

Digital Production of Subjectivity in Governmental Processes

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Abstract

Is there a subjectivation process traceable on the internet? Are we conscious of subject modeling and the impacts of human-digital interaction on our brain? The findings of neuroimaging show that: neuroplasticity (brain modification) is a phenomenon that continues into adulthood and does not cease in childhood; digital causes brain changes; and the changes in the brain induced by digital are related to components that make up subjectivity. The objective of the paper is to conduct a critical investigation about the effects of the Internet on the components of subjectivity by referring to fMRI scans; the purpose is to identify a process of subjectivation conveyed by the digital. The methodology is interdisciplinary. The approach is genealogical: the subject is investigated as the product of a social process that takes place on the Internet. The reference articles selected are based on the neuroimaging research methodology, i.e. on the sampling of the population divided by gender, age, sex, and type of activity conducted online. The purpose of this work, on the other hand, is to overcome the fragmentation of the analysis by unifying the scientific results, bringing them back to a broader theoretical vision in order to become aware of the existence of a more generalized problem. This theoretical operation is built on the hypothesis that, as statistics show that the screen time of digital devices has soared for everyone in recent years, the effects of digital on the brain can be understood in the same pattern of subjectivation.

Keywords: subjectivation, neuroimaging, neuroplasticity, digital users, governmentality

1. Introduction:

The basic assumption of this paper is the general understanding of subjectivity as a process influenced by the environment rather than a substance. In contrast, the concept of substance evokes the notion that there is a universal core of identity within all of us that forms the foundation of our personality and that can guide our behaviour, thoughts, and emotions.

“The philosophical idea of an individualised self-consciousness dates back to Descartes, for whom the thinking subject provides an indubitable foundation for truth in the world. Over the last fifty years, thinkers have challenged this essentialist notion of the subject. It is argued that, contrary to Descartes, the subject is not universally given, but is in fact socially constructed by forms of knowledge and techniques of power. The historical fabrication of subjectivity has come to be known as ‘subjectivation’.” (Butler, 2011)

The elements that constitute subjectivity are numerous, such as memory, reflectiveness and concentration, emotions, etc. The ability to concentrate, reflect, memory contribute to build and evaluate oneself through cultural parameters let measure progress and self-increase one's social and productive skills and abilities. Today, since real life has doubled on the virtual plane, knowledge and techniques of power that give substance to the govern of omnes et singulatum (Foucault, 2020) also act on online platforms where the interaction with and between users is looped.

In this paper, I propose a development of the hypothesis of digital governmentalization that enables the modelling of the subjects (Landolfi, 2016) by referring to neuroimaging in order to demonstrate that the elements that constitute subjectivity are altered by digital technology not only through discourses on the net but also and mostly through digital brain stimulation.

In last years, the brain has become an object and a target: new "cerebral knowledges" and technologies play a role in our contemporary forms of subjectification and ways of governing ourselves. Neuroscience, psychopharmacology, brain imaging, neuroplasticity, and genomics become intertwined with the government of the living. They do not represent sectoral knowledge for the exclusive use of the academy but find an application in the governmental field. In fact, the epistemological paradigms that guide and inspire the production of subjectivity in the government apparatuses that today are almost entirely expressed through digital systems come from this knowledge. It makes us think about a constant modelling of our subjectivity on the Internet, of which we are not aware.

“By the 1990s, a new vision of the brain had taken shape: a molecular, visible, mutable brain, whose characteristics might be predictable and manageable, open to its milieu, transformable by experience, affected and affecting all that passes through it in ways not available to consciousness, shaping and being shaped by the experiences, feelings, intentions and cognitions of the person within which it resides, creating the illusion of selfhood itself. Along each pathway, developments in neuroscience have become entwined with what one might term ‘human technologies’ – strategies for the government of conduct drawing upon empirical knowledge of the brain and beliefs about its relation to conduct.” (Rose & Abi-Rached, 2014)

The technique is never neutral but is oriented and produces effects on human understanding about itself and the world. (Strate, 2012) The technology that produces something defines the essence of what it produces. (Heidegger, 1993) Such discourse can be applied to the subject as human resource and neuro-resource to be governed and used through digital technology. (Sturdy, 2012)

The growing and unbridled proliferation of the use of digital technologies in today's world is accelerating the development of the technologies themselves and the application domains that are geared towards the expansion of human cognitive abilities and practises.

During the pandemic, the intensive use of digital devices increased. In countries such as India, China, the United States, Canada, and Australia, total digital device use has increased by 5 hours, resulting in an increase in screen time up to 17.5 hours per day for intensive users and an average of 30 hours per week for non-intensive users (Balhara et al., 2020; Dienlin & Johannes, 2020; Ministry of Human Resource Development, 2020; Vanderloo et al., 2020; Xiang et al., 2020). The increase in screen time has implications for the brain, habits, and meanings. Thanks to fMRI, it is now possible to map the activation of specific brain regions in relation to online social media activities. Looking at the evolution of the online connection phenomenon in recent years, we can deduce that online connection can be represented in a hypothetical diagram with a straight line running upwards, indicating a ubiquitous increase and intensification of the human-digital relationship.

“In 2010, U.S. adolescents spent an average of 8.5 hours per day interacting with digital devices, up from 6.5 hours in just 2006. Thirty percent of the time they are simultaneously using more than one device, bringing daily total media exposure time to 11.5 hours. These numbers are a moving target and vary by survey, socioeconomic status, ethnicity, and geography, but all indications are that the amount of screen time has been dramatically increasing and is likely to continue to do so as the technology improves and becomes even more widely available.”¹ (Ofcom’s Communications Market Report, 2018)

Neuroimaging and neuroscientific theories focus mainly on sectorial aspects of subjectivity such as emotions, decision-making, memory, desire/pleasure/reward system and on sampled population, but it is necessary to link them with an interdisciplinary reflection on the general processes that generate and condition subjectification. The transformative potential of the digital affects subjects and redefines the body, emotions and social relations at the micro level, i.e. at the neural level, in a direct way through digitally generated sensory stimuli. There is a need to unfold ethical and governmental implications about the impact of digitalization on the human brain and thus on subjectivity. (Chandler & Fuchs, 2019)

2. Extra-role behaviours and the reward system in digital

“Cyber society is obviously the most complex (the sphere of public consciousness) high-tech product of a technocratic society. Is still to be developed the study of what is called “the interman” i.e. to personality formed under conditions and under the influence of a neurodigital noosphere.” (Devterov & Skyba, 2020)

¹ The pace of “penetration” (i.e., the amount of time it takes for a new technology to be used by 50 million people) is unprecedented. For radio, technological penetration took 38 years; for telephone, 20 years; for television (TV), 13 years; for the World Wide Web, 4 years; for Facebook, 3.6 years; for Twitter, 3 years; for iPads, 2 years; and for Google+, 88 days.” (Giedd 2012) Another source, more recent reports: “One in five people spend more than 40 hours a week online. Brits now need constant connection to internet, and are checking their smartphone every 12 minutes. (...) People in the UK now check their smartphones, on average, every 12 minutes of the waking day. Two in five adults (40%) first look at their phone within five minutes of waking up, climbing to 65% of those aged under 35. Similarly, 37% of adults check their phones five minutes before lights out, again rising to 60% of under-35s.” (Ofcom’s Communication Market Report 2018)

In Devterov's and Skyba's view, the existence of interman (but I would say 'interliving' so to not connote its gender) is inextricably linked to the Internet. The interman's identity is established on the Web. He or she: is intellectually and emotionally attached to it; makes plans based solely on the realities of the Network; is dependent on cyberspace processes; experiences delight and shock in terms of events occurring on the Network; falls in love and hates through the Network; seeks help and support solely through the Network. The interman is psychologically linked to the processes taking place on the Internet and is direct.

Devterov and Skyba offer a psychological explanation to the constant connection of users in digital world but, obviously, users spend most of their time for multiple reasons and often depend on their job.

If users are constantly online, it is no longer possible to divide them into online internet addicts and sporadic users: it is evident that we are all frequent internet users. The distinction between pathological and non-pathological use (Park et al., 2018), (Korte, 2020), therefore, needs to be overcome. We risk neglecting the general framework of digital subjectification if we remain in the frame of mental health problems related to digital addiction.

Going beyond the categorizations of individuals online (workers, gamers, addicts, users, citizens, customers and so on) a fundamental problem can be identified, namely the effects of the digital on the brain, which are the same for two reasons: first, because the time people spend online also measures the brain's exposure to digital stimuli, regardless of what people are doing, and second, because of the homologation of platform and binary language. Social, institutional platforms and commercial websites are all managed according to marketing rules that focus on taking care of the customer (personal profile, personal page, chat, customization of content, etc.) and aesthetic-synaesthetic forms that aim to capture the attention and emotions of the subjects (colours, pop-up, visual effects, sound effects, etc.) so that they feel centre stage and constantly excited, as if they are achieving something really important and urgent for their lives. Users feel like there's always a good reason to be connected. Individuals switch between the categories mentioned before, or play these roles simultaneously without even realizing it. Voluntary behaviours such as collaboration, sharing and helping are applied on the net, reproducing civic forms of interaction on the virtual plane. It is productive to absorb concepts from applied psychology and refer them to digital behaviours of users which act in online platforms as prosumers, customers and "partial employees" (Bowen & Schneider, 1985), and their participation in digital life is categorized as either in-role and/or extra-role behaviours (Bettencourt & Brown, 1997). To provide a service are required in-role behaviours, while extra-role behaviours involve sacrifices of users' time, effort, material possessions, or physical well-being. Barbuto (2001) defines psychological taxonomy of motivation providing a conceptual frame for external and internal self-concept, and process of internalization of goals in relation to motivation. The intrinsic process motivation explanation states that people are motivated to act for the pleasure of doing so.

From those studies emerge interesting insights: extra-role behaviour, like digital behaviour, requires the internalisation of values so to face sacrifice; furthermore, extra-role behaviour is not based on awards. If we compare studies focused on citizen customer behaviour to Internet users' behaviour, we can recognize the same sacrifice of time, energies and abilities even when are not directly or explicitly expected or rewarded (Groth, 2005), (Rosenbaum & Massiah, 2007). Graham (1991) depicts such compliance as internalization, acceptance, and adherence to rules, regulations, and procedures (even if one is not observed or monitored). The voluntary

behaviour is interrelated to subjective categories of beliefs and behavioural tendencies (obedience [respect for orderly structures and processes, recognition of rational-legal authority, and respect for laws], loyalty [serving community interests and values, promoting and protecting it, and volunteering efforts for the common good], and participation [active and responsible involvement in community self-governance]). (Van Dyne et al., 1994)

Applying this to digital users, we can easily see subjectification processes that require the same process of internalisation of values and the same renunciation, but there is a point that needs to be discussed. Indeed, Internet users are apparently not rewarded, but neuroimaging shows the activation of the reward system at the neural level when users are online. The pleasure that comes from the reward system reinforces behaviour and creates forms of subjectivity even when we are not aware of what is happening to us.

What is reward system? The reward system is a complex of structures at the core of the brain; it drives our behaviour towards experience that stimulate the production of dopamine and drives us away from painful one. It reinforces positive emotions linked to behaviours and choices that are meant as useful to survive even if we are not aware of it. Dopamine works together with opioids and provide pleasure and euphoria. Memory let the brain anticipate that a particular action will lead us to pleasure again. Fluctuating levels of dopamine produce behavioural dependency. The main source of dopamine in striatum is the ventral tegmental area (VTA), then it goes to the nucleus accumbens (Nacc), finally prefrontal cortex determine the signal to stop or to go on, to inhibit the desire or not.

Reward is experienced after the activation of the frontal lobes which are responsible for high cognitive function that supervise the conscious experience of the pleasure like thinking , planning, and motivation.

Sherman, Hernandez, Greenfield and Dapretto (2018) investigated the neural structures that are activated in terms of social media rewards. The 'Like' option, which is prevalent on many social media platforms, is believed to give social rewards to those who receive them. The researchers found this to be the case when the participants completed a task in an MRI scanner. This task was designed to mimic the social photo-sharing app Instagram. When examining the neural correlates there was activation in the brain's reward circuits, especially in the VTA, when participants received Likes. Similarly, they found that when the participants would provide positive feedback (gave them Likes) through this task, this also activated the reward circuits of the brain.

3. Neuroplasticity and the Internet

In the field of neuroscience neuroplasticity, or the brain's ongoing change of neural networks based on its experiences, has been the subject of years of research.

The neuroplasticity of the brain refers to its ability to restructure synaptic networks at its neural pathways. The brain's function and structure are continuously altered by the environment. (Choudhury et al., 2013) Neuroplasticity is the potential of the brain to adjust to macroscale adaptations in response to increased environmental demands (Lövdén et al. 2010a), more specifically, they are irreversibly altered by repetitive behaviors, life experiences, and frequent thought patterns (Hellerstein, 2011).

“It is therefore an adaptive process triggered by a prolonged mismatch between the functional supply the brain can momentarily provide and the experienced demands the environment

currently poses.” (Wenger et al., 2021) According to neuroplasticity, the brain is not a 'fixed organ' and can be changed without any genetic predisposition. As a result, depending on how it responds to its interactions, brain circuits can be enhanced or weakened.

The use of the digital cause changes in grey matter structure which are detectable and visible on magnetic resonance images. According to neuroimaging data, excessive Internet use causes functional and structural brain alterations that are similar to those seen in substance addiction. “According to MR volumetry, problematic Internet use was associated with increased grey matter volume of bilateral putamen and right nucleus accumbens while decreased grey matter volume of orbitofrontal cortex (OFC).” (Altbacker et al., 2016)

It is proved that the use of social media can affect the flow of neurotransmitters such as dopamine and oxytocin, causing structural and functional changes in the brain; hence, social media use has a neuroplastic effect. It has been established that social media has an impact on human cognitive skills such as attention. (Basheer & Bhatia, 2019).

Social media can convey stimuli that cause detrimental brain alterations. Such critical aspects of the problem are little investigated but it is necessary to detect their urgent centrality by suggesting dedicated research projects. Despite the benefits of digital media like communication, the dangers of digital media as well have been suggested.

“Neuroimaging of frequent Internet users shows twice as much activity in the prefrontal cortex as sporadic users. This part of the brain is reserved for short-term memory and quick decision-making.” (Small et al., 2009)

From 2009 to present time the gap between frequent Internet users and sporadic users has been dramatically fulfilled because it is no more possible to distinguish between them. Short-term memory and quick decision-making are two fundamental features of subjectivity: the growth of brain activity in the prefrontal cortex is leading humanity to a compulsive and non-reflexive behaviours. In the articles identified in this paper, one aspect of interaction with the digital is taken for granted: namely that it changes the brain.

In general, a critical view of the use of digital technology shows the devaluing effects on the brain of children and adolescents (hyperactivity syndrome, social isolation, concentration difficulties, addiction, sleep disorders), while in older age, where memory deficits appear, this use of digital technology can be instrumental to remind streets' names, events and so on. Plus, internet searching may stimulate brain circuits not activated while reading text pages to a higher level, but only in persons who have prior computer and Internet search expertise. These findings imply that earlier Internet searching experience may modify the brain's response in neural networks mediating decision making and complicated reasoning in middle-aged and older adults. (Small et al., 2009)

Digital use modify behaviour since it affects the parts that make up subjectivity, namely: attention, memory, cognition and emotions. Recent studies are focused on how the Internet affects: a) attention (i.e. how the constant influx of online information, can induce people to shift their concentration between multiple incoming media streams and what implications this can have); b) memory and knowledge (i.e. how the unique properties of access to information on the network can affect how we process new memories and value our inner knowledge); c) social cognition and the personal and social consequences of the increasing embedding of our social networks, interactions and status in the online world. (Firth et al., 2019)

With the exponential growth of Internet access, problematic behaviours have evolved, with some persons failing to limit their Internet use despite its harmful influence on their everyday

life. Problematic Internet use has been linked in recent neuropsychological and neuroscience research to increased cue-reactivity and impaired inhibitory control. Most studies have revealed that impaired self-control abilities (i.e., inhibition and error monitoring) are associated with underactivated frontal areas in problematic Internet users, according to this review of the electroencephalography (EEG) literature (PIUs). (D'Hondt et al., 2015)

“Emerging scientific evidence indicates that frequent digital technology use has a significant impact—both negative and positive—on brain function and behaviour. Potential harmful effects of extensive screen time and technology use include heightened attention-deficit symptoms, impaired emotional and social intelligence, technology addiction, social isolation, impaired brain development, and disrupted sleep. (...) Some apps and digital tools offer mental health interventions providing self-management, monitoring, skills training, and other interventions that may improve mood and behaviour.” (Small et al., 2020)

If from a practical point of view it is unthinkable to return to pre-digital life since the advantages are innumerable, however, it is not ethically acceptable to passively ignore the effects of human-digital interaction on the brain, especially because it determines an unconscious change in behaviour of the subjects and their existential choices. Numerous apps facilitate the life of sick and elderly people because they allow the monitoring of their condition, however, their usefulness is not so obvious because the data they detect must always be interpreted in a scientific conceptual framework by an aware subject to be truly effective. If digital solicits unproductive aspects of subjectivity, being connected to an app does not seriously improve life except in the illusions of users who delegate to technology the search for the meaning of their life.

3. Conclusion.

Prior to the invention of digital technology, a process of subjectivation into the activity of power apparatuses had been identified by scholars in the field of Philosophy and Sociology. The institutionalization of omnes et singulatim governing disciplines (such as psychology, education, and economics) allowed for the reinforcement and dissemination of discursive regimes, visibility regimes, and practices aimed at shaping subjectivity in order to be governed. It is now possible to detect a process of subjectivation on the internet (Landolfi 2016), thanks to the pervasive digitalisation of life in all of its aspects. The Internet is a virtual environment in which enunciation and visibility regimes are exponentially multiplied and quickly replicated, with impacts on subjectivity in terms of political conditioning, affective mutations, consuming standardisation and so on. Furthermore, when examining neuroimaging findings, it is conceivable to conclude that the impact of digital on the brain demands a multidisciplinary approach because it has unique characteristics and has a greater impact on our lives than we sometimes realize.

Digital is characterized by semiotics of contagion which affect the body and mind. Computation thrives on mutations, detecting, reproduction and control of emotions which tie subjects to online platforms for a more and more prolonged time.

Since we are all continuously online, the demarcation line between frequent, sporadic, addicted users, and gaming, professional, and personal internet use is becoming increasingly

blurred. Being a citizen necessitates the usage of the internet for public use and for private purposes such as access to medical services or communications with the children's schools,. Platforms are designed for enjoyment, to grab attention, and to keep interest alive through interaction with satisfaction systems are used to mediate every social activity.

The prolonged connection time to online platforms is explained not only by the actual advantage obtained through the use of digital technology itself but also because the Internet is filled with reward systems that lead us to believe that by clicking a button, we've accomplished something worthwhile for ourselves and our lives. Many studies show that as a result of digital use, changes in the brain occur, affecting memory, concentration, attention, sleep, and choices, as well as personality. The digital does not develop reflexive, rational, or logical parts of knowledge and cognition, but rather short-term memory, compulsory choices and the same mechanisms of addiction, lowering awareness levels.

Today's technology has improved to the point where we can pinpoint the location of the neural response for each stimulus. This means that it is technically possible to reinforce certain actions (memories, speeches, practices and so on) by introducing stimuli with positive perceived consequences, while discouraging others by introducing stimuli with negative seen effects. As each subject seeks satisfaction for their personal pleasure, the former will undoubtedly be repeated by the subjects. The circuit of stimuli-response has reached a more profound level than the past and Internet users are not aware of it because it changes the brain too fast, bypassing the processes of reasoned learning.

Digital media shape the brain and affect the body, therefore changes subjectivity with consequences that we can barely glimpse. The neural responses to stimuli and reward system can be managed, governed and manipulated. We are already witnessing the arise of compulsive, uncritical, ahistorical subjectivity on the net.

It's unclear where the digital process of subjectivation begins and ends, who directs and manages it, and for what goals. Such phenomenon can be defined as digital neurogovernmentality. While there are aspects of digital governmentality that are not necessarily negative, such as users sharing voluntary advices on platforms (as in the case of a video tutorial on YouTube), risks of brain manipulation², digital epigenetics, and neurototalitarianism and psychic enclosure (Landolfi 2016) must be taken into account for the ways in which digital and humans evolve together.

The synaesthetic hyperstimulation in digital could expand trans-human, trans-technological and environmental affectivity but also blind political-economic observance and obedience without the possibility of opposition and differentiation.

²For depressed individuals who are refractory to existing treatments scientists have proposed deep brain stimulation (DBS): it works through the implantation of an electrode in the nucleus accumbens, which is located in the striatum (neostriatum) and is associated with emotions and feelings such as fear, pleasure, and reward. DBS, however, is associated with potentially dangerous side effects. (Cyron, 2016), (Buhmann et al., 2017) Deep brain stimulation opens critical reflection on the manipulation of the brain and the ends of science.

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