionally occurs in a workplace and during fixed working hours, and home life, leisure time and travel similarly have their own time and space. The internet and mobile media, however, blur the boundaries between the spheres of living, since any activity can now be performed at any place and any time. Thus, we see people working on vacation or at home, and playing games or facetimeing with friends at the office or while traveling. While boundaries between these spaces were traditionally maintained by their separation in time and space, people now increasingly have to maintain these boundaries themselves.

We can understand the threats posed by the internet to the boundary between our public and private lives, and between the spheres of living, in terms of two potential harmful effects. First, we must consider how the internet exacerbates the problem of competition for our limited attention and engagement (Brey, 1998) when spheres blur into each other, as when work bleeds into domestic life as a result of email accessibility – a phenomenon that Brey calls presence invasion. Second, assuming that certain shifts in these boundaries are inevitable, one potential harmful consequence is the difficulty in transitioning from one conception of the public/private distinction and of the spheres of life to another, with all the changes in behaviour and expectations that such a transition entails. This issue also raises the problem of how to manage and shape that transition, so that the new public/private boundaries and boundaries between spheres of life have the shape we want and reflect our core values.

3.7.2 Empirical evidence

There is a number of ways in which the potential harm to our public/private boundaries and boundaries between the spheres of living can be realised. Assessing these threats requires assessing the evidence for particular instantiations of these harmful effects.

Blurring the boundaries

There is no doubt that the boundaries between public and private, and even the meanings of those terms, are shifting. Our private activities—e.g. posts to friends on Facebook or Twitter or on a personal blog—are able to spread widely in the public sphere in a way that was previously only common for politicians and celebrities, individuals who are watched constantly. In response, people have begun curating their social networks and private personae to optimise whatever values they have (e.g. trying to maximise likes per post). Social media sites have begun doing the same thing, shaping the content of supposedly public online spaces using algorithms to enhance engagement. This is a different experience of the public sphere than existed before the internet and even in the period prior to widespread social media use.

Brey (1998) has argued that different 'presences' compete for one's attention. A presence is part of one's environment that invites one to engage with it, whether through attention or activity. Different presences compete for one's attention, as when one loses track of the narrative in one's podcast while preparing a complicated dinner recipe. On Brey's view, different presences necessarily compete with one another—one cannot engage with another without sacrificing attention to the first. While it is not necessarily a novel insight that one can't cook and fully follow the narrative of a radio/podcast program, the internet and social media have created forms and venues of presence competition that are both novel and potentially more harmful.

The clearest case of presence competition occurs when internet technology allows for the blurring of work and home life. A person who works from home is, in some sense, always in his/her office. This is especially true as more and more people are employed in the 'sharing economy' made possible through digital platforms from companies like Uber, TaskRabbit, and Favor. Jobs like this may require that work and leisure time bleed into one another. The number of such independent workers is increasing, both those working independent jobs full time (35+ hours/week) and those using these 'gigs' to supplement other full-time positions (MBO Partners, 2017). There is significant debate about the economic dimension of the 'sharing economy', with some arguing that Uber drivers and other 'gig workers' work more, earn less, and lack health benefits and job security (Singer, 2014).

However, in addition to these economic concerns, there are worries about the social and cultural effect of such work. For example, a person cobbling together full-time work from a number of independent sources may not be able to take weekends off. While this cost may be balanced by the benefit of greater independence, it may nonetheless interfere with the person's ability to socialise with traditionally employed friends or to spend time with family. Even more problematic is the increasing number of people who are supplementing their full-time jobs with occasional gig work, thereby diminishing their leisure time. A substantial minority (at least 13 %) of independent workers in the United States are in this position (MBO Partners, 2017).

Another concern is that people who work independently, at a variety of individual jobs, may not have access to some of the social benefits of employment, for example socialising with co-workers or working in a team. The sharing economy is often lauded as a way of bringing people together, but the evidence that it builds social capital is mixed (Schor, 2014). Finally, the employment apps themselves, like email and social media, are available on smartphones and are therefore present wherever one goes, competing for attention even when a worker is not on a job. This competition is driven by the ubiquity and interactivity of these digital platforms (Lievrouw & Livingstone, 2006).

In addition to competing for attention, internet and social media can invade our private lives in unwelcome and harmful ways. McDonald & Thompson (2016) describe how employers can use Facebook and Twitter to gather information about prospective employees that, in the past, would have been unavailable and which, in some cases, may be illegal to ask about. Such profiling is just one example of how social media open 'new terrains' for employees and management to contest their respective interests (2016). For example, private use of social media by existing employees to criticise company policies, practices, or managers may be viewed by employers as a legitimate cause for punishment, while employees view it as an appropriate form of 'voice' by which to express dissatisfaction (2016; see also Hirschman, 1970).

Another area of concern about the blurring of public and private spheres is safety and security, especially with regard to children. As internet and social media use increases among younger cohorts as a source of socialising and entertainment, children are entering the public sphere earlier. In particular, there is concern that ICT use is leading young people to engage earlier in consumer spending, public identity creation, and acquiring sexual knowledge and experience (Livingstone, 2005). One issue that recently became a popular topic in the media is cyberbullying. While many of the specific concerns that received media attention may be exaggerated, there is wide agreement that cyberbullying is a problem and that it is facilitated by social media use among younger people and by the public nature of otherwise private behaviour (Sabella et al., 2013).

Finally, many have expressed concerns about the phenomenon of publicly shaming strangers online for their private behaviour (Ronson, 2015). It is increasingly easy for a tweet or Facebook post to be spread to thousands or even millions of readers. There seems to be widespread agreement that public shaming is morally problematic as a form of social punishment (Radzik, 2015; Tandoc & Jenkins, 2018), even among those who believe such behaviour is sometimes justified (Jane, 2017). Nonetheless, it is easy for individuals to be harassed by publicly sharing their regrettable behaviour online.

Reconceptualising the boundaries

In response to the erosion of the traditional boundaries of our public and private spheres, and between the spheres of life, it is necessary to reconceptualise and redraw those boundaries in a way that reflects the practical realities of internet and social media as well as individual and social values. Redrawing the borders is inevitable, but it can be done in better and worse ways.

Many users are already adapting their practice to shifting boundaries and changing norms. For example, while much of the content, engagement, and behaviour that occurs on Facebook and other social media platforms would traditionally have been viewed as part of one's private life, users seem increasingly to perceive social network sites as public rather than private venues. They expect others, even indirectly linked others, to see or learn about what they post (Burkell et al., 2014). Adolescents, in particular, are becoming more selective and discrete about their online activity (West, Lewis & Currie, 2009; Patchin & Hinduja, 2010). Even so, while teens are increasingly selective in what they disclose online, they nonetheless are susceptible to posting regrettable content online, especially if they have more strangers as online friends or use social media more frequently (Xie & Kang, 2015). The fact that selectivity is improving among this vulnerable group is encouraging, but it is also evidence that users recognise reasons to distrust others online and harm that might result from careless online activity. Similarly, people are finding ways to adapt to new spheres of living, which have become more permeable and flexible, but in which they create their own boundaries, as well as new blends of work, home, leisure and travel.

Phenomena like this suggest that social media users are engaged in a transition from one set of public/private and sphere of living boundaries to another. Given the possible harm to users of misunderstanding changing norms and practices, it is important to manage this transition as effectively as possible. This is especially important because it does not appear that it is being actively managed now (Thompson, 2011) and because the transition, especially the one to a new set of public/private boundaries, makes possible the exploitation of vulnerable groups, like children, the elderly, and other infrequent or new users (Smahel & Wright, 2014).

In summary, the blurring of public/private boundaries and spheres of living due to the internet and electronic media has had major impacts on how people lead their lives. The absence of naturally occurring boundaries in the new configuration means that people have to actively maintain these boundaries themselves. If they fail to do this properly, significant harm can occur. One sphere of life can disrupt and even dominate others, as when work permeates home life, leisure, and travel, or as when individuals are so active on social media that their private life is fully made public. Harm that can result from such permeations includes loss of quality of life, harm to privacy, decreased safety and security, and harm to social relations – when friends and family members feel left behind when they lose out in the competition between spheres of life enabled by electronic media.

3.8 Harm to social relationships

3.8.1 Potential harm

One potential harm of increasing internet use is that it will undermine and degrade social relationships and reduce the quality of social interaction. A concern is that, as users spend more time online, they will neglect existing social relationships and be less likely to form new relationships. This would constitute a significant

harm because these relationships are non-replaceable contributors to human wellbeing (Helm, 2017). In addition, online social interactions, as is well-known, can be superficial, uncivil, and hurtful, and involves malicious behaviour like cyberbullying, online harassment, trolling and cyberstalking. There is worry in society concerning what the quality of online social interactions does to social relations.

The scholarship on social relationships and the internet is concerned with three potential threats: withdrawal, replacement, and degradation. We want to know whether and to what degree increased internet use leads users to withdraw from social relationships; whether it replaces these relationships with less valuable alternatives; and whether increased internet use degrades these relationships.

Internet use may harm social relationships by undermining them and by preventing the formation of new relationships of the same kind. Existing social relationships could be undermined in different ways. Users might, due to their (excessive) internet use, act in ways that actively damage the relationship. For example, an excessive consumption of pornographic material might cause damage to one's relationship with one's spouse. Alternatively, one might neglect the necessary maintenance of the relationship due to internet use. For example, one might choose to spend free time playing video games alone on the internet rather than spending that time socialising. Finally, internet use might undermine a relationship by decreasing the value of time that is spent with others. For example, one might spend time with friends and family checking Facebook or commenting on Reddit rather than engaging with one's friends.

Internet use could also harm social relationships by interfering with the creation of new relationships of that kind. The worry here is that, by spending time on the internet, one may fail to develop new offline relationships and that this will ultimately result in less meaningful and valuable sociality for the person. This phenomenon may manifest in various ways. For example, one may simply lose interest for forming new offline relationships or one may become unable to engage in common forms of offline sociality.

Of course, these broad categories of harm must be balanced against corresponding benefits. It may be that internet use allows people to improve their existing relationships, either by providing the forms of sociality that offline contact does not (e.g. completing a mission together in a video game) or by allowing the maintenance that isn't possible offline (e.g. regularly Skyping with family). Similarly, it may be that people are using the internet to form new relationships, either online relationships only or relationships that have significant online and offline dimensions (mixed relationships).

Given that internet use is increasing steadily — 71 % of EU citizens use the internet every day or almost every day (Eurostat, 2016), and 38 % use social media every day or almost every day (Eurobarometer, 2016) — the threat to social relationships seems credible. However, in order to assess the present extent and future risk of this harm we need to consider empirical studies.

3.8.2 Empirical evidence

Increased internet use has the potential to undermine every sort of social relationship from romantic partnerships and friendships to interactions with co-workers and even strangers. We will consider both close relationships and effects on sociability more generally. Our assessment of harm refers to how internet use undermines the purported benefits of social relationships: relationship satisfaction, attachment, emotional support, intimacy, reciprocal feelings and social capital (Fehr, 2004; La Guardia & Patrick, 2008; Fagundes & Diamond, 2013). It also considers malicious online social interactions and their effects on people.

While evaluating empirical evidence, several points must be kept in mind. First, we must identify at what level of use negative effects begin to appear (e.g. is it only in the case of heavy use or even at the moderate or low levels). Second, we must identify the relevant comparison class—e.g. it is one thing to compare the social value of internet use to watching TV, but another to consider it to be optimal form of sociability available. Third, much of the empirical evidence describes correlation and the direction of causation may go in either or both

directions—e.g. those less capable of offline sociality may turn to the internet, while others who turn to the internet may become less capable of offline sociality. Fourth, while much anecdotal evidence of the harmful effects of internet use refers explicitly or implicitly to the harm of replacement, it is not clear which offline activities, if any, are being replaced with time online.

Withdrawal

A first threat to social relationships, withdrawal from one's valuable relationships, is likely to be harmful whatever the cause. The present concern is that internet users will engage less with family, friends, co-workers, and others. Early critics of the internet worried that the internet would, like TV a generation before, cause people to be less social across the board (Bargh & McKenna, 2004: 577). However, the harm of withdrawing from relationships depends, in part, on the value of what replaces social engagement.

Replacement

A second threat to social relationships is the replacement of offline relationships by purportedly less valuable online relationships. As internet technology improves, online spaces will partially replace offline spaces for socialising and interacting. Early studies suggested that internet use replaced watching TV (Bargh & McKenna, 2004) but there is also some evidence that online activity is substituting for or competing with face-to-face interaction (Baek, Bae, & Jang, 2013; Taghavi & Goodarzi, 2016; Hill & Zheng, 2017).

Early commentators on computer-mediated communication worried about the relatively low 'bandwidth' of online communication, i.e., its ability to communicate the detail, nuance and important social cues found in face-to-face offline communication (Sproull & Kiesler, 1985; Bargh & McKenna, 2004). While current forms of online communication are much richer than purely text-based communication imagined by early critics, similar concerns are still discussed with respect to emojis, gifs, and other new communication tools (Highfield & Leaver, 2016). However, if these same technologies are improving the richness of online communication and, thereby, of online relationships, then we must ask whether replacement is such a bad thing? Some argue that online sociality is still relatively impoverished compared to offline one (Dreyfus, 2009). Others have claimed that richer forms of internet sociability make the replacement of offline relationships with online or mixed relationships seem less harmful on balance (Søraker, 2012).

In the end, it appears that there is some evidence for the replacement of offline by online social relationships, although the jury is still out on how worrisome this is for the quality of social relationships.

Degradation

A third threat of internet use concerns potential degradation (rather than replacement) of one's offline (or mixed) social relationships.

General sociability

It is often unclear whether internet use, especially social media use, is a form of social interaction or not. This question is particularly important given that users in the developed world are spending 2-3 hours per day on social media. According to one study, only 2 % of social interactions are led through social media and those were the cases of 'talk-focused, one-on-one exchanges' (Hall, 2018; see also Selfhout et al., 2009). This would seem to support claims that social media use is actually inimical to sociability (Kuss & Griffiths, 2011; Przybylski & Weinstein, 2013).

Romantic relationships

The harm that internet use causes to romantic relationships is best documented in relation to pornography. Given the number of internet users who regularly watch pornography—in a 2014 survey, 46 % of men and 16 % of women aged 18-39 report watching pornography in the previous week (Regnerus et al., 2016)—the potential harm caused by pornography deserves consideration.

Pornography use has the potential to harm relationships in a variety of ways. From a relative dearth of evidence on this topic ten years ago (Manning, 2006), scholars have increasingly identified a variety of harmful effects on relationships from watching pornography (Owens et al., 2012; Perry, 2017). Owens et al. (2012) summarise a variety of indirect negative effects of pornography on marital relationships (Reid et al., 2010; Manning, 2006) and family relationships (Perrin et al., 2008). Owens et al., note that adolescents who watch pornography have lower degrees of social integration, more delinquent behaviour, and decreased emotional bonding with caregivers (2012). Perry (2017) provides representative longitudinal data supporting the common assumption that pornography use by male partners (especially married ones) reduces marital quality over time. Indeed, his evidence suggests that pornography use is among the strongest predictors of decline in marital quality. Moreover, pornography use appears to be a proxy for other sources of marital dissatisfaction. Interestingly, though, the same study showed that pornography use by married women is associated with increased marital quality.

Friendships

There is a considerable amount of evidence linking internet use, particularly social media use, to loneliness and social isolation (Primack et al., 2017a; Shensa et al., 2016). For example, Primack et al. (2017a) showed that young adults (19-34) who spent more time online (top quartile) are twice as likely to feel socially isolated than those who spent less time online (bottom quartile). As already mentioned, this phenomenon might be explained through the replacement of face-to-face interaction with social media (Baek, Bae, & Jang, 2013). Another possible explanation is that viewing others' highly curated online profiles makes users dissatisfied with their own lives and relationships. In either case, there are at least indirect links between time spent on social media and increased symptoms of depression and anxiety, possibly mediated by loneliness and social isolation (Primack et al., 2017b; Andreassen et al., 2016; Block et al., 2014; Kross et al., 2013; Lin et al., 2016; Woods & Scott, 2016). Despite the various links between problematic social media use and mental health, it is not yet clear whether the total time, the frequency of use (Shensa et al., 2017) or the number of social media platforms (Primack et al., 2017a) is the most problematic aspect.

Relationships with non-users

In addition to potential harm to internet users themselves, increasing internet use can also harm non-users. Internet non-users are either individuals who have never used the internet or those who have quit using it. In a 2015 survey, roughly 30 % of non-users reported being excluded from communications with friends and family because they do not use the internet, and a similar percentage reported being told that others have difficulty contacting them (Surveying the Digital Future, 2015).

Malicious online social behaviour

Whereas most online social interactions are benign interactions with friends, families and likeminded individuals, the internet is home to a wide variety online behaviors that involve malicious intent. We will discuss the most important ones. *Online harassment* constitutes a broad category that covers most of the others. It is the act of sending offensive, rude and insulting messages to online recipients or being abusive to them. It can take place through email, chat and other forms of communication, but also through such actions as impersonation, doxing (the collection and distribution of confidential or hard to retrieve personal data from an individual), revenge porn, online shaming, online sexual harassment, cyber defamation, targeted hate speech, denial of access, and the targeted sending of viruses.

Cyberbullying is any form of repeated online harassment that involves sending or posting mean or cruel messages to people, either by individuals or by groups, usually on social media, and often anonymously. *Cyberstalking* is the anonymous use of the internet to pursue, intimidate and harass another person in a systematic way, through threatening messages, spamming or other means. It is punishable by law in many countries. Cyberbullying is more commonly associated with minors, whereas cyberstalking is associated with adults. *Online predation* is child sexual abuse that begins or takes place on the internet. It is a form of cyberstalking that involves an adult and a minor. *Trolling*, finally, is the posting of inflammatory, digressive, or off-topic messages in online communities in order to upset people, start quarrels or sow discord.

Online harassment has been experienced by 11 % of European women according to a 2014 study (EPRS, 2018). A 2017 U.S. study shows that 41 % of Americans have experienced online harassment, with 18 % reporting severe forms of harassment, including physical threats, stalking, sustained harassment and sexual harassment (Duggan, 2017). A 2014 German study showed that 6.3 % of internet users have been victims of cyberstalking. Of these victims, 23 % were harassed for more than 1 year, and 48 % were stalked at least once a day (Dreßing et al., 2014). As reported in section 3.2, 12 % of European 12-15 year-olds have experienced cyberbullying on social media. Studies show that online harassment can have detrimental effects on victims, especially the more severe forms. A 2015 study shows that victims of cyberstalking experience high levels of psychological distress, often with psychological effects comparable to those of post-traumatic stress disorder (Short, Guppy, Hart & Barnes, 2015). Victims can experience anxiety, depression, social isolation, trauma and disinterest in work or school. Instances of suicide because of cyberbullying or cyberstalking are reported regularly in the media.

Benefits

Internet use can be both beneficial and harmful to social relationships. The most obvious beneficence of internet use is the increasing ease with which families—including couples, parents and children, and extended families—are able to stay connected and, thereby, maintain and manage their relationships (Neustaedter et al., 2013). In addition, online dating services are now very prevalent, and make it easier for people to meet others and establish romantic relationships. The internet also makes it easier to find like-minded individuals with whom one shares interests. Studies also suggest that heavy internet users have significantly more friends than non-users and that users and non-users alike had more friends in 2007 than in 2002, despite the large increase in internet use over this period (Wang & Wellman, 2010; Livingstone, 2005). Sabatini & Sarracino (2014) show that social networking sites serve a number of relationship-promoting services, including promoting offline meetings between friends. A number of studies suggest that online sociality can promote social capital (Bargh & McKenna, 2004; Gross 2004; Sabatini & Sarracino, 2014; Perry et al., 2018), though in some cases these benefits accrue primarily to individuals who do not have strong offline support (Cole et al., 2017).

In summary, studies have shown the various significant harmful effects of internet use to social relations. Extensive internet use, particular social media use, can lead to loneliness and social isolation. Romantic relationships can be degraded by internet use, particularly because of online pornography. There is also a significant problem, finally, with malicious online behaviour, particularly cyberbullying, cyberstalking and online predation. It could also be the case that the partial replacement of offline by online social interaction decreases the quality of social interaction, but evidence is not conclusive. It has been demonstrated, however, that many people who do not use the internet report being excluded from communication with friends and family.

3.9 Harm to communities

3.9.1 Potential harm

A community is a group with a limited membership, the members of which have formed networks of personal relationships by means of their shared history, shared values and norms, mutual commitments and obligations, and cooperative practices (Brey, 1998; Galston, 2000). Communities come in various forms, such as social clubs, neighbourhood associations, office sports teams, volunteer organisations, book groups, and board game meetups. Increasing internet use poses the same threats to these communities as it does to social relationships. Users may *withdraw* from communities, *replace* community engagement with other online activities, and cause *degradation* of communities in such a way that they are no longer as valuable to their members as before. In considering the empirical evidence for these developments, it should be noted that, as with much of the empirical evidence about effects of the internet, most of the literature surveyed provides correlations and cannot speak to causation. Moreover, much of the earlier research did not use representative or randomised datasets (Sabatini & Sarracino, 2014: 4; Rosenfeld & Thomas, 2012: 525).

Early critics worried that increasing internet use would lead to diminished participation in various local community organisations, resulting in the deterioration of these communities and their physical infrastructures (Winner, 1997; Kraut et al., 1998; Putnam, 1995; Nie, 2001; Borgmann, 2004). They worried about internet users replacing their involvement in communities with solitary pursuits or with less valuable online communities (Winner, 1997; Brey, 1998; Galston, 2000), and about the transition from offline to online or mixed communities (Haythornwaite, 2002). Finally, they worried that continued engagement in online communities would be of a lower quality, as their expectation was that commitment to community values and projects would decrease (Winner 1997; Galston, 2000). They focused, in particular, on issues of impoverished communication, anonymity and incivility, and other inadequacies of online communities in which participation was increasingly voluntary (Haythornthwaite & Nielsen, 2006).

Precise concerns about how communities could be harmed by increased internet use seemed to change through the decades as technological change would assuage some worries, deepen others and raise new ones. Some dire predictions now seem amusingly short-sighted and unimaginative, such as Langdon Winner's doubt that the internet could allow for the establishment of online communities of readers (1997). However, many concerns still resonate both with academics and across the population as a whole. For example, a recent US opinion poll suggests that a substantial minority of US citizens believe that internet use may be undermining communities and disrupting family life (Allstate/National Journal, 2015), with older populations and parents expressing greater pessimism than other groups.

Moreover, some concerns have intensified, such as the worry that illiberal individuals will find or form communities of like-minded ideologues (Bowman-Grieve, 2009). More recent assessments of the internet's effect on communities are generally more specific, issue focused and empirically driven. Many aim to discredit the monolithic treatment of online sociality and internet users as a group (Haythornthwaite & Nielsen, 2006) and the equally artificial dualistic utopian-dystopian descriptions of the internet's effects (Williams, 2006). The present move towards identifying and studying particular at-risk groups is increasingly important as the number of regular internet users approaches 90-100 % of the population in many developed countries (Pirannejad, 2017).

Nonetheless, in addition to the more empirical and quantitative assessments of the harm posed by the internet to communities and social organisation, it is useful to consider the goods that communities provide and how they can be undermined—e.g., solidarity, sense of belonging, and mutual trust and care (Brey, 1998).

3.9.2 Empirical evidence

As with social relationships, early critics of the internet focused on potential harm to offline communities. However, recent interest has focused as much, if not more, on harm to online communities. A large proportion of the empirical research on the effects of internet use on communities is now focused on how online communities are damaged or susceptible to degradation.

Withdrawal

Early studies have suggested that, while online interaction generally supplements offline interaction rather than increasing or decreasing it, the heaviest internet users were the least committed to online communities that they are part of (Wellman et al., 2001).

Replacement

Many social practices and institutions are partially migrating to the internet. Commerce, for example, has moved online in part, with many people and businesses now making use of e-commerce. This has had consequences for inner cities and neighbourhood, where many local shops have had to close down. More and more professional interactions take place online, as do some leisure activities, like playing games with others and discussing and engaging in one's hobbies. These developments unavoidably put pressure on offline communities and may lead to their partial replacement or degradation.

A more specific hypothesis is that online and offline communities compete for members' engagement and that online interactions (so-called 'surrogates') will tend to replace offline experiences (Brey, 1998). This is a difficult claim to assess empirically because it requires knowing which of a person's previous leisure activities are being replaced by time spent online. As of 2006, Haythornthwaite & Nielsen could still not answer the question of where users were finding ever more time for online activities, which means we cannot be clear about what, if anything, is being replaced by time online. One likely possibility is that internet use is replacing watching TV. Another is that time online actually coincides with other offline activities (e.g., we surf the web or check Facebook while doing other things). However, to our knowledge, neither of these hypotheses has been confirmed.

Nonetheless, one study shows that internet use can both displace and augment social engagement in rural communities (Chew et al., 2011). There is also evidence that the internet is to some extent replacing family, school, neighbourhood, friends, and workplace as a venue for meeting romantic partners (Rosenfeld & Thomas, 2012) and, while the effects of this are not obviously negative (Cacioppo et al., 2013), it seems likely that support from offline communities remains important in this area, especially when online relationships migrate offline.

Degradation

By far the biggest concern in contemporary discussions of the harm of internet use to communities is the potential for damage to or degradation of both offline and online communities.

Impoverished communication

As with social relationships, a central concern was (and is) that the internet is an impoverished environment for communication, especially emotional communication, and that relationships are harder to build online. If this is the case, then affective ties will be more difficult to forge and online relationships will be harder to form and maintain (Haythornthwaite & Nielsen, 2006). Such a conclusion is also supported by studies that show that mixed communities (i.e., those with both online and offline components) promote trust between their members and that the offline dimension of these social networks contributes to a reduction of sociability problems and thereby promotes knowledge sharing (Matzat, 2010). Other studies have shown that offline

communication is necessary in order to maintain a community that continues to contribute to its members' social capital (Lee & Lee, 2010). In particular, internet users seem to be more sociable, but also less satisfied with their lives (Lee & Lee, 2010).

Incivility

A phenomenon of increasing concern is the apparent rise in incivility online, especially on social media. Incivility is viewed as a problem both by academics (Anderson et al., 2014; Antoci et al., 2016) and by the public, close to half of whom perceive discussions of politics on social media as angrier, less respectful, and less civil than offline interactions (Duggan & Smith 2016). Sabatini et al. explain: 'Online incivility is a manner of harassing behaviour that can range from aggressive commenting in threads, incensed discussion and rude critiques, to outrageous claims, hate speech, and more severe forms of harassment such as purposeful embarrassment and physical treats' (2018).

Incivility is especially problematic if, as evidence suggests, it is becoming the status quo in online political communities (Duggan et al., 2014; Antoci et al., 2016; Rost et al., 2016; Duggan, 2017), because the expectation of incivility may undermine trust in others or in communities. Rösner et al. (2016) have found that exposure to uncivil comments on a news article is associated with increased hostile cognitions in the reader, though exposure did not increase readers' hostile emotions or prompt incivility or worse reasoning in readers' own comments as had been shown in other studies (Zimmerman & Ybarra, 2014). These conclusions suggest that uncivil comments can damage communities, but they do not demonstrate what prompts uncivil behaviour in the first place. In a study of civility online, Groshek & Cutino (2016) identify what they call the 'mobile online disinhibition effect' as a potential threat to our sociality in the public sphere. They show that participating in online discussions via a mobile device predicts impoliteness, though not incivility. In addition, they show that Twitter users are more likely to retweet others' posts when the content of the tweets is uncivil. Sabatini & Sarracino suggest that the use of social network services undermines social trust, perhaps because of the number of new, weakly tied contacts (2014: 32).

Anonymity is often held to be a contributor to antisocial behaviour online, like aggressive or hostile commenting on news articles (Christopherson, 2007; Halpern & Gibbs, 2013), though some evidence suggests that non-anonymous commentators are more likely to be aggressive (Rost et al., 2016). However, the latter possibility may, if anything, be more problematic since a large majority of commentators (70 %) do not remain anonymous.

Voluntary association

Employing Hirschman's (1970) framework, Galston has hypothesised that the voluntary nature of online communities would prevent members from developing a sense of mutual obligation and would instead encourage 'exit' rather than 'voice' (2000: 201). That is, people would be more likely to choose to leave a voluntary community when it ceases to serve their needs rather than to try to change it. Winner, likewise, argues that online communities will be unable to maintain the commitments, obligations, and shared and delegated work that goes into maintaining an effective community (1997: 17). While there may be counterexamples to this claim (e.g., Wikipedia), there are also many examples that support it.

Another concern is that voluntary association could foster extreme communities of various sorts. These can take many forms, from user-led mental health communities (Giles & Newbold, 2010), to groups supporting anorexics and others who engage in deliberate self-harm (Bell 2007; Smithson et al., 2011), to racist or otherwise illiberal political groups (Bowman-Grieve, 2009).

Benefits

Despite these harmful effects, polls show that most people are optimistic about effects of the internet revolution on communities (Brownstein, 2015). They recognise that increased use has brought both benefits and harm. This view is borne out by empirical studies. While there is evidence that internet use threatens the amount and quality of community involvement, there is also substantial evidence of its benefits. Much of this evidence concerns the ability of online communities to replace or augment the functions of their offline counterparts.

For example, early studies have shown that online communities were being used in ways that developed users' social capital, though these activities did not correspond to increases in offline community involvement or attachment, except among those who were already involved and attached (Kavanaugh & Patterson, 2001; Williams, 2006; Boase et al., 2006). Some have even questioned concerns about civility and trust by showing that experiencing civility on social media promotes trust, but experiencing incivility does not diminish trust (Sabatini et al., 2018).

In summary, the following conclusions can be drawn regarding the harmful effects of the internet on communities. First, offline communities have had to cope with the fact that many human activities (shopping, commerce, socialising, leisure activities, professional interactions) have partially migrated to the internet. This has put pressure on offline communities which harbour fewer shared activities as a result. There is evidence that online communities have partially replaced offline communities, but also that some online communities form continuations of offline communities and help strengthen them. There is evidence that virtual communities, especially those that are exclusively online, do not have the qualities of offline communities, and may suffer from impoverished communication, incivility, and lack of trust and commitment.

3.10 Harm to Democracy and Democratic Citizenship

3.10.1 Potential harm

Not too long ago, the internet was mostly seen as a positive force for democracy: a democratic medium in which everyone can be a sender and receiver of communication, which can help to democratise authoritarian countries, as was the hope at some point during the Arab Spring. Nowadays, the negative effects of internet use on democracy and democratic citizenship are an increasingly popular topic within the mainstream media. Concerns are increasing that the internet, and social media in particular, are being used to undermine democratic processes. In response to the increasing power and popularity of far-right political parties in a number of countries, especially the United States, the conduct of both social media companies like Facebook and individual information consumers and sharers is being questioned. At the same time, some are noting that social media are, at best, a small part of a larger story of misinformation, polarisation, and geopolitical developments (Boxell et al., 2017b). While the internet undoubtedly harms and benefits the practice of democratic citizenship in developed countries, it is important to understand precisely what comprises the harm caused and how it arises.

As with social relationships and communities, the threat increasing internet use poses to democracy and democratic citizenship can be understood in terms of harmful effects on withdrawal, replacement, and degradation. That is, internet use may cause citizens to participate less in civic and political activities, to replace offline and online democratic participation with other activities, and to degrade the value of participation (both for themselves and others) through incivility, misinformation, and other problematic online behaviours.

In addition to these three categories of issues, we can identify a number of ways in which internet use might undermine democracy and citizenship or fail to promote it as much as it could. While optimists refer to the

freedom available on the internet, the interactive potential of the medium, and the greater breadth and depth of information it provides (Gimmler, 2001; van Dijk, 2012), pessimists have pointed to the flood of low-quality information, uncivil and irresponsible participation, the co-opting of new technology for non- or anti-democratic ends, and digital divides reproducing and entrenching existing inequalities (Schlozman, Verba and Brady, 2010; Nam, 2017).

3.10.2 Empirical evidence

Given the wide range of *potential* threats, it is important to have empirical evidence of the harm of internet use for democracy and democratic citizenship. In addition to evidence of direct harm, we should be interested in whether the internet is fulfilling its potential. After all, it is a harm of sorts if a technology does not provide us with all the benefits in its range. It is important to note that the empirical study of internet use in a particular population will inevitably be limited in its applicability by the speed of technological development, adoption, and use itself (Xenos and Moy, 2007: 705).

Withdrawal

Interest

Some have expressed concerns that the interest in politics is lower among young people (Henn, Weinstein & Wring, 2002). In particular, some studies show that political disaffection, in the form of cynicism, apathy, and skepticism, is rising as a result of internet use (Yamamoto et al., 2014). However, it is not entirely clear whether political interest is lower amongst young people or whether they demonstrate their interest in new and different forms of participation (Bakker & de Vreese, 2011). Some studies have shown that internet use promotes political interest (Wang, 2007; Boulianne, 2011) and it may present a bigger threat to participation than to interest.

Participation

Internet use is positively correlated with political participation but the type of media used matters (Bakker & de Vreese, 2011). A Japanese study suggests that internet use is positively associated with political participation but only among home internet users and not mobile internet users (Ikeda et al., 2013). However, their explanation of these results points to technological limitations that have since been overcome—e.g. the use of mobile devices for one-to-one communication and the difficulty of browsing the internet on a mobile device (Ikeda, 2013: 309).

One study of Dutch citizens found positive correlations between some forms of political internet use and interest in politics but also negative ones (Kruikemeier et al., 2014). For example, among citizens with lower interest in politics, reading political comments online increased the likelihood of voting, but writing comments decreased it. It also seems that those who use the internet for political purposes are those who are already engaged in politics (2014: 914; see also Bimber, 2003 & Xenos & Moy, 2007). That is, internet use appears to *reinforce* those who are already active rather than mobilise new citizens. However, two particular forms of political internet use do seem effective in mobilising less interested citizens: i) reading political comments on a news article and ii) using Twitter for political purposes (Kruikemeier et al., 2014; Dimitrova et al., 2011).

Schlozman et al. (2010) show that patterns of the effects of internet use on political participation in the United States display the same influence on socio-economic status as traditional media. This suggests that internet use is not fulfilling its expected potential to mobilise previously disenfranchised groups. They write that 'the effect of internet may be not to raise political activity but instead to repackage it' (2010: 489; see also Hindman, 2009). Along the same lines, Nam (2017) notes that there is a strong evidence that internet use promotes access to information. However, this access might not be leveraged into improvements in democratic governance, specifically the transition from an electoral democracy to a liberal democracy with more and better protected civil liberties (Nam, 2017: 545).

Finally, while participation is generally a good thing, one potential threat to democracy and democratic citizenship is the fact that non- and anti-democratic groups can use the same technologies to promote interest and participation in their political endeavours (Bowman-Grieve, 2009).

Support for democracy

The use of Twitter and Facebook during the Arab Spring produced a wave of optimism about the democratising potential of the internet in general and social media in particular. It also prompted more study of the effects of internet use on support for democracy around the world. The results seem to be mixed. Some have argued that the empirical evidence does not support the claim that social media contributed significantly to the Arab Spring (Morozov, 2011; Van Dijk, 2012). Internet use is associated with demand and support for democratic institutions (Nisbet et al., 2012) but primarily in democratic countries (Cho, 2014). Moreover, this relationship is mediated by the level of internet penetration, which is much lower globally than in OECD countries (Pirannejad, 2017: 289), as well as by the existing level of democratisation (Nam, 2017).

Moreover, many of these studies either take a global perspective (Cho, 2014; Nam 2017) or focus on less developed countries (Nisbet et al., 2014; Pirannejad, 2017), so it is not clear whether these results tell us anything meaningful about the influence of internet use in Europe or the developed world more generally. Indeed, there is some concern that geopolitical factors combined with effective use of internet and social media could allow for non-democratic parties to grow (Powell & Tucker, 2014).

Replacement

Studies show that a large majority of internet users seem not to use the internet for political purposes other than reading the news (Hindman, 2009; Rainie & Smith, 2012; Kruike-meier et al., 2014: Table 1). On the one hand, this suggests that one of the main theoretical benefits of online political participation (i.e. information creation and sharing) is not currently realised for most people. However, at the level of national politics even 3 % of the population, the amount that engage in active forms of internet use like posting comments or participating in social media activities, can be significant. On the other hand, it suggests that replacement is not (or not yet) as serious a worry as diminished or degraded participation.

Degradation

Among the most discussed threats to democracy and democratic citizenship are incivility, polarisation, misinformation and manipulation. We discussed incivility on internet in the previous section, so we will only summarise the conclusions here. Incivility is viewed as a problem both by academics (Anderson et al., 2014; Antoci et al., 2016) and by the public, close to half of whom perceive discussions of politics on social media as angrier, less respectful, and less civil than offline interactions (Duggan & Smith, 2016).

Recent studies show that political partisanship is growing and that its rise corresponds to the rise of the internet, starting in the early 1990s (Gentzkow, Shapiro & Taddy, 2016). A number of hypotheses have been offered for this, including a number that blame the internet (Sunstein, 2001) and the various problematic phenomena it makes possible, like occupying virtual 'echo chambers' in which we only encounter views similar to our own (Polat, 2005; Pariser, 2012). However, while most authors recognise increasing polarisation and its correlation with the rise of the internet, Allcott & Gentzkow (2017: 223) and others argue that the internet and social media are less to blame than cable television, at least in the United States. Likewise, a recent study suggests that the groups in which polarisation is growing most quickly are those groups who use internet the least (Boxell et al., 2017a).

Third, social media seems to be a more likely vehicle for misinformation or 'fake news' than traditional media, including traditional internet media (Allcott & Gentzkow, 2017). The costs of producing and distributing content are small; the format lends itself the consumption of 'thin slices of information' anyway, which makes distinguishing real from fake news more difficult; social media networks seem to be ideologically segregated (Bakshy, Messing, & Adamic, 2015), which can prevent users from accessing true information about the world

and promote confirmation bias. While the news media has reported widely on the influence of bots (computer programs that autonomously retrieve and produce information) promoting fake news, a recent study has shown that, while false news spreads faster than real news online, humans and not bots are the main culprit (Vosoughi, Roy, & Aral, 2018). It is not yet clear what impact misinformation has on voting behaviour (Allcott & Gentzkow, 2017) but it may be affecting citizens trust in online content. According to *The Economist*, a 2017 poll found that only 37 % of users trust the information they get on social media. The public still trusts newspapers and magazines twice as much ('Do Social Media Threaten Democracy?').

Finally, manipulation has become an issue with the Facebook - Cambridge Analytica scandal, which involved the illicit harvesting of social media data of up to 87 million users for the purposes of targeted political messaging to exploit their vulnerabilities and inner worries. Apart from Facebook users not having given consent for their data be used in this way, the problem of this use of social media data is that it adheres to a model of political speech that is based more on manipulation than on persuasion, and does not treat voters as autonomous, rational subjects. Moreover, when only one political party is in control of such information, it gives them an unfair advantage.

Benefits

Despite the harm described above, the effects of internet use on democratic citizenship appear to be mostly positive. One of the few meta-analyses to have been done about internet use and political engagement notes that the vast majority of significant effects found by empirical studies have been positive (Boulianne, 2009). However, Boulianne's meta-analysis focuses on North America and may not be generalised.

Nonetheless, there is reason to believe that these generally positive effects are not limited to non-European regions. Social media use in Central and Eastern European countries is associated with increased support for democracy. More specifically, people who use social media are more likely to be engaged in national and local politics, to be tolerant to groups from outside their country, and to support democratic norms (Placek, 2017). Korthagen et al. (2018) provide a European perspective, and they review studies that suggest moderately positive impacts.

In summary, empirical evidence shows some negative impacts of internet use on democratic citizenship and engagement, but on the whole, the effects seem to be positive. There are however reasons to believe that some activities on the internet are harmful for democratic deliberation and decision-making. These are (1) the incivility of much online (political) discourse, (2) ideological and political polarisation that can be correlated with internet use (although polarisation also takes place off-line), (3) misinformation, particularly so-called fake news, and (4) voter manipulation through profiling based on harvested social media information. The jury is still out on the extent to which these developments threaten democratic institutions, but it is clear that some harm is done to trust of citizens in media and politics, the ability of voters to make autonomous and well-informed decisions, and the fairness of elections.

3.11 Conclusion: eight types of harm

We have reviewed eight types of social and cultural harm associated with internet use. We have concluded, on the basis of empirical evidence, that internet addiction, information overload, and negative effects on knowledge and belief cause serious harm to people and society. We have also concluded that there are potential harmful effects on social relationships and the associated wellbeing of individuals, to cognitive development, communities, democracy, and the ability of individuals to separate different spheres of life.

These eight types of harm can be related to three more fundamental types: harm to individuals, social institutions, and equality and social inclusion (Figure 6). It is useful to define these more fundamental harmful effects, since they tend to be recognised in public policy, and therefore can be conveniently referred to in the

next section on policy options. We hereby describe these three types of harm and relate them to the eight categories of harm discussed above.

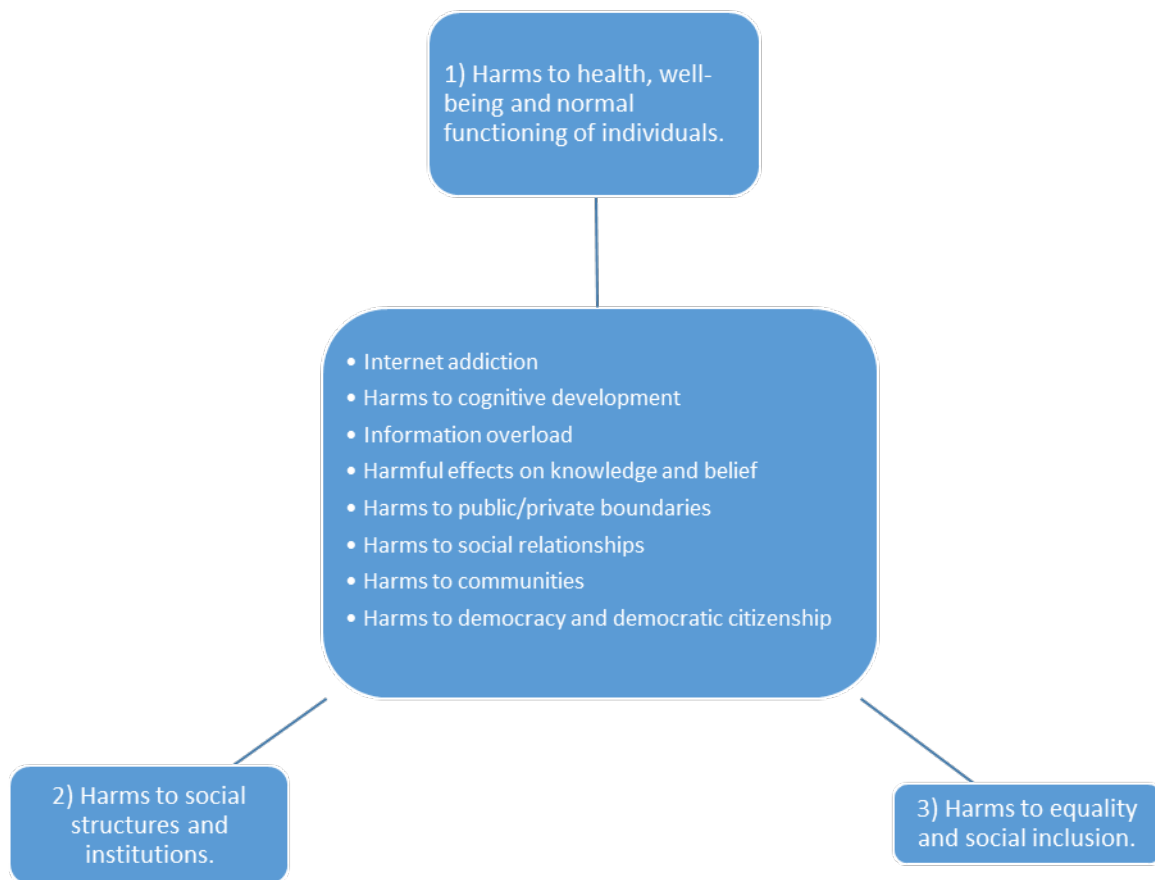


Figure 6. The eight types of harm can be related to three more fundamental types of harm: i) harm to individuals, ii) social institutions, and iii) equality and social inclusion.

- 1) *Harm to health, wellbeing and normal functioning of individuals.* Many of the types of harm we discussed include direct harm to individuals, concerning their health, wellbeing and ability to function normally. Internet addiction, impaired cognitive development, information overload, reduced or degraded social relations and problems in separating different spheres of life clearly include harmful effects that impede one's health, wellbeing and normal functioning. These types of harm can also be at issue in negative effects on knowledge and belief, since misinformation and biased belief can undermine normal functioning, wellbeing, as well as health, if people act on false or biased information. If communities do not flourish, this will also harm individuals. The link to democracy is less direct, even though the degradation of democracy will ultimately have a negative effect on the wellbeing of citizens.
- 2) *Harm to social structures and institutions.* These are types of harm to social structures like communities and organisations, and social institutions like the family, government, law, and the economy. Some of the harm that we discussed negatively affect the proper functioning and flourishing of social structures and institutions. This is clearly the case for harm to democratic citizenship and democracy, which harms government, as well as society as a whole. It also applies to harm to communities, as well as to social relations, which include

relations that are part of social structures and institutions such as families and clubs. Evidently, individual harm, such as that involved in internet addiction and information overload can also harm social structures and institutions if they occur at a large scale.

- 3) *Harm to equality and social inclusion.* Some of the harm we discussed exacerbates inequalities between groups because it harms certain populations more than others. Some also harm social inclusion. For example, online harassment targets women and girls more than men and boys and may also involve racial discrimination. Also, less privileged populations may not have the education and resources to properly guard themselves against harm resulting from misinformation, harm to social relationships or internet addiction.

These three types of harm also come with significant economic costs. The individual harm resulting from internet addiction, information overload and others can result in reduced performance and absenteeism that harms economic output. The harm to social structures and institutions and to inequality and social inclusion can also have negative economic effects due to more conflict in society, as it can affect individual functioning and the operation of businesses and may necessitate additional social services.

4. Policy options

While the last decades have been characterised by political endeavours to maximise internet access throughout the European Union and in building a single market online, the current high penetration rate and heavy use of the internet by all types of populations signals the need to look at the potential harm caused by this medium to society overall. Some of these have been discussed back in 2010 in the Digital Agenda 2020, for example threats to privacy, then addressed through new legal European dispositions such as the General Data Protection Regulation.

In this study, we have identified harm that for the most part has not been the subject of past major policy initiatives. In this section, we will present policy options to address issues linked to such harm. We will first analyse common causes of harmful social and cultural effects associated with the internet and arrive at some general options for mitigating or preventing such harm. We will then outline policy options that address these causes and provide potential solutions. For each policy option, we will describe how it could relate to any of the eight types of harm identified in section 3. For policy options on knowledge and belief, see also the recent report *A Multi-Dimensional Approach to Disinformation* of the High-Level Expert Group on Fake News (DG CONNECT, 2018). For policy options on internet addiction, also see the STOA report 'Internet Addiction and Problematic Internet Use' that is published together with this study.

As a caveat, it should be remarked that for some of the harm identified in section 3 here is uncertainty regarding their scope and scale. In addition, for some of the harm, there is lack of evidence for their occurrence with particular populations (children often, sometimes also adult populations, and populations with pre-existing health conditions). There is also a lack of longitudinal studies that could allow to see long-term changes and effects. As such, policy would benefit from further research to address these lacunae.

4.1 Causes of harms

The social and cultural harm related to internet use is the result of multiple factors rather than single causes (Figure 7). We will here analyse the major factors that can contribute to these types of harm. First, the **technology** is a factor. The functionality of internet technology, its affordances and design features, partially determine how the technology is used and what effects it has on users and society. This pertains to both **hardware** and **software**. Hardware includes networking hardware, laptops, tablets, smartphones, and other electronic devices. Software includes platform software (operating systems, device driver, firmware) and application software (programs that run on operating systems and offer specific services). A special category is networking software, which is software that helps administrators deploy, manage and monitor networks. Note that internet users use both locally installed software (on their hardware device) and remote software, such as internet applications that operate at a distance.

Behind this technology are of course, the **tech companies** that provide the technology and can influence its functioning. Notably, these are **computer hardware companies**, who develop the hardware, and **software companies**, who develop the software. In addition, there are **internet companies** that offer specific online services, such as search, social media, e-commerce, entertainment and cloud services. Some of them provide specific software to install to access their service, whereas others only have online webpages that can be accessed. And finally, there are **internet service providers**, which are companies that offer services for accessing using or partaking in the internet, including access providers, mailbox providers, hosting ISPs and others. For simplicity's sake, we call all four types of company tech companies. Clearly, tech companies contribute to social and cultural impacts, not only by the way they design hardware and software, but also by the services they provide, the user policies that they issue, and the way in which they advertise their products and services.

Internet users naturally also have a major role in shaping the social and cultural consequences of internet use. They determine, ultimately, how the technology is used, how often, how long, in which contexts and to which

ends. **User behaviour** is obviously the key factor here. User behaviour is however shaped by all kinds of other factors, including both external factors and factors pertaining to the user's predispositions: their beliefs, attitudes, goals, desires, habits, personally traits, and emotional states.

User behaviour is constrained and regulated by the social structures, practices, and expectations imposed by the **social environment** in which users operate. Private and public **organisations** tend to impose particular regimes of internet use on their employees. **Peer groups** may stimulate or discourage certain user behaviours. **Families and communities** may impose certain rules and stimulate or discourage certain uses. Moreover, organisations, peer groups, families and communities are also the social contexts in which the impacts of internet use beyond the individual user is first felt: harmful user behaviour will often harm, next to users themselves, the organisation they work for and the families and communities of which they are part. Ultimately, such harm adds up to societal harm that can become the subject of **public policy**. Regulations, laws and other policy responses to regulate the development and use of the internet constitute an additional factor that shapes the social and cultural consequences of internet use.

Factors that shape internet use

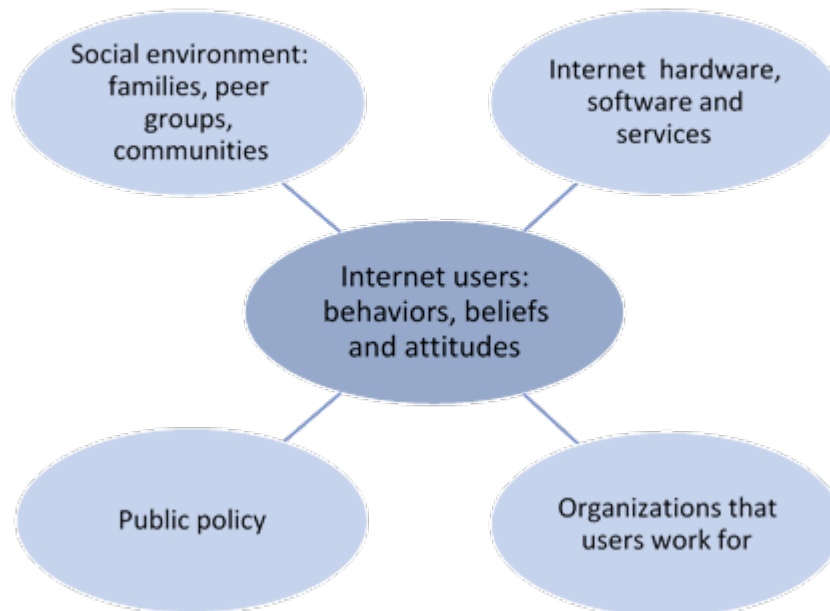


Figure 7. Factors that shape internet use.

4.2 Resulting policy options

Policies for mitigating and preventing social and cultural harm of internet use will need to target one or more of the factors discussed in section 4.2. For each factor, we can therefore define policy options that address that factor, and we can define policy options that combine multiple factors. This gives us the following policy categories:

1. Policies that impact internet technology hardware, software and services.
2. Policies that impact user behaviour and underlying beliefs and attitudes.
3. Policies that impact the way in which organisations regulate and shape internet use for their employees.
4. Policies that impact the way in which families, communities and peer groups shape user behaviour and are impacted by it.

5. Policies that impact the way in which public policy organisations themselves regulate and respond to harm caused by internet use.

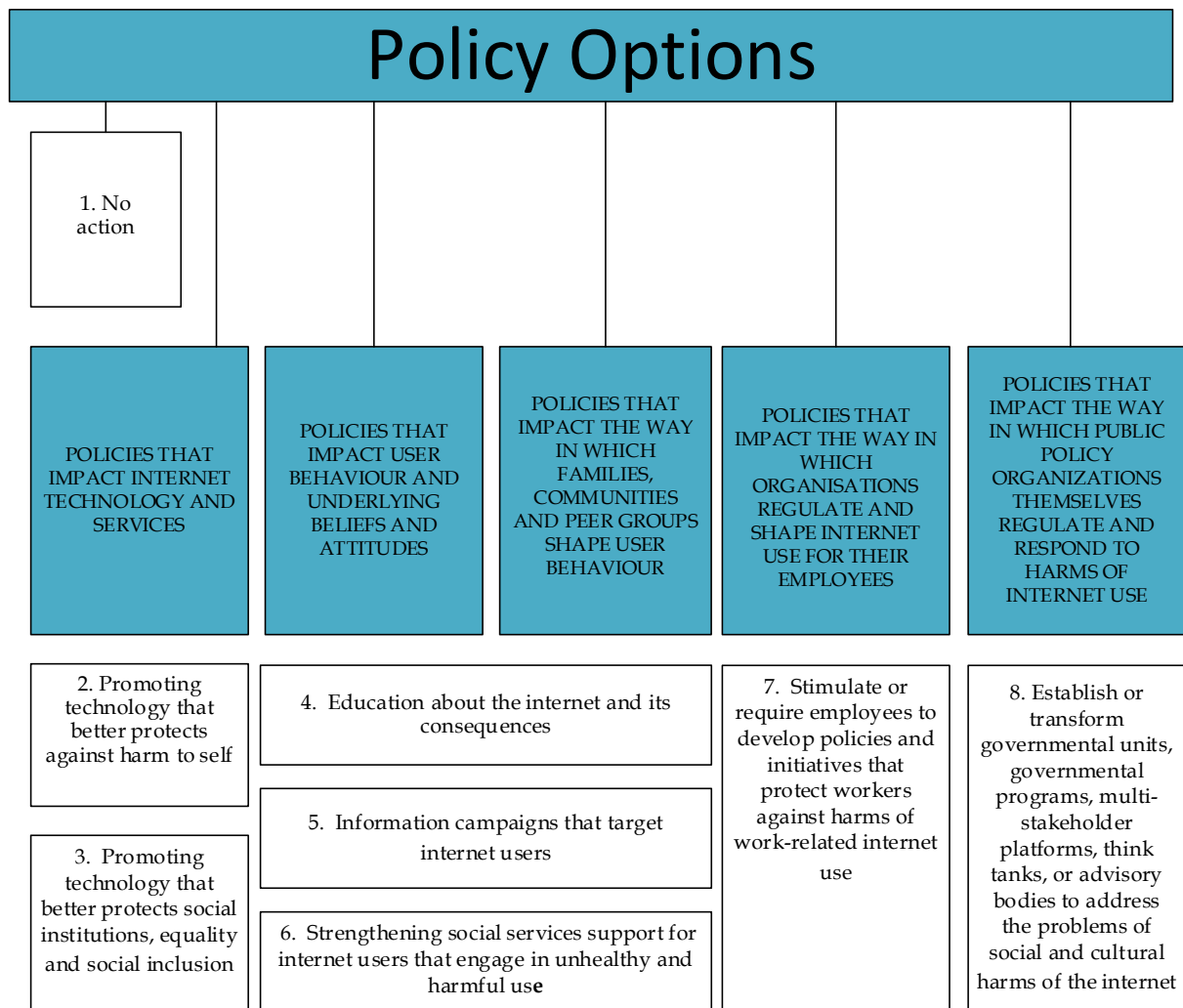


Figure 8. Policy options.

A challenge for policies that concern the internet is that many of them could impinge on free speech and other freedoms, such as freedom of association and freedom of the press. Great care should therefore be taken that policy actions do not abrogate fundamental rights.

We will now discuss each of the five policy categories in turn and distinguish within each category specific policy options for preventing and mitigating internet harm. This will result in seven policy options spread out over these five categories. We will, however, start with an eighth policy option that sidesteps all of these categories, which is the policy option of taking no action.

Policy option 1. No action

The first option open to policy-makers is not to intervene. This option bets on self-regulation by internet users, tech companies, and other stakeholders. Several considerations speak in favour of this option. First, it gives full freedom and control to private parties who are involved in making and using the internet. Users have full freedom to use the internet as they see fit, as long as it there is no clear, identifiable harm to other private parties, and tech developers have full freedom to develop the technology in a way that is most economically beneficial for them. It moreover gives these parties the freedom to self-regulate and find regulatory solutions of their own as they see fit.

Disadvantages of this option are, however, that these private parties may not be in a position to know the harmful impacts of certain designs and uses of internet technology, may not have the knowledge or resources to take action against this harm, or may not feel that they have the responsibility to take such action. Internet users are constrained by the technological options that are provided to them, by tech companies and employers, and research has shown that they often do not realise the harm that their use of the internet causes to their own wellbeing, health, and functioning, or be in a position to take positive action to prevent or mitigate such harm. Users are also not likely to feel individually responsible for societal harm resulting from internet use or see themselves as having the tools to address this harm. Tech companies will not always act in the best interest of internet users, as the discussion in section 3 has shown, and they have less of a vested interest and less of an expertise in and responsibility for preventing societal harm and promoting the common good than do policy-makers. Policy-makers have a responsibility to address societal harms, such as addictions, health hazards, social exclusion, and threats to democracy, and are arguably in the best position to address and mitigate their costs to society.

4.2.1 Policies that impact internet technology and services

We now turn to the five policy categories that we defined in the introduction to this section, starting with policies aimed at the internet technology and services industry. These are policies that induce the hardware and software industry towards certain designs or design features that help prevent or mitigate harmful effects of internet use, and that induce the internet service industry to changes in their services that are believed to help prevent or mitigate harmful effects. We define two broad policy options in this category and address their implementation for the particular harmful impacts discussed in section 3.

Policy option 2. Promoting technology that better protects against self-harm

This policy option is to stimulate or require technology companies to introduce design features, products and services and corresponding user policies that support internet users in avoiding usage patterns that cause harm their health, wellbeing and normal functioning. Just like microwave ovens are designed to prevent users from being exposed to radiation when the oven door is opened, internet technology can be developed to prevent or discourage usage patterns that harm users. Sometimes, this means modifying products and services such that harmful effects to users are reduced or eliminated, and sometimes it means introducing new products and services that help users protect themselves against harm to health, wellbeing and functioning. We will review some options for the categories of harm discussed in section 3:

- *Internet addiction*: computer and internet technologies and services could be required or stimulated to come equipped with settings to measure internet use, notify users when usage patterns exceed agreed norms, and include options for limiting or shutting down functionality when norms are exceeded, or impose such limits in certain settings or during certain hours of the day. It could also be prohibited or discouraged that technology and services include reward systems that encourage addictive behaviour.
- *Harm to cognitive development*: the development and implementation of technologies and techniques could be stimulated that support cognitive development.

- *Information overload*: computer and internet technology and services could be required or stimulated to include solutions that address information overload, for example ones that partially automate information processing, or that limit exposure to information at inconvenient times and places.
- *Harmful effects on knowledge and belief*: internet media companies could be required or encouraged to combat fake news, either through automated identification or reporting by users; it could be required or encouraged that internet search engines base their rankings in part on the accuracy and quality of the information source (Google has developed techniques to select for this); it could be encouraged or required that services, markers and certificates are developed to assess the reliability of information.
- *Harm to public/private boundaries*: tech companies could be encouraged or required to introduce features and solutions that help users maintain better control over private/public boundaries and boundaries between spheres of life, for example by automated notifications when these boundaries are threatened based on previously stated preferences, or by features that allow for particular functions of smartphones and tablets to automatically switch off at certain times or at certain locations.
- *Harm to social relations*: tech companies could be required to do more to combat online harassment and other malicious online behaviour.

Policy option 3. Promoting technology that better protects social institutions, equality and social inclusion

This policy option involves stimulating or requiring tech companies to introduce design features, products and services that better protect social institutions, equality and social inclusion. The climate for such actions is favourable, in that many tech companies have already started to realise that technology and services have major societal impact and have started to acknowledge that addressing societal harm is part of their corporate social responsibility. For example, some tech companies have started combating fake news, online harassment, filter bubbles, and political manipulation of social media. Policy-makers could even make the case that some harmful activities go beyond mere social harm and have become national security issues as they threaten social stability and democracy. The following more specific options can be considered:

- *Harmful effects on knowledge and belief*: policies and actions by tech companies could be required that discourage the functioning of communication spaces as echo chambers, especially when these could lead to radicalisation;
- *Harm to communities*: tech companies could be stimulated to consider the impact of their services on offline communities
- *Harm to democracy and democratic citizenship*: social media companies could be prohibited from transferring social media data for targeted political messaging; media companies could be encouraged to develop technological solutions, services and user policies that promote civil political discourse and democratic institutions.

4.2.2 Policies that impact user behaviour and underlying beliefs and attitudes

These are policies that target internet users, and that aim to shape their behaviour, beliefs and attitudes so as to avoid harmful effects of internet use.

Policy option 4. Education about the internet and its consequences

Given the importance of the internet in young people's lives, from education to leisure to socialising, and given its importance in society at large, schools devote relatively little time to educate children and adolescents about internet technology, its uses and its effects on individuals and society. An option is therefore to

strengthen education about the internet, which could start as early as elementary school. Such education could include the following:

- Instruction on the technical and economic aspects of the internet, and the way it is used by different user groups and for different purposes
- Instruction on and discussion of social consequences, benefits and harmful aspects of the internet, including benefits for and harm to individuals and society as a whole
- Critical internet skills: digital literacy skills that include information literacy, media literacy and information and communication technology literacy
- Self-aware internet use: discussing and developing skills and practices for responsible internet use that reduce potential harm to one's own wellbeing, health and functioning, as well as harm to others.

While most education about the internet has its proper place in primary and secondary education, the first three of these topics can also be taught at university level and in continuing education.

Policy option 5. Information campaigns that target internet users

Surveys show an impressive lack of awareness of internet users regarding the possibilities offered by the technology they use, the risks that are involved, and the potentially harmful impacts on themselves and others. Information campaigns can help create awareness and help users develop skills to prevent harm from taking place. Such campaigns have already been run in several Member States and non-EU countries, including campaigns against cyberbullying, sexting, and internet addiction, for better internet security practices, for recognising and dealing with online sexual predators, for safe internet use by children, and for recognising fake news.

Major health and wellbeing risks of internet use, including internet addiction and information overload, could be the subject of public health educational campaigns, aiming at raising awareness of the impact of internet consumption on one's physical and mental health. Internet addiction and information-related stress could be recognised publicly as disorders so as to encourage citizens to seek help. Health institutions could distribute further materials. Guidelines, tips, recommendations, could be developed together with health specialists and other stakeholders (patients and insurance companies, for instance). Using information and educational approaches stimulates self-regulation for internet users who can regain control of their internet consumption without the assistance of health professionals.

Similar campaigns could be developed to raise awareness about other harmful aspects related to internet use, such as harm to social relations, knowledge and belief, and cognitive development. One option is to develop and promote guidelines for healthy, safe and ethical internet use that have strong support from different stakeholders in society and that are promoted widely.

Policy option 6. Strengthening social services support for internet users that engage in unhealthy and harmful use

Education and information campaigns can help prevent harmful internet use, and can provide users with tools to mitigate harm, but in some cases, these measures will not be enough. Internet addicts need professional help, as do some of the perpetrators and victims of antisocial online behaviour. Organisations for health care social work need to be properly equipped to recognise those cases of harmful internet use where their action is required and need the knowledge and resources to offer adequate support. It can be questioned whether this know-how is currently sufficiently represented. Internet addiction, for one, is currently not officially recognised as a mental disorder, though many health professionals have advocated that it should be (gaming addiction was recently recognised as a disorder by the World Health Organization.) If internet addiction were to be recognised as a mental disorder, this would enhance treatment options ('digital detox') and facilitate

reimbursement by insurance companies. Better screening could be undertaken of children for symptoms of internet addiction. In addition, information lines for questions about harms associated with internet use could be an additional service that helps users deal with internet harm more adequately.

4.2.3 Policies that impact the way in which organisations regulate and shape internet use for their employees

Employers have a major role in shaping internet use. The majority of adults are employed at organisations in which they use the internet for work-related purposes. Many of them also do so outside working hours. In this way, work-related internet use is a major component of internet use overall. Work-related internet use has been cited as the major source of information overload, and a major source of problems in maintaining private-public boundaries. Moreover, it can also be a source of online harassment and be involved in internet addiction. Public policy could address this issue. This is already happening in some Member States. For example, France put into law in 2017 a 'right to disconnect' law that gives workers the right to ignore work emails outside of typical working hours and requires French companies with more than 50 employees to draw up policies with their workers about limiting work-related technology usage outside the office. This law was motivated by the perceived need to limit information overload and enable workers to better set boundaries between work and home life. It should be noted that this law has been proven to be difficult to put to practice and to sanction and may not yet have succeeded in having a major impact in changing behaviours. This suggests that voluntary initiatives may need to be supported next to, or in place of, legal requirements.

Policy option 7. Stimulate or require employees to develop policies and initiatives that protect workers against harmful work-related internet use

Next to policies that address information overload and the maintenance of private-public boundaries, policies can be introduced that require employees to adequately protect workers against online harassment, or that promote the recognition of and support for internet addiction. Codes of conduct for internet use could be part of such policies. In addition, companies could be encouraged or required to review the technology they provide for their staff to manage their internet and information consumption, and the usage habits that they promote or discourage. Any such policies should be sensitive to freedom rights, including rights of freedom of expression and association, that should not be abridged in such policies.

Special consideration should be given to schools and universities, who next to employees also have pupils and students as internet users. It could be argued that schools have a special responsibility for internet use by their pupils, as they are still in a formative stage. Next to education about the internet (policy option 4) schools can take measures to identify harmful internet use by pupils, assign mentoring roles to teachers and staff regarding these harmful effects, and offer social services support. They can also institute and enforce codes of conduct.

4.2.4 Policies that impact the way in which families, communities and peer groups shape user behaviour and are impacted by it

Family members, friends, clubs, and communities in which people operate all have a potential role in encouraging or discouraging harmful internet use. Policies can target these stakeholders to stimulate them to take effective action to discourage harmful internet use. Policy options 4, 5 and 6 can be expanded to include these stakeholders: educational initiatives, information campaigns and social services should not only be directed at internet users that engage in harmful use, but also at the people around them to help them recognise and flag harmful behaviour and provide better support to these users in order to prevent further harm. It can be considered to give special support to parents and professionals (educators, physicians, therapists) that work with children, to equip them better with knowledge, skills and resources to help prevent harmful use of the internet by children.

4.2.5 Policies that impact the way in which public policy organisations themselves regulate and respond to harms of internet use

Under this category, we place initiatives of policy organisations to substantially alter their own capability to respond to harms of internet use. This includes the establishment of new governmental units, programs and initiatives, with or without other stakeholders, to address harmful internet use. This yields the following policy option:

Policy option 8. Establish or transform governmental units, governmental programmes, multi-stakeholder platforms, think tanks, or advisory bodies to address the problems of harmful social and cultural internet use

European institutions have a major role to play given the international nature of matters linked to the internet. DG CONNECT of the European Commission clearly has a role here, given that part of its mission is to foster a modern, secure, open, and pluralistic society by means of ICTs, and it could be considered how DG CONNECT could include units (directorates), programs, and initiatives that explicitly focus on social and cultural harms of the internet. DG Research and Innovation could institute research programmes and calls that focus on research and coordination actions to address harmful internet aspects. Other Directorate-Generals that could establish actions on internet harm include the Directorate-General for Education, Youth, Sport and Culture, which could address options concerning education and youth; DG Employment, Social Affairs and Inclusion, which could develop a focus on issues of employee wellbeing and social inclusion; and DG Justice and Consumers, which could focus on civil rights and consumer protection in internet use.

It could also be considered whether a service should be created with a mandate to enforce measures together with concerned directorates. This could promote a more unified vision policy in terms of internet, instead of having different aspects of activities linked to the internet under the mandate of all directorates.

The EU could also stimulate the development of global forums and initiatives to discuss the harms of the internet for society and potential solutions. Promoting international dialogue could lead to global solutions and having a more important weight to get information and service providers to adopt codes of conduct for a less harmful internet. It could also stimulate the development of forums and expert groups that involve different stakeholders, including ones from industry, civil society, and higher education, to address the issues. An option is also to expand current units, forums and initiatives that focus on internet privacy and security issues to include social and cultural harm associated with internet use.

5. Limitations and Conclusions

This report reviewed eight key types of societal harm associated with internet use. They are harmful effects on human culture and society, negatively impacting the health, wellbeing and functioning of individuals, the quality of social structures and institutions, and equality and social inclusion. After a review of facts and statistics relating to internet use in the European Union, eight types of significant social and cultural harm associated with internet use were identified, and a review was performed of theoretical and empirical literature concerning these harmful effects.

The eight types of harm that were reviewed are: internet addiction, harm to cognitive development, information overload, harmful effects on knowledge and belief, harm to public/private boundaries, harms to social relationships, harm to communities and harm to democracy and democratic citizenship. It was concluded that there is the potential for serious harm to individuals and society in all eight of these areas.

This review was carried out by considering policy options for preventing and mitigating these harmful effects. Eight policy options were identified. Next to an option of no action, options were identified that target the products and services of internet tech companies, internet users (including policies for education and information campaigns about the internet and its consequences and improvements in social services for users that are harmed through their use of the internet), employees (to better protect workers), families, communities and peer groups, and policy organisations themselves. Each policy option was discussed in detail, including ways in which they could be implemented for some or all of the eight types of harm identified in this report.

Limitations of this review, and the resulting policy options, concern the availability of empirical evidence for some of the harm that was discussed. Many of the types of harm identified in this report have not been studied as extensively as better-known societal harm associated with internet use, such as cybercrime and harm to privacy. In particular, the evidence of harmful effects on cognitive development, social relations and democracy is still rather limited. In addition, for some of the harm to individuals, including internet addiction and information overload, there is uncertainty about the number of people who are afflicted and the severity of the afflictions. As is the case with impact studies in general, many of the empirical studies cited in this report only show correlations between internet use and particular impacts, and do not provide strong evidence for causation. For this reason, more research is needed to for all these types of harm, to determine their nature, causes, and extent.

Nevertheless, it appears that sufficient empirical evidence is currently available to conclude that the eight types of harm that were discussed have significant negative impacts for individuals and society, and that urgent policy action is needed to prevent and mitigate further harm.

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In spite of all its benefits to society, it is increasingly recognised that the internet can also be correlated with significant negative effects on individuals and society. Some of these effects have been studied extensively, particularly harm to privacy, harm associated with security and cybercrime, and harm resulting from digital divides. This report covers less studied but equally important effects: harm associated with internet use that concerns the health, well-being and functioning of individuals, and the impact on social structures and institutions.

Part II of the study addresses the internet's negative effects at societal level. Among other things, the study reviews: harm to cognitive development, information overload, harmful effects on knowledge and belief and harms to social relationships.

The ultimate aim of the study is to develop concrete policy options for EU policy-makers' consideration in acting to mitigate the harmful effects of the internet on European citizens.

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