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RESEARCH ARTICLE

Human Flourishing and Technology Affordances

Avigail Ferdman[1]

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Abstract
Amid the growing interest in the relationship between technology and human flourishing, philosophical perfectionism can serve as a fruitful lens through which to normatively evaluate technology. This paper offers an analytic framework that explains the relationship between technology and flourishing by way of innate human capacities. According to perfectionism, our human flourishing is determined by how well we exercise our human capacities to know, create, be sociable, use our bodies and exercise the will, by engaging in activities that ultimately produce valuable output. The paper introduces technology affordances to this framework, to show how affordances enable or restrict the exercise of human capacities, thereby impacting levels of human flourishing. One implication of this analysis is that it highlights how technology affordances can cause the privation (absence) of flourishing, by impoverishing capacities. The upshot is that privation may bring about robustly bad unflourishing, especially given that technology and its affordances have the power to degrade the human capacities in the long run. By linking how human capacities are shaped by affordances, we can achieve a better understanding of the ethical implications of technology on human flourishing.

Keywords Technology · Flourishing · Affordances · Perfectionism · Capacities

1 Introduction

The rapid development of digital technologies is transforming the world and influencing human flourishing. While currently the focus of technology ethics is on issues such as justice, privacy or democracy, there is growing body of literature interested in the relationship between technology and flourishing (Burr et al., 2020; Floridi et al., 2018; Stahl, 2021; Winner, 1997, 2005), accompanied by calls to build a constructive and positive ethics of technology, which concerns the good life and

✉ Avigail Ferdman
avigailf@technion.ac.il

[1] Department of Humanities and Arts, Technion-Israel Institute of Technology, Haifa, Israel

human and societal flourishing (Coeckelbergh, 2019, 33; Vallor, 2016; Nyholm, 2023; Casas-Roma, 2022).

In this paper I offer an analytic framework that explains the relationship between digital technology and flourishing by way of innate human capacities. I adopt a perfectionist conception of the good life (Hurka, 1993), which holds that our human flourishing is determined by how well we exercise our human capacities. My goal, it should be stressed from the outset, is not to defend perfectionism as an account of human flourishing. It is, instead, to demonstrate how a perfectionist approach could help us evaluate the goodness or badness of technology, in order to be better placed to regulate existing technologies, and design future ones.

The paper innovates by introducing the human-capacities approach as an account of human flourishing that has yet to be applied in technology ethics. As humans, we have characteristically human capacities—to know, create, love, have friends, use our bodies and use our willpower, and we flourish when we successfully exercise our human capacities (Bradford, 2021; Hurka, 1993; Kraut, 2007). We flourish when we develop and exercise our capacities, and when we engage in activities that make use of these capacities (Bradford, 2016). Digital technology, in this context, can be evaluated according to whether it promotes or restricts our ability to develop and exercise human capacities.

This framing of technology—its relationship to the exercise of human capacities—allows to conceptualize technology affordances within the discourse of flourishing. The concept of affordances was first introduced by James Gibson (1979): "the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill… it implies the complementarity of the animal and the environment" (p. 127). Affordances are relational (p. 129), as they are action possibilities in the environment not in absolute terms but in relation to a particular context and for a particular species or agent, relative to and thus also unique for the agent in question. The relational aspect of affordances frames, while not determining, the possibilities for agentic action in relation to an object (Hutchby, 2001). Affordances are not mere opportunities for action but invitations that can have a severe influence on the behaviour agents will exhibit in that environment (Withagen et al., 2012). For the purpose of this paper I will be using the following definition for affordance: "an action possibility formed by the relationship between an agent and its environment" (Nye & Silverman, 2012, 179).

Technology[1] can both reveal and veil affordances (Döbler & Bartnik, 2022): artefacts (e.g. technologies) make certain actions likelier given the circumstances (Klenk, 2021). This is an important dimension of technology, as it plays a crucial part in the ways that persons develop and exercise human capacities. The idea that environments can impact, even hinder, how agents exercise their capacities is a familiar one to scholars working in the fields of affordances, scaffolding and ecological niches, especially cognitive and affective capacities (for example Coninx, 2023; Krueger & Osler, 2019; de Carvalho & Krueger, 2023; Timms & Spurrett, 2023). This paper offers an analytic framework that traces the ability to develop

[1] I will be using the term technology as a shorthand for digital technology from here on.

and exercise human capacities not exclusively to technologies themselves, but to technological affordances as well. The innovation of this framework in its ability to approach human flourishing or 'unflourishing' as a consequence of technological affordances, thereby bringing the concept of affordances into perfectionist theories of flourishing.

The relationship between affordances and flourishing is becoming more urgent given the power of the internet, AI and other technologies to eliminate the separation between technology and its users. Previously, when a technological artefact left its place of manufacture, users wielded a significant degree of control over its use. The internet is now an important part of our cognitive ecology (Smart et al., 2017), and it allows to connect physical and digital artifacts, which in turn keeps the designer and the artifact connected, diminishing the power of the user to appropriate the artifact by giving it meanings contrary to the will of the designer (Carabantes, 2023). While this is not a necessary feature of the internet but contingent on how it and other digital technologies currently function, if they carry on functioning this way, these technologies may become more restricting than enabling. The upshot is that users might have less opportunities to develop and exercise their capacities, when the technological affordances of digital artefacts impose restrictions on the development and exercise of capacities, and when there are increasingly less opportunities to develop and exercise these capacities in the physical environment, given that the digital and physical environment become more connected. This might give rise to the worry that these technologies might impact flourishing, not merely by creating harms, but by decreasing opportunities to develop and prosper. This point leads to the concept of 'privation', as follows.

Privation (absence) of flourishing is a concept that has been gaining some attention in the literature on well-being (Kagan, 2014), but has yet to be applied in the context of technology ethics. I argue that the underdevelopment and inactivation of human capacities, brought about by certain technology affordances, can lead to a state of privative unflourishing. At first glance, privation is merely the absence of a good, but not necessarily bad. A deeper investigation, however, uncovers that privation may be more pernicious. As will be developed in the course of the paper, a capacity that is fully developed is a potentiality, whereas in the case of privation, an underdeveloped and underutilized capacity is at risk of degeneration and even disappearance (Sypnowich, 2014). The upshot is that when we consider technology and its affordances, we need to consider not only what it enables persons to do, but what it restricts them from doing, and what potentialities it restricts in the long term. Focusing on long-terms potentialities and restrictions would help overcome the "narrow focus on intervention into design [that] leads to the disregard of factors of human development and regulation as crucial to a proper understanding of the ethics of technology" (Reijers & Gordijn, 2017, 200).

Another reason to focus on privation is its relationship to the concept of 'deskilling'. There is an extensive literature on 'deskilling' as a consequence of technology. This literature is mostly concerned with a) the economic devaluation of practical knowledge and skillsets in highly trained workers (Braverman, 1998; Power, 2000; Taddeo, 2019), b) the threat of moral deskilling (Chomanski, 2020; Vallor, 2015) and c) the degradation of our 'humanness' by increasingly making fewer demands

on our skill, strength and attention (Borgmann, 1984, 42; Strong & Higgs, 2000). I introduce the category of privation because it can help shed light on *why* deskilling is bad. It explains the badness inherent in deskilling in terms of human unflourishing. Deskilling—interpreted in this paper as impoverished human capacities—is bad, because the competent exercise of human capacity or human 'skills' is necessary for flourishing, as will be developed in the course of the paper.

The paper is structured as follows: the first section provides the foundations of the flourishing account, grounded in a recent perfectionist account by Gwen Bradford (2021) that relates flourishing to capacity exercise. The next section explores different manifestations of privation in relation to capacity exercise. The following section introduces the concept of technological affordances to this account. Subsequently I explore how certain technology affordances lead to privation of capacity exercise, and argue that this would lead to unflourishing, not just an absence of flourishing. The penultimate section reflects on the possibility that affordances could cement certain activities into practices and the implications for flourishing. Finally, the concluding section reflects on the implications for future technology design and regulation.

2 Perfectionism and Flourishing

Perfectionism is a theory about the human good in objective terms: a perfectionist holds that the best life for a human being is construed in terms of excellence or success in what makes us human, and that this is good in itself, independent of whether they are desired by humans (Wall, 2021).[2] One prominent account of such objective good or excellence is virtue ethics, which emphasizes moral character or virtuous dispositions as the manifestation of the human good. A growing discourse on the virtues necessary for living well with technology has been largely prompted by Shannon Vallor's (2016) influential work on technomoral virtues.

While virtue ethics has become a very prominent ethical account in technology ethics, there is another branch of perfectionism that is yet to receive attention in technology ethics: a perfectionism that takes the human good to be the excellent exercise of our innate human capacities (Bradford, 2021; Dorsey, 2010; Hurka, 1993; Kraut, 2007). Human capacities like the capacity know, to create, or to exercise willpower are part of human nature, and by exercising them, we flourish as human beings (Bradford, 2021): we flourish by "growing, maturing, making full use of the potentialities, capacities, and faculties, that (under favorable conditions) they naturally have at an early stage of their existence" (Kraut, 2007, 131). So while virtue ethics emphasizes dispositions, the capacities approach emphasizes innate capacities, the potentialities and the activities that realize them (Bradford, 2021).

[2] As such, perfectionism is an objective account of the human good, standing in contrast with both hedonism and desire satisfaction accounts of the human good that are subjective accounts of the human good.

Scholars generally agree that human capacities include at least the following set of capacities, described here briefly[3]:

- *The capacity to know*. To flourish as a person is to "engage successfully in a diversity of information processing activities, such as perceiving, organizing, remembering, inferring, deciding, planning, and acting" (Bynum, 2006, 161). The capacity to know can be characterized as the process of acquiring intellectual excellences or virtues that contribute to reliable success in reaching the truth or enhancing a person's understanding. This process would include open-mindedness, prudence, fair-mindedness, attentiveness, intellectual humility, and intellectual courage (Mang, 2023).
- *The social capacities*. The social capacities include the capacity for friendship and the moral capacity. Friendship, on the perfectionist view, is 'virtue friendship' (Aristotle, 1984, 1156b 8–9). Virtue friendship is based not merely on instrumental reasons or on pleasure but on a sense of the common good (MacIntyre, 1984, 155). To the extent that virtue friendships create common goals for the partnership, the capacity for friendship constitutes of forming and carrying out joint projects, over time, with the intent of making the friends' aims one's own (Hurka, 1993, 133–34). Thus, the capacity for friendship requires exercising empathy and patience. Empathy is the feeling with and for others, sharing their joys and their sufferings, and patience is a willingness to connect with the other person on their terms and not just mine, in order to create deeper mutual understanding, greater and more lasting commitments (Vallor, 2012).
- The moral capacity includes the ability to know right from wrong (Sliwa, 2017); the ability to give and follow moral explanations and to draw moral conclusions (Hills, 2009); the ability to determine what moral principles require of us in particular circumstances (Andre & Velasquez, 1988). The capacity for moral understanding can be characterized as "the holistic competence of navigating the total moral environment in which one finds oneself at any given time" (Wallach & Vallor, 2020, 401).

[3] New capacities might emerge, resulting from human-technology interaction (e.g. cyborgs or human enhancement Ihde, 1990; Verbeek, 2008, 2011). While it is impossible to explore this issue here, the perfectionist framework I propose in this paper might be applicable to new, yet to be discovered capacities. One interesting avenue worth exploring is how different interpretations of perfectionism would apply to the distinction between existing and new capacities. The standard account of capacity perfectionism holds that we flourish when we exercise the capacities that are in our human nature (Bradford, 2016; Fletcher, 2016; Hurka, 1993). On this account, new capacities that are not in our human nature would arguably not contribute to flourishing. On another view of capacities, however, new capacities could be part of an account of flourishing. Antti Kauppinen has recently offered a new interpretation of perfectionism that rejects the idea that are capacities are explained by human nature, in favour of 'telic perfectionism' where "Flourishing consists in successfully realizing the formal aims implicit in the functioning of our fundamental capacities to a sufficient degree". According to this view, flourishing is conceived in terms of the formal aims of our fundamental capacities, which makes them independent of human nature (Kauppinen forthcoming). Our fundamental capacities, therefore, could in theory include new capacities. I am grateful to an anonymous reviewer for prompting this discussion.

- *The capacity to create*. The received philosophical view on creativity is that achievements are creative if they are (1) original, (2) valuable and (3) the result of an act of agency (Currie, 2020); involving unfamiliar combination of familiar ideas, exploring a conceptual space; transforming a conceptual space, thus allowing someone to think thoughts that they could not have thought before (Boden, 2004); a degree of judgement (in how to apply a rule, if a rule is involved) and an evaluative ability directed to the task at hand (Gaut, 2010). Thus the capacity for creativity will include the ability to engage in willful activity that culminates in these characteristics.
- *The capacity to exercise the will*: The capacity to exercise willpower is chief among the human capacities. Humans exercise their will almost all the time, and they exercise it extensively when engaging in difficult activity, requiring to *excel* in the exercise of the will. When we exert great effort to overcome difficulty, we exercise this characteristic human capacity in an intrinsically valuable way; The capacity to will is therefore critical as a capacity to overcome difficulty in order to achieve something that is intrinsically valuable (Bradford, 2015, 119–22). Moreover, developing and exercising other human capacities (e.g. to know, to be sociable) itself requires exercising the capacity to will. This can be partly explained by the interdependence of the capacity to will and other capacities: because cultivating the other capacities requires effort, competently exercising the other capacities goes hand in hand with competently exercising the capacity to will (see Hirji, 2019).
- *The physical capacities*. "Humans necessarily have bodies" (Hurka, 1993, 37). The physical capacities are successfully developed and exercised when our human body obtains a reasonable degree of bodily perfections, i.e. operating healthily (Hurka, 1993, 37–38). Importantly, developing and exercising our physical capacities requires some degree of effort, which therefore requires engaging the capacity to exercise the will.

An important component of this perfectionist account of human flourishing is that we flourish by exercising our human capacities successfully, as measured by the achievement of bringing about an intrinsically worthy outcome (e.g. knowledge, friendship, love, beauty, morality). Thus we fare well to the extent that we use our capacities competently to realize a harmonious set of worthwhile ends—valuable achievements that give meaning to our lives (Kauppinen, 2022a, 2022b).[4]

The capacities, on the perfectionist approach, are universal, in the sense that all humans flourish when they successfully exercise them. However, this is not to say that all individual agents develop and exercise their capacities in the same way. Perfectionism is pluralist with regards to ways of leading a fully good life (Wall, 2013). As such, perfectionism would be pluralist regarding how persons develop and exercise their capacities. This will be important for the discussion on affordances, because different persons have different manifestations of bodily, cognitive and affective

[4] Kauppinen is referring the capacity for reason, but I am extending his argument to capture other capacities as well, since in its formal structure Kauppinen's argument extends to other capacities as well.

capacities, as well as skills, norms and habits. Accordingly, capacities can be actionable through affordances in a variety of ways. A capacity is therefore a much broader concept compared to affordances. For example, if the capacity to know includes the capacity to form true beliefs, the affordances are the action possibilities that enable the development and exercise of that capacity in particular environments.

Before moving on, it's worth distinguishing the perfectionist human capacities approach from another ethical approach to the good human life: the "Capabilities Approach" (Nussbaum, 2011), which has been gaining attention in technology ethics discourse (Curzer & Epstein, 2022; Frischmann & Selinger, 2018; Ratti & Graves, 2021). On the Capabilities Approach, the emphasis is on ensuring that persons possess certain human capabilities. Whether one choose to exercise them or not, is not a matter of ethical or moral concern for the Capabilities Approach (Hurka, 2002; Nussbaum, 2011, 18). On the human capacities approach, on the other hand, exercising the capacities is constitutive of flourishing. In the context of technology, accordingly, the concern is whether technology enables or restricts humans from exercising their capacities, in turn determining their level of flourishing. Therefore, if one is interested in the relationship between technology and actual flourishing, the human capacities has an advantage of the Capabilities Approach.

To the extent that technology plays a role in shaping the conditions under which persons thrive or languish, human capacities perfectionism can help us evaluate technologies according to whether they enable persons to flourish. To this end, I synthesize recent perfectionist accounts of flourishing and unflourishing by Bradford (2021), Kauppinen (2022a, 2022b) and Machek (2022).

3 Perfectionist Flourishing, Unflourishing and Privation of Flourishing

Gwen Bradford's account of human flourishing explains the relationship between human capacities and flourishing: "Each of our capacities enables us to engage in a particular kind of activity, which has an outcome that is proper to it, and the capacity is fulfilled when we attain that end by way of engaging in an activity made possible by the capacity" (Bradford, 2021, 595–96). This is Barford's *tri-partite* framework (Bradford, 2021, 595):

CAPACITY → ACTIVITY → OUTPUT

This tri-partite framework holds that we flourish by exercising a capacity, to produce a proper output. To illustrate: we exercise the capacity to know by the activity of considering all the elements that present themselves to us, and carefully weighing all the reasons in the appropriate ways, producing the valuable output of new knowledge. Importantly, on this perfectionist view, merely possessing a capacity is not sufficient for achieving flourishing. Rather, the competent exercise of the capacity, and the production of an output of intrinsic value, are what constitutes flourishing (Bradford, 2016). Also, the tri-partite framework highlights that the outcome in itself is not sufficient for full flourishing. For example, consider the output of climbing Mt. Everest. The output, in the example, involves being on top of Mt Everest. Yet the value of the output is not to be

found in merely being there. Being dropped off at the summit by a helicopter does not constitute the same valuable outcome as actually making the climb. The value of being on the summit is in getting there, which necessarily involves the exercise of capacities such as physical capacities, the rational capacities (planning the climb) and the capacity to will (overcome difficulty) (Bradford, 2015, 12). This point will become relevant later on, when I discuss the importance of capacity exercise to achieving full flourishing.

The tri-partite frameworks also captures what faring badly is: when a capacity yields an output that is not its proper output, this is robustly bad. It is a 'malfillment' of the capacity (Bradford, 2021, 597). For example, if a person exercises their rational capacity and reaches a wrong conclusion, leading to the adoption of a false belief, this is bad, because the rational capacity has produced the wrong kind of thing (Bradford, 2021, 596). On this account, to be in an unflourishing state is to be actually bad and not just a privation (absence) of good (Bradford, 2016).

3.1 Privation of Value

We have seen how the tri-partite framework explains flourishing and unflourishing. A third category of how one fares in life is the privation of flourishing, an issue which has recently attracted philosophers' attention (Kagan, 2014; Kauppinen, 2022a, 2022b; Sumner, 2020). The privation of flourishing means the absence of flourishing. A closer look, however, reveals that privation has at least 4 manifestations, depending on where we locate the absence: absence of valuable output, or absence of capacity exercise.

I. Privation: absence of value

Privation can manifest in the absence of a valuable output. We exercise a capacity yet produce an outcome of nil value. To illustrate: if a person competently uses their rational capacity to reflect on an issue, and they take into account all relevant information and weigh relevant considerations, yet in the end of this process draws no new beliefs, the activity has produced no output, therefore it would have no (or little) value (Bradford, 2015, 595–96). On Bradford's view, if the output is neither good nor bad, the person's level of flourishing doesn't change, or rises only very slightly: it is a privation of flourishing, but not a robust bad (Bradford, 2015, 596). The privation of flourishing in this instance is explained by the absence of a proper output.

II. Privation: absence of value caused by not exercising capacities

Privation of flourishing can occur when a person does not exercise a capacity and therefore produces no value. Since most perfectionists hold that "the exercise of capacities is valuable independently from whether or not it is successful[] or has value" (Bradford, 2021, 597; Hurka, 2020; Kauppinen, 2022a, 2022b), we may conclude that not exercising one's capacities is an absence of something valuable. When a person does not exercise a capacity, there will be no new output. Therefore, there will neither be any gain nor loss of flourishing. Not exercising a capacity is

therefore a privation of flourishing. The source of privation of flourishing is in the non-exercise of a capacity.[5] To illustrate: If a person does not use their rational capacity to reflect on an issue, they will therefore not engage in the activity of taking into account all relevant information and weigh relevant considerations, which will therefore not initiate a process of drawing new beliefs, in turn producing no output, and thereby creating nil value.

If "faring well isn't simply to have the relevant capacities, but to exercise them well" (Bradford, 2016, 127), then it would seem that to not exercise the capacities is to not be faring well. It is still unclear, however, whether to not be faring well is a mere privation of flourishing, or, it is to be faring badly, which would be a state of unflourishing. The next two manifestations of privation offer support to the second option, namely that to not exercise capacities can indeed lead to a state of unflourishing.

III. Privative unflourishing: negative value caused by impoverished capacities

Some philosophers are uneasy with the conclusion that not exercising a capacity is merely an absence of a good. They argue that realizing a capacity to an insufficient degree, or an impoverished capacity, is an absence that is robustly bad, not merely a privation of a good (Kauppinen, 2022a, 2022b; Machek, 2022).

Kauppinen (2022a, 2022b) has recently argued that impoverishment of the rational capacities leads to bad outcomes, as a result of underdevelopment of these capacities. Interpreted through the tri-partite framework, Kauppinen's argument could be stated as follows: successfully exercising the capacity to know[6] is to create the valuable output of forming a true belief, through the activity of competently making certain inferences about a subject matter. Not exercising the capacity to know, on Kauppinen's account, will detract from a person's potential flourishing. Totalitarian states, for example, deprive children of this potential flourishing, by keeping them ignorant, preventing them from learning about crucial aspects of the world and understanding it. This is not merely privatively bad, but robustly bad. Importantly, even if the children are happy and successful in their practical endeavors, the lack in their capacity to understand cannot be compensated for by other goods such as happiness. The badness here is explained by the insufficient development of the capacity to know, which leads to deprivation in outputs that are constitutive of flourishing lives, such as the good of understanding, as well as the badness of things that constitute unflourishing, such as a false sense of understanding (Kauppinen, 2022a, 2022b, 251). Here the badness is explained by the negative outputs, and/or lack of valuable outputs, which result from an insufficiently developed or under-utilized capacity to know.

Generalizing to other capacities, the argument goes as follows: unflourishing can result from negative outputs, or lack of valuable outputs that are constitutive of

[5] Insufficient exercise of a capacity may come in degrees, but analyzing the level or intensity of capacity exercise goes beyond the scope of this paper.

[6] In Kauppinen's account, the capacity to know is the capacity for reason.

flourishing (e.g. knowledge, close friendships, morality), which results from insufficient development or insufficient exercise of human capacities.

IV. Privative unflourishing: wasted capacities

The fourth manifestation of privation is impoverishment of capacities, which is a waste. Here the badness can be explained as follows: flourishing is dependent on the successful exercise of our capacities. Anything that impedes the development or the exercise of human capacities (things like disease, the sapping of vigor and strength, injuries, the loss of organs) is bad for the human in question (Kraut, 2007, 131). But the development and exercise of capacities can also be impeded by things that are outside of one's body. If one is restricted from accessing education, for example, their opportunity to develop their rational capacity will be impeded. Their rational capacity will be impoverished. This type of impoverishment of capacities is not merely a privation of flourishing, but a deprivation (Machek, 2022): when persons are deprived of the opportunity to develop and exercise their capacities, given their predisposition to acquire them, this constitutes a robust bad. Impoverishment, as deprivation of the opportunity to exercise capacities, is a waste, and waste, on this account, is robustly bad.[7] Waste here is understood as the waste of the possible (Floridi, 2022), where the valuable potentialities have not been properly actualized (Machek, 2022, 13).

Waste is bad, because the realization of one's potential contributes to the goodness of a person's life. More controversially, perhaps, part of the badness of a life can be explained by the degree to which one did not realize their potential, because, as some philosophers argue (Masny, 2022, 20), wasted potential always makes a life go worse, or barely human (Haybron, 2008, 26). Martha Nussbaum illustrates this as follows: "there is something terrible about the [actual powers of humans] being there undeveloped. This gives us a sense of waste and tragedy… when Marx's worker is forced to live a life that reduces his senses to a less than fully human level of functioning, this does give rise to grief" (Nussbaum, 2000, 123). It is important to note that Nussbaum is lamenting the waste of capabilities and not capacities, and as I noted earlier, the Capability Approach is distinct, in an important way, from the human capacities approach that is the focus of this paper. Nevertheless, the intuition captured in Nussbaum's argument, namely that severe waste is tragic, can apply with equal force to the human capacities: there is something tragic—robustly bad—in capacities just being there undeveloped. And at the extreme, living a life reduced to passive pleasures and fully devoid of any kind of worthwhile intellectual pursuits can be regarded as a kind of waste (Machek, 2022, 14).

[7] There is a potential objection to this argument, which goes as follows: that if a person is satisfied with not developing their capacities, then not developing those capacities is not a harm for them. To this objection there is the following reply: waste is a bad, on objective grounds: a good life for someone is determined jointly by their level of (subjective) well-being, and the degree to which they realize their potential (Masny 2022).

Generalizing Machek's argument from intellectual pursuits to other pursuits leads to the following: living a life reduced to passive pleasures and fully devoid of any kind of worthwhile intellectual, social, creative, or willful pursuits can be regarded as a kind of waste. The badness here is the impoverished capacities, that lead to wasted potential. In the language of the tri-partite framework, the badness of impoverished capacities is in the impoverishment itself, over and above the absence of any valuable outputs that could have been achieved.

In sum, there are three types of unflourishing related to capacity exercise: unflourishing that results from the competent exercise of a capacity engaged in an activity that nevertheless produces a negative output; unflourishing that results from *insufficient* exercise of a capacity, thereby producing a negative output; unflourishing that results from the *impoverishment* of a capacity, which is a waste.

4 Affordances and the Development and Exercise of Capacities

Impoverishment of capacities, on the perfectionist account above, is the deprivation of the opportunity to exercise capacities. But what is the source of deprivation? Is it a personal choice not to develop a capacity, or is this choice influenced by the environment? On the face of it, impoverished capacities may be a result of personal choice not to develop or exercise certain capacities. On the tri-partite framework, when a person decides not to exercise some capacity, they will not produce any valuable output, and gain no increase in their flourishing. Choosing not to develop or exercise a capacity could be viewed by perfectionists as incontinence (not exercising self-control), which would be bad, in itself.[8] However, the choice to under-develop or under-utilize one's capacity could be shaped by one's environment, which is where the concept of affordances becomes relevant.

Impoverished capacities may result from an environment that offers impoverished opportunities that do not sufficiently trigger the development and exercise of capacities. To develop and exercise capacities, persons need to be exposed to an environment that will trigger the development and exercise their capacities (Ferdman, 2019). When humans are not exposed to environmental conditions that will trigger the development and exercise of their capacities, these capacities are at risk of deterioration or even disappearance (Sypnowich, 2014). Therefore, the environment one inhabits is an important factor in determining the extent to which persons will be able to develop and exercise their capacities, and hence their level of flourishing.

The concept of affordances is helpful in uncovering the extent to which the impoverishment of capacities is affected by the interaction of an agent and their environment. Recall that an affordance is "an action possibility formed by the relationship between an agent and its environment" (Nye & Silverman, 2012, 179). Since "people will usually not think of a given action when there is no affordance for it" (Gaver, 1991, 80), it follows that people are likely not to execute that action, thereby not exercising the capacity associated with that action. Therefore, an environment

[8] I have attended elsewhere to the question of how to respect to the choice not to develop and exercise capacities (Ferdman, 2019).

that includes constraints, may restrict the development and exercise of capacities, thereby leading to a robustly bad privation of flourishing.

This suggests that the tri-partite scheme could be expanded to a four-part framework, as follows (Fig. 1):

With the four-part framework, we can analyze the relationship between technologies and flourishing through the capacities they enable or constrain, as follows.

Technologies shape what we are able to do, how we are able to do it and what we see ourselves as being able to do (Nyholm, 2023). Technology may afford, enable, allow, induce, stimulate, cause, necessitate or require certain events or states-of-affairs. Or it may constrain, discourage, prevent, prohibit or disallow events or states-of-affairs (Brey, 2018).

In the following, I apply the four-part framework to some examples of current technologies. The analysis is not meant as a comprehensive assessment of all technology, nor as an in-depth analysis of the relationship between flourishing and the specific technology discussed. Rather, the aim here is to show how the framework could be applied and how it could be helpful for understanding the relationship between technologies, the exercise of human capacities, and the potential privation of flourishing.

5 Technology, Affordances and Privation

The perfectionist four-part framework provides us with a tool to unpack the relationship between technology, its affordances, and the exercise of human capacities, such that we may be able to identify whether the technology enables, or limits, human flourishing. The concept of privation of flourishing is important, since it highlights the significance of technologies that impoverish our capacities, and that could, in the long run, reduce human flourishing, even for persons not necessarily using those technologies.

The concept of affordances allows us to examine different types of affordances with respect to the range of action possibilities they include. While affordances are action possibilities, constraints are the way(s) in which an actor is hindered from reaching a specific goal when using a selected technology (Majchrzak and Markus 2013; Maragno et al., 2023). For example, because scientific knowledge can be complex and uncertain, it functions as a constraint for lay people to engage with scientific knowledge online to achieve epistemic aims (Hendriks et al., 2020). Another category of affordances is 'non-affordances', when an object either does not appear in the user's phenomenological horizon at all, or it does not appear as

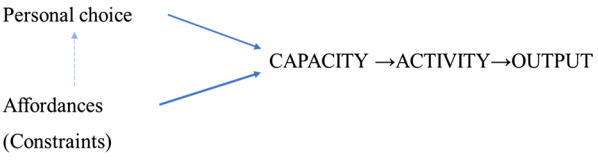

Fig. 1 Four-part framework: affordances can affect capacity development and excercise

carrying with it an invitation to a set of possible actions (Sefat, 2023; Wittkower, 2016).

Affordances, constraints and non-affordances make up the 'field of affordances': "the set of affordances, from the infinitely many that are available, that invite action for an agent" (Wilkinson and Chemero forthcoming, 1). While the capacities (to know, create, be sociable) are universal, persons develop and exercise them in different ways. Accordingly, environments will afford or constrain action possibilities differently for different persons. Normatively, the field of affordances has to be such that provides the appropriate invitations for meaningful activities, such that persons can develop and exercise their capacities in ways that correspond to their bodily, cognitive and affective capacities, as well as their skills, norms and habits. Yet with some technologies, the field of affordances is limited, thereby restricting the development or exercise of certain capacities, and impoverishing these capacities. They do so by changing how we normally exercise capacities like the capacity to know or the social capacities. Social media, in particular, affects the field of affordances. In the following, I will look at the case of social media and three normative concerns that its affordance creates, to demonstrate how the technological affordances restrict the exercise of capacities such that either impoverishes these capacities, or leads to engaging in activities that lead to valueless outputs. In particular, I will discuss echo-chambers and how they afford information consumption such that impoverishes of the capacity to know; online friendships and the impoverished environment for the capacity for virtue friendships, and gamified environments and their impoverishment of the capacity for sociability through communication.

Social media and its affordances are of particular relevance to the examination of technology and flourishing, because, as some scholars warn, the distortions and limitations of online social life are spilling over to humans' offline social lives (Cocking et al., 2012; Krueger & Osler, 2019), and this might lead to an impoverishment in human capacities in offline life as well. In this way, social media's affordances affect the potential for unflourishing not only within these platforms, but also beyond its technological boundaries.

Importantly, the following discussion is not meant as an exhaustive examination of social media, but rather as an example of how applying the four-part perfectionist framework can be useful in evaluating technology and its affordances in terms of flourishing.

5.1 Echo Chambers and Privation of the Capacity to Know

Echo chambers are a social epistemic structure from which other relevant voices are actively excluded and discredited. Members of echo chambers have been brought to systematically distrust all outside sources (Nguyen, 2020), effectively leading to the formation and maintaining of false beliefs (Santos, 2021). In this way, echo chambers constitute a 'hostile epistemic environment' (Nguyen, 2023): an environment that exploits our cognitive vulnerabilities and weaknesses, optimizing the platform to seduce users by creating a feeling of clarity, without any commitment to presenting a belief system that actually captures the world itself. This clarity is

a "thought-terminating heuristic": a mechanism humans typically use to end the process of epistemic investigation (Nguyen forthcoming, 11). In this way, the echo chamber is an environment where knowledge acquisition involves biased inquiry and biased information processing (Avnur, 2020).

According to the four-part framework, the echo chamber would be a constraint on the capacity to know. Recall that an affordance is an action possibility, and a constraint can lead to inaction. This can happen when the echo chamber affords ignorance with respect to affordances (Werner, 2021): a kind of cognitive confinement which is "a state of being systematically blocked from affordances or even *dis*afforded, as it were, and so provided with disfigured affordances due to the way in which the subject's environment… is set up by the subject-world interactions." (p. 6299). The echo-chamber environment is structured in a way that leads to a 'thought-terminating heuristic' by turning off the activation of things that the capacity to know encompasses such as open-mindedness, prudence, fair-mindedness, attentiveness, intellectual humility, and intellectual courage. Not engaging in the activation of these intellectual virtues can be regarded as insufficient exercise of the capacity to know, eventually leading to the impoverishment of the capacity, and to the formation of false beliefs. According to the four-part framework, by restricting users' capacity to know, echo chambers lead to two types of unflourishing: unflourishing that is due to false beliefs (negative outcomes) and unflourishing that is due to an impoverishment of the capacity to know.

5.2 Social Media and the Capacity for Sociability (Close Friendships)

Recall that the capacity for sociability includes the capacity to create virtue friendships. Many thinkers worry that social media is an environment where meaningful friendship ultimately cannot flourish (McFall, 2012), because online environments do not enable a constitutive component of virtue friendship: a shared life, which is dependent on reciprocity, empathy and self-knowledge (Vallor, 2012), or the joint perception/awareness in which the friendship becomes reciprocal thus transcending the instrumental (Fröding & Peterson, 2012). Additionally, the pursuit of virtue friendship relies heavily upon intercorporeality: a rich, face-to-face dynamic of plural modes of self-expression and communication that contribute to the reciprocal building of the unique bond between the friends (Cocking, 2021; Vallor, 2012). Social media platforms (as they are currently designed) propagate user objectification (Palermos, 2023) and enable asynchronous relationships and edited interactions, arguably requiring lower levels of attention, patience, and empathy as face-to-face friendships. This can lead to perceiving the 'friend' as a source of information, part of the network, a "contact" rather than a person with whom one has a unique, reciprocal bond (Sharp, 2012; Bohórquez López & Rodríguez Cárdenas, 2015; Bosch et al., 2022).[9]

[9] For an argument defending social media as a platform for virtue friendship see (Elder 2014; Petricini 2022). Additionally, it is important to stress that, for some (e.g. neurodivergent persons or persons with social anxiety), intercorporeality may work against developing positive social experiences (Bortolan 2023; Osler and Zahavi 2023). In these cases, the affordances of online communication may actually provide the action possibilities for exercising social capacities.

Cultivating 'shallow friendship' rather than virtue friendship can usher in privative unflourishing in two ways: first, in the absence of virtue friendship. When social media affords insufficient exercise of the capacity for virtue friendship, this would lead to the absence of virtue friendships, which, on the perfectionist view, is robustly bad. Second, to the extent that social media restricts the cultivation of empathy, patience, and reciprocity, it might lead to insufficient exercise and cultivation of the social capacity involved in nurturing virtue friendships. This, on the perfectionist view, would be privatively bad, as it would be a manifestation of the impoverished social capacities.[10] The important point here is that social media affordances potentially threaten the development of the social capacity for friendship, not just the quality of friendships. This point is mostly overlooked in analyses of online friendships.

5.3 Social Media, Gamified Communication and the Capacity for Sociability

C. Thi Nguyen (2021) has recently called attention to the problem of gamification on the platform X (formerly Twitter) and other similar social media. Gamification is the application of game-playing elements like scores and competition to other areas of human activity. Twitter and other social media platforms gamify human communication by scoring users' communication and using clear, simplified, unambiguous ranking (popularity) rewards for communicative acts. This motivates users to focus on the scores rather than on engaging in morally sensitive and rich, complex, subtle interactions that characterizes ordinary communication. Nguyen argues that gamified communication "changes our communicative goals away from understanding, connection, and the collective pursuit of truth, and bends them towards something much more impoverished" (2021, 429). As such, Nguyen worries that Twitter and other gamified platforms that are score-driven and intentionally addictive-by-design, not only enable but encourage users to change the values inherent in human communication, that is, to adopt popularity scores as the goal of communication instead of the values of engagement, empathy, or depth of thought.

Analyzed within the four-part framework, these platforms afford score-driven communication, yet due to their addictiveness and pervasiveness, I argue that they create constraints on ordinary communication. The 'field of affordances' metaphor is useful here: in the field of affordances, some affordances stand out more than others (Bruineberg & Rietveld, 2014). In gamified communication, the platform invites posting for likes more than it invites subtle, rich and

[10] On the perfectionist view above, the badness of impoverishment is in that it is a waste of one's capacity, and that waste is bad. One may argue that, intuitively, what is bad about the absence of virtue friendship is precisely the absence of the good of virtue friendship (the output), and not the wasted capacity. In response, the perfectionist could argue first that the capacity for virtue friendship is constitutive of the output (a virtue friend). This is in line with the discussion earlier on, of how the output is dependent on the exercise of the capacity (e.g. being on the summit of Mt. Everest contributes to the valuable output of achievement when one actually climbs it, and not by being dropped off by a helicopter). Second, following Machek above, living a life devoid of pursuits such as virtue friendships can be regarded as a kind of waste.

diverse communication. To the extent that the platforms' affordances incentivize humans to change the nature of communication, they could arguably shape the way that humans will develop and exercise the capacity for sociability. In ordinary communication, the goals of discourse are diverse, rich, complex and subtle, and gamification threatens these goals (Nguyen, 2021, 411, 414, 420). Seen from the perspective of human capacities, in ordinary communication the capacity for sociability would require the ability to form, and respond to, rich, complex, subtle interaction, directed at the interlocutor. In gamified communication, however, exercising the capacity for sociability is oriented towards getting higher scores. Arguably, the value of the interlocutors, for the user, also changes: interlocutors might be perceived by the user more like score-awarding entities, rather than agents of intersubjective understanding, gift and exchange, communicability and community. This might lead to the degradation of the social capacity to view others as agents worthy of moral attention, especially given the proliferation of score-driven communication platforms.

Another useful metaphor is the 'shrinkage' of the field of affordances (Krueger, 2023): the narrowing of the range of affordances that is systematic, enduring and deeply entrenched within the platform, designed to accommodate certain kinds of activities but not others. In the current political economy of social media the shrinkage can be explained by top-down forces such as the corporates' financial interests, where the platform exerts far-reaching structuring effects upon agents that dwell in it, where the user's mind is "invaded" by a disabling techno-social structure (Slaby, 2016). This likely discourages the user's motivation to find ways to compensate for the shrinkage, precisely because the platform changes not only the nature of the activity (i.e. from ordinary communication to score-driven communication), but also the underlying values that persons ascribe to the activity.

Additionally, in engaging in score-driven communication, the user is maladapting their individual environment in a way that reduces their own well-being, but also that of others by maladapting the *social* environment (Coninx, 2023). The social maladaptation here is the degradation of the value of human communication, which could ultimately manifest in the impoverishment of the social capacities.

As such, gamified communication manifests the two types of privative unflourishing. First, gamified communication may lead to privative unflourishing as negative value. In gamified communication platforms, ordinary communication is stripped from its richness, subtlety and complexity, leaving a score-driven type of communication. This in turn creates an environment where the social capacity for communication is being exercised insufficiently, leading to negative output: the output is score-driven communication, which lacks richness, complexity, subtlety and morally attentiveness. This output has negative value, which therefore contributes to unflourishing.

Second, gamified communication may lead to privative unflourishing as impoverished capacities. Here the badness resides in the impoverishment of the social capacities and the wasted potential of these underutilized capacities. To the extent that the affordances of gamified communication change the nature of communication, they do so by impoverishing the capacities necessary for rich, subtle, complex and diverse communication. And according to the four-part framework, the

impoverishment of the social capacities is bad in itself, over and above the loss of the positive value that can be gained from ordinary communication.

It is worth noting that while Nguyen's analysis attributes the badness of gamified communication to the negative output—the degradation in our social values—the four-part framework adds another dimension to the normative evaluation of gamified communication: it highlights the role of the affordances in restricting the way humans develop and exercise their social capacities. By highlighting the affordances and the way they interact with the development and exercise of the social capacities, the four-part framework helps explain the two sources of badness in gamified communication: first, the badness in changing the value of social communication caused by the distortion of the social capacity to communicate. Second, the badness that resides in the impoverishment of the capacity itself—the restricting of the development and exercise of our social capacities.

5.4 Privative Unflourishing: Technology Affordances that Replace Capacity Exercise

The previous sections highlighted how technological affordances impoverish certain capacities. Yet affordances can lead to privative unflourishing in a different way as well: through technologies that do things *for us*. These technologies include things like delivery robots, self-driving cars, generative models like ChatGPT, and decision-making algorithms. They promise to replace certain human tasks or activities in the name of convenience or efficiency, but in the process might reduce the propensity to exercise certain human capacities. In this way, capacities that could have been used are degraded, leading to inactivity, and to loss of flourishing. In the following, I will look at two examples of such technologies. First, generative models like ChatGPT, which may lead to the impoverishment of the capacity to create by replacing certain constitutive activities involved in creative achievements. The second example is self-driving cars and delivery robots, that may lead to the impoverishment of the physical capacities by replacing certain mundane tasks that require bodily movement. Both types of technologies are still in their infancy or in early design stages. As such, the following analysis is speculative. Nevertheless, it offers a lens through which to evaluate the potential effect that these technologies may have on flourishing.

5.4.1 ChatGPT and Replacement of the Creative Capacity

ChatGPT—an AI tool for generating text—affords its user the ability to outsource some of the important components of the writing activity to the AI chatbot. Yet using ChatGPT to replace some of the constitutive components of the activity of writing may undermine the capacity to create. To the extent that the activity of writing requires exercising the capacity to create, using ChatGPT to produce a first draft, may undermine the capacity for creativity. "Your first draft isn't an unoriginal idea expressed clearly; it's an original idea expressed poorly, and it is accompanied by your amorphous dissatisfaction, your awareness of the distance between what it says and

what you want it to say. That's what directs you during rewriting, and that's one of the things lacking when you start with text generated by an A.I." (Chiang, 2023). The point here is that writing includes the activity of grappling with original ideas, through the activation of the capacity to create. To the extent that texts generated by AI reduce the propensity to develop original ideas through the activity of writing, extensive use of such tools may frustrate the capacity for creativity involved in writing.

On the perfectionist view, even if the generated text is of high quality, it would not contribute to the flourishing of the user. This is because on the four-part framework, for an output to have positive value, a capacity must be competently exercised in an activity that generates that output. A high-quality text that was generated by a chatbot does not involve the exercise of one's creative capacity, and as such it is of nil value to the user. Existing AI models create "uncurious creations", and therefore cannot satisfy the kind of agency condition required for creativity, namely curiosity—a motivation to pursue epistemic goods (Brainard, 2023). In this way, ChatGPT may function as a tool of 'harmful scaffolding'. Scaffolding is an external structure that changes the cognitive demands of a task (e.g. a calendar for remembering important dates). Scaffolding is harmful when it undermines the interests of the agent (Timms & Spurrett, 2023). If ChatGPT will turn out to reduce the motivation to pursue the epistemic goods of curiosity and creativity, it could be regarded as harmful scaffolding, that undermines the user's interest in developing and exercising their human capacity for creativity.

On the other hand, ChatGPT could turn out to afford certain activities involving creativity, in particular 'prompt-writing'. To write a prompt is to give the ChatGPT model an instruction or discussion topic for the model to respond to. ChatGPT could be "prompted with sections of early drafts or notes about a project to synthesize nascent ideas, suggest objections, develop lines of argument, raise related points, or highlight areas for clarification" in a way that constitutes the dialogic dimension of a creative task (Rodman, 2023, 17).

It is also possible that ChatGPT will invite creative activities for some persons, and will disafford creativity for others. Vincent Blok (2022) argues that human creativity is responsiveness to affordances in the environment, whereby some persons engage in creative activity in response to new affordances. Yet the motivation to create is in tension with the "metastable niche of human-technology relations that … makes one reluctant to engage in the unfamiliarity of new human-technology creation". Creativity therefore depends on deviating from the established world of familiar human-technology relations (p. 13). Applying this framing to ChatGPT suggests that the tool can either be part of a new affordance that deviates from the familiar, or a scaffolding for remaining within the familiar.

If we take seriously the commitment to ensure flourishing lives, then one normative implication is that technology ought to provide opportunities for positive affordances that encourage the development and exercise of capacities. As such we have reason to worry about generative tools that would disafford opportunities for creativity. Therefore, it is necessary to consider not only the technological tool itself, but the social environment it will be used within. For example, students might be pressured into using ChatGPT for writing their assignments, not out of laziness

but because they live in a society where failing academically means falling into economic precarity (Calarco, 2023). This would amount to privation as waste, when students would be otherwise motivated to exercise the capacity for creativity but are restricted from doing so due to their socio-economic situation. The important point here is that it is necessary to consider not only the affordances that the tool itself provides, but the political economy it operates in, and the norms that will be ingrained around it.

It is worth stressing that the worry here is not restricted to ChatGPT. Rather, the worry is that generative tools, including in visual arts and music, afford users the ability to outsource certain tasks to AI technologies, thereby replacing the human activity with a non-human activity. To the extent that the human activity involved in the creative process requires the exercise of the capacity for creativity in order to produce a valuable output, outsourcing that activity impoverishes the capacity by making it redundant. On the perfectionist view, this wasted capacity is robustly bad and would lead to unflourishing.

Determining whether ChatGPT (and other generative tools) will ultimately afford or disafford opportunities to exercise the creative capacity is beyond the scope of this paper. One would have to examine the extent to which ChatGPT outsources certain creative activities that constitute writing, and whether this would amount to a shrinking in the field of affordances for creativity. The point of the discussion above is more modest: to highlight the relationship between generative models, capacity exercise and potential human unflourishing, adding an important dimension to discussions on the ethics of ChatGPT and similar tools.

5.4.2 Mobility Technologies: Physical and Social Capacities

Technologies such as self-driving cars and delivery robots, on the face of it, offer the promise of convenience, relieving us from the stress of driving, or from having to run errands. More specifically, self-driving cars and delivery robots do away with activities such as driving or running errands, and with the capacities associated with them. On one hand, driving or running errands are in themselves value-less and as such, at first glance, their removal may actually contribute to more flourishing. A closer look, however, may reveal that self-driving cars and delivery robots may in fact contribute to unflourishing, by affording the ability to reduce or eliminate physical activity for carrying out mundane tasks. Consider the goal of getting from A to B using a self-driving car. Riding in a self-driving car achieves the goal of getting from A to B through the non-human activity of the self-driving machine, thereby doing away with the need to use those physical capacities that would be exercised in walking, cycling, or driving. In the four-part framework, since no capacity was exercised in the activity of getting from A to B, there is nil value derived from the activity. Yet this is not merely a privation of value. Rather, the exercise of physical capacities in the activities of walking and cycling creates positive value (O'mara 2019; Krizek, 2019) even when these capacities are exercised in mundane activities (Ferdman, 2019). There are growing indications that self-driving cars may replace active mobility modes like walking and cycling (Pettigrew, 2021), reinforcing

automobility (Wells, 2023) as evidenced by trends in the current transportation landscape (Schaller, 2021), in turn reinforcing sedentary lifestyles (Giles-Corti et al., 2016). The worry here is that technologies like self-driving cars and delivery robots will prioritize convenience over walking or cycling (Shatu & Kamruzzaman, 2022; Pettigrew et al., 2022). A growing dependence on these technologies for mundane tasks, might likely decrease the exercise of the physical capacities involved in mundane walking.

Importantly, self-driving cars require an infrastructure and an environment to operate efficiently: roads, dedicated lanes, sensors, monitors, signage, etc. To maintain safety, the interface with pedestrians must be minimized. The more self-driving cars come to dominate the urban fabric (Riggs et al., 2020), the more urban environments may become hostile to pedestrians and cyclists (Chapin et al., 2016; Piatkowski, 2018; Woodcock et al., 2019), reducing the propensity to walk. The environment that would cater to a self-driving, car-centered city might therefore create even more constraints on the exercise of the physical capacities, not only of the car's passengers, but of non-users (e.g. pedestrians) as well. The autonomous vehicle might usher in a new era replete with its own supporting infrastructure, repeating previous versions of car-oriented urban design that has segregated public space and marginalized pedestrians, where "as with Winner's observation of the longevity of Moses' public works in New York City,…the manner in which this infrastructure for autonomous vehicles is developed and the logics which it supports will dictate human behavior in the built environment long into the future" (Liu, 2018, 175–76). In addition, the opportunity for mundane walking might be minimized further by delivery robots' encroachment on and privatization of public space (e.g. sidewalks) and the imposition of "warehouse logic" onto public space (Marks, 2019). In the language of affordances, these automobility + warehouse logics may lead to a shrinkage in the field of affordances, manifested as a hostile environment for pedestrians, which could impoverish the physical capacities involved in everyday outdoors tasks, in turn leading to privative unflourishing.

Interestingly, the degradation of the physical capacity enacted in walking is not problematic merely because persons will be less physically active. Rather, the problem is that walking is an embodied activity that has multiple agential dimensions. For example, the activity of trust-building occurs in walking, where pedestrians co-create the social rules of the road by using non-verbal communication, making eye contact, or interpreting others' social gestures (Goffman, 1963). In walking, the environment affords the pedestrian the opportunity to shape and change their environment, whether (as Goffman indicates) by acknowledging and interacting with others, or by continuously organizing one's system of meaning and value of the environment by responding to the information it communicates to the pedestrian (Ferdman, 2023). This can be understood as an opportunity to participate in niche-building activity as an agent, rather than just being passively contained in one's space (Kukla, 2021). The upshot is that the *infrastructure* of technologies that replace human activity may reduce persons' opportunities to participate in niche-building activities in public space.

Further, self-driving cars may become containers for passive existence, restricting the opportunity to exercise cognitive, motivational and social capacities (Ferdman, 2022). A transportation environment in which ride-alone self-driving travel

becomes widespread (Ben-Dor et al., 2022; Schaller, 2021) may restrict the exercise of the social capacities. For one, in the driverless car, the rules are predetermined, removing the need to participate in co-creating the rules of the road. If a ride-alone driverless mobility becomes the dominant mode of transportation, the affordances of such an environment could restrict the exercise of social capacities while on the road (Ferdman, 2020). On a different vein, the capacity for morality might be restricted, as users will be shielded from interaction with other people, in contrast to active mobility modes like walking or cycling where persons inhabit the same space with others. If indeed ride-alone driverless transportation becomes prevalent, this could contribute to the impoverishment of the social capacities, thereby contributing to privative unflourishing.

All of the above does not deny that self-driving or autonomous delivery technology could be beneficial, for example by offering mobility opportunities for persons who cannot drive. The point is rather whether, as socio-technical systems, these technologies will extend or narrow the field of affordances for developing and exercising human capacities, and whether this is taken into account in the design not only of the machines themselves, but in the urban infrastructure where they will be deployed.

Generative models like ChatGPT and mobility technologies like self-driving cars are in their infancy, making it difficult to predict how they will affect the propensity to develop and exercise human capacities in practice. Nevertheless, the perfectionist four-part framework can help in anticipating whether technologies might usher in affordances that replace certain human activities like writing or walking with non-human activities. This could be useful in identifying the capacities associated with these activities, to reflect on whether the technology might impoverish these capacities and contribute to unflourishing.

6 Concluding Remarks

The four-part framework shows how certain technologies create affordances that may lead to the privation of flourishing, by creating environments that could lead to the underutilization of certain human capacities. I have argued that this underutilization may lead, due to technological affordances, to the impoverishment of these capacities. Yet this argument may face a potential objection, as follows. Suppose a certain technology affordance discourages the exercise of a certain capacity. Does it follow that this capacity won't be utilized in other contexts, thereby not leading to impoverishment and unflourishing? For example, that a person does not exercise their physical capacities because they prefer to use delivery robots does not mean that they never exercise their physical capacities at all. What if that person uses the time she saved on walking to errands to exercise at the gym? Or what about the person using ChatGPT thereby saving valuable time which they can spend on composing music or some other creative activity?

One possible response is that an activity may become a *practice*, thereby affecting the extent to which the capacity associated with it will be exercised in the long run. This will hold both on the individual level and on the societal level. Gamified

communication, as Nguyen worries, could alter the values of communication. This may have profound implications for communication: if gamified communication alters how we communicate, at a societal level, it would alter how we exercise the social capacities of communication. In other words, the activity of communication would be shaped by the affordances of social media platforms, thereby becoming the standard practice of communication. On a similar vein, the activity of summoning delivery robots and depending on door-to-door autonomous vehicles could become a practice that replaces active mobility modes like walking or cycling. A mobility infrastructure that would prioritize technologies like self-driving cars might transform the localized activity of summoning a self-driving car to a practice of depending on self-driving cars for mobility. Additionally, an environment catering to self-driving cars and delivery robots would require a material infrastructure such that creates a feedback loop: the less the environment affords the conditions for physical movement, the more persons may become dependent on digital solutions like 'work from home', consumer-goods delivery platforms and other such technologies, which in turn would reinforce the restrictions on active mobility.

That activities may become practices suggests that affordances may have a prominent role in affecting the prospects of flourishing. In the literature, the definition of affordance has to do with the relation between an agent and an action: "an action possibility formed by the relationship between an agent and its environment" (Nye & Silverman, 2012, 179). The present analysis suggests that affordances are also a *practice* possibility formed by sustained and repeated activity carried out by an agent in its environment. Thus an affordance can transform into emergent practices or habits, that determine the extent to which persons will develop and exercise their capacities. The worry is that these practices may lead to the impoverishment of human capacities, and the potential disappearance of these capacities if they are not routinely exercised, in turn contributing to human unflourishing.

Human flourishing ought to be an important consideration in how we approach technology and its design. This paper offers a framework which elucidates how technology, through its affordances, has a pervasive ability to shape the way that persons flourish, by shaping environments that affect how persons will develop and exercise their human capacities. The four-part framework that this paper offers—affordance-capacity-activity-output—adds to the understanding of the relationship between technology and flourishing in several ways. First, by adding the affordances to Bradford's tri-partite framework (capacity-activity-output), we may perceive of privative unflourishing not as localized incidents of missed opportunities for flourishing, but as a potentially impoverished life, which is robustly bad.

Furthermore, on the tri-partite framework, it is tempting to view an impoverished capacity as a personal vice. Take the capacity to will as illustrative. According to Shannon Vallor, living well with technology requires the cultivation of 'technomoral virtues', including the technomoral virtue of self-control: the ability to reliably align one's desires with the good and choose the goods that contribute most to one's present and future flourishing (Vallor, 2016, 123). On this view, one should cultivate self-control (the capacity to will) to overcome the multiple distractions that social media and other addictive-by-design technologies create. However, introducing the affordances as an additional component to the tri-partite

framework, helps clarify why cultivating self-control is insufficient to overcome the malaise of multiple distractions. The environment created by attention-grabbing technologies imposes restrictions on the ability to attend properly. This environment is designed as an "excessively narrow channeling of our cognitive and emotional investment down pathways that are structurally guaranteed to limit or prevent personal transformation" (Smith-Ruiu 2022, 38). In other words, the affordances inherent in attention-grabbing technologies create structural barriers on the potential to develop and exercise the capacity for willpower, and other capacities as well.

This is an important move as it points to the need to shift the focus from individual responsibility to a political philosophy which looks at the values underlying the institutions and political norms that shape the prospects of human flourishing. Seeing as technology and its affordances is a collective phenomenon, this requires a political philosophy to ascertain the corresponding collective responsibilities and the institutions to address them (Klenk & Sand, 2020).

Another dimension that the four-part framework adds is the category of privation. Approaching privation not merely as a lack of good outcome, but as a pervasive impoverishment of one's human capacities, brought about by unfavourable affordances, helps establish that such privation is not merely an absence of a good, but a robust bad. To the extent that technology's affordances systematically restrict persons' development and exercise of capacities, they not only create an absence of flourishing, but actively contribute to unflourishing at a societal level.

Finally, the four-part framework adds a normative dimension to the affordances discourse. The working definition of affordances, in the existing literature, is an action possibility, whereas the four-part framework embeds affordances within a process of output production via human capacity exercise. By linking how capacities are shaped by affordances, we can achieve a better understanding of the ethical implications of technology on human flourishing.

In closing, while this paper focused on the likely unflourishing that many technologies bring about, there is potentially much to discover on how technology could improve flourishing, by creating environments that actively encourage the development and exercise of human capacities. My hope is that this paper serves as a starting point for such future examinations.

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