Imaginative Machines

(Article begins on next page)

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Dear Dr. Romele:

It is a pleasure to accept your manuscript entitled "Imaginative Machines or the Uselessness of Narrative" in its current form for publication in Techné: Research in Philosophy and Technology. The comments of the reviewer(s) who reviewed your manuscript are included at the bottom of this letter.

Thank you again for choosing Techné: Research in Philosophy and Technology as a venue for publishing your work. We congratulate you to your contribution to the Journal.

Sincerely,
Neelke Doorn & Diane P. Michelfelder
Editors-in-Chief, Techné: Research in Philosophy and Technology

Reviewer(s)' Comments to Author:

Alberto Romele

Imaginative Machines or the Uselessness of Narrative

Abstract

In philosophy of the emerging media, several scholars have insisted on the fact that the "new" of new technologies does not have much to do with communication, but rather with the exponential growth of recording. In this paper, instead, the thesis is advanced that digital technologies do not concern memory, but imagination, and more precisely what philosophers, from Kant onwards, have called productive imagination. In this paper, however, the main reference will not be Kant, but Paul Ricoeur, who explicitly refers to the Kantian productive imagination in his works, but also offered an externalized, semioticized, and historicized, interpretation of it.

The article is developed in three steps. In the first section, it deals with Ricoeur's theory of narrative, based on the notions of *mimesis* and *mythos*. In the second section, it is first argued that human imagination is always-already extended. Second, it will be shown how *mimesis* and *mythos* are precisely the way software works. In the third section, the specificity of big data is introduced. Big data is the promise of giving our actions and existences a meaning that we are incapable of perceiving, for lack of sensibility (i.e. data) and understanding (i.e. algorithms). Scholars have used the Foucauldian concepts of panopticon and confession for describing the human condition in the digital age. In the conclusion, it is argued that big data makes any form of disclosure unnecessary. Big data is an ensemble of technological artifacts, methods, techniques, practices, institutions, and forms of knowledge aiming at taking over the way someone narratively accounts for himself or herself before the others. Hence, another Foucauldian notion is representative of this age: the *parrhesia*, to speak candidly, and to take a risk in speaking the truth, insofar as such a possibility is anesthetized.

Introduction

In "philosophy of the internet and new media" (Brey and Søraker 2009) or "philosophy of the emerging media" (Floyd and Katz 2016) it has often been said that digital technologies have to do with a modification of human memory. In particular, several scholars have opportunely insisted on the fact that the "new" of new technologies does not have much to do with communication, but rather with the exponential growth of recording (Ferraris 2016). After all, the English verb "to record" has its etymological root in the Latin "*recordari*," which means precisely "to remember." In this paper, instead, the thesis will be advanced that digital technologies do not concern memory, but imagination, and more precisely what philosophers, from Kant onwards, have called productive imagination.

The hypothesis of this paper is threefold. First, it will be argued that human productive imagination is always-already externalized. Digital technologies are one of the privileged places where the schematism takes place nowadays. Second, it will be said that software imitates with increasing fidelity the way human productive imagination works. Hence, software is an imaginative machine. Third, it will be affirmed that in the age of big data digital imagination has the upper hand on human imagination. Callon and Latour's principle of symmetry, according to which human and nonhuman (artifacts, nature, institutions) should be integrated in the same conceptual framework and assigned equal amount of agency, was still based on a sort of *epoché*, a suspension of any kind of judgment and consideration about the extrinsic properties of the social actants. In this paper, an integration of such a principle is proposed: humans and certain machines should also be placed within the same conceptual and agency framework because they share the intrinsic capacity of productive imagination.[1]

In the *Critique of Pure Reason*, Kant (KrV A 138/B 177)[2] presents the transcendental schematism as the bridge between understanding (categories) and sensibility (intuition, appearance): "there must be a third thing, which must stand in homogeneity with the category on the one hand and the appearance on the other, and makes possible the application of the former to the latter. This mediating representation […] is the *transcendental schema*." Such a schema must arise from a faculty that is prior to both sensibility and understanding, which Kant calls the productive or transcendental imagination.

In this paper, however, the main reference will not be Kant, but Paul Ricoeur, who explicitly refers to the Kantian productive imagination in his works, but also offered an hermeneutic, i.e. externalized, semioticized, and historicized, interpretation of it.[3] For

Ricoeur, the schematism is not a "hidden art in the depths of the human soul" (KrV A 141/B 181). The synthesis between receptivity and spontaneity happens outside, in linguistic and historical expressions such as symbols, signs, metaphors, and narrations. Moreover, the French philosopher does not exclude, at least in principle, that schematism can take place in other materialities than linguistic concretizations. Ricoeur's hermeneutics, in other words, does not lead us to what according to Latour (1993, 63-64) is the double impasse of the philosophies of the linguistic turn: consider the discourse as the only mediator between the referent and the subject, and make the connections between an autonomized discourse and what they have provisionally shelved, i.e. the referent and the subject, more difficult.

The article will be developed in three steps. In the first section, it will deal with Ricoeur's theory of narrative, which is also a theory of productive imagination. According to the French philosopher, narrative is made of 1) the threefold *mimesis* (prefiguration, configuration, and refiguration), which is a movement of appropriation and distantiation on the basis of a process of representation of human action, and 2) the *mythos* (emplotment, "*mise en intrgue*" in French), i.e. the capacity of giving coherence to the heterogeneous elements of a story. *Mimesis* and *mythos* are present in both fictional and (auto)biographical stories. Once understood in the light of narrative, productive imagination has to do with two things. First of all, with the capacity, which is also a possibility, a right, and an ethical task, of accounting for oneself before the others by means of the stories someone tells about himself or herself. In addition, one might say that narrative has to do with accounting for the others by means of the stories that someone tells about them. Second, it regards the fact that all stories have an heuristic force on human existences.

In the second section, it will be first argued that human imagination is always-already extended. Second, it will be shown how *mimesis* and *mythos* are precisely the way software works. The *mimesis* is there insofar as software always produces dynamic representations of the world, which interpret the world, and can in their turn be interpreted. The *mythos* is present if we accept Lev Manovich's (2013a) thesis according to which "there is only software," and that "software = database + algorithms." For Kant (1998, 193-194), "thoughts without content are empty, intuitions without concepts are blind." Likewise, it will be said that "algorithms without database are empty, database without algorithms are blind."

In the third section, the specificity of big data, compared with older digital machines, will be introduced. Big data is much more than volume, variety, velocity, and veracity, as defined in the 3V+1 definition (IBM 2013). Today, big data is the promise of giving our

actions and existences a meaning that we are incapable of perceiving, for lack of sensibility (i.e. data) and understanding (i.e. algorithms). In the web 1.0, digital productive imagination was still below human imagination; in the social web, there is rather a distance which is close to zero. In the web of today, the relation between human and digital imagination is going to be inversed, since the latter is overpassing the possibilities of the former.

Several scholars have used the Foucauldian image of panopticon for describing the human condition in the digital age (Romele et al. 2017). Yet, according to Boellstorff (2013), from a Foucauldian perspective the master metaphor for understanding big data should not be the panopticon, but the confession: "the confession is a modern mode of making data, an incitement to discourse we might now term an *incitement to disclose*. It is profoundly dialogical: one confesses to a powerful Other." In the conclusion, however, it will be argued that big data makes any form of disclosure unnecessary. Big data is an ensemble of technological artifacts, methods, techniques, practices, institutions, and forms of knowledge aiming at taking over the way someone narratively accounts for himself or herself before the others. Hence, another Foucauldian notion is representative of our digital age: the *parrhesia*, to speak candidly, and to take a risk in speaking the truth, insofar as such a possibility is anesthetized.

1. Productive Imagination

Ricoeur has never explicitly devoted an entire work to the issue of imagination. However, many scholars have noticed the relevance that this notion had in his thought (Kearney 1998; Taylor 2006; Foessel 2007; Amalric 2014). In particular, this section is going to focus on the role that productive imagination has played, often in the background, during the 1970s and the 1980s.

In order to enter the discussion, a peripheral point is taken, a debate Ricoeur had with Cornelius Castoriadis during a radio broadcast on the French radio channel France Culture in 1985. This debate is illustrative of the way Ricoeur understands productive imagination as the "golden mean" between the reproductive and the creative imagination.

According to Ricoeur, "the idea of an absolute novelty is inconceivable. There is new only as a rupture with the old: there is a pre-settled (*pre-réglé*) before us that we unsettle in order to settle it differently" (Castoriadis and Ricoeur 2016, 44. Translation is mine); "we are never in a sort of shift from nothing to something, but from something to something, from

other to other – that goes from the configured to the configured, never from the formless to the form" (Castoriadis and Ricoeur 2016, 46). In these passages, the French philosopher is taking position against his interlocutor. Indeed, Castoriadis advocates for a radical imaginary constitution, that is to say for the possibility of absolute novelties in history and society by means of imagination: "The self-institution of society implies that we always work in an already settled context, manipulating and modifying the rules; *but also laying down new rules, creating them. This is our autonomy*" (Castoriadis and Ricoeur 2016, 44. Italics are mine).

Ricoeur is equidistant from a creative and a reproductive concept of imagination, represented respectively by Sartre and Hume. In the most illuminating article he has devoted to this topic, he disposes the main philosophical theories of imagination on two axes: on the side of the object, the axis of presence (i.e. imagination as the trace of presence, a weakened form of it) and absence (i.e. imagination as the other-than-present, dream, hallucination, etc.); on the side of the subject, which is not going to be considered in this article, the axis of fascinated consciousness (i.e. zero critical consciousness, the image is confused with real, as it is the case for the power of lies and errors denounced by Pascal), and critical consciousness (i.e. critical distance is fully conscious of itself, and imagination is an instrument for the radical critique of the real) (Ricoeur 2008, 166-167).

On the side of the object, Ricoeur argues that to imagine, individually or collectively, does not have to do with creating *ex nihilo*, but with reorganizing the elements of what already exists. Similarly, as it will be affirmed in the conclusion, this approach suggests that freedom has less to do with liberation than with the renegotiation of the frontiers with the social and technical environments that surround us. For the moment, notice how this perspective fits with our age, in which cultural productions, along with our own identities, are often the result of the recombination of elements borrowed from other cultures and epochs. This is all the more true, considering the way text, sound, and video contents circulate and are reconfigured on the web 2.0 (de Mul 2015). Today, human beings are more bricoleurs than engineers.

To come back to the purposes of this section, it is important to stress that this possibility of recombining the already-existing elements of reality depends, in its turn, on a movement of distantiation from reality and reappropriation of it. Such a movement, however, does not take place in interiority (*in interiore homine*), as many philosophers, from Augustine to Descartes and Kant, have said. Rather, distantiation and appropriation are made possible

by forms of externalisation and concretisation of the human language like symbols, metaphors, and narratives. In the course of his work, Ricoeur has extended his analysis of productive imagination from the unity of the word (symbol) and the sentence (metaphor) to that of the text as a whole (narrative). It is precisely in his analysis of the configurative function of narrative that he most explicitly identified the role of productive imagination (Kearney 1998, 162). The model he refers to is the way Aristotle links, in the *Poetics*, the mimetic function of the tragedy to the mythic structure that the tragic poet has constructed. The impact of this model goes beyond the limits of fictional stories, because for Ricoeur 1) the Aristotelian theory of tragedy is the paradigm of all forms of narrative, and 2) a relevant part of our identities is constituted narratively (Ricoeur 1990, 113-167).

The French philosopher has developed his theory of the threefold *mimesis* in the last volume of *Time and Narrative*. The first *mimesis* (prefiguration) has to do with the predisposition of human action to be told and textualized. In fact, prefiguration deals with the constitution of a plot as imitation of human action. In order to do this, it is necessary to recognize the semantic of the action (i.e. the structure distinguishing it from the physical movements), the symbolic of the action (i.e. the signs, norms, and rules that mediate it), and the narrative of the action (i.e. the temporal elements that make it capable of being narrated) (Ricoeur 1990, 54). The second *mimesis*, (configuration), corresponds to the emplotment: it is the moment in which the different textualized elements of the human action are combined and recombined according to a specific temporal coherence. Ricoeur defines the *mythos* as "the temporal synthesis of the heterogeneous" or as a "discordant concordance" (Ricoeur 1990, 66). As argued by Kearney (1990, 162), "by narrative configuration he [Ricoeur] means […] the ability to create a plot which transforms a sequence of events into a story. This consists of 'grasping together' the individual incidents, characters and actions so as to compose a unified temporal whole." Such a narrative synthesis enacts what for Kant is the productive power of the transcendental imagination.

Yet, narrative is never "*for its own sake*, for its own glory" (Ricoeur 1991, 19). Language and all its forms always have a reference that is external to the language itself. The possibility of emplotment, indeed, is rooted in human concrete actions. The same emplotment is always-already on the way back to the world. The third *mimesis* (refiguration) has precisely to do with the application of the text to the world of the hearer or the reader (Ricoeur 1990, 71). To put it slightly differently, refiguration represents the heuristic value of narrative, its "performativity." This term is actually misleading, since it refers to the codified effects of

speech and language. Narrative, instead, as it will be argued in the conclusion, opens up to a non-codified, and hence potentially risky, novelty. Narratives, at least the good ones, always have unintended consequences on their readers and hearers, but also on their own authors. When we write, read, and hear a story, we are confronted with the actions and choices of its characters, we judge them, and, in this way, we end up judging our own life. For this reason, Ricoeur (1992, 115) has affirmed that literature is "a vast laboratory in which we experiment with estimations, evaluations, and judgements of approval and condemnation through which narrativity serves as a propaedeutic to ethics."

2. *E*magination

The goal of this section is to apply the notion of productive imagination to the context of digital technologies. The hypothesis is that imagining is not exclusive to humans or animals. Rather, one can think of productive imagination as also being at work in the digital technologies. It is precisely this productive imagination that is going to be called the "*e*magination."

To be more precise, *e*magination means two things. First, that these machines play a fundamental role in schematization. Productive imagination never takes place in the hidden depth of human soul, but always depends, sometimes partially, sometimes entirely, on the technologies we have at our disposal. Such a statement is part of a wider perspective according to which "to understand consciousness in humans and animals, we must look not inward, into the recesses of our inside; rather, we need to look to the ways in which each of us, as a whole animal, carries on the process of living in and with and in response to the world around us" (Noë 2009, 7). In this sense, using tools is one of the simplest ways in which we extend beyond the limits of our brains and bodies.

Second, *e*magination refers to the fact that software can partially account for a human faculty that is notorious for its obscurity. In fact, Kant's entire sentence sounds: "this schematism of our understanding […] is an art concealed in the depth of the human soul, *whose true operations we can divine from nature and lay unveiled before our eyes only with difficulty*" (KrV A 141/B 181. Italics are mine).

Certainly a risky territory is entered: using digital computers for understanding human mind could bring to identify human mind and digital computers, to represent the mind as an information-processing system. It is sure that "computers can't think on their own any more

than hammers can pound in nails on their own. […] For this reason, we make no progress in trying to understand how brains think by supposing that they are computers" (Noë 2009, 169). And yet it is possible to use digital technologies as material metaphors for understanding some aspects of the human mind. The approximation of productive imagination and software is legitimate insofar as it remains within the limits of an analogical thinking. One might also refer to Gilbert Simondon's notion of "transduction," an epistemological process consisting in establishing analogies and differences among different modes of existence, especially men and machines (Simondon 2005, 108).

It is noteworthy that Ricoeur has used his threefold *mimesis* in the field of architecture, which is a technique and an art of material building.[4] According to Ricoeur (1998, 4. Translation is mine), architecture is analog to narrative, because in architecture "we can pass from a moment, a phase of 'prefiguration', which is related to the idea, to the act of *inhabiting* […] to a second phase, more manifestly interventionist, of the act of *building*, for finally having a last phase of 'reconfiguration': the re-reading of our cities and all our dwelling places." It is also interesting that, in *The Rule of Metaphor* (2004, 283), Ricoeur compares his theory of metaphor to Max Black's theory of models: "metaphor is to poetic language what the model is to scientific language. In scientific language, the model is essentially a heuristic instrument that seeks, by means of fiction […] to lay the way for a new, more adequate, interpretation." This is noteworthy insofar as the first two levels of Black's hierarchy of models, two out of three, are occupied by technoscientific models: scale models (e.g. the model of a ship, the enlargement of something very small like an oxygen atom or the DNA helix, etc.), and analog models (e.g. hydraulic models of economic systems or the use of electrical circuits in computer). This means that, at least in principle, Ricoeur does not exclude that schematism can take place elsewhere than in language.[5]

"Where does the mind stop and the rest of the world begin?," this is the opening question of Clark and Chalmers' famous article "The Extended Mind" (1998). They both take position against the "realists," according to whom the demarcation of skin and skull are also the limits of the mind, and against the "idealists" who believe that the exteriority of meaning carries over into an externalism of mind. They advocate what they call an "active externalism," based on the active role of the environment in driving cognitive processes.

The example they begin with to show "the tendency of human reasoners to lean heavily on environmental supports" (Clark and Chalmers 1998, 8) is that of a person sitting in front of a computer screen. In all other cases they account for, first and foremost that of Alzheimer

sufferer Otto's notebook, the doubt remains as to whether the coupled system (Otto's mind + his notebook) is not too skewed in favor of Otto's mind. Indeed, the existence of the notebook's contents entirely depends on Otto's moments of lucidity.[6] But the coupled system starts to find its equilibrium only once the issue is no longer a mere recording but the synthesis is *actively* and *autonomously* operated by the technological artifact. This is precisely what happens with computers. Furthermore, once that quantity and capacity of synthesis start to become important, the equilibrium begins to skew in favor of the digital artifact.

A series of approaches have proliferated in the last three decades that conceptualized the human mind and its activity not only as an extended, but also as embodied, enactive, embedded, distributed and situated (Thompson 2007). Despite differences and nuances, they all shares a critique of the traditional cognitive sciences that considered cognition in abstraction from both the body and its natural, social, and technological environment. Instead, they put emphasis on the essential coupling of brain, body and world.

The idea according to which human productive imagination is always-already extended into technologies has been explicitly developed by Bernard Stiegler in the third volume of *Technics and Time* (2001), through the notion of tertiary retention. Taking the melody as an example, Husserl affirmed that the present of perception is in fact a matter of primary retention. In order to perceive sounds as a unique melody, the previous note must be retained when hearing the present note, and must anticipate the note to come. Husserl distinguished this retention from the secondary retention, which is memory properly speaking, such as when we remember a melody we have heard in the past. According to Stiegler, however, Husserl's limitation consists in not having attributed any kind of relevance to the memory made of artifacts and mnemo-technical technologies. Through an interesting reading of the *Critique of Pure Reason*, he argues that Kant has not only confused primary and secondary retention, but also wrongly attributed tertiary retention to the unity of apperception: "Yet, it would be impossible to avoid noticing that Kant's own flux of consciousness […] manufactures and constitutes itself in its unity in the course of his writing of the various works constituting his *oeuvre*. […] A situation such as this […] is possible only because the imagination's primary and secondary syntheses are essentially synthesizable through this synthetic flux (of consciousness) constituting an 'objective memory' analogous to a book or film" (Stiegler 2001, 46).

This paper goes further. First, by trying to describe, through the Aristotelian-Ricoeurian notions of *mimesis* and *mythos*, how productive imagination actually works. Second, by saying that in the case of software it is not just a matter of externalization or delegation of the human productive imagination. Software imitates with increasing fidelity the way human productive imagination works. As it has been said, software is an "imaginative machine". The term is borrowed from Caroline Basset (2007), who defined information technologies as "narrative machines." This means that digital technologies work by *mimesis* and *mythos*. *Mimesis*, it has been shown in the previous section, is a process of distantiation and appropriation. And *mimesis* is present in digital technologies insofar as they depend on a process of dynamic representation of reality.

In an illuminating article, Yoni Van Den Eede has summarized and systematized what he called the theories of technology transparency: Heidegger's, McLuhan's, Latour's, Ihde's and Verbeek's postphenomenology, and Feenberg's critical theory of technology. According to him, despite the different perspectives of these approaches, they all refer more or less explicitly to transparency as the fact that "something is not perceived, that is 'invisible', or escapes conscious attention – it still *is* there in some capacity, but one sees 'through' it" (Van Den Eede 2010, 154). In continuity with these theories, here it is affirmed that, despite their apparent immediacy, digital technologies are hermeneutic in nature.

Don Ihde (1990, 72-112) has famously distinguished four kinds of technologically mediated I-world relations: 1) embodied relations, whose specificity lies in the high transparency of the technological artifact (e.g. glasses); 2) hermeneutic relations, which give a representation of the world that interpret the world, and that must in its turn be interpreted (e.g. thermometers and maps); 3) alterity relations, in which the relation with the world is temporarily suspended, and the technology itself assumes the role of interlocutor/competitor (e.g. computer games); 4) background relations, when a technology creates the conditions of our own relation with the world (e.g. heating and lighting systems).[7]

It is evident that digital technologies have something to do with all these relations. The mobility and portability of objects such as smartphones, smartwatches, and smartbands is the preamble to a radical embodiment of digital technologies. The fact that we trust online services like Google Maps for getting information demonstrates that we consider more and more digital technologies as valuable interlocutors. And of course, the increasing presence of digital sensors in the environment we live in (room, house, city, etc.), along with the fact that such a "sensibility" augments the environment's capacity to adapt to our needs/intentions,

show how digital technologies are capable of establishing background relations between the world and us. And yet, all the digitally mediated I-world relations are based on the hermeneutic possibility of translating – "transcoding" may be a better term – the world in a digital representation.

To take just one example, the Internet of Things (IoT) is commonly considered the paradigm of the integration between online and offline, the being-online of a naturally offline object such as an electrical appliance, a farm animal, a human heart, etc. But in order to be integrated into the Internet, all objects need an IP address as a unique identifier. This is the reason why the IoT will have to use the internet protocol version 6 instead of the version 4, which routes most Internet traffic today, but allows "just" 4.3 billions unique addresses. Hence, each object must have its own symbolic representation, in this case a numerical label, in order to be recognized as being part of the online network.

Digital technologies are always based on a mostly invisible process of symbolic distantiation from the world, and it is only on this basis that they become effective in the world. Marianna Van Den Boomen has opportunely defined digital objects like the desktop icons as "material metaphors." With this term, she meant double entry signs, since they involve two kinds of code: machine-readable digital code, to which the icon refers indexically (in Peirce terminology, an index is a sign entertaining a relation of contiguity with its object), and human-readable code, to which the icon refers symbolically (for Peirce, a symbol is a sign denoting an object by mere convention and abstraction), for example, as mail, file, or program (Van Den Boomen 2014, 40). In other words, digital technologies always pass through a representation that, thanks to its twofold nature, symbolical and indexical, is also performative.

What is interesting in this perspective on digital technologies is that it goes beyond the alternative between representativity and performativity. Indeed, it is the case only insofar as digital technologies represent the world that they can also recombine (plus give people a certain room for maneuvering) its elements. Furthermore, this approach goes beyond the alternative between the virtual and "the end of the virtual" (Rogers 2009), since the possibility for digital technologies of seizing the real always depends on a certain distance they take from it. This approach to digital technologies has been already called "digital hermeneutics" (Romele 2016).

The *mythos*, the emplotment of digital technologies, is founded on such a hermeneutical movement of distantiation and appropriation. The logic of the software is

analog to the emplotment it has been introduced above. According to Manovich (2013a, 9), the software is behind all discussions concerning digital technologies: "If we limit critical discussions of digital culture to the notions of 'open access', 'peer production', 'cyber', 'digital', 'Internet', 'networks', 'new media', or 'social media', we will never be able to get to what is behind new representational and communication media and to understand what it really is and what it does. If we don't address software itself, we are in danger of always dealing with its effects rather than the causes."

The software is the basis of all digital expressions, from the creation and sharing of cultural and social artifacts (a video on Youtube, a page of Wikipedia, a comment on Facebook, etc.) to the way private enterprises and public institutions (GAFA, NSA, Microsoft Research, MIT media lab, etc.) use the digital traces left by the prosumers (producers and consumers) for purposes of marketing, surveillance, research, etc. The analogy with narrative emplotment consists in the fact that the logic of software depends on the articulation of two elements: databases, or data structures, and algorithms. As he says, "*a medium as simulated in software is a combination of a data structure and set of algorithms*. […] We have arrived at a definition of a software 'medium', which can be written in this way: Medium = algorithms + a data structure" (Manovich 2013a, 207). For him, "to make an analogy with language, we can compare data structures to nouns and algorithms to verbs. To make an analogy with logic, we can compare them to subjects and predicates" (Manovich 2013a, 211).

To make an analogy with the productive imagination, one could compare databases to sensibility and algorithms to the forms of understanding. Indeed, the function of an algorithm consists into reorganizing data according to a certain spatiotemporal coherence. This is, for instance, the case with the main data processing task performed by computers, which is sorting, i.e. putting a collection of values into order (Hill 2016). And this is also the case with all other performances operated by digital tools: an image on Instagram is a collection of pixels on which different filters have been applied; an Excel document of scientometric data downloaded from Scopus is a database on which we can apply different algorithms for data treatment and visualization such as Gephi (Romele and Severo 2016); from a user perspective, the web itself is a database on which algorithms like Google PageRank operate.

According to Kant (KrV A 51/B 75), "thoughts without content are empty, intuitions without concepts are blind." Likewise, one might say that algorithms without database are empty, database without algorithms are blind. It is maybe this "imitation game" that provokes the fascination that we have for digital technologies, and makes them the

symbolic form of our age. "Software is the interface to our imagination and the world," said Manovich (2013b), because it "has replaced a diverse array of physical, mechanical, and electronic technologies used before the twenty-first century to create, store, distribute and access cultural artifacts, and communicate with other people." But the truth is that software is not only an interface to our imagination and the world, but it is one of the ways (currently, the main one) in which productive imagination externalizes and realizes itself in the world.

3. Imagination and Big Data

The argument that has been developed until now is twofold. On the one hand, it has been argued that digital technologies act "imitating" the human productive imagination. On the other hand, it has been said that the human productive imagination takes place in digital technologies. These two perspectives are not contradictory, but they integrate each other: human productive imagination operates outside, in digital technologies (but also in other media technologies like books, cinema, and television, with however important differences that are not going to be considered here), and digital technologies work through a schematism that is analogous to that of human beings. We have a circle in front of us (hermeneutical, of course), on top of which another circle is inserted.

Nevertheless, this image is a little bit simplistic. First, because a software is never an isolated system. In its creation and use, it rather depends upon a complex interaction between technological affordances, social conditions, and cultural assumptions. Digital technologies are sociotechnical systems, in which software is entangled with a "material infrastructure" and a "social/cultural superstructure." Productive imagination is never "mine," and it is always-already exposed to the risks of control, domination, etc. Adorno and Horkheimer have highlighted the relation between transcendental schematism and cultural industry. In fact, what they said about cinema is all the more true of digital technologies: "Kant said there was a secret mechanism in the soul which prepared direct intuitions in such a way that they could be fitted into the system of pure reason. But today this secret has been deciphered" (Adorno and Horkheimer 2003, 149). However, their perspective cannot be shared here, because they used to consider technology as a source of alienation per se.

Second, because if we exclude self-tracking technologies (Van Den Eede 2015), in most cases, the data collected and emplotted by the software does not affect the same person this data is about.

Third, because the frontier between imaginative and non-imaginative machines has not been considered. Floridi and Sanders (2004) argued that agenthood relies on 1) interactivity, i.e. the response to stimulus by change of state, 2) autonomy, i.e. the ability to change state without stimulus, and 3) adaptability, i.e. the capacity to change the "transition rules" by which state is changed. These are not universal properties, but depend on a Level of Abstraction (LoA), the point of view from which a certain thing/situation is observed. For instance, the LoA of a buyer towards a car is different from that of a mechanic or from that of an insurer. In the case of artificial agents such as machine learning algorithms (the author propose the example of MENACE, an "analogic" engine that learns how to play at Noughts and Crosses), we must consider them as moral agents (although aresponsible) at a certain LoA – not that of the single game nor that of the code, but the LoA of the tournament. At this specific LoA, machine learning algorithms are not passive recording systems, nor they seem to have a preprogrammed capacity of combination and recombination. Rather, they show an emerging adaptability.

Most software can be said to be imaginative at a certain LoA. For example, the first time someone deals with the Facebook's Year in Review feature, she or he will probably have the impression of an authentic emplotment. The reiterated observation or use of the tool, instead, will make its deterministic character appear. But things are in fact a little more complicated. First, because software users usually do not have access to the code. Second, because in complex machine learning and pattern recognition algorithms, evidence for a conclusion/decision is most of the time inscrutable, even for those who have implemented the algorithm (Mittelstadt et al. 2016, 4). As Norbert Wiener (1964, 21-22), speaking about learning machines, pointed out, "[i]t may be said that all this unexpected intelligence of the machine has been built into it by its designer and programmer. This is true in one sense, but it need not be true that all of the new habits of the machine have been explicitly foreseen by him."

One can certainly imagine that there is always a higher LoA that makes appear these machines' choices as deterministic. Yet such a LoA might not be much lower that a LoA at which supposedly human free choices turn out to be entirely pre- and hetero-determined as well. Digital imagination is certainly nothing more than an emergent property of recording and preprogrammed configuration/reconfiguration. However, the same is true to some extent of human imagination (Ferraris 2016b).

The thesis that is to be advanced now is that one can distinguish among three levels, primarily temporally but also "in depth," of the relations between human and digital imagination. At the time of the web 1.0, when the emplotment of our lifestories online was entirely dependent on the elements we voluntarily entered into the virtual environment, and when academics used to believe that this environment could free people from the physical and social constrictions IRL (in real life) (boyd 2001), then the digital imagination was above human imagination.

With the rise of the social web, the distance between the two imaginations has drastically reduced. At the beginning of the 2000s, Manovich (2001, 218) used to oppose narrative and database. Narrative is linear, while database is a structured collection of data that can take different forms, hierarchical, network, relational or object-oriented. New media, he said, and especially the Internet, are databases in a basic sense, since they "appear as collections of items on which the user can perform various operations: view, navigate, search" (Manovich 2001, 219). However, today databases are, at least from a user perspective, highly narrativized. As argued by Manovich (2012) himself, "in social media, as it developed until now (2004-2012), database no longer rules. Instead, social media brings forward a new form: a data stream. Instead of browsing or searching a collection of objects, a user experiences the continuous flow of events."

Manovich wrongly compares data streams to "a surrealist intentional juxtaposition of completely unrelated objects", and the data stream experience to that of the flaneur, who "navigates through the flows of passerbys and the city streets, enjoying the density of stimuli and information provided by the modern metropolis." In this way, he implicitly readmits database as the main symbolic form of our culture. But in data streams, data is organized according to a temporal coherence which is meaningful for the user. For instance, this holds true of Facebook's News Feed or Twitter's timeline: "Twitter you are likely to care about most will show up first in your timeline. We choose them based on accounts you interact with most, Tweets you engage with, and much more."[8] According to Hochman (2014. Italics are mine), "if the database suppressed traditional linear forms (as it has no pre-defined notions of time), the data stream seems to emphasize once again the linearity of a particular data sequence. […] Put differently, […] *the stream brings back the temporal element as its core organizational and communicational factor* […]."

Certainly, the temporality of data streams does not correspond to that of the classic narrative. Rather, David M. Barry (2013, 144) has said, one could think of the data stream as

"distributed narratives which, although fragmentary, are running across and through multiple media, in a similar way to that Salman Rushdie evocatively described in *Haroun and the sea of stories*." However, data stream is the paradigm of a general tendency consisting of narrativizing the user experience on the web. Let us consider, for instance, three features recently introduced by Facebook: Year in Review ("a collection of photos from your most significant moment this year"), On this Day (which "brings you memories to look back on from that particular day in your Facebook history"), the Friends Day Video (that "celebrates you and your friends").[9] In all these cases, algorithms operate on a database in order to give it a certain temporal and thematic coherence to it, i.e. an emplotment. The logic of software and the logic of narrative, which is, as it has been shown, the logic of the productive imagination, draw close to each other.

Finally, in the age of big data, the digital imagination is going to have the upper hand on human imagination. Jenna Burrel (2016, 1-2) has suggested that the most troubling opacity in machine learning algorithms is not opacity "as intentional corporate or institutional self-protection and concealment", nor opacity "stemming from the current state of affairs where writing (and reading) code is a specialist skill", but rather "an opacity that stems from the mismatch between mathematical optimization in high-dimensionality characteristic of machine learning and the demands of human-scale reasoning and styles of semantic interpretation."

The analogy between productive imagination as it has been presented in this paper and the process of data analytics as displayed by theorists Antoinette Rouvroy and Thomas Berns (2013) is astonishing. For them, data analytics is a threefold process: 1) the digitalization of life, which is the massive collection of data with purposes of security, control, optimization, marketing, etc.; 2) data mining and machine learning, that is to say the algorithmic treatment of digital traces in order to extract significative correlations, and 3) the application of the extracted correlations, i.e. the profiling.[10]

However, there are also at least three important differences between narrative imagination and big data analytics. First, in the latter data is, at least in principle[11], abstracted from its context of production. Second, data mining and machine learning are neither based on emplotment nor on the research of causes (which, according to Aristotle, is the basis of scientific knowledge, and is what makes philosophy the first among sciences), but on the correlation of heterogeneous data, according to the much discussed principle "correlation is enough" (Anderson 2008; see boyd and Crawford 2012 for the beginning of a long critical

literature that has recently given rise to a sub-discipline called "critical data studies").[12] Third, in the case of data analytics, the application does not target a specific individual, but rather attributes the same behavioral predictions to all those who correspond to the same profile. For these reasons, one could say that big data is a sort of limit-case in the logic of software in which the human productive imagination is overpassed in terms of both sensibility and understanding.

It is important to notice that, despite big data's indifference to individuals, it does not mean that singularities are not concerned. Rather, they are implicated in a process of subsumption, since big data is capable of seeing analogies where we see just irreconcilable differences.

Conclusion

The present article represents the first step in a wider research project aiming at exploring the status of the human freedom in the age of the "algorithmic governmentality". Rouvroy and Berns (2013, 167. Translation is mine) define algorithmic governmentality as "the automated extraction of pertinent information from massive databases for purposes of prevision or exclusion". According to Lucas D. Introna (2015, 27), the term stands for the performative nature of the new calculative practices: "In their flow of action, they [algorithms] enact objects of knowledge and subjects of practice in more or less significant ways. […] Their actions are not just in the world, they make worlds."

Productive imagination is not just a matter of cognition. Incidentally, this is one of the main differences between the extended mind approach and the one I have developed in this paper. In his *Kant and the Problem of Metaphysics* (1997), Heidegger observes that Kant's transcendental theory of imagination anticipates in some ways his own theory of human temporality and freedom.[13] The limit of the Kantian approach consists in having looked for freedom in the interiority of consciousness rather than in the "thrownness" of existence. In the course of this article, it has been similarly argued that the schematism does not happen in the depth of the human soul, but rather outside, in the digital (but not only) environment that surrounds us. Yet, according to the way imagination has been described, freedom does not consist in Heidegger's heroic authenticity. As argued by Verbeek (2013, 85) in his postphenomenological interpretation of Foucault, "freedom does not consist in an absence of power but in gaining a new relation to power." Dorrestijn (2012, 226) stressed that Foucault

did not tried to separate two spheres, the human and the technological (in the broad sense Foucault gave to the term "technology"), because "there is no genuine subject that is free from constraints or not yet affected by technology." Thus, freedom is less a matter of liberation than the possibility of recombining, and hence renegotiating, the frontiers with the sociotechnical environment that surrounds us.

Panopticism has found breeding ground in critical Internet and social media studies (Romele et al. 2017). Samuel Bentham conceived the panopticon as a circular prison allowing a single watchman to observe all the cells at once, but impeding the prisoners to know whether or not they are being observed. In Foucault's interpretation, panopticism is a carceral power that spread outwards in the 19th century into complex networks of disciplinary training. Scholars treated social media as forms of reversed panopticon, in which the controlled is alone in the middle of the "prison" and controllers are all around her or him. They used terms such as "dataveillance", "superpanopticon", "panoptic sort", and "electronic panopticon". Baumann and Lyon (2013) have recently referred to the phenomenon as "liquid surveillance." In recent years, data collection, treatment and analysis, for purposes of both monetization and surveillance, from both private Internet companies and national agencies such as the infamous NSA, became global processes of the web. As a consequence, social media are being treated as classic forms of panopticon. For several academics, what is at stake in social media and, more generally, in digital technologies today is not so much the relation among individuals *in* a sociotechnical system, but rather the relation between those individuals *and* the sociotechnical system.

In addition to panopticism, some scholars have opportunely stressed the potential of another Foucauldian concept for understanding subjectivation through social media: confession. According to Foucault, confession has to do with transforming every desire into discourse. In the first volume of *The History of Sexuality* (Foucault 1978, 21) he says that "[t]he Christian pastoral prescribed as a fundamental duty the task of passing everything having to do with sex through the endless mill of speech". He adds that "the Christian pastoral also sought to produce specific […] effects of displacement, intensification, reorientation and modification of desire itself" (Foucault 1978, 23). With the rise of Protestantism, the Counter Reformation, eighteenth century pedagogy and nineteenth century medicine, confession has spread, and today "Western man is a confessing animal" (Foucault 1978, 59). One can say that social media and most of digital technologies – let us think, for instance, of those related to the Quantified Self movement – are a further, technologically

visible, spreading of confession, beyond the frontiers of Western societies, beyond the limits of institutionalized powers. For example, the Like button, along with the other five reaction buttons introduced between 2015 and 2016, allows Facebook both to induce users to externalize affective reactions to web contents, and to reorient them by using generated data for personalized advertising or to show users, through recommendations, what their friends have liked and engaged with. Hence, according to Boellstorff (2013), from a Foucauldian perspective the master metaphor for describing big data should not be the panopticon, but the confession: "the confession is a modern mode of making data, an incitement to discourse we might now term *an incitement to disclosure*."[14]

There is no reason to disagree with these two ideas. The web today is characterized by both forms of governmentality and incitement toward disclosure.[15] However, panopticism and confession may be integrated by a reflection on a third, again Foucauldian, paradigm: *parrhesia*. While the earlier Foucault analyzed the ways the modern subject has been shaped by technologies of power, in his later work he tried to develop an "ethics" or "aesthetics" of the self, "as the active engagement of people with governing and fashioning their own way of being in relation to conditioning circumstances" (Dorrestijn 2012, 227). In other words, while the earlier Foucault is concerned about *interpreting* modern subjectivations, the later Foucault is more interested in finding ways for *changing* or at least dealing with them. In order to do this, he goes back from modernity to antiquity, and especially to philosophical traditions such as Stoicism, Cynicism and Epicureanism.

Foucault (2011a, 55) defines *parrhesia*, an ancient Greek term literally meaning "to speak everything," and by extension "to speak freely" or "candidly," as a way of telling the truth that "does not fall within the province of eristic and an art of debate, or of pedagogy and an art of teaching, or of rhetoric and an art of persuasion, or of an art of demonstration." There is a crucial difference, for him, between the *parrhesia* and a performative utterance. In the latter, the effect which follows is known in advance, is codified. *Parrhesia*, instead, does not produce a codified effect, but it opens up an unspecified risk: "in a sense, therefore, it is the opposite of the performative, in which the enunciation […] gives rise to a completely determined event […]. Here, on the contrary, it is truth-telling, an irruptive truth-telling, which creates a rupture and opens up a risk: a possibility, a field of dangers, or at any rate, an undefined eventuality" (Foucault 2011a, 63).

Although Foucault never refers to them, narrative and productive imagination can be seen as forms of *parrhesia* since they have to do with the Socratic "*didonai logon*", an

expression that Foucault himself (2011b, 159) opportunely renders as "to give an account of themselves, to explain themselves." And certainly there is no true *didonai logon* without political and existential risks, as Socrates' life and death have well demonstrated.

Giving narratively an account of oneself before the others is a possibility that in the age of big data is not denied, but anesthetized. There is no need to confess, because any powerful sociotechnical system is capable of predicting one's choices and actions on the basis of her or his present and past behaviors. The relevance of the stories someone tells about herself or himself will always fail before the exhaustivity of the information a digital machine has at its disposal, and its capacity to correlate. "Who needs stories if you can get the data?" asks Mireille Hildebrandt (2011): "we may assume that statistical inference could one day refuse the stories a person tells to give an account of herself. At some point the police, the judge, the insurance agent, your webshop, Google Analytics, your doctor and your tax collector will point out that you match an aggregated profile that probably (sic!) provides a better prediction of your future behavior than whatever you tell them" (Hildebrandt 2011, 388).

Notice that this does not mean that big data actually *makes* better prediction about oneself. Several scholars have stressed the possible traps and the limits of big data analysis. The initial enthusiasm and the following disillusion about Google Flu Trends is one of the most evident cases (Lazer et al. 2014). "Inconclusive evidence," i.e. the fact that when algorithms draw conclusions from the data they process through machine learning, they produce probable and yet uncertain knowledge, is one of the main ethical issues related to algorithms, machines learning, and big data (Mittelstadt et al. 2016, 4). One may say that at the end of the day it does not really matter if digital technologies are imaginative or not. The hypothesis of this paper is that they are, but what is more important for this conclusion is that people, and especially those who take decisions, *do* increasingly delegate these decisions to the machines, because they *do* trust in their imaginative capacities.

Thus, any form of speaking candidly, and taking a risk in doing so, is increasingly anesthetized. If one assumes that *parrhesia* is a truth-telling that creates rupture and novelty, a force representing the possibility, capacity and capability to negotiate with a specific power relation, it is precisely this potentiality that becomes insignificant. There is empirical evidence that people are getting more and more resigned about the possibility of changing how things work with digital technologies, especially about privacy rights violations in social media. In Turow, Hennessy, and Draper (2015: 3), a 2014 Yahoo report is cited, according to which online Americans "demonstrate a willingness to share information [online], as more

consumer begin to recognize the value and self-benefit of allowing advertisers to use their data in the right way." But the same authors suggest, on the basis of a phone survey of 1,506 Americans, that users are rather resigned to giving up their data: "Resignation occurs when a person believes an undesirable outcomes is inevitable and feel powerless to stop it. Rather than feeling able to make choices, Americans believe it is futile to manage what companies can learn about them" (Turow, Hennessy, and Draper 2015: 3). In the face of such resignation, no individual reaction, however exemplary, can be effective. This is probably the main limitation of the later Foucault's ethics and aesthetics of the self. It is the goal of further researches to provide a framework for inverting such a tendency.

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[1] There is a sort of "emotional turn" in contemporary philosophy, and I must admit that in my approach I do not consider feelings, emotions, or moods (what Heidegger used to call *Befindlichkeit*) as possible insurmountable difference between human beings and machines. This point certainly deserves further reflections. I thank one of the anonymous reviewers for this precious critique.

[2] For the *Critique of Pure Reason* it has been used the English translation and edition by Paul Guyer and Allen W. Wood for the Cambridge edition of the works of Immanuel Kant by Cambridge University Press (1998). It has been used the standard version to cite the *Critique of Pure Reason*, namely the abbreviation KrV (*Kritik der reinen Vernunft*), A and/or B (reference to the first and/or the second edition), and number of pages according to the Akademie Edition.

[3] There is no room for such a discussion, but Ricoeur's perspective on productive imagination is half way between Cassirer's predilection for spontaneity, and Heidegger's plea for finitude. On Cassirer and Ricoeur, see Barash (2007); on Ricoeur and Heidegger, see Piercey (2011); on Cassirer and Heidegger, see Gordon (2012).

[4] In *Eupalinos ou l'architecte*, Paul Valery's Socrates tells us that he would have preferred to be an architect instead of a philosopher. Architecture is superior to philosophy, the art of speech, because it creates a materially existing living space, and because it is an art of movement: buildings are motionless, but they shape space, magnificating some movements and reducing some others (Vitali-Rosati 2016, 96). This critique to philosophy, which is more generally a critique of all static and abstract writing, does not seem applicable to the way Ricoeur understands narrative. This is probably the reason why he sees, contrary to the Valery's Socrates, a continuity between his thinking and architecture. And this is also why an affinity between his approach and digital technologies is highlighted in this article. As argued by Vitali-Rosati (2016, 106), indeed, "digital writing is a kind of architecture: writing, in digital space, is building."

[5] Two caveats, however, are necessary here. First, when it comes to Black, his scale of models is a scale of abstraction. The last level is occupied by theoretical models, and the example he gives is Maxwell's representation of an electrical field in terms of the properties of an imaginary incompressible fluid. Second, with regard to Ricoeur, he continues to refer to language as the paradigm for all kind of synthetization. According to the intentions of this paper, instead, language is just one of the possible external places in which schematism can happen.

[6] This includes e-memory technologies (Clowes 2013). Incidentally once autonomy, i.e. the fact that these kind of technologies do not only store data, but also process it, is considered to be one of the main features of e-memory technologies, we have already left the field of memory properly speaking and entered that of productive imagination.

[7] More recently, Peter-Paul Verbeek has expanded such a fourfold distinction "downwards" and "upwards." For downwards, he has introduced the notion of cyborg relations, in which technologies start to merge either with the human body, like in brain implants, domotics, and augmented reality devices. When referring to upwards, he talks about immersion relations, in which technology does not merge with the body but with the environment, like in the case of smart toilets or smart beds in hospitals (Rosenberg and Verbeek 2015, 20-22). This integration of Ihde's scheme is more convincing than that proposed by Verbeek himself in *Moralizing Technology* (2013, 145-146), when he introduced, in addition to the cyborg relations, the so-called "composite relations." In his view, this kind of relations should integrate Ihde's concept of hermeneutic relations, since it assumes that in some situations of technology use, there is a double intentionality involved: one of the technology toward "its" world, and one of human beings toward the result of this technological intentionality. However, one could say that this is precisely the condition of *all* hermeneutic relations.

[8] https://support.twitter.com/articles/164083. Accessed on June 9, 2016.

[9] https://www.facebook.com/help/. Accessed on June 9, 2016. There have been several discussions especially on the feature Year in Review. Few days after its launch in December 2014, Facebook had to apologize for the "inadvertent algorithmic cruelty," as it has been called by web designer Eric Meyer on his blog, after Facebook showed him the pictures of his daughter Rebecca, who died in that year. See https://www.theguardian.com/technology/2014/dec/29/facebook-apologises-over-cruel-year-in-review-clips. Accessed on June 9, 2016. However, it seems that in 2015 Facebook improved the algorithm, which is now able to filter our bad memories.

[10] Similarly, Rob Kitchin (2014) presented data analytics as being made of 1) pre-analytics (data selection, data pre-processing, data reduction and projection, data enrichment); 2) machine learning, consisting into automatically learn to recognize complex patterns and construct models that explain and predict such patterns and optimize outcomes, and 3) data visualization and visual analytics, i.e. diagrams, graphs, spatializations, maps, and animations that effectively reveal and communicate the structure, pattern, and trends of variables and their interconnections.

[11] Latanya Sweenye (2000) found that combinations of few characteristics often combine in populations to uniquely or nearly uniquely identify some individuals. Hence, data released containing such information about these individuals must not be considered anonymous.

[12] To say the truth, there are several schools in machine learning (ML), and the main ones are five in number (Domingos 2015): 1) symbolists view ML as the inverse of deduction; 2) connectionists reverse the engineer the brain; 3) evolutionaries simulate evolution on the computer; 3) Bayesians believe ML is a form of probabilistic inference, and 5) analogizers learn by extrapolating from similarity judgments.

[13] Apparently, Kant refused to resort to productive imagination in his *Critique of Practical Reason*, which deals with moral philosophy. Yet, Johnson (1985, 265) argued that "in spite of his repeated insistence on the purely rational nature of moral judgment, Kant recognized the need for imagination in order to apply moral rules to specific cases." Furthermore, several contemporary thinkers such as Carol Gilligan, Martha Nussbaum, and especially Paul Ricoeur have insisted, mostly in the wave of Kant, on the importance of imagination for ethical and political actions (Pierron 2015).

[14] According to Franck Cormerais and Amar Lakel, one can distinguish among three kinds of confession throughout human history: 1) the confession to God, exemplified by St. Augustine's *Confessions*; 2) the confession to the others, whose paradigm are Rousseau's *Confessions*, and 3) the confession to a machine, which is emerging nowadays. The specificity of this latter is the impossibility of authenticity, reflexivity and self-understanding, and the homogenization of oneself to the others. See "De la confession à la confiscation de soi. Herméneutique du sujet et régime de la trace numérique", session of the seminar "Ecritures numériques et éditorialisation", organized by the journal *Sens Public*, http://seminaire.sens-public.org/spip.php?article58. Accessed on December 2, 2016. Further considerations on confession and digital media and technologies can be found in Talvitie-Lamberg (2014), and Hall (2016).

[15] There is at least one case in which big data does not directly have to do with governmentality: when it is used by the NSA, and more generally by public institutions for purposes of surveillance and control. Foucault (1991, 94) defined governmentality as "the right disposition of things, arranged so as to lead to a convenient end." Big data for surveillance is not much concerned with disposition, distribution, and organization, but rather with a form of "negative paternalism". The term has been suggested by Luciano Floridi during a three-day seminar he gave at the University of Ferrara, Italy, on April 28-30, 2016. Negative paternalism consists, for him, into checking that a person goes from Status 1 to Status 2, and not to Status 3. In other words, big data aims in this this case at observing without intervening (unless a specific action, like posting comments in favor of the Islamic State of Iraq and the Levant on social media, is done).