

Discovering Subjectivity in the Technosystem: Developing a Critical Position towards Contingent Forms of Rationality

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Abstract: Two of the main approaches of what is often referred to as the ‘empirical philosophy of technology’ are postphenomenology and critical constructivism. Critical constructivists charge postphenomenologists for paying too little attention to the fact that our society is co-constituted not only by technologies, but also by forms of rationality exercised on a political level. Postphenomenologists, then, charge critical constructivism for insufficiently recognizing that the way technologies are appropriated in the lifeworld often evades forms of institutionalized rationality. The goal of this paper is to show how these different approaches should not be juxtaposed, but can better be seen as complementary in the development of a political philosophy of technology. This will be made clear through a discussion of the role of STS in the work of Peter-Paul Verbeek, and in the work of Andrew Feenberg. I suggest that developing an ‘empirically informed’ political philosophy of technology requires to both recognize how technologies constitute particular forms of subjectivity and to understand the rational processes through which particular technologies are designed. When combining both of these insights, it becomes possible to articulate a normative position with regard to technological developments.

Key words: subjectivity, rationality, technosystem, postphenomenology, critical constructivism

1. Introduction

Two of the main approaches of what is often referred to as the “empirical philosophy of technology” (cf. Achterhuis 2001; Franssen et al. 2016; Kroes and Meijers 2000) are postphenomenology and critical constructivism. Recently, An-

drew Feenberg has argued that postphenomenology should include a politics of technology in order to be able to incorporate the possibility that technological forms of rationality can be changed from within technological culture. He explicitly states that he is interested in hearing the response to “this amplification of [the postphenomenological] framework” (2015, 236). In this paper, I take up this challenge by sketching a starting-point for a normative philosophy of technology through a discussion of the relation between rationality and subjectivity in Feenberg’s critical constructivism and in postphenomenology. Specifically, I explore how the way both authors draw on Science and Technology Studies (STS)¹ gives rise to a specific form of normativity within their philosophies of technology. This exploration serves to clarify the differences and similarities between postphenomenology and critical constructivism in terms of their appropriation of work in STS, and limits itself to how STS inspires the philosophy of technology, rather than the other way around.

Postphenomenology, having its roots in phenomenology, uses empirical research to reveal how technologies shape human experience and understanding, thereby giving rise to new forms of subjectivity. It is inspired by Actor-Network Theory, most notably the work of Bruno Latour, and incorporates the idea that subjectivity must not be ascribed to isolated human beings (e.g., Verbeek 2011, 52–55), but instead depends on a flood of entities—both human and nonhuman—to exist (cf. Latour 2005, 209). Critical constructivism, inspired by the tradition of Critical Theory, draws on the program of *Social Construction of Technology* (SCOT) (e.g., Feenberg 2017, 45–54; see: Bijker 1995; Pinch and Bijker 1987) to express the idea that technological developments are never just the product of a disembodied technological rationality alone. The decision-making processes giving rise to technological developments always involve contingency: they are also co-constituted by political ideals and value judgments. Critical constructivists charge postphenomenologists for paying too little attention to the fact that our society is co-constituted not only by technologies, but also by forms of rationality exercised on a political level. Postphenomenologists, then, charge critical constructivists for insufficiently recognizing that the appropriation of technologies in the lifeworld often evades forms of institutionalized rationality.

The goal of this paper is to show how postphenomenology and critical constructivism should not be juxtaposed, but can better be seen as complementary. This will be made clear through a discussion of the role of STS in the work of Peter-Paul Verbeek² and in Andrew Feenberg’s latest book, *Technosystem*. Both attempt to develop a normative position with regard to technological develop-

ments. Through comparative discussion, I suggest that developing an ‘empirically informed’ normative philosophy of technology requires to both recognize how technologies constitute particular forms of subjectivity as well as the rational processes through which such technologies are designed.

The empirical turn in philosophy of technology does not mark the first attempt to establish a link between philosophical reflections and social-scientific investigations. In the 1930s Max Horkheimer argued that social philosophy should proceed in the form of “interdisciplinary materialism” (cf. Abromeit 2011, 89; Jay 1973, 25; Wiggershaus 1995, 38–39) to contribute to pressing societal issues identified through the methods of social science (cf. Horkheimer 1993b). Horkheimer argued that obtaining a critical position with regard to social developments requires that we engage with social scientific research revealing how individuals and their ways of life are shaped by the societal structures imposed on them. Important here is that contemporary (continental) philosophy of technology claims to have a similar aim (e.g., Latour 1994; Feenberg 1999, 2017; Verbeek 2011, 155).

The paper is structured as follows: Firstly, I discuss why Horkheimer aimed to develop an empirically informed social philosophy, and focus on what form of normativity was already assumed in this attempt. Secondly, I show how the appropriation of the empirical field of STS in Andrew Feenberg’s work can be understood an extension of Horkheimer’s project in our current technological society. Thirdly, I show that Feenberg’s reconceptualization of contemporary society as a technosystem forces him to develop an alternative understanding of rationality that takes into account its radical contingency. Fourthly, I argue that empirically studying how contingent forms of rationality come into being within the technosystem presupposes the possibility of identifying specific forms of subjectivity which is the focus of postphenomenology. Fifthly, I show that critical constructivism’s focus on rationality and postphenomenology’s focus on technological mediations are complementary when it comes to the constitution of moral subjectivity. To conclude, I argue that a combination of postphenomenology and critical constructivism helps articulating a normative position that allows for the evaluation of technological developments.

2. Providing Social Philosophy with an Empirical Grounding: Critical Theory and Max Horkheimer’s Interdisciplinary Materialism

As already indicated, the empirical turn in philosophy of technology is not the first attempt to align philosophical with social scientific methods. One of the most famous philosophical attempts in which these were combined is in Max

Horkheimer's interdisciplinary materialism that guided the research conducted at the *Institute for Social Research* in Frankfurt in the 1930s. In a recent discussion of Horkheimer's philosophy, John Abromeit (2011) argues that interdisciplinary research can learn from "the early Horkheimer's stress on interdisciplinary collaboration and his openness to incorporating new methods and research from other fields" (13). With this in mind, the following brief review clarifies why Horkheimer thought that a non-empirical materialist philosophy of society motivated inaccurate predictions and should be modified accordingly.

The crucial inspiration for Horkheimer and his colleagues—most notably Erich Fromm—to collaborate more closely with the empirical social sciences was the fact that the German labor movement failed to bring about a socialist revolution after the First World War (cf. Brunner 1994, 633). From a Marxist-materialist perspective, the unjust economic situation of the working class should eventuate in a revolutionary mass challenging the capitalist structure of bourgeois society. However, despite the fact the economic position of the workers continued to worsen under the yoke of bourgeois capitalism, they remained compliant with the authority of the state. Accordingly, Horkheimer and colleagues held that there had to be another factor ensuring that the working class continued to accept the authority of a state that did not further its economic interests (cf. Abromeit 2011, 212).

In this context, Horkheimer and colleagues appealed to social science in order to help identify the blind spots in earlier materialist philosophies of society with Horkheimer himself developing a form of materialism grounded in the inseparability of philosophy and social science. The ultimate purpose of this effort was socio-political change in order to mitigate human suffering through the correction of systemic injustice:

Materialism is not interested in a world view or in the souls of men. It is concerned with changing the concrete conditions under which men suffer and in which, of course, their souls must become stunted. This concern may be comprehended historically and psychologically; it cannot be grounded in general principles. (Horkheimer 2002, 32)

The key to understanding Horkheimer's materialism is that it was intended to contribute to the human pursuit of happiness, and that this legitimation of philosophical research could not be challenged despite lacking a clear metaphysical grounding, as "man's striving for happiness is to be recognized as a natural fact requiring no justification" (ibid., 44). On Horkheimer's view, the position of the German workers in a capitalist bourgeois society was not contributing to the pur-

suit of happiness, and materialist theories of society should analyze and ultimately help to change this situation. Orthodox forms of materialism proved ill-equipped for this task, as indicated again by the absence of a German revolution. Accordingly, Horkheimer sought to support socio-political change through a combination of materialist philosophy and empirical research, rather than relying on the philosophical premises of Marxism alone.

From this brief overview two conclusions can be drawn that are relevant to the current debate between advocates of postphenomenology and critical constructivism. First, the pursuit of happiness as a fundamental human drive is simply posited, social science is identified as potentially able to help fulfilling this drive, and that scientific aims for “objectivity” become relevant in relation to this normative stance. In this vein, however, it remains unclear what Horkheimer understands striving for happiness to be. Secondly, the individual pursuit of happiness is not solely dependent on the rationality of economic structures, but also on the socio-psychology of concrete individuals. Importantly, the socio-psychological interests peculiar to individuals are not interpreted as universals, but rather as being historically mediated by the particular socio-political situation in Weimar Germany. Accordingly, both the structure of society and of one’s psychological make-up are understood as contingent constructions that are susceptible to change. The question that remains unanswered in Horkheimer’s work is how this change should be understood, initiated and coordinated. In particular, this problem of how to align various forms of subjectivity within a collective struggle for political change is important for the development of an empirically informed political philosophy of technology today.

3. Science and Technology Studies as the Empirical Ground of Critical Constructivism and Science and Technology Studies

The socio-political situation for individuals in the contemporary Western World differs from that of the German working class in the interbellum. Notably the influence of technologies has increased, and philosophical questions and normative concerns have changed. Whereas Horkheimer identified his era as a “bourgeois epoch” (e.g., Horkheimer 1993a, 117), today’s society can better be understood in terms of what Andrew Feenberg in his latest book calls a *technosystem*; a “field of technically rational disciplines and operations associated with markets, administrations, and technologies” (2017, x). Understanding how society is structured means understanding the particular forms of rationality at work in specific technical disciplines and operations, and how these forms of rationality shape the lifeworld of

concrete individuals. It is in this context that Feenberg argues that a philosophy of technology cannot do without detailed empirical studies of how such processes take place, and that these studies then must be philosophically interpreted in order to ground a theory of political change as mediated by the purposeful design of technologies. However, as will become clear in this section, Feenberg holds that empirical studies need to be complemented with normative philosophical reflections to become fruitful for a philosophical theory of political change.

Interest in the empirical details through which technologies become part of our world does not imply the neglect of the normative ambitions of philosophy. In Feenberg's work, the empirical details serve a specific normative purpose. For example, empirical studies conducted within the Social Construction of Technology (SCOT) program serve to show that "technically rational design is underdetermined by purely technical considerations and thus is biased under the influence of social criteria" (ibid., 58). In other words, because Feenberg treats SCOT as giving an incentive for political action by revealing that technological developments are not inevitable, it becomes clear that citizens can influence how they unfold:

As "rational," technology takes on an apparent inevitability. . . . To create a place for agency, technical citizens must struggle to overcome it [technology's apparent inevitability] and achieve consciousness of the contingency of the technical domain. (Ibid., 59)

Empirical research shows that technologies embody values and political ideals, and thereby makes it possible for people to evaluate whether or not these align with *their* values and ideals. In this way, empirical research establishes a space in which technologies can be made subject to normative evaluation, making technological design accessible to democratic deliberation. Accordingly, technological design should not be considered solely an affair to be handled by technological experts. On the contrary, since the social is always part of the technological and citizens have expertise with regard to social considerations, their expertise should be a necessary requirement in technological design.

In sum thus, it is impossible to strictly separate technological concerns from lifeworld concerns, and from here Feenberg concludes that in technological design, also lifeworld experience must be taken into account as a form of expertise.

However, so Feenberg holds, while STS opens up a potential domain of political actions, it closes it off simultaneously by also revealing the contingency of political ends:

The constructivist approach has a high theoretical cost activists cannot accept. Because it is relativistic, it is incompatible with the idea of progress. Yet environmentalists and others who struggle in the technical domain consider their movements to be essentially progressive. (Ibid., 70)

According to Feenberg, SCOT throws out the baby with the bathwater for the purpose of developing a political philosophy of technology. Because of this, Feenberg needs to make room for a critical position that circumvents the socio-political relativism that he believes to be introduced by constructivist approaches.³ To do so, he develops a notion of subjectivity that escapes the contingency of technical reason. It is relative to this subjectivity that political struggle can appear both meaningful and justified, despite the fact that it never can be—and never should be—isolated from technoscientific concerns.

The denial of individuality and the reflective capacities that it accompanies is Feenberg's main criticism on STS-inspired ways of thinking about science and technology. While he subscribes to the idea that individuals are constituted within networks that are structured by a form of technological rationality, he holds that,

once constituted [,] the individual retains its identity and agency as it switches from network to network. It cannot be dissolved into its roles. The relative stability of individuality is the basis of the reflective capacities that enable it to distance itself from and criticize the networks in which it participates. (Ibid., 52)

Instead of being determined by the power structures introduced through a technoscientific rationality, individuals are resistant subjects that can generate a conflict with the technological developments to which they are exposed. That is, they can democratically intervene when technologies are introduced in the lifeworld, contravening the powers to which they are subjugated. STS, according to Feenberg, fails to take into account that such interventions often occur, as is indicated by the many hearings and lawsuits arising through protests against manufacturing pollution, or the marketing decisions of pharmaceutical companies. Individuals remain capable of exercising democratic agency and influencing technological developments, regardless of them being constituted within networks. According to Feenberg, by denying this and subscribing to a relativistic framework, STS does not allow to theorize how technoscientific rationality can be shaped and guided by citizens.

Thus, on the one hand, STS helps showing that the way the technosystem is currently structured is not written in stone, as technological developments are

underdetermined by the logic of technology alone. On the other hand, however, according to Feenberg, its relativistic framework is incompatible with developing a normative theory of political change. Therefore, the framework of STS should be augmented with an account that allows for the development of a genuine critical position with regard to specific technological developments.

4. Contingent Forms of Rationality within the Technosystem

Feenberg elucidates the critical position of modern individuals with reference to Critical Theory, but intends to update the tradition of Critical Theory in light of the contingency of technological design as articulated within SCOT, as well as the analyses of rationality as developed in the work of Michel Foucault. In the work of Horkheimer and Marcuse, Feenberg finds a distinction between technoscientific rationality on the one hand, and alternative forms of rationality on the other (cf. Feenberg 2017, 122). However, Feenberg argues that contemporary society is structured around a technoscientific form of rationality alone—hence his notion of technosystem. Contrary to Horkheimer and Marcuse, he does not consider technoscientific rationality a necessary affirmation of existing capitalist structures, but holds that technoscientific rationality itself can be a source of political change. Feenberg does not understand human beings as passive recipients of an instrumental—technoscientific—rationality, but instead as being capable of actively forming the powers to which they are subjected. To show how human beings can do so, Feenberg develops a concept of subjectivity within the technosystem that is neither determined by a capitalist logic, nor disappears within the relativist framework of constructivism.

The central concepts that Feenberg draws on in developing his own position are the notion of *(de-)reification* taken from Georg Lukács, and the notion of *mediation* inspired by a Foucauldian reading of Marx. In Feenberg's reading, Lukács developed the notion of reification to describe capitalism as a rational system, and argued that critics arguing for the irrationality of capitalism in fact miss the point. Instead, Lukács held that capitalism should be understood *qua* its particular form of rationality, and that criticism should target the bias included in this particular form. Criticism and protest should accordingly intend to dereify particular forms of rationality, such that particular biases are eliminated. From this perspective, the rationality of capitalism that undermines the interests of the workers—i.e., their pursuit of happiness—contains a particular form of bias that has the potential of being dereified through a unified proletariat.

The fact that a socialist revolution did not occur is for Feenberg no reason to dismiss Lukács' logic of reification and de-reification, but rather shows that it can be integrated into a Western democratic context (i.e., the technosystem). Also technoscientific rationality can be understood in terms of a reified form of rationality that has a formal bias. Technoscience exerts power on the members of society through the mediation of a lifeworld-transforming rationality. However, citizens need not uncritically accept such mediations but can develop forms of resistance that are inherent to the relation of life to power based on what Feenberg—borrowing from Foucault—calls *subjugated knowledges*: forms of “experiential knowledge [that are] responsive to a broad range of values, not simply efficiency and control [that] inspire resistance to the dominant organization of the networks as does working class consciousness” (ibid., 34). Experiential knowledge is different from a purely technical form of expertise, but nevertheless can influence technical design, precisely because technical design is underdetermined by technical reason alone. Being a Foucauldian resistant subject then implies engaging critically with technical developments by drawing comparisons between technical and lifeworld values. Such comparisons, then, form the potential basis to dereify a specific form of technoscientific rationality through the introduction of new values constituted within the lifeworld.

Feenberg understands political struggle in terms of a dialectical logic of reification and mediation of which the opposition of individuals against top-down decision-making processes based on technical expertise is a necessary part:

Activism ‘limit[s] the autonomy of experts and capitalist management and force them to redesign the worlds they create to represent a wider range of interests. The translated demands are assimilated by the institutions and may lead in turn to future iterations of the struggle, further contestation. This is the logic of reification and mediation and it is unsurpassable. (Feenberg 2015, 235)

Within this logic, it becomes possible to develop a critical position towards technoscientific rationality, which allows to “identif[y] fundamental contingencies in the relation of formal knowledge to the lifeworld. It shows the limits of formalization and cancels its universalization at the expense of other ways of knowing” (Feenberg 2017, 130). Thus, Feenberg holds that developing a critical stance does not imply to disqualify technical design as irrational, but rather to follow “the ‘*Spuren der Vernunft*’ in the transformations of the technosystem” (ibid., 198). And importantly, tracing how rationality develops simultaneously implies to trace

forms of—implicit or explicit—normative bias that cannot be reduced to technical values alone, such that dereification becomes possible.

By developing a critical position towards technoscientific rationality through an acknowledgement of its contingency, Feenberg makes room for citizens to struggle against and reevaluate reified forms of technological design. While “this reevaluation is no more infallible than scientific-technical knowledge, . . . it, too, can claim a kind of universality for the values motivating movements for environmental protection, livable cities, or safe and interesting work. *These are values all human beings recognize as valid*” (Feenberg 2017, 14, my emphasis). Critical judgment thus appears as a form of subjectivity that allows for evaluating technological design against lifeworld values that are of interest to the subject living in the technosystem. This seems to assume that values such as “safety,” “interesting work,” “livability,” or “environmental protection,” have a claim to universality such that they have a stable meaning in different lifeworld contexts.

It is at this point that postphenomenology can be used to critically intervene into Feenberg’s theoretical framework. Rather than assuming the stability of value frameworks and particular values such as “safety” or “privacy,” postphenomenologists have shown that the experience and understanding of such values changes in relation to technological developments (e.g., Kudina and Verbeek 2019; Verbeek 2008). Precisely because society is co-constituted by technological developments, also the moral frameworks used in the evaluation of these are subject to a similar process of co-constitution (cf. Verbeek 2011). For example, a technology such as Google Glass shapes what can be considered “public” and “private” spaces, thereby changing the meaning of a value such as ‘privacy’ (Kudina and Verbeek 2019). Also, technological developments can give rise to new values. For example, the presence and extensive use of online social media platforms in contemporary society generated debates revolving around a new value: the ‘right to be forgotten’ (i.e., whether or not individuals should be able to ask search engines to remove results in search queries featuring their name) (Romele 2015).

If technologies indeed shape the meaning of values and even give rise to new values, the (relative) stability that Feenberg ascribes to the values against which individuals evaluate technological design must be challenged. In the next section, I show how postphenomenology helps in doing so by showing how (moral) subjectivity can be understood as mediated by technological developments.

5. Postphenomenology and Discovering Subjectivity in the Lifeworld

In postphenomenology, research in STS is credited for showing that human subjectivity—and therefore also *moral* subjectivity—is shaped by technological developments (e.g., Verbeek 2011, 163). Whereas Feenberg credits SCOT for revealing the underdetermination of technical design by technological functionality alone, postphenomenologists draw on the work of Bruno Latour to point to the hybrid nature of human subjectivity (e.g. Ihde 1998; Rosenberger 2017; Verbeek 2011). That is, they hold that human subjectivity does never exist in a vacuum, but that its coming into being is constituted by the material artifacts to which it relates. Because of this, our moral judgments are the product of lifeworld interactions with the technologies around us. Accordingly, the existence of moral subjectivity cannot simply be assumed, but its coming into being should be turned into a topic of philosophical investigation. STS, then, is treated as giving an incentive for developing new ethical frameworks that take into account the hybridity of moral subjectivity.⁴

Just as Feenberg does not treat constructivism as being necessarily incompatible with normative ideals of progress, postphenomenologists hold that the co-constitution of moral subjectivity by technologies does not necessarily lead to the demise of moral judgment. Similar to Feenberg, Verbeek holds that Foucault's "historical analyses show the *contingency* of the structures of power that are at work in society. They could have been otherwise, and therefore human beings can change them" (Verbeek 2011, 71). However, the crucial difference between the two approaches is that, in postphenomenology, opposing power structures is not an act conducted by an unmediated form of subjectivity. On the contrary, it is precisely in the interplay with technologies and technological structures that specific structures of subjectivity come into being, and particular forms of opposition appear as relevant.

This subtle twist stems from the difference in how Foucault's work is integrated in postphenomenology and critical constructivism respectively. In Verbeek's hermeneutic reading of Foucault, the constitution of moral subjectivity is understood as derivative from the interplay between human beings and

the structures of power in society—just as entities in general derive their meaning in interaction with the context in which they exist. Opposing these power structures would be nonsensical, since every attempt to escape them can be made only in terms of these powers themselves. (Verbeek 2011, 72)

Whereas critical constructivism conceptualizes subjectivity in terms of a dialectic of oppression and resistance, postphenomenology moves beyond this logic by suggesting a relational understanding of subjectivity. If the shaping of subjectivity indeed can be understood as engaging in a relation with power structures—instead of being determined by them either negatively or positively—then subjects co-shape the role that these power structures play in their lifeworld.

Developing a relational notion of moral subjectivity requires to take into account that moral intuitions and frameworks must be understood as mediated by technological developments. This is what Verbeek misses in Feenberg's reading of Foucault. He accuses Feenberg of understanding democracy as a means "to make sure that the power is with the people, not with technology. If technology invades too deeply in the human sphere, practices of resistance and subversion are needed to push it back into its own realm" (Verbeek 2013, 76). Indeed, this remark seems justified since Feenberg remains associating technological rationality with values such as efficiency and control that need to be countered by values based on the subjugated knowledges constituted within the lifeworld (cf. Feenberg 2017, 34). When analyzing why specific forms of protest arise—and should arise—it does not help to draw a sharp contrast between technical values and lifeworld values, but the focus should rather be on the intertwinement of the two. That is, the relevant question in this context becomes how the lifeworld values that human subjectivity draws on are mediated by technological developments, such that these values can become a driving force for political action.

As we saw, Feenberg attributes a relative universality to the values (e.g., health, safety) that constitute the interests of citizens. Verbeek, on the contrary, holds that the meaning of these values is shaped by the coming into being of a specific kind of human subjectivity that is constituted in the relation between human beings and technologies. Ethics, then, starts from an investigation of how the value frameworks are mediated by technological design. In line with Foucault, Verbeek holds that "ethics is not primarily about which imperatives we need to follow and how we need to act, but about how human beings constitute themselves as "subjects" of a moral code. And rather than aiming to develop a new code himself, [it should investigate] what these codes "do" to people and how humans "subject" themselves to them" (Verbeek 2011, 74). Investigating what these codes do can thus be understood as investigations into subjectivity from within the technosystem.

While Feenberg assumes the presence of a rigid form of subjectivity that forms the "resistance" pole in the dialectic between oppression and resistance,

Verbeek takes subjectivity to take a particular shape when orienting to the specific moral code through which it is co-shaped. Whether and how resistance is organized is, from Verbeek's perspective, dependent on the particular ways in which subjectivity is constituted through the way it relates to the power structures it inevitably faces. In other words, a specific form of subjectivity needs to be shaped, before it can engage in acts of resistance in the first place.

The next question that needs to be answered then is: How can Verbeek's ethical subject be turned into a political subject? In terms of the discussion between postphenomenology and critical constructivism, this question can be formulated as follows: if the constitution of moral subjectivity is constituted in the individual relation between individuals and the forms of power they encounter, how do collective forms of protest come into being? Foucault already pointed to this problem in his analysis of Enlightenment, and argued that Kant's *sapere aude* in fact points to a process that transcends individuality: "Enlightenment must be considered both as a process in which men participate collectively and as an act of courage to be accomplished personally. Men are at once elements and agents of a single process" (Foucault 1984, 35). On the one hand, Enlightenment is considered an inauguration of the critical subject, while on the other hand it requires that individuals voluntarily pick up their role as critical actors. Even though that the Enlightenment can be considered a historical transition in which room for critical subjectivity becomes possible, a critical position needs to be explicitly articulated in order for the promises of the Enlightenment to be carried out.

In the next section, I show how postphenomenology and critical constructivism can complement one another when it comes to the articulation of how the cultivation of moral subjectivity can be considered a political act. Doing so requires aligning the phenomenological starting-point of postphenomenology that focuses on the often tacit ways in which individuals relate to concrete technologies with Feenberg's focus—inspired by the tradition of Critical Theory—on the identification of the forms of technoscientific rationality that are imposed on modern citizens. Through a combination of these two points of emphasis, it becomes possible to analyze how individual forms of moral subjectivity can be transformed into collective democratic interventions. The next section attempts to explore how moral subjectivity can become a source for developing oneself as what Feenberg terms a resistant subject.

6. The Complementarity of Critical Constructivism and Postphenomenology: The Political Potential of Human Subjectivity in the Technosystem

Developing a form of moral subjectivity that gives rise to the potential of political change through democratic intervention requires that human beings do not completely coincide with the technoscientific rationality through which they are inevitably exposed. Even though that there is no escape from the technological structure of modern society, the manner in which the lifeworld is technologically constituted does not need to be determined by a top-down instantiated logic of technical action. Thus, human subjectivity has the potential of exercising its critical potential when a space of reflection about what is brought upon it can come into being. This assumes that there is a possibility of distancing individuals from the structuring powers that they are faced with. But how to develop such a critical distance?

The main inspiration in answering this question for both critical constructivism and postphenomenology is taken from Michel Foucault's contention that developing an ethical position should not be understood in terms of the development of a set of normative guidelines, but rather in engaging in practices of self-cultivation. Ethics, then, should not be a matter of formalization and of obeying to universal rules, but instead is a practice in which subjectivity forms itself in its relation with external forces. For Foucault, this presupposes to investigate the forms of rationality present in power structures against which subjectivity needs to develop itself, as well as the practices of self-cultivation that human individuals develop in their confrontation with rational process external to them (Foucault 1984, 49). In a more recent terminology, we can say that Foucault understands subjectivity as constituted both by the processes within which technologies are designed and by the way designed technologies mediate the lifeworld of users.

When looking at how Foucault is incorporated within the work of Verbeek and Feenberg respectively, we see that they each tend to focus on one of the poles through which subjectivity is constituted: whereas Verbeek focuses on the variety of ways in which users incorporate technologies in their lives, Feenberg focuses on the rational structures that are always already there before technologies enter the lifeworld, and the capacity of users to alter these structures.

This is reflected in where they identify the most important contribution of STS to their work: Feenberg draws on SCOT to point to the underdetermination of technical design by technical criteria alone, which makes him argue that "values are the facts of the future. . . . Our world was shaped by the values that presided over

its creation. Technologies are the crystallized expression of those values” (2017, 8). In this sense, a space for a critical form of subjectivity opens up when technologies are identified as embodying specific value frameworks that can be changed through democratic interventions. Accordingly, the result of critical reflection is an intervention in design processes from the outside. Verbeek is primarily inspired by Latour’s work rather than by SCOT, and uses Latour to develop an understanding of subjectivity as a hybrid constitution that is often unconsciously mediated by technologies. Because of this, he understands critical reflection on technology as the creation of “the distance needed to gain a free relation to technology and to modify and shape its impact on our existence. [This free relation makes it possible that] human beings can co-shape their technological subjectivity by styling the impacts of technological mediations” (Verbeek 2011, 84). In this view, critical reflection should not be directed at targeting power structures external to the human individual, but rather has an internal target: the way the human subject relates to power structures embodies an answer to the question of what kind of technologically mediated subjected one desires to be. Therefore, the way humans co-shape their subjectivity can be considered a political act; it gives an (implicit) answer to the question of what kind of world they want to live in, and how this world can be shaped when relating to technological mediations in specific ways.

The results of the different appropriations of research in STS in fact mirror each other: In Verbeek’s work, the responsibility for allowing human beings to align technological mediations with their desires is for a large part allocated to the designers of technologies, who should ensure that users are “equipped adequately to develop a creative relation to the technologies that affect their lives” (Verbeek 2013, 87). As a consequence, to make a free relation with technologies possible, designers have the responsibility to modify the rationality of technical design processes in such a way that moral and ethical questions become central.⁵ In Feenberg’s work, the technosystem is understood as “a dominating power [that] ‘subjectifies,’” thereby creating “resistant subjects [that] are actors in the sense given this term in constructivist science and technology studies” (Feenberg 2017, 27). This requires to make individuals attentive to the fact that they are not passive recipients of unalterable power structures, but in fact can shape their subjectivity in such a way that the rationality guiding technoscientific developments can be influenced. In both cases thus holds that pointing to the contingency of one of the poles of the way moral subjectivity is constituted, simultaneously implies to act upon to other pole: While Feenberg focuses on how the contingency of technical reasons places responsibility on human beings to become resistant subjects, Ver-

beek invites designers of technologies to take responsibility for how their products help constituting particular forms of human subjectivity.

If postphenomenology and critical constructivism can indeed be interpreted as mirroring one another, they can be complementary when developing a normative position with regard to technological developments. Verbeek explicitly separates the construction of technical artifacts from their mediating role—two aspects that for Foucault cannot be dissociated when trying to understand the constitution of moral subjectivity:

An analysis of the mediating role of artifacts can take for granted the constructed character of this role, however. For the understanding of technical mediations, the inscription processes and delegation from humans to non-humans may remain black-boxed. Only the mediating role itself is relevant here, not where it comes from. (Verbeek 2011, 168, fn.5)

Indeed, this separation might be warranted when the mediating role of artifacts is particularly concerned. However, if we are concerned with the articulation of critical subjectivity within the technosystem, we cannot do without an analysis of the particular form of rationality guiding technical design. Being able to subjectify oneself instead of being subjectified by the rationality present in the technosystem presupposes that one is capable of relating explicitly to this form of rationality. Because of this, as suggested by Andrew Feenberg, it does become relevant to lay bare the moral and social decisions within technical design in order to develop a distance from technologies that allows for their critical evaluation.

7. Conclusion: Articulating a Normative Stance

In the beginning of this paper, I gave a brief historical exposé of the relation between philosophy and empirical research in Horkheimer's social philosophy. In his view, (a materialist) philosophy should be concerned with changing the concrete situations to mitigate the suffering of oppressed individuals. Collective forms of political struggle should take place to realize this change. In Horkheimer's project, empirical investigations into how the psychological make-up of individuals is mediated by societal conditions functioned to better understand how, and to what end, collective forms of struggle should be organized. This perspective implicitly posits a relation between individual forms of subjectivity and the collective activity of political action, and points to the relevance of asking the question how these can be aligned. In other words, it asks: how can a collective normative stance with regard to societal developments be articulated?

In this paper, I have shown how the different ways in which STS is appropriated in postphenomenology and critical constructivism respectively can complement one another in answering the above question in the context of our current technological society. Critical constructivists charge postphenomenologists for neglecting the insight of SCOT that technological design is underdetermined by a technical form of rationality, and accordingly neglect that society is co-constituted by politics—besides being co-constituted by technologies. Postphenomenologists, then, criticize critical constructivism for insufficiently recognizing that the way in which technological mediations are appropriated often evades the rational purposes for which technologies are designed. Accordingly, so it is argued, the constitution of moral subjectivity should not primarily be understood as stemming from a relation with a specific form of rationality, but rather as coming into being in interaction with concrete technological artifacts. In this paper, I have shown that rather than being opposed, the perspectives of critical constructivism and postphenomenology should be considered different, albeit complementary ways through which a normative stance towards technological developments can be articulated. In the remainder of this conclusion, I make clear how this complementarity helps constituting this normative stance.

According to Foucault, the Enlightenment is a project that consists both of collective action and of individual courage (Foucault 1984, 35). And, if a politics of technology can be considered in terms of this project (i.e., as an attempt of individuals to not being enslaved to forms of rationality that are external to them), the articulation of a normative stance is simultaneously an individual and a collective act. Feenberg situates his political philosophy of technology explicitly as an answer to the question “What is enlightenment?,” when stating that “critical constructivism understands the politics of the technosystem as a dialectic between official rationality and the informal everyday rationality of protest. Enlightenment means assuming a place in the dialectic” (Feenberg 2017, 202). Accordingly, being a political subject within the technosystem requires acknowledging that official rationality can be dereified through the local rationality of protest, and that the human subject is able to explicate her place within this process. Because of the latter, the local forms of rationality that Feenberg considers the source of political resistance presupposes the existence of local forms of subjectivity. Assuming a place in the dialectic of Enlightenment is, therefore, to assume a place for hybrid subjectivity.

Through its focus on how technologies mediate the constitution of moral subjectivity, postphenomenology articulates the conditions for political resistance.

In postphenomenology, subjectivity is not considered as a given, but instead as something that is to be accomplished in interaction with the powers faced. Being able to interact with such powers presupposes not to coincide with them. Drawing on Foucault, Verbeek argues that the constitution of moral subjectivity requires the possibility of developing an *ascetic distance* “from anything that otherwise remains self-evident in order to find a productive relation to it. From an ascetic distance, the subject is not simply handed over to the powers that shape it but explicitly *takes a stance* toward these powers, actively accompanying and reshaping them” (Verbeek 2011, 78). Rather than interpreting political resistance in terms of a dialectical model in which it automatically is constituted in relation to oppressive powers, a genuine form of protest can only come into being through the shaping of specific forms of subjectivity. Since the constitution of subjectivity is never a given, but always implies a directionality towards who one desires to be and includes the values one uses to evaluate the world, the constitution of subjectivity already *is* a political act.

Importantly, when seeing this process of constitution as technologically mediated, articulating a normative stance can no longer take place with reference to universal values, but instead implies to be able to position oneself in relation to how values change in relation to technological developments. A politics of technology should therefore not only be understood in terms of a *struggle for power* between two (seemingly) conflicting forms of rationality, but should for an important part be considered a *struggle for values*. Values are the “facts of the future” (Feenberg 2017, 8), not because they settle how technical design is materialized, but instead because their continuous reevaluation—just as the continuous reevaluation of facts—allows for new realities to come into being. Philosophy of technology should take a normative stance in this regard through ensuring that a space in which this struggle for values takes place is not closed off by prioritizing one possible form of rationality over others.

Notes

1. Of course, “STS” is far from a homogeneous field of research that can be done justice to under this single header. However, since STS is treated in both constructivism and postphenomenology as a means to bring “the empirical” into philosophy of technology—and thereby turned into a homogeneous category, I use STS as an umbrella term to refer to empirical studies of science and technology.

2. My focus on Verbeek's work is motivated by the fact that he is—within post-phenomenology—most explicitly concerned with the relation between technology and morality, and is, therefore, as far as I know the postphenomenologist closest to the goals of Andrew Feenberg's project of developing a political philosophy of technology.

3. Whether this accusation holds can be debated. In the later work of Bruno Latour, he is clear that his position should not be considered a relativism that is at odds with activists' ideals of progress. For example, his work on the politics of environmentalism and climate change (e.g., Latour 2004, 2017) can be considered as an attempt to build a bridge between constructivism and political activism. A detailed discussion of the extent to which constructivist accounts within STS are relativistic is beyond the scope of this paper, as the focus is on why *Feenberg* considers constructivist accounts to be relativistic, and which solution he develops to escape this relativism.

4. This view is most clearly expressed in Verbeek's response to David Kaplan's review of *What Things Do* in which Kaplan criticizes Verbeek's mediation theory for lacking any normative framework against which technological developments can be evaluated. In response to this criticism, Verbeek argues that "the "universally binding moral claims" that Kaplan wants to invoke here in order to assess technologies will be hard to obtain. Calling for such claims actually misses the very point of the mediation approach, which implies that these claims are technologically mediated as well" (Verbeek 2009, 259).

5. The need for explicitly recognizing that technical design is in fact an ethical affair is most strongly visible in Verbeek's remark that "designers are in fact practical ethicists, using matter rather than ideas as a medium of morality. Usually this "material ethics of design" remain implicit: designers shape a new technology with certain functionalities in mind, without explicitly aiming to influence the actions and behavior of uses" (2011, 90). Recognizing the material ethics of design would therefore be one way in which designers can take responsibility for the ethical and moral impact of technological developments.

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