LUISS

Dipartimento di Scienze Politiche

Cattedra: *Political Sociology*

Virtual Politics and the Socio-Cognitive Revolution

Professor Michele Sorice

Relatore

Lucia Terenzi [089782]

Candidata

Anno accademico 2020/2021

Index:

0. Introduction

In all its complexities and facets, the true impact of the Internet on democratic institutions, collective psychology of the new generations, social fabric and, as a basis of it all, human neurological development is still not fully understood by scholars. The reason behind that, to use Quan-Haase and others' words in their evaluation of social capital, is that the internet is such a huge intellectual and technological innovation that its implications end up being "non-directional": for all we know, the effect is so wide that it does not produce an impact that could be defined as either negative or positive. However, this does not mean that the impact is not there, on the contrary. Neuroscientists are increasingly aware of the fact that the plastic nature of the human brain makes it so adaptable that an unprecedented paradigmatic shift, such as the advent of the Internet, results in literal biological alterations of our species. James Olds, a professor of neuroscience who directs the Krasnow Institute for Advanced Study at George Mason University claims that, even in the adult mind, nerve cells routinely break old connections and form new ones. "The brain," according to Olds, "has the ability to reprogram itself on the fly altering the way it functions.". When, for instance, in the 14th century the mechanical clock started being of common use, the "abstract framework of divided time" became "the point of reference for both action and thought." (Lewis Mumford, 1934): "people began thinking of their brains as operating "like clockwork"." (Nicholas Carr).

The focal point of this thesis is concerned with the malleability of the human brain as a response to the advent of the internet and the potential consequences in terms of socio-political development. This notion goes beyond our (almost philosophical) ability of self-constructing and defining our identity, it is a cognitive process that impacts the way we manage information, absorb it and rearrange it in a critical way, thus building an original opinion and developing

personal patterns. Exactly as it happened with the spread of the mechanical clock and many other intellectual and material technologies, the human brain is not only adapting to the Web, but it is doing so by emulating its basic functions and reproducing its logics. It is a dynamic of integrations that finds even more interesting points in its mutual nature: the Internet is shaping us; however, it is us who construct it and fill it with content every day, hence, are we getting back nothing but a distorted image of ourselves? Or does the Internet leave a footprint that belongs uniquely to its mechanics and is affecting us beyond our control?

The aim of this work is that of exploring, on scientific and academic basis, patterns able of explaining the modern struggle of the human species, finding itself navigating unprecedented spaces both within and around it. The scope might seem excessively wide, ranging from introspective, mental and neurological mechanisms to considerations about the global social fabric and political scandals, however the fascination that comes with the preparation of this work resides exactly in this. The biggest global network to ever be created is being emulated by the restructuring of the human brain, mechanisms which dictate the functioning of algorithms are being either atrophied or enhanced in our cognitive system, the degree of integration of the social, the economic and the political that is being witnessed in our virtual hyperreality, is being followed by our methods of mental management: socioeconomic success merging with primordial emotional needs, decision-making mechanisms with new personalized biases and so on.

The structure of this thesis will be based on the delineation of three different human cognitive skills that have been sensibly impacted by the abruptly pervasive spread of the Internet. They are functions neuralgic to the chain of knowledge production - fundamental for the development of

cultures, societies and institutions: Focus (Running through information), Memory (Storing information) and Critical thinking (Elaborating and confronting information).

The first chapter will tackle a tendency that stated manifesting ever since the beginning of the XX century and the adjustment of the Western system of mass consumption and entertainment. It concerns an integrational trend, involving society, advertisement, entertainment, capitalism and the individual, which was allowed by technological progress and could be argued to have culminated with the channelling of all these fundamental layers of human life to the same virtual and untouchable dimension. The currency which dominates this muddled and increasingly prominent layer of reality is attention, which will be the protagonist of this first section, analysed from an historical, economic, neurological, social and then psychological perspective, with an attentive eye towards the interweaving relation between the brain and the Web.

The second section will be focused on memory: the intersection between the action of paying attention and absorbing information neurologically speaking, how our control on the short term/long term transaction has been affected by the digital revolution resulting in interesting post-human conditions and mergers of human knowledge and, finally, how thanks to communicative practices such as online memetics, this has led to new forms of collective political consciousness.

The final section combines elements of the modern individual neurological and social condition, explored throughout the first chapter, with notions concerning collective and politically relevant implications, analysed by the second one, in an attempt of giving a new wider standpoint to observe the contemporary crisis of democratic institutions. The objective is to link topics such as echo chambers, behavioural bias and theories of hegemony and address the political

consequences of the privatized and monopolistic configuration of reality construction new digital spaces are fostering.

Chapter 1: Focus!

"Attention is not just any resource. It is the resource whose efficient use is called intelligence."

- Georg Franck (2002)

1.1. Digital technology within the economy: a XX century Trend

An enormous mole of academic work was developed in order to update our understanding of the structure of the digital economy. Academics like Williams, Bukht, Brynjolfssonm and Goldfarb have attempted ever since the early 2000's to give a comprehensive overview of the configuration of this new market but, since the actors, laws and parameters within it are evolving at an unprecedented rate, it results difficult to fully measure it and predict its behaviour. Therefore, it might be useful to identify historically the integrative tendency that our economic society started showing in the XXth century towards technological and intellectual progress, resulting in its contemporary structure.

It is possible to trace the core concept of digital economy back to the 50's when innovations such as the radio and the television started revolutionizing the market and the consumers within it, while the line between entertainment and advertisement got thinner and thinner changing the very nature of consumption. Business industries and costumes will be supported by technological progress in their XXth century process of becoming less of a science and more of a performance: in the total saturation of the modern collective mindset and offer, a flowless start-up idea or plan of execution is nothing if it lacks the critical factor of human appeal and catchiness. This "market

law" has only gotten truer over the decades, being aided by the introduction of new layers of proximity and direct channels of communication with the masses.

Throughout the 70's, technologies developed the ability of taking in inputs, process them, give relative outputs and store information thanks to the very first personal computers such as the KENBAK-1, Programma 101 and the Altair 8800. Similar innovations had been introduced into the workforce ever since the 30's, in situations requiring complex computations and spaces of storage. For instance, the US Government had been using computers to conduct census counts and develop defence strategies for decades. However, from the moment microcomputer technologies were adopted by small businesses in the 70's and 80's it did not take long to realize that this was not only going to increase productivity and enhance data collection, allowing companies to compete with big corporations, but it actually revolutionized the whole market. It was going to alter the nature of job positions, the approach to costumers, the priority of the companies and create a demand in the job force for computer technician, application specialist and microcomputer support technician. By the 90's the introduction of two new possibilities in the realm of computers applications brought about the premises for the economic configuration we are living in today: programming and networking. Programming is the implementing phase of software development, and it is fairly based on the creation of algorithms finalized at having the computer completing one or multiple tasks. Networking is the result of a set of computers sharing resources, of which the Internet is the biggest specimen, currently heading towards expansion thanks to the discipline of the Internet of Things. By the turn of the century, new technologies were revolutionizing the whole consumption cycle and introducing new valuable protagonists in the capitalistic landscape.

1.2. Paying (with) Attention: from Knowledge economy to Attention economy

“The digital illusion of infinite resources, infinite production, and no costs appears as an “end to scarcity,”” however “this fantasy of production without consumption hides the physical costs and real-world impacts of these technologies.”.

In 2006, Professor Manfred M. Fischer from the Vienna University of Economics and Business Administration, wrote that “knowledge is an economic resource in its own right, taking the privileged role that once was accorded to natural resources.” The concept of knowledge economy was mentioned for the first time in the 60’s, when Peter Drucker emphasized in his 1966 book “the Effective Executive” how the economic structure was going to be increasingly reliant on data, skills and knowledge rather than the production chain and material capital. Drucker was far ahead of his times and in the 90’s, thanks to the advent of networking computer, the rapid expansion of global knowledge and reliance on computerization made his prediction come true, at least in some form. “Data is the new oil” was an easy to stumble upon refrain in the last decade, mostly ever since the Economist published a study named "The world's most valuable resource is no longer oil, but data.” (2017), citing a 2006 quote from Clive Humby and bringing the now concretely legitimate claim to the attention of the big public.

However, as of today we can claim to be part of yet another economic system and consumption cycle and, with the rise of social media and platforms, considering knowledge as the central actor and commodity of the digital era is not convincing anymore. Tiziana Terranova, in a brilliant 2012 work, analysed how the logic of knowledge economy cannot represent contemporary reality beyond a certain extent, provided that we apply all the axioms of market economics. The consumption cycle that was theorized to be revolving solely around data - a good of abundance - completely overturns laws of Darwinian competition and demand-supply dynamics, making

classic economic laws often unapplicable and, consequently, undermining the nature of the internet as an economic medium. Shifting the perspective and placing human attention as most valuable core of our virtual system instead, entails the return of scarcity in theories of the digital economy, implying its normalization. The first time the concept of attention economy was theorized, it was by the American psychologist Herbert Alexander Simon who identified the corrosion of attention as the economical consequence of an information-rich world. He understood that the true problem of information systems was not the scarcity of information but rather the lack of a system that "excelled at filtering out unimportant or irrelevant information" (Simon 1971). The academics who defined the knowledge economy had already, ever since the 60's and with a peak in the 90's, inverted the poles of the old economy to obtain a description of the new one, swapping material value with intangible capital based on valuable information and ideas. However, according to the attention economy theory, this operation needs to be brought to the extreme in order to accurately capture the new digital order.

1.3. The two sides to the Attention crisis

If once upon a time knowledge was a luxury good to be chased, we are now drowning in information. Not only the amount of data is overflowing, but it is also piloted by the economy-driving effort of catching our attention as consumers of goods and content through, for instance, targeting algorithms, absurdly fabricated fake news, catchy notifications, fishhook thumbnails and so on.

It is possible to classify two main aspects to the phenomenon of mortification of the modern human attention span: Relative and Effective.

The former had already been theorized by Simon in the 70's, supporting that "what information consumes is rather obvious: it consumes the attention of its recipients". According to Anderson,

Simon's explanation of the poverty of attention is the "most concise possible description of our modern struggle" and it stresses the consequential relationship between wealth of information and scarcity of attention. This relative discrepancy can be linked to our incapacity of allocating our attention efficiently and navigating the amount and speed of circulation of data that technology allowed us to possess. In this sense, we can define poverty of attention as an organic and natural consequence of the possibilities the digital era has offered us, a side effect of its benefits that would require, in a classic Darwinian manner, for our mental skills to step up and develop the necessary competences of managing and containing our own material and intellectual progress. It is therefore a scarcity of attention in a wide and intuitive sense, defined in proportion to the astounding amount of data we are either actively or passively exposed to.

There is then a whole side to the phenomenon of paucity of attention that we can refer to as Effective and has to do with the plasticity of our brain, not solely a concept of scarcity but of concrete damage. Statistic Brain Research Institute, interpreting data from a 2008 study by Professor Weinreich and others called "Not quite the average: An empirical study of Web use.", highlighted the fact that the average attention span dropped from 12 seconds in 2000 to 8 in 2013 and for many academics that is due to the spread of internet usage, despite there being need for further research. According to Dr. David Greenfield, Assistant Clinical Professor of Psychiatry at the University of Connecticut School of Medicine and founder of the CITA (Center for Internet and Technology Addiction) "on a functional level people have a much higher degree of distractibility, when it comes to digital technology" but, clearly, "whether those effects lead to long-lasting neurobiological changes we don't know yet.". In order to explain this phenomenon, we can identify a set of effects the average brain configuration has accused, which have arisen automatically due to extensive Web usage and that were enabled and amplified by the shape the

global virtual environment has acquired, mostly ever since it was colonized by companies, becoming a core of the new economy.

As mentioned, the long-term neurological effect is still to be observed and interpreted but the brain's ability of reshaping itself and adapting to new intellectual realities by atrophying or developing specific areas is not news. In her book "Reader, come home", Maryanne Wolf identified an intellectual ability that is already on the verge of getting lost: Cognitive Patience, which concerns our ability of remaining focused and can be traced back to neurological dynamics and chemical unbalances observable in addicts. One small but surely common example is what Robert Sapolsky has theorized as the idea of the "magical maybe", according to which "the individual may or may not find a notification when looking on the phone. There is a large increase in dopamine levels when the indication is seen. The dopamine disappears quickly after the mental sensation is experienced. Then the brain starts searching for dopamine again, the individual repeatedly feels request of looking at the phone screen.". It is evident what this kind of cycles bring about: by chasing the short-lived dopamine rush we gain by browsing, receiving digital attention and multitasking we lose the capacity of deep thinking, critical reasoning and most of all our focusing abilities, that according to Wolf are degrading our brains out of the capacity of immersing themselves in books. In fact, in the cognitive neuroscientist's book, she explains how humans were never born to read, the brain re-wired itself to develop this ability, creating a relatively short 6000 years history of reading and thus implying its potential ability of re-re-wiring itself, adapting to new technologies and unlearning this same ability.

The digital media logic is today embedded in the modes of data fruition of fairly anything. As Nicolas Carr wrote in his well acclaimed article "Is Google making us stupid?": old media have little choice but to play by the new-media rules. This mean that the influence of the Internet now

goes way beyond the screens: our inevitable and intense exposure to its mechanics is starting to influence how and why we pay attention to what in general and since, as we mentioned, the WWW is now a capitalistic economic medium, it is dictated by the rush of competition which implies seeking more and more attention, in more and more colourful, immediate and concise formats. The result is not only a scarcity of attention due to our brains simply not being used to the amount of data we "need" to process nowadays (Relative) or the demonized screens that surround us, but the beginning of a proper re-wiring process that is being enhanced by deeper aspects of the digital exposure and new market laws still to be tamed.

To summarize, the Effective scarcity of attention is due to how the consequences of the Internet on the ductility of our brain are being amplified by the fact that the consumption of attention by new media is the core of the constructed economic reality we are experiencing, adding to the wealth of information a state of constant overstimulation and dopamine-driven rewards, that are accelerating the process of cognitive re-shaping.

1.4. From Attention crisis to Identity crisis: Social implications of the Digital economy

So far, we have dealt with theoretical and scientific facts and their economical and neurological causes, but what is precisely the impact this dynamic has had on our global social texture? We have and will talk about deep and critical thinking in an environment of digital stimuli, yet what does the attention economy, as an integrated socioeconomical system, do to individuals? This mechanics - and the arenas they take place into - affect one essential human paradigm that define macroscopic social fabrics: identity

The individual Internet user has, thus far, been described as a consumer of content and provider of human attention, however if we move from the economic domain to the adjacent social domain, both intersecting and cohabiting the big melting pot of "augmented life", we find roles

to be somehow inverted. The system involves an agent seeking attention and one consuming content; from this new standpoint users become providers, the significance of attention shifts from a matter of psychological involvement to a meter of socioeconomic success and perceived selfhood, and the content provided is a francized summary of our idealized personalities. The academic work concerning the sociological and philosophical development of sense of identity in contexts of virtual "agorae" is rather extensive (Floridi 2012, Lupton 2014, Grover 2015, Carter 2015, Seibel 2019), however the intersection between the features of the economic configuration implied by the attention economy and the new complex perception of the Self and the Other has not attracted too many scholars so far, even though the two domains appear to be, in fact, two facets of the same coin and even submitted to the same laws.

The concept of attention economy has its roots in a behavioural and psychological reality first. In a 1997 conference, Goldhaber explained the essential nature of the flow of attention which concerns even – or mostly – the simplest forms of human interaction, like greetings between acquaintances or a child seeking attention. A normal conversation or a kid asking an endless series of questions to an adult, according to Goldhaber, hides behind a request of information a simple attempt of attracting attention. It is a rather intrinsic part of human nature, which goes beyond psychological necessity: infants learn the need to draw attention to themselves for a matter of material survival (being provided food, warmth and so on) and later on, as toddlers, to develop a sense of themselves, a demand that will not be extinguished by time or progress, in this case even enhanced.

The phenomenon of interest right now is the merging of social and economic canons, the fabrication of one unique domain with its own statute, clustered with the coexistence of roughly every aspect of human life: what it enhanced, what it undermined and what it created. Therefore,

the true fascination is not behind the not-so-new concept of interaction-transaction alone, but rather the sense of entrepreneurship that has become embedded in the management of our sense of identity, social roles and egos, which is inevitable the moment we realize, aided by Goldhaber's examples, that what is now nurturing the digital economy is also one of the most essential and basic human needs.

> It can be argued that identity is not about values, choices, personal paths and coherence, but about product, branding, aesthetics and packageability. Before going in depth, it is essential to note that, as mentioned in the introduction, this is an example of non-directional impact; this analysis has nothing to do with an intent of condemnation: it is not exaggerated to claim that thousands of young digital natives' lives were saved by the opportunity of expressing themselves and being consciously or unconsciously exposed to the free expression of others online. It is enough to think about young members of the LGBTQ+ community, growing up in conservative or repressing contexts, and having as sole possible outlet and opportunity for self-discovery and sense of acceptance the online realm, in all its facets, allowing the support necessary to undertake personal development and a healthy identity construction. This part of the argumentation poses its interest in the general tendency of identity marketization and the modern integration between psychological needs and contemporary economic paradigms that the Internet and specifically social media and celebrity culture have fostered.

In fact, the concept of identity has always been faceted and explicable through different material, behavioural and social cues, among which many had the intent of attracting attention and shape a better personality, in terms of likability and self-continuity. What the Internet has done consists in having set a huge and global arena where ordinary individuals and big companies share the

same racing circuit to compete for the same scarce resource in a more or less explicit manner. The conceptual bridge between the consumer's and the provider's perspective of online identity construction is the concept of "Self-presentation". Goffman (1959) defined self-presentation as the "intentional and tangible component of identity", according to which "social actors engage in complex intraself negotiations to project a desired impression" followed then by a process of impression management. The practical implication of this social and personal objective is consumption oriented (buying cars, branded clothing and so on) and finalized at impressing others and gaining attention. As the focus of business models migrated towards attention catching strategies, individual and personal strategies of catching attentions became increasingly serious, tangible, strategic and exploitable by modern mechanics of Communicative capitalism (Payne 2012), resulting in both dimensions somehow merging. As Floridi said in a 2012 article for Philosophy and Technology: "to [digital natives], it seems most natural to treat their personal identities as a very serious work-in progress and to toil daily to shape and update them online. It is the hyperconscious generation…". But where does this new urgency come from? As we have seen the need for attention and the undertaking of social actions finalized at self-presentation are nothing new. The difference stands in the fact that social media change the rules of the game and invest the aim of unprecedented cruciality. The increasingly private aspects of life that get shared, the endless possibilities of feeding the digital gaze an "idealized" version of our identities, the direct involvement of today's biggest companies and a glaring enrichment of expectations, sensibly raises the stakes. Being able of attracting attention through the francization of our personality not only affects psychological fulfilment and social success, but it also determines a whole status, index of "integration"[1], and, in many cases, even creates money and jobs.

1. It is fundamental to specify that the concept of Digital divide and a considerable degree of privilege need to be considered a priori, thus the concept of integration in said context acquires a rather narrow sense and scope of application.

It generates a new form of social pressure and an equal sense of social opportunity, by extending many features of a century old celebrity culture to ordinary people within social digital environments, enabling new forms of shared yet exploited intimacy, creativity and disclosure. In fact, social media are often advertised by highlighting their objective of encouraging free expression and fostering creativity, which is definitely true and helpful as personal outlet but, as Professor Lupton from the university of Liverpool notices, “counter to the idealised notion of the sharing subject that can be creative and resistant to dominant discourses, industry has begun to use this ideal for its own ends.”

The modern forms of social pressure entailed by new media dynamics can also, among many, be interpreted through the lens of Wouters’ concept of Informalization, according to which the twentieth century has witnessed a trend of tolerance, then appreciation and eventually expectation of informality. “Previously forbidden behaviours became permissible and the regulation of conduct and behaviour in many parts of social life became less formal.” This phenomenon might suggest a sense of freedom, interpersonal closure and social integration, however, as observed by Wouters himself, “we are not witnessing a liberation of emotional and behavioural alternatives instead, formal rules and expectations have gradually been replaced by increased demands for self-regulation.”

Social norms have not disappeared into nothingness, but they have been internalized, resulting in an augmented complexity in norms of self-expression, successful self-presentation and most of all self-perception. It is a really evident trajectory, thinking about the social climate and psychological priorities that social media demonstrates; One of the sparse elements that may provide an explanation on why some politicians are posting like Netflix stars, some Netflix stars are posting like your friends, some of your friends are posting like sponsored influencers and

some sponsored influencers are posting like health gurus. A generalized and simplified model of young internet user craves human authenticity in the content is consumes (from a YouTube video to a dank meme, to a new record) and claims a public recognition which somehow reflects a specific idea of themselves. It is a dynamic that, in its complexity, might carve personal dispositions in endless ways: homologation, self-discovery, inhibition, personal development, anxiety, deep fulfilment, alienation, open-mindedness.

We are witnessing a complex process of conceptualization of people and behaviours, which we simultaneously produce and consume as users and human beings in a synthetic system of reality construction that, by playing with our most intimate necessities, constantly blurs the lines of actuality and society.

Chapter 2: Remember!

"Automation does not necessarily supplant human activity but rather changes it, often in ways unintended and unanticipated by the designers of automation, and as a result poses new coordination demands on the human operator."

-Parasuraman, Sheridan, & Wickens, 2000

2.1. Benchmarks of Post-human Memory

The conversation about the effects of the Web on the ability of retaining information is deeply rooted in the concept of Attention crisis but still essential in itself since, first of all, it concerns a different facet of the internet's existence in our life, having less to do with hyperconnectivity and entertainment and more to do with everyday assistance and research and, secondly, by constituting a bridge towards our next phase of analysis. We do not base our opinions and reasoning on what we see every day but on what struck us, stays in our system and is being critically reformulated to generate patterns, thoughts and ideas.

To resume the leading thread yet develop the discussion from this perspective, we can roughly refer to attention also as "working memory". Our working, also known as short-term, memory is located on the frontal lobe, it is a cognitive organ of storage with limited capacity and the function of running through strains of information (called Cognitive load) on the spot, acquiring the important bits and then transferring them to long term memory, where they will be processed into conceptual schemes and patterns of knowledge. It is much like how the Random Access Memories (RAM) component of devices is just a "working" memory, used to actually run the

operating system and carry out functions, while the Read Only Memory (ROM) is the actual unit of internal storage. However, in the case of the human brain, there is a connection between working and long-term mnemonic functions and this linkage turns out to be the very premise for any kind of deeper cognitive activity, such as applying logic and creating opinions.

Even just from this simplified definition, we can already intuitively draw a deeper neurological understanding of the relationship between data overload and scarcity of attention which the previous chapter explored. When the Cognitive load exceeds the storage possibilities of the brain - which includes the ability of handling, according to Dr. Merritt from the Moritz College of Law, not more than seven bits of information and processing two, maximum four, at the time - it becomes impossible for any bit of information to cross the threshold of long-term elaboration. In addition to that, “a break in attention can sweep information from our short-term memory”. Thus, by shortening our attention span and constantly juggling a variegate and discontinuous flow of information, memories are prevented from becoming such, be retained, cemented and organized into bigger schemes, allowing strong neural connections to form. Dr. Ziming Liu, from San Jose University, in a 2005 publication explained how “the screen-based reading behaviour is characterized by more time spent on browsing and scanning, keyword spotting, one-time reading, non-linear reading, and reading more selectively, while less time is spent on in-depth reading, and concentrated reading”. It becomes clear then how the attention crisis’ impact on the natural process of storing information is a rather direct and inevitable one if analysed in the context of the modern digital environment and keeping in mind the iter through which the human brain absorbs information.

However, there are cognitive mechanisms that deal in a stricter way with how the brain choses which “chunks” of knowledge to retain and several experiments that in the last fifteen years have

displayed how this process was altered by the power of having every possible bit of information on the palm of a hand. Sparrow and Liu from Harvard published the results of a series of four experiments, attempting to evaluate whether the Internet, in its vastity and accessibility is serving as an efficient form of "external transactive memory" and exploring relative consequences. Given the incredible accessibility that search engines offer, it appears that the brain has started to consider the World Wide Web as a remote branch of its own storing capacity resulting in a one-sided transactive and integrated memory that leaves to the individuals the sole responsibility of remembering where and how to access information rather than the information itself. It is important to specify "one-sided" since the new theorization of transactive memory can be traced back to an academic publication from 1987 by American psychologist Daniel M. Wegner and it concerns one of the most influential behavioural group theories: the group mind. According to Wegner and others "a transactive memory system is a set of individual memory systems in combination with the communication that takes place between individuals." Being part of a smoothly running transactive memory in a group is immensely beneficial for the individual: it expands his expertise, increases collective productivity and allows the system as a whole to acquire new knowledge without the active involvement of all members being necessary at the same time. However, there are some drawbacks to the transactive system such as what Hart theorized as the "feeling of knowing". It can be simply explained as overreliance on the single's ability of accessing knowledge, resulting in a sense overconfidence given by the feeling of already knowing the information.

In a modern interpretation of the system, we can observe how the feeling of knowing is directly proportional to the perceived ease of retrieval of information, which brings us to today. At the beginning of computer history, when the machines started to serve for scientifical or

governmental purposed as archives, they could have been intended as a central knot and storing device for a real life transactive memory system, made up of human members actively enriching the common knowledge. This system is applicable today but with a different structure. Today's transactive memory system still technically includes a computer network filled with human knowledge and people accessing it but the "group" in question is not constituted by said people anymore. From the perspective of our brains, the group is now only composed by the individual and the smart device, thus it is evident how the unprecedented ease of accessibility results in a disproportional distribution of collective knowledge and, therefore, an enhanced "feeling of knowing" on our part. Among Sparrow and Liu's experiments, the most exemplifying and empirically significant for the matter is Experiment 4: participants are asked to type on a computer a series of memorable trivia sentences, save them in a specific folder and then given a recall test, concerning both the content of information and the location. The results were as it follows:

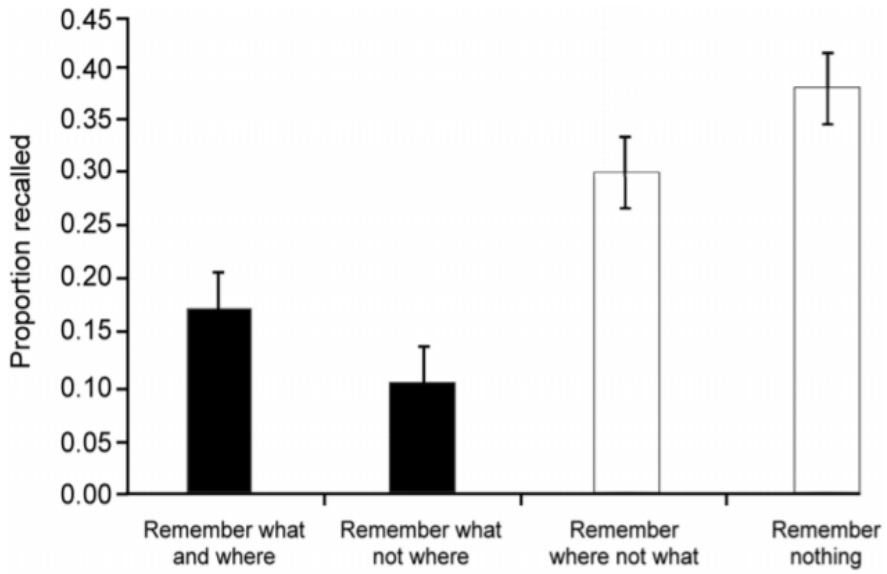

Fig. 1

Sparrow, B., Liu, J., & Wegner, D. M. (2011). Google effects on memory: Cognitive consequences of having information at our fingertips. *science*, *333*(6043), 776-778.

"Scale is measured in proportion recalled. Error bars, mean +/- SEM."

This study shows how, first of all, people seem to be more prone to forgetting bits of information they know will be externally available, as if the integration between our own personal knowledge and the one promptly available on devices was already unconsciously taken for granted by our mnemonic organ, and secondly that, because of the same dynamic of feeling of knowing, people appear to generally remember where an item was stored rather than the item itself, most likely to remember the location alone and most unlikely to remember the item and not the location.

2.2. Internet Memes and the Revolution of Memoricity

It would be dramatically reductive to assert that mnemonic abilities are being undermined to atrophy by the hellish technology of the modern times. Even though neurological explorations have given the empirical premises to claim so, it is now a basic law of physic that should suggest us that nothing, from mass to energy, ever disappears into nothingness, at the cost of morphing in the most unpredictable, yet naturally logical, forms. If we combine neurology and communication with sociology and politics, we obtain a system just as complex, supposedly slave of analogous principles, which entails that our memories - individual, collective and transactive - must be finding new ways to function in the digital realm. This readaptation of human cognition and communication can be efficiently summarized by the idea of the meme.

The Internet meme is defined as a multimodal artifact circulated, imitated and transformed by countless online users, generating a "shared cultural experience" (Shifman 2013), which rises and falls in popularity in short periods of time. Ewald Hering, an Austrian sociologist, coined the expression "Die Mneme" (from Greek, mneme = memory) in 1870, which the German biologist Richard Semon used as the title of the study on memory he published in 1904. However, the first complex definition of the word meme only appeared in 1976, in biologist Richard Dawkins' book: The Selfish Gene. Dawkins shortened the Greek word "minema", which means "something that

is imitated", to rhyme with "gene" in order to express a conceptual equivalent of the biological gene in the intellectual and cultural domain. Memes, therefore, are single-unit means of transmission which in their online form are commonly, but not necessarily, characterized by a humorous spirit and an opinion-making value. In our discussion, internet memes are an incredibly useful tool in other to give a concrete form to two important things discussed thus far: it is a concise bit of information embodying the prototype of format a users' working memory is used to process when navigating online and a mean of transmission, creatively remixing familiar and recognizable words/images in a transactive popular reaction to reality or reorganized memory of the past.

There seems to be a new level to knowledge storage that cannot be defined as either personal knowledge or a shared memory for the device to have and the user to access. It is a layer in between the two of a completely different nature. The internet does not simply store human information like an external hard disk, the reality of things shows a new, dynamic, mutual and everchanging form of collective memory and knowledge that is being replicated and transmitted from human to human, as it used to in the most ancient oral traditions, but throughout platforms so advanced, vast and smart, that the whole process resembled, to the first scholars that theorized it, the cultural equivalent to the biological replication and diffusion of genes.

A fitting facet of the Internet meme, in evaluating the true effects of the cognitive rewiring we are experiencing, stands in its capacity of enhancing critical thinking, which is mostly powered by long-term memory. As it has been discussed, the true damages of extensive Internet use on the memory does not simply concern the operation of recalling facts, names and general knowledge, but it points at an impairment of higher brain functions. It is not about storing information for the sake of retaining it, the true aim is that of processing knowledge, critically evaluating it,

generate schemes, patterns and formulate concepts. Nicholas Carr's article for the Atlantic had a massive mediatic resonance in its role of waving red flags against the risk of giving up higher cognitive functions, including intimacy and empathy, at the cost of an hyperconnected and permanently entertaining augmented reality. However, memes might point to a whole new approach of the brain to knowledge acquisition and mental connections.

Leight, summarizing the work of other colleges such as Kandel (1979 and 2009) and Tsien (2007), explained that "newly formed neural connections, as memes, interact with existing neural connections (which may be themselves acquired memes, or DNA-derived memes), forming neural clusters with enhanced connections, forming a neural code, which represents a meme complex, i.e., information that is connected and potentially processed as a unit". What this means is that our brain happens to have its own mechanics in meme acquisition, which have to do both with previous memories involving similar bits of information and our ability of inserting the new meme being acquired in a neural network, generating strong and deep conceptual links. This phenomenon in particular refers to "generic" memes, meaning single cultural units which, extracted by the context of WWW, can be understood if compared to what photons are for light, but in culture and communication. This concept, however, never really had a clear practical form until its impactful and concise characteristics made it perfect for virtual communication and entertainment, creating, starting from 2011, an incredible wave of popularity that made it what it is today: an essential online format. The most intriguing aspect about new cognitive strategies involved in meme processing is that these "neural codes may be represented as binary codes" (Lin, Onan and Tsien 2006). Our initial understanding of transactive memory is thus once again evolving: we not only "share" knowledge with the Internet, using it as external interface, but we compromise with it, by adopting formats of information compatible with its mechanics of

transmission and roughly processing its language. It seems that post Fourth revolution human brains are not simply dumber versions that are now lacking basic cognitive functions, they are re-wiring in ways yet to understand but all based on the premise that they are doing so by emulating the configuration of the technological challenge they are facing. We can look at online memetics as a new form of memory: a living, vibrant, dynamic, global and multidimensional chain of knowledge transmission, from human to human, with a digital intermediary and a hybrid language.

Makhortykh and Aguilar discussed, in a remarkable study from 2020, the relationship between memory and politics through the model of Internet memes about protests in Venezuela and Ukraine. The interaction between politics and memory in contexts of Western new media has been fairly explored, however the phenomenon assumes an increased socio-political value in the case of fractured memory regimes, in which historical facts are politically instrumentalized by the elites and ruling classes. In fact, the meme, as mnemonic intertextuality, "not only offers a new perspective on the relationship between the past and the present" (Silvestri 2018) but can also "challenge existing memory narratives" (Makhortykh 2015). The societal perception of the past, in relation to present events, can be sensibly influenced, if not shaped, by its online formulation on social media and, thanks to dynamics of globalization and virality, it might be tough to obfuscate inconvenient historical or political realities once they assume form in the world of online memetics.

An interesting experiment by Wells and others consisted in asking students from POLS 1101 American Government to create "a political meme that took a stance related to American politics or public policy, broadly defined." The assignment not only turned out to be stimulating and modern but, through a more concise form, unlike traditional assignments, it was able of

considerably aiding critical thinking skills. Wells conducted a series of surveys and personal considerations, drawing the conclusion that working with this familiar style of expression really helped students get a deeper idea of the nature of political opinions within new media, generating a bridge between modern humour and entertainment and deeper cognitive qualities, concentrating both elements in a single-unit and concise work of substance. Wells' experiment is nothing but a circumscribed example of these new ways of transmitting and understanding real life facts, which can be symbolized by the internet meme, however, the implications of this trend are likely to revolutionize collective political consciousness in unprecedented ways.

In summary, memory might seem a trivial or dependent aspect in the analysis of our cognitive evolution, but it appears to be rather neuralgic in the incredible complexity of its adaptive development to new technologies.

Chapter 3: Think!

"Automatic reality construction operations, happening online daily and in the subtler ways, have become almost the richest businesses and definitely the most powerful phenomena of our historical period "

One of the focal premises of this thesis relies on the already mentioned concept of non-directional effect. For each revolutionary aspect there is a specular devolutionary one and vice versa. Thus, in the same way the transmission powers of online memetics create a vibrant and popular collective memory and real-life commentary, their content can be more or less accurate and more or less constructive, without their virality depending on it. They are powerful communicative tools by definition "out of control", for good or ill.

In the same way, the benefits of freedom of expression and aesthetic richness offered by social media platforms may be counterbalanced by the additional social pressure they imply, and the extreme vulnerability of self-consistency caused by an environment in which the boundaries between market-oriented manipulation of content and genuine sharing of personal experiences not only blur but merge. It is enough to look at the coveted figure of the influencer: a sponsored professional who shares private bits of their daily life, shaping in more or less explicit manners, consumption habits, personal choices, opinions, aesthetics and thoughts of millions of people. Same goes for knowledge circulation in general, the point stays the same: the new public sphere is now privately owned, dictated by socioeconomical norms and managed by technologies so advanced that they become, in their immense usefulness, totalizing.

We have observed how new cognitive mechanisms, deriving from internet use, can actually enhance certain specific forms of critical thinking but, all considered, times might not be mature enough for the evolutionary switch to be complete and synchronized with changes and processes of privatization occurred in all matters of socio-political life, which leaves some important elements hanging. There is pollution and manipulation of information, polarization of opinion, sense of alienation, detachment from everything that falls outside the sphere of interest of the various "Western" fabricated realities, less mental strength to focus and engage properly in activism or citizenship and, most of all, no forms of proper consumer protection and adequate reinterpretation of fundamental laws on the model of a wider form of antitrust.

What if new declinations of human identity, between approaches of self-presentation and business-like strategies, also involved politics, creating an undistinguishable and instrumentalized fog, with an unmeasurable power of reality fabrication and social constructivism? A fog that, with the help of increasingly unhealthy dopamine cycles and attention corrosive overstimulation might, eventually, sensibly discourage users from generating an original and thought-out idea about the world and themselves. How has our way of formulating an opinion changed and what was the impact on democratic institutions and public views?

This third section will conjugate identity related concepts, deriving from theories of digital attention, with elements of deep cognitive changes already dealt with in the second section, to culminate in an analysis of contemporary decision making.

3.1. Echo chambers

The most adequate concept to start off this discussion is that of Echo chambers. According to Technopedia (2018), an echo chamber can be defined as "a situation where certain ideas, beliefs or data points are reinforced through repetition of a closed system that does not allow for the

free movement of alternative or competing ideas or concepts." It is a vast concept that in the last few years has been abundantly mentioned, understated in its causes yet maybe overestimated in its effects. The phenomenon combines human biases, such as confirmation and motivated reasoning, with internal mechanics of social networks and web surfing, altering the circulation of content into a unidimensional social and political airlock. How does this happen?

The human factor of it is nothing new, and explicable through a series of psychological and behavioural attitudes distinctive of political opinion formation. Gathering and recalling bits information selectively, favouring the ones supporting the person's hypothesis or beliefs, is a common bias called Confirmation and it is proportional to how emotionally involved or consolidated the thought on the matter already is. Motivated reasoning is a very similar bias which explains how decisions are not taken through rational computations only but also accounting for motivational and affective considerations. However, these biases are not new: what is making these kinds of mechanisms easier to fall into in contemporary conditions?

In the Rationalizing Voter (2013), Lodge and Taber analysed how political behaviour and decision making are rooted in "unnoticed forces and processes that occur in the early, unconscious phases of information processing." Later on, in a study from 2016, they added "the hardwired associative architecture of long-term memory promotes networks of connections among thoughts, feelings, and intentions that enable rapid and effective response patterns but may also promote bias and misperception". The material of their discussion hence concerns, first, "unconscious phases of information processes", that in a virtual context can be pictured as a user scrolling through feeds and news, paying attention to a series of headlines and images, of which not all will be stored in his long-term memory, but that will set her mentality and alter her critical approach through unconscious and silent channels. Secondly, information that does cross the threshold of long

term will create conceptual patterns and consciously shape our evaluation, however it may be reinforcing bias or creating new ones, based on what we have been exposed to in the past and, again, our mentality in apprehending and processing new information, which is inevitably affected by first impressions. Thus, logic is never objective and subjective reality can be shaped every day towards any direction, depending on the inputs and stimuli. Today the stimuli are of enormous quantity, increasingly manipulated and of catchy, impactful and uncertain quality: the grip of control and rationality on critical factors in opinion-forming gets more slippery.

What about the "machine" factor? Meaning the ways new media platforms may foster closemindedness and weaken political reasoning. How is it possible that mechanics of social networks, created "specifically" to generate public spaces of human exchange, already have the automatic tendency of generating total or semi-total echo chambers, without user necessarily seeking them? Social networks are private companies whose main objective is that of selling advertisement spaces and, most of all, data to other private companies. As we know, publicity does not consist in mass advertisement anymore, but it is strictly individual so that each person is part of a series of intersecting targeted bands of people and gets personalized and specific ads. The more the user interacts with the content offered by the platform, the more data is collected and sold, the more specific targeting can be, the more accurate the ads, the more the overall engagement of the user, and the cycle goes on. Like any self-respective cycle of capitalistic consumption, it appears endless, accelerating, exploitative and self-powering. However, the amount of data to manage is too vast and complex to be processed by normal informatic system, thus a whole new discipline has landed on our daily lives and mental "drivers": the infamous Big Data. The mediatic stir around big data related scandals has been impressive, first and foremost the 2016 Facebook-Cambridge Analytica one which made the world question the possibility of

coexistence of new technologies with the legitimacy of democratic systems. It goes without saying that the cycle of social media fruition is for the benefit of the consumer until it is not: sponsoring becomes the dominant engine of global knowledge circulation and the moment it becomes political in nature the damages to the human system turn uncontainable. However, despite the undoubtedly alarming state of personal data markets and democracy, the bigger picture urges us to consider wider criteria of analysis and go back to the human factor for a moment in order to link it specially and consciously to modern conditions and open the possibilities of drawing a human-scale solution.

3.2. Hyperreality and Hegemony

Several are the theories concerned with the concept of "world view", objective truth and ideological hegemony (Williams 1960, Althusser 1970, Gramsci 1972, Foucault 1980), however the condition of tight, addictive and all-permeant exposure to influences and impactful inputs we are now facing, calls for new solutions, and most of all, new problems. What is happening within and around the screen of a smartphone is a proper never-ending fight for hegemony: to gain engagement, as we have established, you need to draw attention, to win commitment you need to enforce a brand, display a winning communicative style, be consistent in the type of content and basically successfully selling an idea and creating an ideology, and these rules apply to both the social, the economic and the political. The mission of the "offeror" is that of creating the winning view of reality and conquer subjectivity.

Foucault is one of the greatest thinkers of the last century, and he has the merit of taking Marx's declination of power, described as exclusively economic in nature, no matter the forms in which it manifested itself, and expanding it to all layers of society, explaining that modern power is "exercised through discursive and behavioural rituals, which become internalized norms by

which people live out their everyday lives." Gramsci conducted a similar operation in reinterpreting Marx, introducing a significant accent on soft power in power relations. One of the differences between the two is that Gramsci still relied on a dualistic power dynamic and binary sets of roles, with leaders and masses, hegemonic forces and peripheral ones: "the ideological predominance of bourgeois values and norms over the subordinate classes which accept them as "normal"(Carnoy 1986, 66)". Modern exploitation still retains a clear direction, yet new abstract weapons. His theory was widely inspired by the phenomenon of the rise of Fascism in Italy. Foucault, on the other hand offers a more layered and multidimensional scheme that, although Gramsci's considerations may be interestingly applicable to the contemporary structure of economy and politics, perfectly represents virtual life. Foucault's power is not something that is acquired, seized, or shared; it is produced at every moment and exercised from every direction, shaping collective views and promoting ideas. We can glaringly observe how a Gramscian-Foucauldian perspective is much more effective in explaining a world where the mean has overwhelmed the message, the form has overwhelmed the content and the commentary has overwhelmed the event itself. True power consists in running a platform hosting a community of more than 2.3 billion rather than leading a whole country and that is because, in other to impose a "convenient" world view, the latter needs the former: never the other way around. The impact of Facebook on Brexit and Trump's election was not totalizing or singlehandedly decisive, yet in circumstances of rough parity, it had the ability of generating a surplus notch of support on one side determining a definite result and, in an increasingly polarized political spectrum, that notch of difference is becoming more and more relevant.

The way social media are able of either reinforcing an already strong opinion or giving a crucial push to an indecisive voter is through invisible algorithmic mechanisms that not only manage

advertisement-intended profiling, but systems of targeting that determine everything that appears on a user's screen, from news feeds to search recommendations. Algorithms are the muscles of the discipline of Big Data. However, these algorithms are not neutral in their working choices. As RNS's Cathy O'Neil explains, generally speaking an algorithm is written with a task in mind, which can be accomplished with essentially two things: an historical data set and a definition of success. As we might have concluded thus far, success can be considered rather subjective, if not even ambiguous in the context of digital interactions. The definition of "success" of social network companies is that of keeping users online as much as possible, therefore the algorithm will be built to eliminate any form of "stop cue", end of the Feed and to use its historical data set of personal information to mould the content to individual interest. Success in a corporate setting is that of making profit, success in a political setting is to manoeuvre public opinion and so on. Therefore, the virtual public reality, today source of roughly every bit of information the brain processes daily, thus definable with a post-structural concept of hyperreality, is not only a Gramscian-power warzone, but it works following rules that strictly benefit private agents. According to the predictions of philosopher Batillards, mediatic representation and actual reality (which is already a complex concept in itself) have become completely undistinguishable and, in the context of this discussion, such consideration leads us to alarming new questions.

Modern, digital, integrated reality is undoubtedly modelled according to values of private interest. This includes fact, news and ideas and it is a notion already known and in place ever since academics started highlighting the mediatic monopolistic structure, especially recently within the USA, with media giants like ABC and CNN being tightly related to certain political instances. Automatic reality construction operations, happening online daily and in the subtler

ways, have become almost the richest businesses and definitely the most powerful phenomena of our historical period and, since thanks to technology they happen so close to our faces, our psychological needs, our senses of selves and our neurological mechanisms, how big of a margin to be fully aware as consumers and human beings are we left with? Internet addiction is a complex phenomenon, which has been scientifically proved, however also overstated and even politically instrumentalized to bring about restrictions of personal freedom (see China). The Internet has resulted in benefits that are simply too incredible to be reduced to a generational plaque. The lens on analysis of it, therefore, needs to be as narrow and objective as possible thus, in the case of this work, the intention is not that of exposing conspiring schemes of manipulation, but to highlight how many modern struggles of human psychology, communication, political and public spheres are converging in a new integrated and constructed layer of reality, which is leading to question future human abilities of navigating it and keep processing it as a rationally creative and unique species.

4. Conclusion

The attempt of this work was of offering a neutral and scientific picture of human development within the Fourth Revolution. It is structured in three parts, each referring to a basic cognitive function: paying attention, absorbing information and critically re-elaborating it. They are not fully detached; each is substantially impacted by any factor that might influence the previous one creating what we can think about as a chain of knowledge processing and production. However, it is fascinating to observe how the struggles each function is facing either reflect or can be traced to different phenomena, symbols and virtual spaces, constituting an independent aspect of the cognitive revolution that can open the inquiry to new directions.

The first section concerning attention is economy and society oriented: it is possible to argue that the increasing integration of digital technology with the core engine of the economy has resulted in a heightened interactivity and proximity with the consumer/user. Consequently, mass consumption and services-related business models increasingly value individual interests, engagement, communication, personal information and, generically, human attention, shifting the priorities of the market. At the same time this motion can be symmetrically observed in the development of human psychology and both social and introspective values, gradually indiscernible from criteria of marketing, numerically or abstractedly assessed worth, objective confrontation, advertisement and mutual attention consumption. This form of integration has impacted social norms, interpersonal interactions, self-perception, selfhood and “strategies” of self-presentation, creating an agglomerating hybrid texture, merging economic and social canons in a human psychology-sized virtual system.

The second section, since all three modules can be thought of as part of a chain, starts off where the first ended. Memory is a complex extension of focus, which allows us to discern among the

endless stimuli the brain has received and paid attention to, in order to choose which ones are going to be cemented in our long term and permanent vision of the world. It allows for strong neural connection to form between information that has been absorbed, thus generating patterns, conceptual schemes, personal biases and knowledge. Empirical studies showed how the human brain evolved with the spread of user-friendly search engines and accessible digital archives, starting to function and conceive them as "hardware" and remote extensions of its memory, in a dynamic typical of collective behaviour called Transactive memory. This notion might seem alarming at least, however we find ourselves on the verge of observing and understanding how skills of memorization have not simply disappeared but morphed in more complex and collective mechanics which, in their public and global-scale nature, might bring about interesting political implications. Online memetics can be considered the core of this soon to be deepened potential thanks to their virality, structural features, unobstructed content, instantaneity, accessible format and vibrant online presence. A revolution in collective political consciousness.

The third and final section is a final layer of evaluation, more factual and concrete. The second section closed on a rather optimistic prediction about the path of collective political consciousness, the third one accounts for all considerations explored thus far to trace an evaluation of individual political consciousness instead, in the context of the online realm. The discussion starts off from the concept of Echo chambers, attempting not to dwell on the mediatic sensationalism surrounding the phenomenon, and posing an objective analysis of both the human mental dynamics and the platforms' algorithmic mechanics that have fostered this kind of environment on social media. Once extrapolated, these principles have been used to explain in a wider sense online manifestations of reality fabrication, soft power hegemonies, hyperreality

and socio-political constructivism. The issue emerges once the utter privatization of algorithms, at the basis of social networks and channels of information, is recognized, in addition to the fact that exactly as the WWW is more and more accessible to us, we become more and more accessible to (and through) it.

This is undoubtedly among the biggest shakedown our brains have had to face in history, due to unprecedented proximity of exposure to the triggering phenomena and the immense complexity of the mechanics that follow. It touches everything, from microscopic introspective perceptions to centuries old political institutions. The internet allowed incredible things to happen, as it pointed out important flaws of the human brain, by weakening them, as the latter was attempting to adapt to it by emulating its workings. What to do when progress, in its immense benefit, surpasses the psychological, mental, social and political capacity of the present? Going back to the Bronze Age seems neither appealing nor constructive. The key might be in an operation of counterpartying philosophical, mental and legislative progress, not aimed at compensating the progress itself, but at providing the adequate tools to navigate it safely, preserve freedom of thought which, as we have seen, has been challenged in non-trivial ways yet to be profoundly understood, preserve mental health, enforce updated anti-monopolistic measures and generate a social and philosophical predisposition to rethink critically and freely the complexities of our era.

5. Bibliography:

- Augoustinos, M. (1999). Ideology, false consciousness and psychology. Theory & Psychology, 9(3), 295-312.
- Betancourt, M. (2016). *The critique of digital capitalism: an analysis of the political economy of digital culture and technology* (p. 262). punctum books.
- Brynjolfsson, E., & Kahin, B. (Eds.). (2002). Understanding the digital economy: data, tools, and research. MIT press.
- Bukht, R., & Heeks, R. (2017). Defining, conceptualising and measuring the digital economy. Development Informatics working paper, (68).
- Carr, N. (2010b) The Shallows: What the Internet is Doing to Our Brains. New York: W. W. Norton and Company.
- Carter, M., & Grover, V. (2015). Me, My Self, and I(T): Conceptualizing Information Technology (IT) Identity and its Implications for Information Systems (IS) Research MIS Quartely, 39 (4), 931- 958
- Daldal, A. (2014) Power and Ideology in Michel Foucault and Antonio Gramsci: A Comparative Analysis, Review of History and Political Science June 2014, Vol. 2, No. 2, pp. 149-167
- Efthymiou–Egleton, T., Sidiropoulos, S., Spanos, E., & Stougiannou, E. (2020). Big Data and Democracy. HAPSc Policy Briefs Series, 1(2), 18-25. doi:https://doi.org/10.12681/hapscpbs.26473
- Fisher M. (2006) The New Economy and Networking. In: Innovation, Networks, and Knowledge Spillovers. Springer, Berlin, Heidelberg . https://doi.org/10.1007/3-540-35981-8_5
- Floridi, L. (2012). Technologies of the Self. Philosophy & Technology, 25(3), 271-273.
- Franck G. (2018) The economy of attention, Journal of Sociology 2019, Vol. 55(1) 8–19 © The Author(s) 2018
- Franck, G. (2002). The scientific economy of attention: A novel approach to the collective rationality of science. Scientometrics, 55(1), 3-26.
- Goldfarb, A., Greenstein, S. M., & Tucker, C. E. (Eds.). (2015). Economic analysis of the digital economy. University of Chicago Press.
- Jensen Schau, H., & Gilly, M. C. (2003). We are what we post? Self-presentation in personal web space. Journal of consumer research, 30(3), 385-404.
- Kari Mercer Dalton, Their Brains on Google: How Digital Technologies Are Altering the Millennial Generation's Brain and Impacting Legal Education, 16 SMU SCI. & TECH. L. REV. 409 (2013)
- Kay, A. (2018) Erikson Online: Identity and Pseudospeciation in the Internet Age, Identity, 18:4, 264-273, DOI: 10.1080/15283488.2018.1523732
- Klinger, U., Svensson, J. (2018). The End of Media Logics? On Algorithms and Agency. New Media & Society, vol. 2018, issue 12, p. null

- Kuutti, K. (2004). Trust, acceptance, and alignment: the role of IT in redirecting a community. Social Capital and Information Technology.
- Leigh, H. (2012). Memory, memes, cognition, and mental illness–Toward a new synthesis. Journal of Cognitive Science, 13(3), 329-354.
- Liu, Z. (2005), "Reading behavior in the digital environment: Changes in reading behavior over the past ten years", Journal of Documentation, Vol. 61 No. 6, pp. 700-712. https://doi.org/10.1108/00220410510632040
- Lupton, D. (2014). Digital sociology. Routledge.
- Macït, H. B., Macït, G., & Güngör, O. (2018). A research on social media addiction and dopamine driven feedback. Mehmet Akif Ersoy Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 5(3), 882-897.
- Macrae, F. (September 15, 2010). Facebook and internet 'can re-wire your brain and shorten attention span.' Mail Online. Retrieved July 31, 2013, from http://www.dailymail.co.uk/sciencetech/article-1312119/Facebook-internet-wire-brain-shorten-attention-span.html
- Manning, N., Penfold-Mounce, R., Loader, B. D., Vromen, A., & Xenos, M. (2017). Politicians, celebrities and social media: a case of informalisation?. Journal of Youth Studies, 20(2), 127-144.
- Mattessich, R. (2003). Accounting representation and the onion model of reality: a comparison with Baudrillard's orders of simulacra and his hyperreality. Accounting, Organizations and Society, 28(5), 443-470.
- Merritt D. J., Legal Education in the Age of Cognitive Science and Advanced Classroom Technology, 14 BU J. Sci. & TECH. L. 39, 45 (2007), available at http://www.bu.edu/law/central/jd/organizations/journals/scitech/volumel41/documents/Merritt.pdf
- Mykola Makhortykh & Juan Manuel González Aguilar (2020) Memory, politics and emotions: internet memes and protests in Venezuela and Ukraine, Continuum, 34:3, 342-362, DOI: 10.1080/10304312.2020.1764782
- Mulligan, M. (2013). Threat Talk: The Comparative Politics of Internet Addiction.
- Nelson, T. O., Leonesio, J., Shimamura, A. P., Landwehr, R. F., & Narens, L. (1982). Overlearning and the feeling of knowing. Journal of Experimental Psychology: Learning, Memory, and Cognition, 8(4), 279.
- Ordioni, J. (February 5, 2013). Social Media and Short Attention Spans. ERE Net. Retrieved July 31, 2013, from http://www.ere.net/2013/02/05/social-media-and-short-attention-spans/
- Pénard, T. & Poussing, N. & Suire, R. (2013). Does the Internet Make People Happier?. Journal of Socio-Economics. 10.2139/ssrn.1918937.
- Seibel, B. (2019). Insta-identity: The construction of identity through Instagram an extended literature review.
- Shifman L. (2014) Memes in Digital Culture – London: the MIT Press
- Sparrow, B., Liu, J., & Wegner, D. M. (2011). Google effects on memory: Cognitive consequences of having information at our fingertips. science, 333(6043), 776-778.

- Taber, C. S., & Lodge, M. (2016). The illusion of choice in democratic politics: The unconscious impact of motivated political reasoning. Political Psychology, 37, 61-85.
- Vidyarthi, N. (December 14, 2011). Attention Spans Have Dropped from 12 Minutes to 5 Minutes — How Social Media is Ruining Our Minds [Infographic]. Social Times. Retrieved July 31, 2013, from http://socialtimes.com/attention-spans-have-dropped-from-12-minutes-to-5-seconds-how-social-media-is-ruining-our-minds-infographic_b86479
- Weatherhead, R. (March 19, 2012). Say it quick, say it well – the attention span of a modern internet consumer. The Guardian. Retrieved July 31, 2013, from http://www.theguardian.com/media-network/media-network-blog/2012/mar/19/attention-span-internet-consumer
- Wegner, D. M. (1987). Transactive memory: A contemporary analysis of the group mind. In Theories of group behavior (pp. 185-208). Springer, New York, NY.

6. Sitography:

- CFI (Corporate finance institution) website: https://corporatefinanceinstitute.com/resources/knowledge/other/knowledge-economy/
- Inside China's battle to keep internet addiction under control : https://www.dailymotion.com/video/x7bxuo7
- The myth of the online echo chamber - BBC Future
- The Truth About Algorithms | Cathy O'Neil - YouTube
- What is an Echo Chamber? - Definition from Techopedia

7. Estratto

In tutte le sue complessità e sfaccettature, il vero impatto del Web sulle istituzioni democratiche, la psicologia collettiva delle nuove generazioni, il tessuto sociale e, come base di tutto, sullo sviluppo neurologico umano non è ancora pienamente compreso dagli studiosi. La ragione di ciò, per usare le parole di Quan-Haase ed altri nella loro valutazione del capitale sociale, è che Internet è un'innovazione intellettuale e tecnologica così grande che le sue implicazioni finiscono per essere "non direzionali": per quanto ne sappiamo, l'effetto è così ampio che quasi non produce un impatto che potrebbe essere definito negativo o positivo. Tuttavia, questo non significa che l'impatto non ci sia, al contrario. I neuroscienziati sono sempre più consapevoli del fatto che la natura plastica del cervello umano lo rende così adattabile che un cambiamento paradigmatico senza precedenti, come l'avvento di Internet, si traduce in alterazioni biologiche della nostra specie. James Olds, professore di neuroscienze e direttore del Krasnow Institute for Advanced Study presso la George Mason University, afferma che, anche nella mente adulta, le cellule nervose spezzano regolarmente le connessioni neurali per formarne di nuove. "Il cervello", secondo Olds, "ha la capacità di riprogrammarsi sul momento, alterando i propri meccanismi di funzionamento". Quando, ad esempio, nel XIV secolo l'orologio meccanico iniziò ad essere di uso comune, il "quadro astratto del tempo diviso" divenne "il punto di riferimento sia per l'azione che per il pensiero". (Lewis Mumford, 1934): "la gente cominciò a pensare al loro cervello come operante "in senso orario".” (Nicholas Carr).
Il punto focale di questa tesi riguarda la plasticità del cervello umano nella sua reazione all'avvento di internet e le potenziali conseguenze in termini di sviluppo sociopolitico. Questa nozione va oltre la nostra capacità (quasi filosofica) di costruire e ridefinire la nostra essenza, è un processo cognitivo che influisce sul modo in cui gestiamo, assorbiamo e riorganizziamo in

modo critico le informazioni, costruendo così un'opinione originale e sviluppando modelli personali. Esattamente com'è successo con la diffusione dell'orologio meccanico e di poche altre tecnologie intellettuali e materiali, il cervello umano non solo si sta adattando al Web, ma lo sta facendo emulando le sue funzioni di base e riproducendo le sue logiche. È una dinamica d'integrazione che trova spunti ancora più interessanti nella sua reciprocità: Internet ci sta plasmando; tuttavia, siamo noi che lo costruiamo e lo riempiamo di contenuti ogni giorno, dunque, quello che otteniamo non è nient'altro che un'immagine distorta di noi stessi? Oppure il Web potrebbe star lasciando un'impronta che appartiene esclusivamente ai suoi meccanismi, influenzandoci silenziosamente e al di fuori del nostro controllo?
Lo scopo di questo lavoro è quello di esplorare, su base scientifica e accademica, schemi in grado di spiegare la lotta moderna della specie umana, trovatasi a navigare in spazi inediti sia all'interno che intorno a sé stessa. La portata del discorso potrebbe sembrare eccessivamente ampia, spaziando da meccanismi introspettivi, mentali e neurologici a considerazioni sul tessuto sociale globale e scandali politici; tuttavia, il fascino che deriva dalla preparazione di questo lavoro risiede esattamente in questo. La più grande rete globale mai creata sta venendo emulata dal cervello umano, i meccanismi astratti che dettano il funzionamento degli algoritmi, già presenti nel nostro sistema cognitivo, stanno venendo oliati o atrofizzati secondo regole ancora non chiare; Il grado di integrazione del sociale, dell'economico e del politico che si sta verificando nella nostra iper-realtà, viene imitato e risposto dall'integrazione dei processi mentali: il successo sociale e le abitudini di consumo si fondono con i bisogni emotivi, la preferenza politica con bias incoraggiate dalla nuova diffusione d'informazioni e così via.
La struttura di questa tesi si baserà sull'analisi di tre diverse abilità cognitive umane che sono state influenzate dalla diffusione bruscamente pervasiva di Internet. Sono funzioni nevralgiche nella catena di produzione della conoscenza - fondamentali per lo sviluppo di culture, società e

istituzioni: Concentrazione (gestire l'esposizione alle informazioni), Memoria (immagazzinare selettivamente informazioni) e il Pensiero critico (elaborazione e confronto delle informazioni). Il primo capitolo affronterà una tendenza che ha iniziato a manifestarsi sin dall'inizio del XX secolo e del sistema occidentale di consumo e intrattenimento di massa. Si tratta di un processo d'integrazione che coinvolge società, pubblicità, intrattenimento e psicologia individuale. è stato reso possibile dal progresso tecnologico e si potrebbe sostenere sia culminato con la canalizzazione di tutti questi strati fondamentali della vita umana in una stessa dimensione virtuale e intoccabile. La moneta che domina questo comprensivo e prominente strato della realtà è l'Attenzione che, protagonista di questa prima sezione, verrà analizzata attraverso una lente storica, economica, neurologica, sociale e poi psicologica, con un occhio di riguardo verso l'intrecciata incidenza cervello/Web.
La seconda sezione sarà focalizzata sulla memoria: l'intersezione cognitiva tra il prestare attenzione e l'effettivo assorbimento di informazioni, come il nostro controllo sulla transazione da breve termine a lungo termine sia stato influenzato dalla rivoluzione digitale, conseguenti condizioni post-umane e di fusione della conoscenza umana. Sarà inoltre analizzata la Memetica online e come questa figura comunicativa abbia portato a nuove conformazioni di coscienza politica collettiva e transattiva.

La terza e ultima sezione combina elementi della moderna condizione introspettiva e sociale dell'individuo, esplorati nel primo capitolo, con le conseguenti implicazioni collettive e politiche, analizzate dal secondo, nel tentativo di dare un nuovo punto di vista più ampio nell'osservazione della crisi contemporanea delle istituzioni democratiche. L'obiettivo è quello di collegare fra loro temi come le echo chambers, le bias comportamentali e le teorie dell'egemonia al fine di

contemplare le conseguenze del passaggio della politica a spazi virtuali di fabbricazione della realtà, in cui l'informazione risulta spesso privatizzata e monopolizzata.

La quarta rivoluzione è senza dubbio uno dei più grandi shock tecnologici che il nostro cervello abbia mai dovuto affrontare a causa della prossimità dell'esposizione ai fenomeni scatenanti e dell'immensa complessità delle dinamiche che ne seguono. Il suo impatto è a trecentosessanta gradi, tocca dalle microscopiche percezioni introspettive ad istituzioni politiche secolari. Internet ha generato opportunità inimmaginabili nell'arco pochissimi anni, sottolineando nel mentre importanti difetti del cervello umano intento ad emulare il suo funzionamento. Cosa fare quando il progresso, nel suo immenso beneficio, supera la capacità psicologica, mentale, sociale e politica del presente? Come impedire la strumentalizzazione e il monopolio di beni comunicativi e funzionali, ormai parte integrante delle basilari necessità umane nel contesto della civiltà occidentale?