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RESEARCH ARTICLE

Technological Capital: Bourdieu, Postphenomenology, and the Philosophy of Technology Beyond the Empirical Turn

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Abstract

This article builds on the hypothesis that theoretical approaches to philosophy of technology are currently stuck in a false alternative: either embrace the "empirical turn" or jump back into the determinism, pessimism, and general ignorance towards specific technologies that characterized the "humanities philosophy of technology." A third path is however possible, which consists of articulating an empirical point of view with an interest in the symbolic dimension in which technologies and technological mediations are always already embedded. Bourdieu's sociology of the symbolic forms represents an important and mostly unexplored resource in this respect. In this article, we introduce the notion of technological capital and its tree states—objectified, institutionalized, and embodied. In the first section, we briefly account of the empirical turn in philosophy of technology. Specific attention is then devoted to postphenomenology. We depict three perspectives in postphenomenology: (1) standard postphenomenology, in which one single human-technology-world relation at a time is considered; (2) the attempt of some technological mediation theorists to articulate postphenomenology and actor-network theory (ANT); (3) the original effort in Ihde, which is currently practiced by a minority of postphenomenologists, to combine an interest for the empirical dimension of technological mediations with an attention to the social and cultural conditions of possibility in which these mediations are embedded. In the second section, we consider some recent critiques of the limits of the empirical turn in philosophy of technology, especially related to postphenomenology. Furthermore, we argue that Pierre Bourdieu's sociology may benefit the philosophy of technology. One might say that according to a Bourdieusian perspective, technologies are, in their

> The concern to return to the 'things themselves' and to get a firmer grip on reality, a concern that often inspires the projects of postphenomenology, can lead one purely and simply to miss a 'reality' that does not yield to immediate intuition because it lies in structures transcending the technological mediations which they form. (Bourdieu 1991, p. 68. Two words modified)

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invention, implementation, and use, embedded in symbolically organized interactions among social actors or groups. The notion of technological capital is introduced. A specific attention is given to its embodied state, which is related to the habitus. Such concept suggests that, to rephrase the famous sentence by Heidegger, "the essence of technology is not totally technological." In the conclusion, we consider three risks related to a Bourdieusian approach to technology: (1) transparency, (2) determinism, and (3) absolutism.

Keywords Technological capital · Bourdieu · Postphenomenology · Habitus · Empirical turn · Transcendental dimension of technology

1 Introduction

This article builds on the hypothesis that theoretical approaches to philosophy of technology are currently stuck in a false alternative: either embrace the "empirical turn" (Achterhuis 2001) or jump back into the determinism, pessimism, and general ignorance towards specific technologies that characterized the "humanities philosophy of technology" (Mitcham 1994) of such authors as Heidegger and Ellul. A third path is, however, possible, which consists of articulating an empirical point of view with an interest in the symbolic dimension in which technologies and technological mediations are already embedded.

Bourdieu's sociology of the symbolic forms (Bourdieu 1970) represents an important and mostly unexplored resource in this respect. In this article, we introduce the notion of technological capital and its three states—objectified, institutionalized, and embodied. The goal is to show that technologies are always already entangled in social (and cultural) dynamics of classification, separation, and eventual exclusion and discrimination. In other words, technologies are always more than the sum of their material parts. Bourdieu's social theory, we believe, allows us to reintroduce a transcendental dimension in philosophy of technology without falling back into forms of dogmatism.

The argumentation is a two-step development. In the first section, we briefly account of the empirical turn in philosophy of technology. Specific attention is then devoted to postphenomenology, which is one of the most influential approaches in this field nowadays. We depict three perspectives in postphenomenology: (1) standard postphenomenology, in which one single human-technology-world relation at a time is considered; (2) the attempt of some technological mediation theorists to articulate postphenomenology and actor-network theory (ANT); and (3) the original effort in Ihde (1990), which is currently practiced by a minority of postphenomenologists like Hasse (2015), to combine an interest for the empirical dimension of technological mediations with an attention to the social and cultural conditions of possibility in which these mediations are embedded.

In the second section, we consider some recent critiques of the limits of the empirical turn in philosophy of technology, especially related to postphenomenology. Furthermore, we argue that Pierre Bourdieu's sociology may benefit the philosophy of technology. While Bourdieu never devoted any specific attention to technology and philosophers of technology generally paid little attention to his work, it has been

observed that "his work is 'friendly' to technological scholars" (Sterne 2003, p. 369). One might say that according to a Bourdieusian perspective, technologies are, in their invention, implementation, and use, embedded in symbolically organized interactions among social actors or groups. The notion of technological capital is introduced. A specific attention is given to its embodied state, which is related to the *habitus*, another key concept of Bourdieu's social theory. Such concept suggests that, to rephrase the famous sentence by Heidegger, "the essence of technology is *not totally* technological."

In the conclusion, we consider three risks related to a Bourdieusian approach to technology: (1) the risk of transparency; that is, the focus on the symbolic dimension of technologies can be cause of neglect with respect to their materialities. We argue, however, that this risk is extraneous to Bourdieu's original intentions, and hence to our import of Bourdieu's social theory in the philosophy of technology; (2) the risk of determinism: if the relation (in terms of property, design, or use) a social actor/group has with technologies is determined by the *habitus*, there is no possibility of liberation or freedom. However, we do show that this risk is extraneous to Bourdieu's social theory and, by consequence, irrelevant to its possible application to the philosophy of technology; and (3) the risk of absolutism, which consists in considering the symbolic dynamics of social recognition, oppression, discrimination, and exclusion, as the highest (if not the only) transcendentality when it comes to society or, in the case of this paper, technologies. We contend that this is a concrete risk, but we also propose to counterbalance it through the notion of "mapping" which is introduced by Smith (2018).

2 From Postphenomenology to Posthermeneutics

In 1998, Peter Kroes and Anthonie Meijers organized a conference at the Delft University of Technology in which a programmatic call for an "empirical turn" in philosophy of technology was made—see Smith (2018, Chapter 5, Section 1: "The Empirical Turn: An Enduring Influence in Philosophy of Technology"). In the introduction to the subsequent collection of papers, they write:

> Philosophy of technology should keep its distinctive philosophical nature. Nevertheless, it should also base its analyses on empirical material, much more than has been done so far […] The philosophy of technology should concentrate more on the clarification of basic conceptual frameworks used in the engineering sciences and in the empirical sciences studying technology and less on abstract myths and fictions of which it is not clear how they relate to the real world of technology (Kroes and Meijers 2001, p. XXI).

In 1997, Hans Achterhuis edited a book in Dutch entitled *Van stoommachine tot cyborg: Denken over techniek in de nieuwe wereld* (*From Steam Engine to Cyborg: Thinking about Technology in the New World*). The book contains chapters written by Dutch or Dutch-based philosophers of technology such as Peter-Paul Verbeek, Philip Brey, and Achtehuis himself on American philosophers of technology like Hubert Dreyfus, Don Ihde, and Andrew Feenberg. The book was published in English in 2001 with the title *American Philosophy of Technology: The Empirical Turn*. In the

introduction to the English translation, Achterhuis (2001, p. 8) presents the empirically oriented approach to technology as the work of a constellation of authors who "stand in the middle of the world of designers and users of technology; they make abundant use of research into technology, especially from sociology and women's studies; and they communicate directly with technologists and engineers."

The way in which the empirical turn in philosophy of technology is understood by Kroes and Meijers, on the one hand, and Achterhuis, on the other, is rather different. For this reason, Brey (2010) suggests that one should rather talk of *two* empirical turns in philosophy of technology. A first empirical turn emerges in the 1980s and 1990s, when neo-Heideggerians like Dreyfus, neo-critical theorists such as Feenberg, and postphenomenologist such as Ihde start to focus on concrete technologies and issues and attempt to develop contextual, less deterministic theories of technology. Another empirical turn takes place in the 1990s and 2000s, when scholars like Peter Kroes, Anthoine Meijers, and Joseph Pitt argue that the problem is that philosophy of technology is less about technology than its social or anthropological consequences. This does not mean that philosophy of technology must be transformed into an empirical science: "its focus should be on conceptual problems, more in particular, on the clarification of basic concepts and conceptual frameworks employed in empirically adequate descriptions of parts or aspects of technology" (Kroes and Meijers 2001, p. XXIV). The first empirical turn is society-oriented, while the latter is engineering-oriented.

Despite these clear differences, in research objects, goals, and methods, we believe that these two empirical turns share at least one aspect, namely the exclusion of all considerations regarding the transcendental—to be understood in the largest sense possible as "conditions of possibility"—from the philosophy of technology. For instance, Verbeek (2011, p. 161) explicitly accuses the humanities philosophy of technology of such authors as Heidegger and Jaspers of "transcendentalism," "because of its kinship to the transcendental-philosophical focus on understanding phenomena in terms of their conditions of possibility." The empirical turn he pleads for would represent, in this respect, a "radical shift." According to Smith (2018, Chapter 1, Section 4: "Philosophy of Technology: Making Sense of Many Turns"), the approaches influenced by the empirical turn tend to repeat a fallacy that they diagnose in classical approaches. In other terms, while accusing classical approaches in philosophy of technology of reifying technology as a monolithic entity, they also end up reifying the notion of transcendental.[1] "Transcendental," Smith says, should be used as an adjective rather than a noun. We discuss this remark in the conclusion.

In the rest of this section, we focus on the specific case of postphenomenology. On the one hand, because of the philosophical tradition, which refers to phenomenology, hermeneutics, and more broadly continental, post-Kantian philosophy, postphenomenology has all the means at its disposal for reflecting on technology without losing sight of its non-technological conditions of possibility. On the other hand, however, despite some marginal exceptions, postphenomenology is one of the

[1] For Smith, other two problems with postempirical turn philosophies of technology are that (1) the empirical turn tends towards problematic common-sense presuppositions on what constitutes a "Technology," to the detriment of the potential for a focus on "exceptional technologies," and (2) the empirical turn has set a problematic precedent where a key picture of method in philosophy of technology is one of "turning." We discuss these aspects in the conclusion as well.

strongest and most influential proponents of an empirical and, so to say, "flat" perspective in philosophy of technology. Such a perspective could certainly be justified between the 1980s and the 1990s. It was a matter of overcoming the humanism and anthropocentrism that, despite the efforts of many structuralist and poststructuralist theorists—and, interestingly enough, of Heidegger himself—still dominated human and social sciences. It was also about going against the exaggerations of the linguistic turn that ravaged human and social sciences for decades—and of which structuralism and poststructuralism have been the most powerful and fascinating tenants. But, it also ended with throwing the baby out with the bathwater.

In particular, we depict three perspectives in postphenomenology. In order to do so, we resort to a metaphor, or model. In Edwin Abbot's novel *Flatland: A Romance of Many Dimensions* (1884), the story is told of a Square who lives in a two-dimensional world called Flatland occupied by geometric figures—whereof women are simple line segments, while men are polygons whose importance in society depends on their number of sides.[2] The second part of the novel begins with the Square dreaming on New Year's Eve about a visit to Lineland, a one-dimensional world inhabited by "small straight lines" and "lustrous points." These points are unable to see the Square as anything other than a set of points on a line. Thus, the Square attempts to convince the realm's monarch of a second dimension but is unable to do so—resulting in the monarch's attempt to kill the Square.

Following this vision, he is himself visited by a three-dimensional Sphere. The Square is unable to see the Sphere as anything other than a circle that expands and retracts. The Sphere inhabits a three-dimensional world called Sphereland and visits Flatland at the turn of each millennium to introduce a new apostle to the idea of a third dimension. The Square cannot convince anyone of Spaceland's existence, not even his brother, and is imprisoned for preaching the existence of three dimensions.

Like in Abbot's novel, we might say that in postphenomenology as well, there are three worlds or dimensions:

1) In its earlier version, postphenomenology is a Lineland in which one single human-technology-world relation at a time is deployed. Small straight lines and lustrous points are the basis behind Don Ihde's famous idealtypical distinction among four human-technology-world relations: (a) *embodiment relations*, in which a human integrates the artifact into their bodily encounter with the world, and the artifact becomes almost transparent in use (e.g., glasses); (b) *hermeneutic relations*, when technology must be "read" in order to access the world (e.g., maps or thermometers); (c) *alterity relations*, in which the encounter with the world is suspended, and the user treats the technology as a quasi-alterity (e.g., video games); and (d) *background relations*, when technologies create the conditions of possibility of a certain relation with the world (e.g., heating system or artificial lighting) (see Ihde 1990, pp. 72–123).

From this starting point, the orthodox postphenomenological literature takes two main directions. Some scholars focus on analyzing how specific technologies fit the four ideal types. They also concentrate on how emerging technologies impose adaptations of

[2] https://en.wikipedia.org/wiki/Flatland. Accessed on September 21, 2019.

the original framework proposed by Ihde. For example, Verbeek (2011, p. 140) introduces the notion of cyborg relations, to describe situations in which the boundaries between technologies and human beings are blurred in a physical way, as in the case of psychopharmaca and neural implants. He also speaks of immersion relations (Rosenberger and Verbeek 2015, pp. 21–22) in which technologies merge with the environment. Other adaptations are suggested, for instance, in Wiltse (2014), Liberati (2016), and Rodighiero and Romele (2020).

2) Yet, the limits of this linear approach quickly emerge, especially when compared with the more complex analysis in other fields such as science and technology studies (STS). For instance, in actor-network theory (ANT), technologies are considered as part of a broader network of interactions between humans and non-humans technologies, institutions, animals, etc. These interactions "transcend," and one might say, the single technology or technological mediation. However, one should keep in mind that such transcendentality is still immanent, in the sense that it focuses on the ways single technological mediations are *materially* embedded in networks of social actants.

Some mediation theorists[3] have proposed to articulate postphenomenology with ANT, in particular in its Latourian version. According to Verbeek (2005, p. 165)

> While Latour in principle can study the endless number of chains, postphenomenologists seem to be restricted to two […]. But the difference between the two approaches is more subtle than that, for in these short chains the postphenomenological perspective can bring to light things that remain invisible to actor-network theory. The postphenomenological perspective, for instance, offers a more nuanced look at the connections between the entities in its chains.

To put it differently, while ANT is more suitable for analysis "in-width," postphenomenology is to be privileged for researches "in-depth," especially when it is a matter of recognizing differences among the modes of existence. In Aaron Smith's (2003, p. 189) words, "Latour's view […] does not develop in nearly the same depth the direct personal relationships with artifacts that Ihde's does. Instead, Latour's project could be seen as picking up where Ihde's left off because it emphasizes systems of relations."

[3] In this context, we are using "postphenomenology" and "mediation theory" as synonyms. Mediation theory presents itself as an evolution of postphenomenology. While the latter is mainly concerned with perception, the former also focuses on signification and, in particular, on the ethical implications of technological mediations. There is no room in this context for fully deploying such a criticism, but we contend that mediation theory does not represent any substantial step forward compared to postphenomenology. Firstly, because in the seminal work of Ihde, there is already much concern for signification, and secondly, and more importantly, because the kind of ethics developed within mediation theory is, so to say, as flat as the postphenomenological perspective. For instance, in the ethics by design developed in Verbeek (2011), both ethical problems and solutions are entirely materialized in technologies. A Bourdieusian perspective such as the one sketched out in this paper instead paves the way for a series of political initiatives concerning the normative and symbolic conditions of possibility of technologies.

ANT is a Flatland. Actually, Latour himself contends that "it's as if we had to emulate in social theory the marvellous book *Flatland*, which tries to make us 3-D animals live inside a 2-D world only made up of lines. It might seem odd at first, but we have to become the Flat-Earthers of social theory" (Latour 2005, pp. 171–172). Bruno Latour's social theory aims at overcoming the individual versus society conundrum that has kept social and political theorists busy for the last two centuries; incidentally, this is also the reason why, in the past years, he gave so much importance to digital methods for social research. Moreover, because of the "principle of symmetry" according to which humans and non-humans should be assigned an equal amount of agency, actor-network theorists tend to level out the differences in terms of intentionality, agency, etc.—in this respect, we have said, postphenomenology is supposed to be more attentive to the peculiarities of each mode of existence. ANT "zombifies," in sum, social actors and society itself.

According to Jasanoff (2015, pp. 16–17), ANT is, for example, "too distributive, too promiscuous in attributing cause and agency. As even the friendliest critics have observed […] it risks a kind of moral nihilism, making all actions and agents seem equally responsible, or irresponsible, for the network in which they function." She then tried to bring together "the normativity of the imagination [the sociotechnical imaginaries] with the materiality of networks" (Jasanoff 2015, p. 19). In more recent publications, Latour himself admitted the limits of ANT. For instance, he wrote:

> We understand this now, this method has retained some of the limitations of critical thought: the vocabulary it offers is liberating, but too limited to distinguish the values to which the informants cling so doggedly […]. A tool in the war against the distinction between force and reason, it risked succumbing in turn to the unification of all associations under the sole reign of the number of links established by those who have, as it were, 'succeeded' (Latour 2013, p. 64).

Hence, as paradoxical as it may sound, ANT is arguably a metaphysics of presence, in the sense that it is content with the most visible aspects of the sociotechnical reality. Further illustration will show that the same holds true, at least in what concerns society, for postphenomenology as well.

3) In Ihde's earlier version of postphenomenology, the linear perspective of the human-technology-world relations is counterbalanced by the notion of multistability. It can be argued that while the former is the result of the phenomenological heritage *stricto* sensu (mainly Husserl and Merleau-Ponty), the latter is a derivation of the—often neglected—properly hermeneutic dimension of postphenomenology. The former concerns perception, while the latter regards meaning. Once understood in this light, postphenomenology appears to be a sort of Sphereland: technological linear mediations, and eventually two-dimensional networks of social actants, are embedded into a third dimension whose nature is mainly symbolic.

It is not by chance that in Ihde (1990), the concept of multistability is introduced in Chapter 6, entitled "Cultural Hermeneutics." The articulation between the empirical perspective developed in the analysis of the human-technology-world relations (plus ANT) and the interest in the cultural and symbolic dimension in which these relations

are entangled coincides with what we call the shift from postphenomenology to posthermeneutics. The "post-" means that such approach aims at overcoming both the limits of the "idealism of matter" that characterizes classic hermeneutics (Romele 2019) and the empirical exaggerations of philosophy of technology after the empirical turn.

Ihde initially introduced the concept of multistability within a phenomenological framework. It was meant to account for illusions and multistable phenomena exceeding familiar perceptions, as in the cases of the Necker cube or the duck-rabbit illusion. Similarly, phenomenology could be considered a practice to "do violence to the passivity of ordinary viewing" (Ihde 2012 [1977], p. 76). The notion took after a hermeneutic connotation in the sense that it was argued that technologies essentially depend on their multiple uses, which, in turn, depend on different social and cultural contexts. The fact is that "[a]t the cultural level, […] more occurs than simply the number and type of human-technology relations" (Ihde 1990, p. 124). Against the predictions of analytic uniformity (Marcuse), of the victory of technique (Ellul), and of the sheer world of calculative thought (Heidegger), the American philosopher (Ihde 1990, p. 159) announces enthusiastically that "[t]here will be diversity, even enhanced diversity, within the ensemble of technologies and their multiple ambiguities, in the near future." Ihde's perspective brings to the forefront Clifford Geertz's approach, according to which humans are animals "suspended in webs of significance." All human actions, gestures, and productions (included the technological ones) are entangled in these webs. This is the reason why, for Geertz (1973, p. 6), "the difference, however unphotographable, between a twitch and a wink is vast; as anyone unfortunate enough to have had the first taken for the second knows."

It is important to stress that human productions such as technologies are entangled in networks of meaning in an even more radical way than bodies and actions. Indeed, if one cannot exclude that there are at least certain actions and bodily movements that are not culturally constituted per se (this is precisely the case of the twitch), technologies are mainly the result, in their invention, implementation, and use, of cultural transmission. It is not by chance that the use of the notions of animal culture and tradition is closely related to the observation of the transmission within a group and from generation to generation of specific techniques or technologies. This does not mean, of course, that technological multistability is infinite: the "interpretational flexibility" of technology, as they call it in the social construction of technology approach (SCOT) (Pinch and Bijker 2012 [1987]), is high, but not infinite, since technologies have their material and technical limits and, thus, their affordances.[4] This is why one should also consider the existence of "technological twitches" such as glitches. As one of the anonymous reviewers of this article has pointed out: "What about technological twitches, unintended unwillingly brought about functionalities or effects? Is not a malfunction a sort of techtwitch or tech-spasm and therefore not culturally constituted? Some elements of technology do not stem from their cultural transmission, but from the inherent uncertainty of technological action, from the fact that a realized process or artifact never coincides perfectly with the intended ones." In conclusion, one can say that it is

[4] Robert Rosenberger (2014, p. 377, no. 7) has opportunely noticed that strictly speaking SCOT's "interpretative flexibility" and postphenomenological multistability do not refer to the same phenomenon. The former deals with history of the social conflict leading to the establishment of a specific design, while the latter focuses on the potential for any technology to fit into different contexts.

not a matter of opposing material and symbolic dimension when it comes to technologies, but rather of articulating them.

3 Technological Capital

In the previous section, we have used the metaphor or model of *Flatland* to present three levels of analysis in postphenomenology: (1) a linear focus on single human-technology-world relations, (2) a two-dimensional integration of postphenomenology with ANT, and (3) the interest in the seminal work of Ihde for the symbolic dimension in which technological mediations (and eventually networks) are embedded. Incidentally, the problem with Ihde is that he limits himself to say *that* there are variations in technological uses depending on the cultural background in which such technologies are embedded; however, he does not seem interested in *what* these variations are, *why* they exist, neither seems he concerned about their *consequences*. For this reason, we propose to move from Ihde to Bourdieu. Bourdieu's social theory is indeed one of the most exhaustive attempts of accounting for the essence, the reasons, and the consequences of the variations in terms of recognition, appreciation, taste, and judgment (one could generally refer to the notion of "worldview") between societies and between social group or classes within the same society. These variations invest not only social relations and institutions, but also artifacts. While in the course of his career Bourdieu (1993) has been mainly interested in the cultural artifacts, we contend that his approach can be applied to technological artifacts as well.

In this section, we show how postphenomenology today focuses mostly on levels 1 and 2, while it tends to neglect level 3. We consequently discuss a few attempts at overcoming such a flat perspective. Particular attention is devoted to Rosenberger (2017) and Coeckelbergh (2017). Finally, we introduce the notion of technological capital, inspired by the social theory of Pierre Bourdieu, and discuss its potential for a philosophy of technology beyond the empirical turn. We distinguish between an objectified, institutionalized, and embodied state of the technological capital. Particular relevance is given to the latter, which recalls another key notion of Bourdieu's social theory, namely the *habitus*. The notion of *habitus* applied to technology, we argue, suggests that technologies are always more than their materialities.

While the notion of multistability had an important role in Ihde's earlier postphenomenological program, it seems to have lost momentum in the successive evolution of the field. In Verbeek (2005), just few pages are devoted to it. He vaguely refers to the fact that technologies have no essence and "they are what they are only in their use" (Verbeek 2005, p. 118). He also transforms its meaning when he says that multistability also implies "that specific goals can be technologically realized in different ways by a range of artifacts" (Verbeek 2005, p. 136). In this way, he implicitly moves the attention from the plurality of cultures (and also from the forms of life within each culture), in which a technology is embedded, to the plurality of technologies that can realize a scope that seems to transcend the specificity of a culture.[5] In Verbeek (2011, p. 97), the notion

[5] The example, borrowed from Ihde, is that of the confrontation between Western navigation and South Sea islanders' navigational techniques. It can be argued that despite the differences in culture and technology, these two activities accomplish the same objective, namely navigation.

seems to have the sole function of recalling the limits and the difficulties in anticipating all possible mediations, because "there is no unequivocal relationship between the activities of designers and the mediated role of the technologies they are designing."

Lasse Blond and Kasper Schiølin (2018, p. 160) affirm that the problem of recognizing conditions external to technology in postphenomenology may be embedded in the very core of the theory or at least in one of its most well-known programmatic trademarks: Don Ihde's […] *program 1*, which categorizes different human-technology relations. Through Verbeek's […] reception of program 1, it has indeed become the locus classicus of postphenomenology and the point of departure for many new comers and students in the field.

Some attempts have been done within postphenomenology to rehabilitate multistability and, more generally, to develop a series of considerations on the transcendental (mainly social and cultural) conditions that have an impact on technological invention, implementation, and use. For instance, Blond and Schiølin (2018) themselves analyze the transfer of technology (TOC) between two cultures, specifically the transfer of the South Korean robot Silbot to a Danish rehabilitation center.[6]

Robert Rosenberger (2014) introduces a two-step method consisting of (1) variational analysis, which demonstrates a technology's multistability, and (2) variational cross-examination, i.e., a critical contrast of the stabilities that have been identified as useful for scrutinizing the dominant stability. He focuses on three categories of features that characterize various stabilities: (1) the set of bodily behaviors and habits involved in each relation to technology; (2) the roles a technology could potentially play in various networks of associated actors, and (3) "concrete tailoring," i.e., the particular way a technology may be physically altered in the process of making it useful towards a specific use. It can be contended that none of these features actually overcome the limits of the empirical, technical, or material impacts of multistability. While the author would certainly agree with the fact that the reasons of variations and stabilizations of technology lie elsewhere (for instance, in what concerns the design of public benches he studies, in forms of domination and discrimination), in this context, he does not offer any specific account for it.

In his more recent pamphlet about design against the homeless, Rosenberger (2017, Chapter 4: "Politics") explicitly affirms that "design and law come together to unjustly and unethically push the unhoused out of shared public space." This actually corresponds to the idea that philosophy and ethics of technology are not enough, because technologies are embedded in norms which reflect, in their turn, (dominant) principles and values. A good example might be the speed bump popularized by Latour (1994). Certainly, the speed bump is a case of delegation of moral behaviors from humans to non-humans, in the sense that it perfectly works in the absence of the engineer or the (non-sleeping) policeman. But, it must not be forgotten that this artifact, throughout its invention, implementation, and use, is constantly sustained by a "force of law." If this was not the case, someone could simply get out of the car and push it out of the

[6] For a similar approach, see the work of the anthropologist Cathrine Hasse—for instance (Hasse 2015).

way. The fact is that technologies are implicated not only in linear or bi-dimensional relations among humans and non-humans but also in three-dimensional normative and symbolic structures. In the words of Rosenberger (2017, Chapter 4: "Politics"), "technologies should also be understood as essentially wrapped up within our society's larger politics, including economic systems, law enforcement procedures, democratic and undemocratic representational schemes, penal methods, and racial and sexual power dynamics, to name just a few of the basics." Incidentally, one can argue that even the empirical approaches to technology are, in fact, not empirical, but rather embedded in a specific libertarian conception of the society.[7]

It is precisely for systematizing a plethora of notions and perspectives (economic systems, representational schemes, power dynamics, etc.) which remain mostly implicit in Rosenberger's approach that Bourdieu's sociology might be useful. Mark Coeckelbergh (2017) analyzes the relations between technology and language and pleads for what he calls a "transcendental turn" in philosophy of technology. For Coeckelbergh, technology has both the role of mediator between the humans and the world, and of transcendental condition that make a particular mediation possible. Referring to the philosophy of the "second" Wittgenstein, he speaks of "language games" and "technology games" that make possible and structure particular uses of language and technology. However, it can be argued that this transcendental turn is not transcendental enough, because language and technology as transcendental conditions have their conditions of possibility lying elsewhere.[8]

In his brilliant introduction to *Language and Symbolic Power*, John B. Thompson (in Bourdieu 1991, p. 8) clarifies that according to Bourdieu, "the efficacy of performative utterances is inseparable from the existence of an *institution* which defines the conditions (such as the place, the time, the agent) that must be fulfilled in order for the utterance to be effective." "Institution" does not mean any specific organization, but rather "any relatively durable set of social relations which *endows* individuals with power, status, and resources of

[7] Critical theory would say that the empirical turn in philosophy of technology is indeed ideological. According to Habermas (2005, pp. 73–74), "[i]t is a single achievement of this ideology to detach society's self-understanding from the frame of reference of communicative action and from the concept of symbolic interaction and replace it with a scientific model." The German philosopher is referring to technocracy, so it might be argued that philosophy of technology after the empirical turn is the ultimate result of the penetration of technocracy into philosophy. The limits of Habermas' approach to technology lie not only in his "essentialist picture of technology" but also in the "abstract universalism" in what concerns both technology and communicative action. In the words of Bourdieu (2000, p. 65), "the representation of political life that Habermas proposes […] obscures and represses the question of the economic and social conditions that would have to be fulfilled in order to allow the public deliberation capable of leading to a rational consensus. […] How indeed can be ignored […] that the force of arguments counts for little against the arguments of force […], and that domination is never absent from social relations of communication?" The same holds true for technology, which, for Habermas, will always be a non-socially determined relation to nature—on the point, see the partial rehabilitation of Marcuse over Habermas proposed in Feenberg (1996).

[8] Without entering the details of the discussion, a movement similar to the one proposed here can be observed in the shift in Wittgenstein's philosophy from the concept of "language game" to the notion of "Weltbild." While in the Wittgenstein of the *Tractatus*, the word finds its meaning in the sentence, and while in the *Philosophical Investigations*, the sentence has its meaning in the context of a language game; in *On Certainty*, language games derive their meaning from a specific culture or form of life.

various kind" (Thompson in Bourdieu 1991, ibid.). This means that there is no sentence or discourse which is performative per se, because the performativity of language always depends on social conditions: "Not anyone can stand before a freshly completed ship, utter the words 'I name this ship *Queen Elizabeth*' while flinging a bottle at its stem, and succeed in *naming* the vessel: the person must be *authorized* to do so" (Thompson in Bourdieu 1991, ibid.). Bourdieu (1991, p. 66)—whose main targets are Austin, Chomsky, and French structuralism—offers a rigorous definition of linguistic exchange according to his perspective:

> Linguistic exchange—a relation of communication between a sender and a receiver, based on enciphering and deciphering, and therefore on the implementation of a code or a generative competence—is also an economic exchange which is established within a particular symbolic relation of power between a producer, endowed with a certain linguistic capital, and a consumer (or a market), and which is capable of procuring a certain material profit. In other words, utterances are not only (save in exceptional circumstances) signs to be understood and deciphered; they are also signs of *wealth*, intended to be evaluated and appreciated, and signs of *authority*, intended to be believed and obeyed.[9]

What Bourdieu's says of language, in which of course, language, discourses, and narratives *about* technologies are included, we say in this article concerning technology. Technology has specific mediating functions between humans and the world—a world to be understood in the threefold Heideggerian sense of *Selbstwelt*, *Umwelt*, and *Mitwelt*. But in technology, there is also an exchange between a "producer" and a "user" which is established within a particular symbolic relation of power. Producer and user must be properly understood. There are, in fact, technology producers who are merely "users," in the sense that they contribute to the creation of a technological artifact that does not symbolically fit them and their world. Similarly, there are users who are, in reality, "producers," because they resort to technological artifacts that correspond and improve their symbolic status. Think of someone working at the assemblage of iPhones in China. Such a producer is a user, because her intentions, needs, and desires never enter the design process. On the other hand, think of a young business woman working downtown Manhattan. Her intentions, needs, and desire are embedded in the iPhone she uses, so one could say that she is a producer. Technologies, probably more than language, have their materialities and their affordances. And yet, they are also, or even mostly, signs of authority, intended to be believed and obeyed as they are. Indeed, the symbolic dimension penetrates the entire process of technological invention, implementation, and use.

Bourdieu (1986) famously distinguishes between three forms of capital: economic, cultural, and social. Generally speaking, capital is "accumulated labor

[9] It is important to stress that Bourdieu is using here an economic terminology ("economic," "market," "producer," "consumer," "profit," and of course "capital") metaphorically.

(in its materialized form or its 'incorporated,' embodied form) which, when appropriated on a private, i.e., exclusive, basis, by agents or groups of agents, enables them to appropriate social energy in the form of reified or living labor" (Bourdieu 1986, p. 241). The capital is what guarantees both the force of a social actor/groups of actors and the attraction for this actor/group of actors of a certain good, and the regularities of the interactions within the social world. Capital tends to accumulate, and it is precisely on the basis of such accumulation that differences in terms of hierarchy, recognition of the authority, and ultimately, in capacity or possibility of action for social actors/groups within the social world are based. The more capital a social actor/group has, the more she or it will be able to move forward and succeed within a social world that is, moreover, framed according to her/its wills and needs—because dominant social actors/groups have the double role of players and rulers.

In this paper, we introduce the notion of technological capital: the more a social actor/group has technologies at her/its disposal (in terms of property, but also accessibility and design), the more she/it will be recognized as an authority and the more she/it will be able to move and act within a technologically mediated social world which will become increasingly tailored to her/it. As an example, think of the way city public transports or even the public transport system of an entire country is often designed according to a centralized logic that favors the dominants over the dominated. For instance, in France, if one wants to go from Nantes to Bordeaux (both near the Atlantic coast of the country) by high-speed train (TGV), she has to travel through Paris. Hence, Paris has technologically imposed itself over other parts of the country, and those who live in Paris (and can afford, both economically and symbolically, to travel by TGV) deal with a world that better fits their needs, intentions, and desires.

The notion of capital is strictly related to that of field. According to Bourdieu and Wacquant (1992, p. 100), "[w]e may think of a field as a space within which an effect of field is exercised, so that what happens to any object that traverses this space cannot be explained solely by the intrinsic properties of the object in question. The limits of the field are situated at the point where the effects of the field cease." The best analogy is probably that of a game, in which there are rules stating what is acceptable and what is not for the players and therefore deciding who wins and who loses. There are, however, at least two differences between field and game: (1) in a field, rules are rarely explicit—and social actors who already are in the field have no interest in revealing these rules, and (2) in a field, rules can quickly change, for instance when an outsider from another social actor/group succeeds in imposing herself/itself in the field.

One can distinguish among two different kinds of field and hence of capital: (1) micro-fields, each one with its own capital, i.e., the ensemble of goods that has value within the field, such as the journalistic field, the artistic and literary field, and the philosophical field, and (2) macro-fields and capitals (for instance, in the French society studied by Bourdieu, economy, society, and culture). Linguistic capital is another form of macro-capital, in the sense that language, spoken and written, is used in a plurality of other fields for social interactions. Several elements contribute to the establishment of distinctions among social

actors within this macro-field, like accents, the use of particular regional expressions, vocabulary at disposal, and knowledge of foreign or ancient languages.[10] Technological capital is precisely a form of macro-capital, at least in our Western or "westernalized" societies.

One can also distinguish among three states of the technological capital—this threefold distinction is freely inspired by Bourdieu (1979): (a) an objectified state, which is represented by all the technologies that are owned by the social actor/group, or can be used by her/it at will and desire, or are designed for her/its needs; (b) an institutionalized state, in which some social actors are authorized to use technological artifacts in a certain way or have access to them while others are not; and (c) the embodied state, in which social actors/groups "authorize themselves" or prohibit the use of technological artifacts in a particular way. This last state recalls the third key notion of Bourdieu's sociology, after those of capital and field, namely the notion of *habitus*.

The *habitus* is what makes a social group or class become a group or a class; that is, what makes the single decisions and actions of each member of a social group or class, when it comes to specific objects and situations, resemble each other. In the words of the French sociologist, the *habitus* is a "conductorless orchestration which gives regularity, unity, and systematicity to the practices of a group or class, and this even in the absence of any spontaneous or externally imposed organization of individual projects" (Bourdieu 1977, p. 80). And again, "the practices of the members of the same group or class are more and better harmonized than the agents know or wish" (Bourdieu 1977, p. 81). The *habitus* does forge not only our actions or reactions but also our desires and, supposedly, most autonomous and authentic aspirations. It is both cognitively embedded and embodied in gestures, postures, movements, accents, etc.

The *habitus* in Bourdieu has to do with the way in which each social agent, as a member of a specific group or class, sees and discriminates among the things in the world. In other terms, the Bourdieusian *habitus* recalls the Kantian schematism, but a historicized and socialized version of it. It is not by chance that *habitus* is the Latin translation of the Greek term *hexis*, which has *echein* ("to have," *habere* in Latin) as its root, which is also the root of the world *schema*. Several sources have influenced

[10] The emergence of new macro-fields and capitals has been observed. For instance, Fourcade and Healy (2016, p. 8) have introduced the concept of "übercapital," i.e., "a form of capital arising from one's position and trajectory according to various scoring, grading, and ranking methods"—many of them of course related to the ubiquitous presence of connected digital devices. Floridi (2018, p. 483) has discussed the notion of "semantic capital," defined as "any content that can enhance someone's power to give meaning to and make sense of (semanticise) something." However, Floridi's semantic capital has not much to do with the Bourdieusian capital, viz. with capital as such, insofar as capital implies a problem of scarcity and unequal distribution of the resources that Floridi's semantic capital has not. In order to develop an authentic theory of the semantic capital, it should be studied how the capability of giving meaning to facts or data is not equally distributed among the symbolically dominant and the dominated. Moreover, there is a theoretical mistake in Floridi's understanding of Bourdieu's notion of capital, when he says that "it *presupposes* economic capital as a foundational concept" (Floridi 2018, p. 483). Indeed, in Bourdieu's perspective, the least common denominator among the different forms of capital is not "$$$," but, as it will be argued in this paper as well, symbolic exchanges. Bourdieu (1998a, p. 93) makes this point clear, writing that "[w]hat certain adepts of *fast-reading* (including many professors, unfortunately) saw as an expression of economism [he is referring to his "principle of symbolic goods"], marked, to the contrary, a desire to wrest from economism (Marxist or neomarginalist) precapitalist economies and entire sectors of so-called capitalist economies […]."

Bourdieu in his elaboration of the concept of *habitus*. Among them is Durkheim and his work on the historicization and socialization of the Kantian categories—see Schmauss (2007) and Mauss and Durkheim (1963) on primitive classification. The Bourdieusian *habitus* has, in sum, a transcendental dimension, insofar as it refers to the conditions of possibility of our access, as members of a specific social community, to the world. Unlike the Kantian transcendentalism, however, the Bourdieusian *habitus* is not the same for all human beings, because it is culturally, historically, and socially determined. Moreover, the Bourdieusian *habitus* is not only cognitively embedded but also constantly embodied in the world, in someone's gestures, accents, etc., and in (her use of) tools, artifacts, and technologies.

The concept of *habitus* is particularly important insofar as it suggests that behind technological design, and normativity, there are also uses and accesses to technologies that social actors/groups impose on themselves. One trivial example is that of the public transport systems in a metropolis. Transport systems are full of designs that allow specific uses and prohibit others, such as the anti-homeless benches described by Robert Rosenberger. They also have several norms which cannot be directly embedded into the technological design, like the prohibition in many cities to perform music on buses and subways. But what is particularly interesting is that often social actors/group has a "sense" of what is allowed and what is not. To some extent, it is a matter of culture: in Paris, for instance, people usually do not eat or drink on the buses or in the subway, while this is not the case of several German cities. In part, it is a matter of social distinctions. For example, while all parts of Paris are well connected to each other by public transports, people from poorer arrondissements of the Rive Droite have perfectly internalized the fact of not going into the richer arrondissement of the Rive Gauche—and vice versa of course. This does not happen because they cannot (this would be the case if the public transport system was designed for impeding people to freely move between Rive Gauche and Rive Droite), nor because they are not allowed to (this would be the case if there was a law similar to the Group Areas Act during apartheid in South Africa); it happens simply because they do not want to, and because they do not have any particular interest in walking through districts which are considered pleasant just for tourists and postcards. Interestingly enough, these social tendencies usually transcend the limits of a single culture. The example of the social silent separation between the Parisian arrondissements can also be applied to most of the cities in the world, as well as to other contexts and objects (schools, theaters, sports, etc.). It is also noteworthy that even the eventual actions of subversion can be labeled as such precisely because they take place in a sociotechnical reality which has been framed according to the unequal distribution of the technological capital.

Incidentally, with this example, we show that the technological capital must not be confused with the economic accessibility of certain products, neither must it be reduced to the prestige of one brand or model over the other. These are indeed just secondary aspects of the technological capital. In the case of the Parisian subway, there is no difference in terms of economic accessibility or prestige, and yet people do not interpret, understand, and use it in the same way.

Needless to say, the threefold distinction between an objectified, and institutionalized, and an embodied state of the technological capital is idealtypical, in the sense that these three dimensions influence and penetrate each other continuously. For instance, normativity is always embedded into technological design. The same holds true for the *habitus*, and this is the reason why one can say that "technologies are little crystallized parts of *habitus*" (Sterne 2003, p. 377). Conversely, the reiterated contact with a certain technological design and with a certain normativity contributes to framing the *habitus*. From a Bourdieusian perspective, it is, however, important not to reduce the *habitus* to its technological actualizations. This would mean, in fact, returning to the limits of the empirical turn—this happens, for instance, in Sterne (2003, pp. 376–377) who sees a perfect continuity between Latour's famous example of the door-closer and the application of Bourdieu's concept of *habitus* to technologies. The technological *habitus* is always more than its actualizations, not only in technology but also in norms and actions/intentions. It might be said that the technological *habitus* is the interface (the schema) between the visible and the invisible, the material, and the symbolic dimensions of the sociotechnical reality.

In fact, it must be stressed that next to micro- and macro-forms of capital, Bourdieu also introduces what might be called a meta-capital, namely the symbolic capital. Behind all dynamics of exchange and distribution of micro- and macro-capitals, there is indeed the quest and struggle for social recognition and consideration:

> All manifestations of social recognition which make up symbolic capital, all the forms of perceived being which make up that is known, "visible," famous, admired, invited, loved, etc. are so many manifestations of the grace (*charisma*) which saves those it touches from the distress of an existence without justification […]. Conversely, there is no worse dispossession, no worse privation, perhaps, than that of the losers in the symbolic struggle for recognition, for access to a socially recognized social being, in a word, to humanity (Bourdieu 2000, p. 241).

Every form of micro- and macro-capital function as a symbolic or meta-capital, so that in rigorous terms, Bourdieu (2000, p. 242) says, one should better speak of "symbolic effects of capital." This means that all other forms of capital are contingent to a specific culture, epoch, etc. For instance, one could imagine a society in which the economic capital has no symbolic value or at least in which its symbolic value is counterbalanced by the symbolic value of other capitals. This has been precisely the case for Bourdieu of the cultural capital in French society, although it is decreasingly true. Technological capital still lacks full recognition. Unquestionably, most of us live, under many respects, in technocratic societies, in which technologists (i.e., people having a relevant amount of technological capital) are widely recognized, acclaimed, or admired. Generally, technological competences are appreciated, and several measures are undertaken in this moment by public institutions to improve them among the population. However, this is not yet a complete vision of what technological capital is. Indeed, the technological capital is primarily about the unequal distribution of technological resources, embedded in design, norms, and habits. In addition,

technological capital also depends on the symbolic capital, insofar as technological design, norms, and habits are results of processes of social recognition, distinction, and exclusion.[11]

One of the anonymous reviewers opportunely asked: "Are not the relevant aspects of the capital idea that can be found in technological capital in fact aspects of social, economic, cultural capital and represented by some sort of technology? Is not the social reputation gain that might come with the right kind of luxury car in the respective appreciative context in fact more connected to the economic capital then to the technology?" We contend that from a Bourdieusian point of view, it would be a mistake to reduce the technological capital to the economic capital or to other forms of macro-capital. There are, for sure, laws and principles of convertibility between them, and between all the forms of capital. But the conversion depends on the symbolic value we attribute to each form of macro-capital within a specific culture and society. This means that (1) the technological capital has its own autonomy from other forms of macro-capital such as the economic capital. For instance, there is no economic value in the technological capital of a subway bench—technological capital understood in terms of accessibility and legitimacy in use; (2) the technological capital, as all the other forms of macro-capital, is indeed submitted to the symbolic meta-capital. The same reviewer proposes the intriguing idea of a turning point in the technological capital:

For example: if the recognized authorities (elites, upperclass etc.) use smart phones while most of the others don't (capital is unequal distributed), then gaining access to or possessing a smart phone will probably increase your technological capital […]. But – and we seem to approach the situation with billions of smart phones worldwide –, if everyone uses smart phones and the devices are even used for self-exploitation in precarious knowledge our IT micro jobs, then *not* to own a smart phone, *not* having to be reachable becomes part of the elite *habitus*.

This remark actually supports our idea according to which the technological capital, as all forms of capital, is dependent from the "symbolic effects of capital." This means that technologies are embedded into symbolic dynamics of recognition, authority, discrimination, and exclusion and hence cannot be reduced to their empirical dimensions.

4 Conclusion

In the first part of this paper, we have accounted for the flatness of the empirical turn in philosophy of technology, with a special focus on postphenomenology. We have also argued that the articulation between postphenomenology and ANT remains within the

[11] This might sound in contradiction with the very definition of symbolic capital as "any property (any form of capital whether physical, economic, cultural or social) when it is *perceived* by social agents endowed with categories of perception which cause them to *know it and recognize it, to give it value*" (Bourdieu 1998a, p. 47. Italics are ours). Technologies capital is indeed mostly unrecognized, because technologies are still taken into a sort of illusion of transparency and neutrality. But this is the case of other forms of capital as well, such as the informational capital Bourdieu (1998a, p. 45) talks about, and which is concentrated for him into the State. Incidentally, it would be interesting to account for the struggle for both technological and informational capital undergoing today between public institutions and big private tech companies such as Google, Facebook, and Apple.

limits of an immanent transcendentality. Furthermore, the seminal work of Ihde on the cultural dimension of technology has been mainly neglected by the following generations of postphenomenologists.

Zwier, Blok, and Lemmens (2016) propose to overcome the limits of the empirical turn of postphenomenology through a rehabilitation of the ontological dimension of Heidegger's early phenomenology and his notion of Enframing. This approach is particularly suitable for limit situations in which we deal with what Morton (2013) has called "hyperobjects," as when it comes to planetary ecological dynamics. Smith (2018, Chapter 4: Introduction) introduces the notion of "exceptional technologies," that is, "artefacts and practices that appear as marginal or paradoxical exceptions to a received sense of what empirically constitutes a technology in a given context […] but can nevertheless act as important focal points for drawing out and challenging conditions implicated in the received sense." While we share with these authors the same judgment about the exaggerations of the empirical turn, as well as the same concern for the conditions of possibility of the technologies, in this paper, we have taken a different and more modest path, which concerns human daily dealings with ordinary technologies. For us, the most intriguing task for a philosopher of technology who wants to overcome the limitations of the empirical imperative consists of showing the "banality of transcendentality" in all technologies.

The second part has accounted for few attempts, within and beyond postphenomenology, at overcoming an empirical attitude, in particular through a reactualization of the "posthermeneutic" notion of multistability (Rosenberger) and through an analysis of the transcendental properties of the language (Coeckelbergh). We have suggested that Bourdieu's social ontology might integrate these attempts by revealing the symbolic dimension in which technology and language, both as mediations and transcendental conditions of possibility, are always already embedded. In particular, the concept of "technological capital" has been introduced, with its three states: objectified, institutionalized, and embodied. More importantly, it has been said that the value of technological capital depends on the social dynamics of recognition or exclusion of which technological capital in its different states is one of the possible actualizations.

In the conclusion, we would like to account for three risks related to a Bourdieusian perspective on technologies:

1) Firstly, the risk of transparency. With this expression, we mean the fact that the focus on the symbolic dimension in which technologies are embedded might bring us to underestimate their materialities. For instance, this is the case of most literature resorting to Bourdieu in order to understand the possible uses of information and communication technologies (ICTs)—for an overview, see Ignatow and Robinson (2017). Scholars referring to Bourdieu in this field tend indeed to treat ICTs as an almost transparent means to observe social distinctions that would exists anyway—for instance, the difference in use between low- and middle-income families, the former resorting to ICTs according to a "taste of necessity," while the latter as a form of "serious play." The same holds true for several researches regarding Bourdieu and STS studies, in which the attention is focused

on Bourdieu's contributions to the sociology of science—see, for instance Hess (2011), and the entire issue of the journal *Minerva* in which this article is included.

In this paper, a different perspective has been suggested, in which material and symbolic dimension must be hermeneutically articulated. The empirical approach to technologies must not be abandoned, but integrated using a wider approach concerning the symbolic dynamics in which technologies are embedded, allowing us to better understand specific choices in design, implementation, and use. This perspective is closer to Bourdieu's own view, who, while he always fought for not reducing the reality to its most immediate and visible aspects, never reduced it to its symbolic dimension either. To put it differently, while the symbolic capital cannot be reduced to any of its actualizations in a specific social, historical, or cultural context, there is no symbolic capital that exists outside such actualizations. There is, in sum, an important difference, in social ontology, between arguing that social facts and forces have a dimension that transcend individuals, and to affirm that the existence of social facts and forces' is independent from these individuals. The same holds true, of course, for technologies.

2) Secondly, the risk of determinism. In Bourdieu's perspective, the symbolic dimension is mainly ideological, in the sense that it has the function to confirm and reiterate the dynamics of domination that are already more or less explicitly accepted in society. According to Bourdieu, the dominants are interested (which is often not clear to them) in maintaining the *status quo* and the dominated tend to internalize and hence apply these same discourses to themselves. Institutions like those related to education have the main function of transmitting these social distinctions from generation to generation.

There are two ways of understanding Bourdieu's perspective. The first one consists indeed in considering his point of view as deterministic. The *habitus* reduces the actions, intentions, and desires of a social actor towards a specific object or situation to those of her social group of origin. Ultimately, the social actor does not exist *qua* social actor, but just as manifestation of a social group or class. In its turn, the social group or class is already the manifestation of a higher symbolic order. According to a similar framework, no freedom or room for individual or collective change seems possible. The scope of a philosophy of technology resorting to this framework would consist of describing (and fatally accepting) both domination and illusion of emancipation when it comes to the ways the technological capital is unequally distributed into society.

The second one rather consists in understanding Bourdieu's sociology as a "martial art," especially for a sort of collective defense.[12] From a Bourdieusian perspective, there cannot be any individual extreme, heroic, and immediate act of liberation—such as those announced, more than practiced, in Sartre's existentialism and Heidegger's philosophy of authenticity. In fact, there is no liberation as such, but rather a long negotiation with the social determinations that constitute us as social actors. In the example of the public transport systems proposed in Section 2, the parodic performance of an individual or a small group of people sleeping on subway benches despite their

[12] https://vimeo.com/92709274. Accessed on April 9, 2019.

anti-homeless design, or designing an alternative artifact allowing them and other people to do so, is certainly enjoyable, smart, and amusing. It even has the possibility to raise important questions, but that is simply not enough. Technological hacking, in general, is as flat as the nudge it eventually claims to criticize—or, at least, it suggests a "verticalization" by the sole mean of the "internalization" of virtues. In the 1998 English introduction to the *Masculine Domination*, Bourdieu (1998b, p. viii. Italics are ours) speaks of a "strictly *political* mobilization, which would open for women the possibility of a *collective* action of resistance, oriented towards *legal* and *political* reforms." Such mobilization, he adds immediately after,

> contrasts both with the resignation that is encouraged by all essentialist (biological or psychoanalytical) visions of the difference between the sexes and with a resistance that is reduced to individual acts or the endlessly recommenced discursive 'happenings' that are recommended by some feminist theoreticians – these heroic breaks in the everyday routine, such as the 'parodic performances' favoured by Judith Butler, probably expect too much for the meagre and uncertain results they obtain.

Similarly, it might be said that a Bourdieusian approach to technology could pave the way for a strictly *political* mobilization, a *collective* action of resistance, oriented towards *legal reforms*, against the unequal distribution of technological capital among social actors and groups.

3) Thirdly, the risk of absolutism, that is, to believe that the social symbolic forms are the *only* and *highest* transcendental dimension in which individuals and, in the case of this article, technologies are embedded. We contend that this is a concrete risk of a Bourdieusian approach to technologies. Smith (2018) proposes to consider the transcendental as an adjective rather than as a noun. In his words:

> Given X, an approach is transcendental when it enquires into a priori conditions for x […] this apparent formality and emptiness [of the definition] may be precisely what marks out this articulation as the nontrivial condition for describing a philosophical approach as transcendental, irrespective of whether that approach subsequently takes on a Kantian 'epistemological' character, a Heideggerian 'ontological' character, or a character that turns out to be irreducible to the presuppositions of either of these approaches (Smith 2018, Chapter 1, Section 3: "Expanding Further: From Minimal to Maximal Sense").

Such definition has two advantages. Firstly, it allows to not reify the transcendental, if done precisely, with respect to technology, in the philosophies of the empirical turn—but also, in philosophical tradition, in certain interpretations of the Kantian and Heideggerian schematisms. Secondly, it paves the way for what might be called a multidimensional perspective. In Chapter 5, Smith criticizes "turning" (such as the empirical and speculative turns he considers in the book) as a method. The problem with the empirical turn is, for instance, that it turns away from the transcendental and

speculative dimension. Vice versa, we cannot turn towards the transcendental and speculative dimension without turning away from things. For this reason, he proposes to use "mapping" as another approach in philosophy of technology:

> Picture a series of interactive and evolving maps, on which is possible to zoom in and out in terms of complexity, detail, and abstraction […]. Imagine also that they have topological functionality: it is possible to simplify their elements in order to draw out relations between other maps and the elements on them. Imagine, crucially, that the limits of these maps are apparent […]. This, I submit, is an alternative picture of method to which philosophy of technology might productively aspire today: as 'mapping.'

As far as we understand this metaphor, or model, Smith suggests overcoming the limitations of an empirical attitude, but also foreseeing in philosophy of technology the possibility of a multitude of (transcendental) perspectives. One might say that "technology (and its transcendental) is said in many ways." The empirical perspective is just one way to say or see technologies among many others. However crucial, the social symbolic forms similarly represent just one of the possible ways of dealing with the transcendental of technologies. The notion of mapping in this respect might be helpful to counterbalance the absolutizing tendencies of the approach proposed in this paper.[13]

In *Flatland*, after the Square's mind is opened to a new dimension, he tries to convince the Sphere of the possible existence of a fourth and higher dimension, but the Sphere returns his student to Flatland in disgrace. Somehow, this is the same situation of those who are willing to recognize a transcendental dimension in technologies, but end up believing that this is the highest dimension possible. In this respect, the notion of mapping introduces a sort of principle of symmetry among the dimensions—including those which are empirical in nature—and to the theoretical possibility of other dimensions that we have not yet explored.

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[13] Conversely, one could argue that this paper, along with other researches that make the effort of giving a positive definition of the transcendental of technologies, counterbalances the risk of relativism or emptiness of the meta-transcendental approach proposed by Smith.

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