Report from the EU H2020 Research and Innovation Project Artsformation:
Mobilising the Arts for an Inclusive Digital Transformation

The Role of the Arts in the Digital Transformation

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870726.

arts formation

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State-of-the-Art: The Role of the Arts in the Digital Transformation

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Suggested citation: Alacovska, A., Booth, P. and Fieseler, C. (2020) *The Role of the Arts in the Digital Transformation.* Artsformation Report Series, available at: (SSRN), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3715612

About Artsformation: Artsformation is a Horizon 2020 Research and Innovation project that explores the intersection between arts, society and technology Artsformation aims to understand, analyse, and promote the ways in which the arts can reinforce the social, cultural, economic, and political benefits of the digital transformation. Artsformation strives to support and be part of the process of making our communities resilient and adaptive in the 4th Industrial Revolution through research, innovation and applied artistic practice. To this end, the project organizes arts exhibitions, host artist assemblies, creates new artistic methods to impact the digital transformation positively and reviews the scholarly and practical state of the arts. The following report is one part of this ongoing effort.

For more information, please visit our website: www.artsformation.eu

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Executive Summary

The following report is part of a project entitled 'Mobilising the Arts for an Inclusive Digital Transformation' (hereafter referred to as *Artsformation*), funded by the European Union's Horizon 2020 Research and Innovation Programme. In this project we are investigating the potential of the arts to help transform our society to become more inclusive and sustainable in the context of a digitalized future. The ultimate aim is to develop arts-based methods capable of bringing together technologists, policymakers and stakeholders to deliberate on feasible ways of creating and implementing new technologies and business models.

The initial stage of this project involves a set of three literature reviews of the state of research on the following core topics related to the arts and digital transformation: the transformative potential of the arts and artists (this report); the interplay between the arts and enterprises (O'Dea, Alacovska, & Fieseler, 2020); and the socially engaged arts that give voice to stakeholder interests and needs (Andersen, Renza, Fieseler, Papadopoulos, & McDermott, 2020).

The current study proceeds with some preliminary thoughts on how the arts may instil or impede change for better or for worse, drawing parallels from previous thinking on transformation achieved through the arts with the current set of challenges our society faces as part of ongoing digital transformation. We propose a set of four interrelated mechanisms through which the arts are intertwined with processes of change, finding that the arts foster empathy and a notion of care while radically empowering imagination and bestowing capabilities to act on change. We then proceed to discuss these mechanisms in the light of digital transformation and put forward a set of proposals regarding the agency of the arts. These proposals will be empirically validated and leveraged in the subsequent field work and innovation phases of the project. This overview will conclude with some key findings as well as an outlook on critical questions for future research on the potential of the arts for empowering positive change in the context of digital transformation.

1. The Transformative Potential of the Arts: A Pharmacology of the Arts

The transformative potential of the arts has long been a topic of fierce contestation, philosophical speculation and scientific measurement (Belfiore and Bennett 2007). Philosophers, psychologists, sociologists and neuroscientists have all been intrigued by questions related to the agency of the arts. *What do the arts do? What is the influence of the arts on people's lives? How do the arts affect society? What is the social impact of the arts?* The answers to these questions are still open: evidence of the agency of the arts remains inconclusive and the efficacy of the arts to bring about change is still debated. With this review we take stock of the multiple, heterogeneous, and interdisciplinary ways in which the transformative effects of the arts, including their agentic, active and dynamic influences, have been theorized, discussed, measured and evaluated.

The arts have always been looked to in times of social, economic, and cultural upheaval. Social and political crises have sparked new artistic movements throughout history. The dadaist

and surrealist movements, for example, aimed at new ways of making sense of human existence after the First World War. The horrors of the Second World War and Auschwitz moved the arts resolutely in the direction of abstraction and the poetics of the absurd. The current covid-19 pandemic, a health catastrophe of planetary dimensions, has given rise to artists, artistic movements and artistic practices making upbeat and colourful coronavirus murals, paintings, and pastiche digital works to imbue our despondent daily existence with hope, to raise morale and ease isolation (Sayej 2020). Arts offer comfort in times of distress and disaster.

The current digital transformation constitutes another major social, cultural and economic shift triggered by technological advances such as smart technologies, artificial intelligence (AI), the Internet of things (IoT), and automation processes linking digital networks and data-tracking tools and algorithms (Park and Humphry 2019). Amidst this profound digital transformation, people are more likely to seek to make sense of their own positions and to look for guidance and consolation, not least in and through the arts (Swidler, 2001). At the same time, artists are harnessing the power of digital technologies such as artificial intelligence as mediums of expression in order to experiment with new genres and new techniques that raise critical questions about the future of humanity in the face of often black-boxed, inscrutable and unthinkable software operative mechanisms (e.g. Hito Steyerl, Holly Herdon, Krostoffer Ørum, and many others).

Figure 1: Hito Steyerl: Still from "How Not to be Seen: A Fucking Didactic", 2013 dismagazine.com

Digital transformation is bringing about a multitude of new opportunities for societies and organizations, including technologies that can support processes of democratization and the introduction of increasingly sophisticated forms of work-automatisation. With this transformation also come pitfalls, however, such as the exacerbation of existing inequalities and even the creation of new inequalities (Eubanks 2018; Park and Humphry 2019). Enabled by recent technological developments, our communications, movements, relationships, financial transactions, and interactions with governments all increasingly generate data that are used to profile and sort groups and individuals. Concerns about the type of digital society we are building include the following key issues, all of which threaten the sustainability of an equitable, just and transparent

digital future: the production of social control and surveillance capitalism (Schüll, 2016; Eubanks, 2018; Zuboff, 2019); the entrenchment of inequality and discrimination against already marginalized and vulnerable groups on the basis of their gender, race or social belonging (O'Neil 2016; Pasquale 2015); the engendering of new divides in data access, interpretation and representation (Boyd and Crawford 2012); the capturing of individuals' private data for corporate profit; and the automatisation of decision-making, thus outsourcing accountability and responsibility for actions to algorithms and technological solutionism (Greenfield 2013; Morozov 2013).

A range of initiatives have recently emerged in an urgent effort to make digital society more equitable, accessible, and accountable. Such initiatives span private, public and third sector domains and often take the variegated form of digital justice activism, data ethics protests, conferences, public debates, and public engagement experiments. On the basis of emerging and rapidly growing evidence, we propose that the arts can play an increasingly important role in raising awareness of the perils emanating from digital transformations as data activists and datatification policy-regulators mobilize the arts as a 'critical pedagogy' to build critical consciousness about the impact of new technologies on everyday technology use, data storage and data-driven remembering (Markham, 2020). At the same time, the arts not only help build critical capacities, capabilities and imaginations for devising alternative and potent solutions for tackling the malaise inflicted by digital technologies but also influence the shape and outlook of future digital technologies. We argue that the emphasis on the transformative role of the arts in the context of digital transformation is part of a long-standing lineage of thought that foregrounds the 'pharmacological' agency of both art and technologies insofar as historically the arts are inextricably related to advances in media and technology.

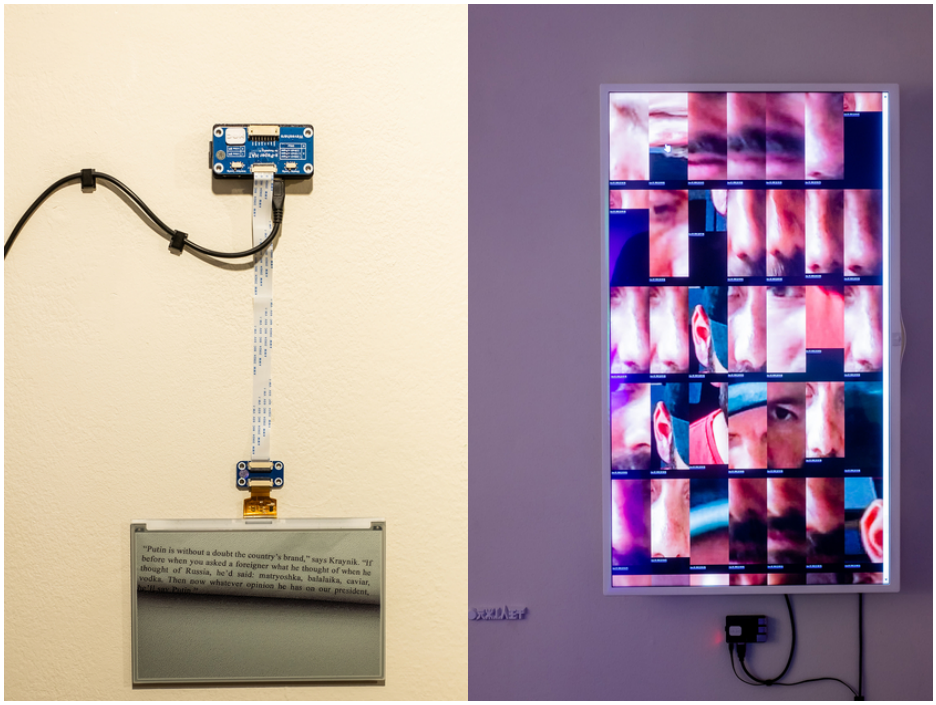

Figure 2: Kristoffer Ørum: "Putin's Nose", installation view, 2019, via http://kopenhagen.dk/artguide/single/article/putins-naese/

1.1 The arts as catalysts of enlightenment

The effects of the arts were classically encapsulated in the Aristotelian notion of *catharsis*. Although the precise definition of this term remains contested, catharsis remains a central concept in the history of human thought, and especially aesthetic theory, to capture the purgative and/or sublimating properties of art. For Aristotle, the spectacle of tragedy served to free people of fear and pity by transforming the aesthetic encounter with negative, dark, and despairing emotions into aesthetic exaltation. In this view the arts possess healthful and wholesome properties that lead to moral improvement and virtuous citizenship. Through aesthetic experience, it is argued, the arts serve to discharge negative emotions and enable the 'discharge of nervous energy', transforming them into a calming and 'delicate, transparent feeling of a breath of fresh air' (Vygotsky 1971).

In contrast to such positive views, the efficacy of art was theorized by members of the Frankfurt School as a double-edged and dialectical phenomenon (Adorno and Rabinbach 1975; Horkheimer and Adorno 2006; Marcuse 1979). Adorno, Marcuse and Horkheimer influentially and seminally conceptualised the efficacy of the arts as Janus-faced, coupling in unity the contrasting – i.e. healthful and harmful – effects of the arts. On the one hand, they argued, art enlightens by embodying a progressive orientation and emancipation via its aesthetic dimensions (Horkheimer and Adorno 2006), and on the other hand art, especially mass and popular art anaesthetizes and severs people's capacity for attentive, responsible and intelligent thought and action.

'Great' or 'authentic art' (Marcuse 1979) *elevates* the spirt, *stimulates* self-transcendence, *amplifies* sensory experience of the world, *enhances* imagination, *overthrows* dominant modes of thinking and perception and *overcomes* the status quo (Bourdieu 1996). 'True art', according to Adorno and Rabinbach (1975: 13 and 14), has historically 'always simultaneously raised a protest against the petrified relations under which [people] lived. Moreover, Adorno and Rabinbach (1975: 14) maintain that the arts must 'lead to changes for the better'. In an oft-cited quip, Marcuse famously pronounced that *'*art cannot change the world, but it can contribute to changing the consciousness and impulses of men and women who can change the world' (Marcuse 1979:32–33).

Later studies have set out to empirically demonstrate the wholesome effects of the arts. Dissanayake (1988/2015:18), for example, has contended that the arts have 'survival value', arguing that the arts have served humanity throughout evolution to adapt to a menacing and hostile world whose operative mechanisms were long inscrutable and opaque, in this way helping to secure reproductive success. In other words, according to Dissanayake, the arts are biologically evolved propensities of human nature. Burgeoning studies in psychology and neuroscience have also set out to ascertain and demonstrate experimentally *what the arts do to people.* These studies have shown the causal influence of the 'progressive' cognitive and neural impacts of experiencing art, demonstrating that the experience of awe and self-transcendence arising from encounters with art (usually defined as 'literary', high or authentic art) induces a range of beneficial and often long-term effects. For example, the arts have been shown to promote pro-social behavior (Stellar et al. 2018; Van de Vyver and Abrams 2018), to enhance empathetic attitudes (Bal and Veltkamp 2013; Kidd and Castano 2013) and to strengthen moral dispositions

(Greitemeyer 2011). (For a full overview of psychological studies of the impact of the arts, see Stamkou & Keltner, 2020). Such studies provide abundant evidence that engagement with the arts fosters prosocial co-operation and thus, by the same token, that the arts can provide vital stimulants for building an inclusive and sustainable society. Similarly, studies of the role of the arts within organisations (see O'Dea, Alacovska, & Fieseler, 2020) have argued that the arts can 'function as a creative injection in organisations' (Stenberg 2016:1) that reinvigorates critical, innovative and empathetic thinking, boosts workers' wellbeing and instigates teamwork and fruitful communications in the workplace (Biehl-Missal and Antal 2011).

On the other hand, the arts can also have detrimental and stalling effects, especially the popular arts disseminated via mass communication media such as radio and television. In this view, so-called 'trivial art' is anti-enlightenment, stalls progress and 'dumbifies': 'it impedes the development of autonomous, independent individuals who judge and decide consciously for themselves' (Adorno and Rabinbach 1975). 'Bad' art debases the human spirit, simplifies, infantilises, corrupts mental vitality, entices conformist and escapist behaviour, enslaves into passivity and produces a docile consciousness. According to Adorno and Rabinach (1975:15–18), untrue art has 'baneful social consequences', 'regressive effects' and is 'anything but harmless'.

With regard to the potential negative effects of the arts highlighted by members of the Frankfurt School, some scholars of media and communication studies have set out to investigate *what people do with media/artistic products,* adopting a positivistic approach by applying the 'uses and gratification theory'. Uses and gratification studies seek to understand in what ways media and cultural products are used by audiences and what specific needs the audiences tend to satisfy by media/cultural consumption. Such studies have shown the potential 'dumbing down effect' of media. People use mass media cultural products and resort to popular culture exclusively to fulfil specific pleasure-seeking needs such as escape from everyday stresses, relaxation, enjoyment and entertainment, etc., rather than for edification or enlightenment (Katz, Blumler, and Gurevitch 1973; Oliver and Raney 2011). Drawing on cultivation theory, which essentially maintains that extended exposure to audio/visual media, especially television, distorts viewers' perceptions of social reality over time (Gerbner 1998; Shrum 2017), scholars in recent decades have diagnosed the psychological, perceptual and cognitive disturbances caused by popular culture television genres such as crime and reality TV (Martins and Jensen 2014). These studies argue that protracted exposure to dramatic violence and aggression *cultivates* viewers' attitudes and their beliefs in 'a mean world', i.e. a world outside permeated with looming danger and imminent threats. Scholars have meticulously researched this 'mean world syndrome' and demonstrated that heavy television intake heightens depression, stress, anxiety, pessimism, anger, anguish and nightmares. (See Shanahan & Morgan, 1999, for a review of the 'mean world syndrome'.) In this view, moreover, a high intake of popular arts becomes addictive, entrapping the viewer in a vicious circle of pleasure and self-harm.

In contrast to such pathologising or even paranoid diagnoses of popular culture arts and their pernicious effects, Sedgwick (1997) has proposed there is an urgent need to acknowledge the 'reparative' motives of art and people's relation with art. Recognising these reparative effects privileges and cherishes the sensual, affective, amorous and joyous dimensions of the arts. In this view the arts not only destroy but are also able to repair a broken vision of the world and a wrecked history of humanity. A reparative reading gestures towards the possibility of existence

of a better world which is prefigured in art. Studies following the cultivation theory have also found that the enjoyment of media that portrays an optimistic version of the world contributes to the envisioning of a better and more just world. Challenging the prevalence of the 'mean world' syndrome, Appel (2008: 65), for example, has convincingly contended that fictional narratives are equally powerful for cultivating 'the belief that the real world is a just place'.

Pessimistic denunciations of the toxic and pathological – i.e. mind-numbing and gut-wrenching – properties of the arts have always been closely linked to changes in the technological means of communication and dissemination of the arts. The advent of the 'culture industry' based on technological innovations in the 'means of mechanical reproduction' (Benjamin 2008), above all on new audio-visual technologies, has most notoriously been accused of debasing the enlightening properties of the arts. Such condemnations have continued unabated in the face of emerging digital technologies. Fears, moral panics, and accusations of the noxious qualities of digital arts enabled and disseminated by digital technologies have surged with the advent of cheap, user-friendly, and now ubiquitous digital and algorithmic technologies (Bogost 2019). This alarm persists in spite of the fact that computer-generated art has been part of artists' expressive toolkits since the 1950s.

In line with reparative approaches to the popular arts, however, some scholars have called for a 'pharmacological' reading of the effects of digital technologies that recognises the cure is often found within the venom itself (Stiegler 2013). By this logic, even if digital transformations – including the ongoing shift to automated algorithmic governance and decision-making – have indeed damaged people's freedoms and privacy, dumbing down and reducing our capacity for purposeful attention, then it is arguable that these same digital technologies may contain the remedial substance required to regenerate and restore the catatonic conceptions of freedom, privacy, independence and equality that have become stupefied through their misuse. Stiegler (2010) clearly makes this case in arguing that the arts are best-positioned to provide the treatment for the pestilence bred by digital technologies precisely because the arts are inextricably linked with technological experimentation and the imaginative repurposing of technological tools – processes that activate the pharmacological valence of the arts.

In reviewing the ways in which the arts have been invested with high hopes as to their therapeutic, restorative and revitalising agency, we adopt and adapt Stiegler's 'pharmacological critique' and employ the metaphor of 'the arts as a pharmakon' furnishing remedies for the malignant aspects of digital transformation. This metaphor helps to capture some of the more starstruck enthusiasm with which the reparative and therapeutic functions of the arts has been greeted in recent discussions of the positive and beneficial effects of the arts in tackling festered and embittered societal, economic and health problems – including the malaise brought about by digital transformations.

1.2. The arts as a pharmakon

In the same tradition as Adorno's condemnation of the detrimental effects of art produced by the 'culture industry', Bernard Stiegler (2013) has called attention to the harmful effects of arts produced by the 'hyper-industry' of audiovisual and digital technologies. These products, Stieg-

ler claims, estrange us from 'authentic' aesthetic experiences, causing 'symbolic misery', impoverishing our consciousness, undermining our autonomy and exercising control over our minds. This 'symbolic misery' results in sickening conditions of disenchantment, leading people to lose sight of why life is worth living. Such disenchantment, Stiegler (Stiegler 2013:76) states: 'leads to liquidation of fidelity, friendship, love, *philia*, knowledge, art and letters, in a word, of what makes life worth living'. In this view the arts as mediated by proliferating audio-visual digitized symbols, such as homogeneous global electronic broadcasts, are bringing about a pernicious, historical-cultural banalization and degradation of the human spirit.

Nevertheless, Stiegler's (2010, 2013) recent reinterpretation of Adorno argues that the arts can also be a means of cultivating, improving and transforming the human condition, especially in the context of the disenchanted, disillusioned and despondent digital present. Arts possess the capacity to re-enchant the world and to contribute to making life worth living again. The arts thus have a restorative potential in addition to their harmful valence. Art re-enchants the world by keeping it on 'paths of transindividuation', involving the creation of relations, trust and fidelity, all of which comprise what Stiegler (2013) calls 'care'. A work of art does not only *mean* (signify, semioticize) but a work of art initiates 'new circuits', creating new 'transindividual' connections across the technological, environmental and human worlds. The arts thus provide care in the sense Stiegler (2010:178–79) means in stating that care involves the cultivation of and commitment to the idea that 'the better' must come: 'To take care, to cultivate, is to dedicate oneself to a cult, to believe there is something better.'

As such, the arts embody both the curative (relief) and the poisoning (toxic) valence of the pharmakon: they initiate and enact care but can also contribute to symbolic misery. According to Stiegler, an artwork is a pharmakon that furnishes meaning, sense-making capacities and value when positioned face to face with the disenchantment of the present. At the same time, by virtue of being an economic product of the 'hyper-industry' and the commercial art world, art itself also contributes paradoxically to disenchantment. As Lorna Collins (2014:219) puts it: 'art provides a care-full agency for making a difference in lieu of the ills caused by hyper-industry, marketing and consumer capitalism'. In this sense, according to Collins (p. 220), aesthetic experience becomes 'a method of making sense of the world' and thus, in this sense, offers the possibility of re-enchantment, acting as a medicine against the symbolic misery of a disenchanted world.

In this review, therefore, we adopt a pharmacological approach in our discussion of the agency, efficacy, and transformative potential of the arts. This is because the arts should not only be treated as a means of exposing, countering and negating the symbolic misery of the world, its toxic elements and vacuous nature, through subversion, deviation or revolutionary impulses (Marcuse 1979); rather, art should be acknowledged for its agentic dynamism, curative properties and restorative power as 'a therapeutics', concerned with 'the development of regulations for behaviour, how one lives with such difficulty' (Stiegler et al. 2012:172). Artistic objects are part of the creation of co-individuation technics of the self, or 'a therapeutics'. Through art, Stiegler argues, 'one must be able to work out the possibility of developing a remediation, of the development of remedies, in an extremely poisonous, extremely toxic context' (Stiegler et al. 2012:180). In other words, the pharmakon makes possible the recuperation of the long-

lost desire for the infinite (love, community, philia) that in turn could be the foundation for a restoration of social, economic and political life.

On the basis of our review we identify a four-pronged typology of the pharmacological agency or function of the arts in the face of societal challenges, including the challenges arising from digital transformation. The following four pharmacological implications of the arts are thus discussed: 1) the arts as therapy; 2) the arts as a means of re-enchantment; 3) the arts as a source of imagination; and 4) the arts as stimulators of human capabilities.

2. In the Art's Pharmacy: A Review of the Pharmacological Agency of the Arts

Although the wholesome and medicinal properties of the arts have long been celebrated ('The arts are good for you!'), some questions still remain open. These questions, we argue, are mostly related to the curative properties of the arts, and especially the still ambiguous (or mystified) operative principles of their pharmacological effects on the individual, communal and social body. How do artworks do things to people? How can we trace the pharmacological effects on 'the patient'? In what ways do artworks exercise their agency?

Figure 3: Damien Hirst: "Pharmacy", 1992, Tate, via www.tate.org.uk

2.1. Art's agency: how does art 'get in action'?

To begin to answer these questions we must first move away from an understanding of art as a communication system, vehicle of meaning or sense-making mechanism and approach it instead as 'a matter of doing' (Gell 1998:ix). In his seminal essay on *Relational Aesthetics*, Nicolas Bourriaud (2002) makes the case for the arts as active agents of change rather than as generators of vicarious utopian realities. According to Bourriaud (2002:13): 'the role of artworks is no longer to form imaginary and utopian realities, but to actually be ways of living and models of action within the existing real, whatever the scale chosen by the artist'.

Tracing the agentic pharmacological effects of the arts thus requires a focus on 'art in action' (DeNora 2000). Sociologists have long grappled with the question of 'art-as-agency' (De La Fuente, 2010, p.221) and how arts 'get in action' in social life (DeNora 2000). In doing so, some scholars have treated art as a mediator or agent that exercises influence over the recipient, variously defined as a person, a community or society, in this way treating the recipient as 'a patient', (Gell 1998). In this view the agency of artworks is traceable as a 'agent/patient relation' whose connection is reciprocal and shifting (Gell 1998:42).

As Alfred Gell (1998:23) has stated of artworks: 'They fascinate, compel, and entrap as well as delight the spectator. Their peculiarity, intransigence and oddness, is a key factor in their efficacy as social instruments'. By approaching artworks as mediators, it can be seen they have an 'affective efficacy' in the world (De La Fuente, 2010: 223) and thus have the capacity to inform real lines of social conduct and trajectories of behaviour. For example, DeNora (1997) has demonstrated how music can inform erotic conduct and Anderson (2006) has shown how music can shape a hopeful outlook on the world in recovering from distressing life events. Understood as a pharmakon (Stiegler (2010:17), moreover, works of art are capable of 'working': 'Works work […] by showing what [they] make us do'. Gomart and Hennion (1999) have gone a step further in defining the pharmacological potency of the arts when they influentially compared the impassionate love of music to drug addiction: like a drug, they argue (Gomart and Hennion 1999:221), music attaches people to itself, and such attachments lead to 'accepting that "external" forces take possession of the self; of being "under the influence" of something else; of bracketing away one's own control and will in order to be expelled or rendered "beside oneself".'

In these senses, then, the arts have the power to enchant. They are 'technologies of enchantment' (Gell 1992) that possess the capacity to dazzle, to beguile and to enthral recipients as if exercising a hypnotic influence. Artworks have the power of 'casting a spell over us so that we see the real world in an enchanted form' (Gell 1992:44). As such, according to Gell (1992), artworks can be used in 'psychological warfare'. By establishing the 'social efficacy' of Trobriand canoe art, for example, Gell (1992) shows how artworks can be used to demoralise and confuse opponents. However, artworks exercise agency not as a direct or immediate consequence of the visual, audible or tactile effects they produce (as documented by psychology-based studies of art's agency), but rather art 'achieves its purpose in a much more roundabout way' (Gell 1992:46). The agency of art is not in itself physical but is the result of expectations, understandings and definitions that have been inscribed in the artwork by social fields that imbue the artwork with quasi-magical agency. The artwork is enchanting because it has been enchanted: it

has long been cast as pharmacologically potent and as such fabricated to act as a distinct form of placebo whose 'real' pharmacological properties are forcefully assumed and viscerally felt but rarely subjected to critical (chemical!) scrutiny.

Figure 4: *Bill Viola: "The Dreamers", 2013. Video/Sound Installation, seven channels of colour High-Definition video on seven 65″ plasma displays mounted vertically on wall in darkened room; four channels stereo sound.*

2.2. A four-pronged typology of the pharmacological effects of the arts

In this review article we cover the most prevalent ways in which the arts have been treated as pharmacologically potent in the face of social and personal ills, distress, and fallout. This grouping of the pharmacological effects of the arts is a necessary exercise of simplification and generalization that artificially separates the outcomes of pharmacological actions that usually seamlessly overlap and happen simultaneously.

The first most dominant approach to the study of the pharmacological potency of the arts that we survey here is based on the assumption that *arts act as a therapy*. A large body of literature across academic disciplines focuses on the ways in which the arts across media provide 'transformative therapeutics' (Collins 2014). These studies focus their attention on empirical support for the various ways in which the arts reveal their pharmacological agency and act as a cure, both in a literal sense as art-based medication applied in clinical environments, i.e. art as a medicine in which the medicinal agent is art itself (McNiff 1992), as well as in a figurative sense of self-discovery, self-enhancement and self-empowerment, i.e. art as catharsis. Accordingly, our review of this approach surveys a variegated body of literature that has treated the arts as capable of furnishing the tools and practices for alleviating suffering, attenuating malaise and healing individuals (Collins 2014).

On the basis of this review we argue that art does not act by 'simply' restoring people to perfect health, but rather entails self-knowledge that in itself helps to heal by causing pain and discomfort. In this view, art reveals itself as a method of being in the world. As Lorna Collins has

said: 'Art can nurture a new way of being where existence is replenished and suffering is counter-actualized' (Collins 2014:6). We thus summarise the dominant modes in which the arts are taken to 're-enchant the world', recuperating the deficit of 'savoir-vivre' that has long been depleted under the pressure of detrimental capitalist and consumerist living and working conditions (Stiegler 2013:31). Philosophers such as Jane Bennett (2001) have pointed out the importance of such enchantment in restoring the vitality and ethical equilibrium of the human condition. For Bennett (2001:4), enchantment is predicated on the feeling of being 'struck and shaken', of wonder and disconcertion that arises from a clash between the mundane and familiar and the extraordinariness and unexpectedness of art. This feeling of awe, wonder and enchantment nurtures élan and ethical propensities to potentially make for a re-enchanted world (Holmberg and Ideland 2016; Stiegler 2013).

The second most dominant approach that we identified in the literature concerning the pharmacological potency of the arts treats the arts in terms of *care*. We thus survey the most seminal studies and ways in which art has been thematised as implicated in relationships of care and caring. Here the focus is also on art as an upshot of what (Stiegler 2013:42) has called the 'binding effect of the pharmakon' rather than on art as an individualising medicinal agency (as in the case of the arts seen as therapeutics). In this view the agency of art can be traced in practices of 'taking care' in and through art, a research procedure that entails sourcing the remedial and curative potential of the arts within specific troubled, ailing and indisposed communities (Rooke 2013).

The agency of the arts as care, according to Bernard Stiegler, manifests itself in initiating and perpetuating 'circuits of transindividuation' in which care for others and care for oneself are enmeshed, transcending psychic, collective and technical individuation. Care provides 'the feeling that life is *worth* living, that life is *worth the BLOW, the COUP,* of being lived" (Stiegler 2013:41), and hence the arts help people '*learn to live* pharmaco-logically, that is, normatively, affected and even *wounded*' by 'the pathogenetic content' of the world while not renouncing the reason that makes life worth the blow and the pain of being lived. This pharmacological conceptualisation of care takes the negativity of the present as a driver of a hopeful and relational engagement with the present (Bourriaud 2002). Here we explore a perspective which proposes that the participatory and community dynamics of relational aesthetics, social practice art and socially engaged arts projects can be understood as forms of affective solidarity and caring (Alacovska 2020). That is we explore arts-based practices of caring that serve as a pharmacological antidote to the toxic effects of a *careless* society and careless institutions that perpetuate exclusion, discrimination, destitution and suffering – effects that imbue daily life in so many neighbourhoods and communities. The remedial qualities of the arts as caring practices have been most consistently thematised in scholarly discussions about *participatory* or *social practice art*. Matarasso (2013:11), for example, critiques these practices as having been extolled by policymakers and artists themselves for 'addressing – or even servicing – the complex symptoms of a more and more unequal society'.

The third approach in the literature we identify and review treats art as '*an imagination laboratory*' (Holmberg and Ideland 2016). In this approach art is seen as manufacturing, concocting and proffering pharmacologically potent *imaginative solutions* to deadlocked, deep-seated and long-standing societal, organisational and technological problems. According to Holmberg

and Ideland (2016:448), for example, 'imagination laboratories' facilitate the unframing and rupturing of contemporary rationalities 'while they offer new crossings and attachments'. Approached as laboratories of imagination, the arts are hereby invested with high hopes and expectations that the outcomes of imaginative experimentation will synthesize and release the curative substance of the pharmakon. The arts as imaginative experimentations are thus celebrated for their potential to forge new, unexpected and alternative ways of thinking that disturb taken-for-granted and unreflective knowledge by initiating novel and unforeseen connections, in this way giving rise to enriched ethical considerations and fresh perspectives on innovation. We survey the ways in which the arts' pharmacological effects have been cast as amplifiers of imaginings of how better future worlds could be created, including in ethically-wrought organisational settings such as biomedical engineering, in socio-cultural settings afflicted by a crisis of imagination in the face of environmental disaster or antithetical social and cultural conditions of terror and suffering such as war.

Last but not least, the **fourth** approach identified and reviewed in our survey sees the pharmacological power of the arts – typically from a normative and prescriptive perspective – as stimulating our critical *capabilities to live a life well and to achieve collective wellbeing* as a critical precondition for citizenship 'in an interlocking world' (Nussbaum 1998). Art thus serves to 'cultivate humanity', in Martha Nussbaum's words, developing the 'citizen's imagination' of a life and form of collective organisation worth pursuing and thus promoting 'adequate civic perception' (Nussbaum 1998: 86): 'The arts cultivate capacities of judgement and sensitivity that can and should be expressed in the choices a citizen makes'. In this sub-section we thus survey the ways in which the pharmacological potency of the arts has been directed towards conserving and replenishing the possibility of democracy and 'good' civic life, usually through the cultivation of citizens' critical capacities (i.e. their capacity to question power and control) and sharpening their perceptions, including acquiring the perspective of others sympathetically and emphatically. Such cultivation is needed, it is argued (Jenkins, Peter-Lazaro, and Shresthova 2020), because 'civic imagination' consists of the capacity to conceptualise, conjure up and aspire to better political, social and economic worlds and in this way practise more sustained and impactful 'communal participation'.

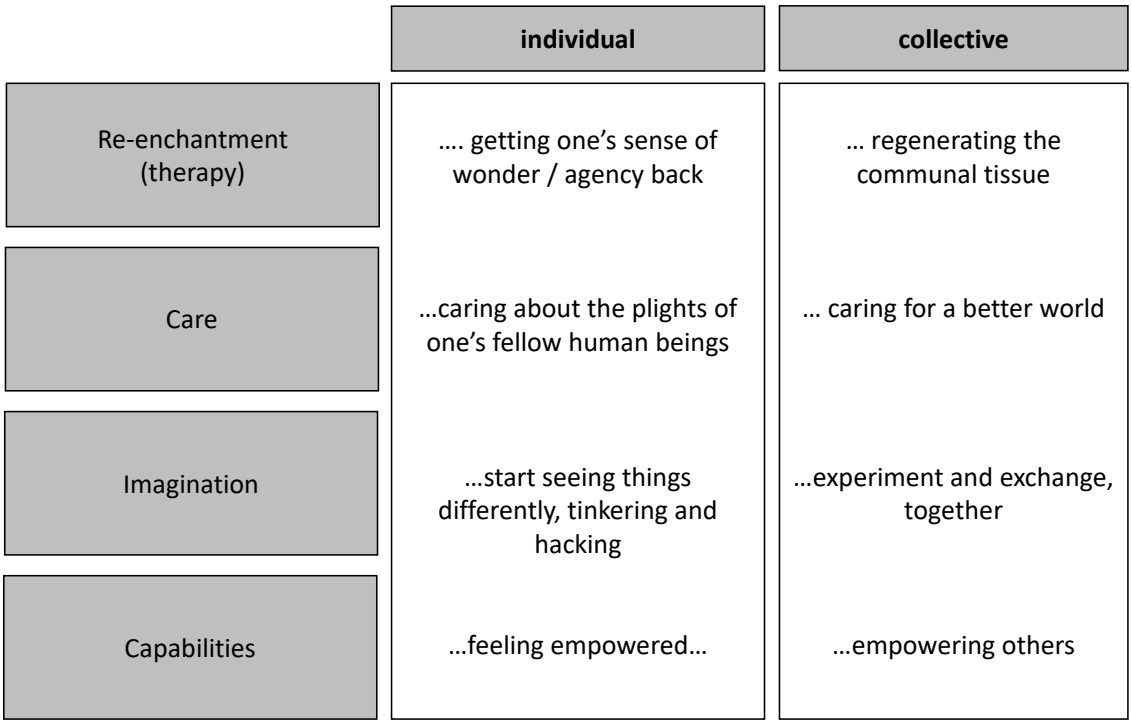

Figure 5: The pharmacology of the arts

2.3. Re-enchantment: the arts as healing and transformative therapeutics

According to aesthetic theory, aesthetic experience is transformative in that its transcendental property 'breaks in upon us' (Schwartz 2004:vii) as 'phenomena that exceed our intuition, and certainly exceed our conceptual control'. Aesthetic experience is thus associated with heightened awareness that leads to self-confrontation, enlightenment, cognitive development, and conflict resolution (Pelowski and Akiba 2011). Critical to any such transformation is the idea that aesthetic experience causes an individual to see something new and to question or recalibrate their existing conceptions of themselves and the world (Pelowski and Akiba 2011). This quality is connected to the ontology of the arts (Danto 1985; Pelowski and Akiba 2011) and their social role (Becker 1982).

A dominant view of aesthetic-related transformation is linked to Kant's notion of aesthetic judgement. Kant's (1987) 'Third Critique' extends aesthetics to include the feelings that accompany self-reflection on the internal cognitive process and the role of aesthetic objects in facilitating this reflection. By this extended definition, aesthetics is associated with forms of self-reflection and self-reference enacted through artistic works and practices. To attain such autonomous self-reflection requires enabling the 'free play' of the faculties, and thus detachment from the power of cognition or desire (Rancière 2006). While aesthetic experience is sometimes associated with detached sensory and cognitive pleasure (Fenner 1996) or an enjoyable 'evaluative dimension' (Shusterman 1997:30), other scholars have been critical of the idea that art can 'break in upon us' without the displeasure of disruption.

The American philosopher John Dewey maintained that aesthetic experience, far from being a matter of unalloyed joy, emerges from the disruption that occurs when an old habit or way of

thinking is redirected: 'Friction,' he stated, (Dewey 2005: 353) 'is as necessary to generate aesthetic energy as it is to supply the energy that drives machinery'. Taking up Dewey's challenge to the notion of detached aesthetic experience, Pelowski and Akiba (2011) have explored the psychological processes through which audiences have substantial transformative experiences with art and aesthetics. They find that art audiences, when confronted for long enough by an aesthetic experience that disrupts an existing schema of perception or understanding, often attempt to re-classify what is observed. A common response, for example, is to maintain that the artist or some other external source has made an error. Alternatively, the viewer may attempt cognitive withdrawal by leaving and blocking out dissonant stimuli. It is only where these resistant strategies fail or are bypassed that 'viewers may instead enter into a period of active experiential and expectational reassessment' (Pelowski and Akiba 2011:89). Such 'reassessment', it is argued, allows the individual to develop a new set of schemata that enables an understanding of previously discrepant elements. Understood as a transformative process that has a purposive or instrumental element, aesthetic experience is quite different to a disinterested 'art for art's sake' framing of aesthetics (Pelowski and Akiba 2011). Rather than being tied to a particular form of pleasure, the argument outlined above holds that the unique value of aesthetic experiences lies in its potential for cognitive reorganization.

Aesthetic experience leading to cognitive reorganization is not limited to art. According to McClelland (2005:56): 'Art is simply a refined expression or language exhibiting experience's aesthetic, manifesting our temporal movement as being capable of greater depths of meaning.' Moreover, because we often encounter art with some expectation of a transformative aesthetic therapeutics, it offers a setting for encountering cognitive dissonance where self-protection mechanisms may be more suppressed, and thus a setting where cognitive, mental and emotional transformation is more likely to be experienced.

Arts-based therapies in the form of arts therapy, bibliotherapy and creative writing have long been recognised by medical professionals as providing beneficial (healing) effects and alleviating the psychosomatic symptoms associated with emotional trauma and mental and physical pain (Camic 2008). There is evidence that engagement with artistic activities, either as an observer of the creative efforts of others or as an initiator of one's own creative efforts, can enhance one's moods, emotions and other psychological states (Stuckey and Nobel 2010). However, the evidence for the efficacy of such treatments remains contentious, at least by the standards of evidence commonly applied in other domains of clinical psychology. For the most part this evidential issue is a consequence of the elusive nature of the subject under investigation and the lack of any clear definition as to what precisely constitutes robust artistic intervention and therapy, though it also the result of suboptimal treatment of control conditions in related research (Leckey 2011). Nevertheless, there is a growing consensus that arts' healing and convalescing properties are very much context-dependent, at least in terms of what can and cannot be proven with concrete evidence.

The four creative therapies most commonly employed are visual arts therapy, music engagement, movement-based creative expression, and expressive writing (Stuckey and Nobel 2010). Accordingly, we first review the evidence found for the efficacy of these particular types of art therapy. Thereafter we highlight how another approach is to ascertain efficacy by treatment group and ailment.

Music Engagement. Music as a medium of art therapy has been widely researched, with an emphasis on the soothing capacity of music and its ability to offset overly technological approaches to care (Lane 2005; Stuckey and Nobel 2010). Music therapy has been shown to decrease anxiety (Rohner and Miller 1980), while the pleasure shared by engaging with music can help patients restore emotional balance (Gross and Swartz 1982). There is further evidence of the effectiveness of auditory stimulation as a strategy for achieving control over pain, together with a strong suggestion that such stimulation can diminish pain. (Melzack, Weisz, and Sprague 1963). Music can calm neural activity in the brain, which may lead to reductions in anxiety and may help to restore the effective functioning of the immune system, partly via the actions of the amygdala and hypothalamus (Stuckey and Nobel 2010).

Visual Arts. Visual expression can be a refuge from the intense emotions associated with illness (Collie, Bottorff, and Long 2006). The rationale for employing visual arts in treatment is to give form to experiences that are too difficult to put into words, such as a diagnosis of cancer. For instance, Erin Borgmann (2002) has recorded how individuals stricken with cancer explore the meanings of past, present and future during art therapy, thereby integrating cancer into their life-stories and giving it meaning. Visual self-expression contributes to the maintenance or reconstruction of a positive identity, and to making meaning of one's diagnosis (e.g. Guillemin 2004; McMurray and Schwartz-Mirman 2001; Reynolds and Prior 2003). Similarly, studies on the use of clay-sculpting for therapeutic purposes have explored its efficacy in the expression of grief and shown how tactile involvement at a somatic level, as well as through the facilitation of verbal communication, can serve to foreground previously subconscious thoughts and symbols (Sholt and Gavron 2006).

Movement-Based Creative Expression. Movement-based creative expression focuses on non-verbal and primarily physical forms of expression as psychotherapeutic or healing tools. Stress and anxiety can be relieved through dance and acting that involves controlled and aesthetic movements of mind and body, bringing other health benefits as well (Stuckey and Nobel 2010).

Expressive Writing. Studies have shown that individuals who have written about their own traumatic experiences exhibit statistically significant improvements relative to control group participants in various measures of physical health, including reductions in visits to physicians and better immune system functioning (Esterling et al. 1999; Mcardle and Byrt 2001). The expressive writing paradigm has generally produced positive results (Pennebaker 2006). Self-report studies suggest that writing about upsetting experiences produces long-term improvements in mood and health (Pennebaker 1997). Finding one's voice via poetic means can further be a healing process because it opens up opportunities for self-expression not otherwise felt to be attainable through everyday words or prose (Stuckey and Nobel 2010).

In reviews of previous research with adult populations undergoing art therapy, Maujean et al. (2014), Regev & Cohen-Yatziv (2018) and Slayton et al. (2010) have found different levels of efficacy according to the intervention groups. However, they have also called for more reliable case-control studies to draw more definite conclusions.

Of the studies reviewed, research specifically with *cancer patients* points to the effectiveness of short-term art therapy interventions in significantly improving the emotional state and perceived symptoms of patients. In the wider field of patients suffering *non-cancer related medical*

conditions, there is less evidence overall, and though predominately preliminary studies point towards the potential benefits of art therapy, they do so with less basis of proof. For patients suffering from *mental health conditions*, little robust evidence is available, specifically with regards to helping patients suffering from schizophrenia, and the literature is thus far not optimistic about the curative potential of art therapy for schizophrenia. In the domain of work-related stress reduction, however, a literature review by Huet (2015) points toward art therapy being beneficial for people working in stressful work environments. For *trauma victims*, evidence of the benefits of art therapy is sparse, though there are studies that point to some curative potential, such as witnessed in a reduction in the severity of trauma symptoms and a decrease in levels of depression in clients treated with art therapy. However, a review by Schouten et al. (2015) has criticised these research findings for their lack of control groups, limited sample sizes, and lack of control for alternative explanatory factors, which render the results obtained so far tentative at best. Research with *the elderly* has likewise so far been inconclusive, and though some minor effects of art therapy have been claimed, more rigorous testing is needed to declare their efficacy with more confidence. Research on *prison inmates*, meanwhile, suggests art therapy interventions can improve inmates' emotional states (Gussak, 2006).

***Figure 6**: A therapy program, HeRe We Arts, at the Cleveland Clinic Akron General helping adults with chronic illnesses explore the arts.*

2.4. Care: arts as a remedy for social, communal and neighbourhood ills

Several studies have found that the arts can play a transformative role by fostering 'community psychology', raising consciousness of community-relevant issues, and playing a pedagogical role by transferring knowledge.

Community psychology refers to the process by which people develop critical awareness of themselves and their social surroundings (Sonn and Baker 2016). This approach emphasises the development of partnerships with marginalised communities in order to leverage resources and co-create strategies to bring about positive individual and collective change in oppressive social environments (Sonn and Baker 2016). Community psychology, according to Martin-Baro (1994:41), "supposes that persons change in the process of changing their relations with the surrounding environment and, above all, with other people". Consciousness-raising and *conscientization*, i.e. the process of developing a critical awareness of one's social reality through reflection and action, are key transformative processes within the field of community psychology (Freire 1970; Sonn and Baker 2016). Epistemologies and methodologies from diverse disciplines, including Participation Action Research (PAR), are often employed to achieve conscientization and consciousness-raising outcomes (Sonn and Baker 2016).

Another method seen as important in achieving these outcomes is that of public pedagogical work engaged in by artists, cultural institutions, and community organizations (among others). Within this process, artists have the opportunity to play an important role in achieving individual, group and collective transformation. Firstly, they facilitate such transformation through their expertise in generating powerful narratives, metaphors, and images that can have a powerful pedagogical impact. Secondly, artists offer forms of public pedagogy that occur outside of traditional settings of schooling (Sonn and Baker 2016) that may be perceived, especially by marginalised groups, as being linked to existing social issues and injustices. Thirdly, artists bring a tradition of interruption, disturbance, and reconsideration to dominant and hegemonic stories that are often upheld by the acquired condition of collective indifference (Slee 2011; Sonn and Baker 2016). Fourthly, by creating channels for participation, dialogue and connection, the arts offer a particular kind of participatory practice that permits co-research, co-creation and social change (Madyaningrum and Sonn 2011; Sonn and Baker 2016). In this view the arts can function as a means for individuals and communities to *act on* the world, often through embodied means (Sonn and Baker 2016).

Related to the suggestion that art can reinvigorate community engagement, art practices captured under the label of 'relational aesthetics' are held to affect social change by shifting the concept of social change itself: moving away from a utopian agenda towards finding provisional solutions for the present (Bishop 2004; Bourriaud 2002). Rather than asking that we 'look at' an object, relational art is a practice concerned with producing and reflecting upon interrelations between people. As Bourriaud writes: "the general mechanisation of social functions gradually reduces the relational space" (Bourriaud 2002:15). In this context, Bourriaud (2002:45) claims: "It seems more pressing to invent possible relations with our neighbors in the present than to bet on happier tomorrows." In relational aesthetics the role of the artist is thus akin to that of a quasi-social worker seeking to reinvigorate social relations against the tide of mechanization and

to bring about social change in the process. Whilst Bourriaud's conception of relational aesthetics has been criticised on several fronts, a question critical to its transformative potential is whether it does much more than apply neo-liberalist commodification to the private and social realms (Downey 2007).

An important limitation on the ability of art to effect any degree of social transformation is the short-lived nature of much public exposure to art. An art object in a museum illustrates this point, for while we may be moved by the artwork and even have an aesthetic experience, a single exposure means any transformative effects on our schema might be ephemeral. In contrast, long-term individual and social change tends to occur where involvement is active and where the activity occurs over a longer period. Studies on the effects of music intervention have found that active and longer-term participation results in long-term change outcomes, while listening alone tends to produce only short-term changes (Bergh and Sloboda 2010).

Figure 7: *Mierle Laderman Ukeles: "Sanitation Celebrations: Grand Finale of the First NYC Art Parade, Part I: The Social Mirror", 1983. Garbage collection truck, tempered glass mirror, and acrylic mirror; 28 x 8 x 10 1⁄2 ft. Created in collaboration with DSNY. Courtesy of the Artist (via https://www.artpractical.com/feature/the-art-of-citizenship-mierle-laderman-ukeles-at-the-queens-museum/)*

2.5. Imagination: arts as laboratories of future better worlds

A milder variant on transformation through disruptive aesthetic experience is the transformation that occurs through the promotion of alternative knowledge and perceptions. By offering jolts or nudges to conventional knowledge, artists and artworks can be tools for triggering reflection, discussion and awareness of contemporary social issues (Duxbury 2010). In this view

art need not offer solutions or necessarily cause an individual's existing schema to be fundamentally disrupted, instead functioning as a proposition of 'another way of seeing'. Art can nevertheless be used to express and represent ideas, concepts and phenomena previously unseen, leading to open discussion of things we may not have dared to think or express, and serve towards the concrete formulation of questions that can help move society forward (Schneider 2016). Art often subjects the 'normal' to new associations, provocations, and irritations (Schneider 2016); and while this may not change the solutions we pursue, it does deepen our knowledge of our existing schema. Art often brings a human quality to what it proposes (Schneider 2016), moreover, thereby enabling alternative knowledge to emerge by reframing issues in human terms and offering alternatives for a more habitable future.

In addition to producing and disseminating alternative cognitive knowledge, art can be transformative via the evocation of physical or bodily modes of perception (Duxbury 2010). The concept of bodily knowledge emerges from a feminist critique of traditional epistemology's perceived exclusion of the role of subjectivity in the formation of knowledge (Parviainen 2002). Typified in the work of dancers, knowledge cannot be reduced to trained bodily skills or knowledge of how to perform certain movements; rather it is argued that there is an additional bodily-lived knowledge that the body itself addresses to the body as an object (Parviainen 2002). As a knowledge we all consciously but mostly unconsciously draw on, the enactment of bodily knowledge is not limited to the performer. If choreography is defined as 'all activities and events in which movement appears as meaningful interactions and relations between various agents' (Parviainen 2010:315), then artists and activists are able to combine choreography and the experience of bodily knowledge to 'create interactions between ordinary people, authorities, animals, urban or natural environments, vehicles, weapons and online media' (Parviainen 2010:324–25). As a tool of transformation, art-directed choreography of bodily knowledge has 'helped people articulate formless intuitions of which they have been barely aware, bringing them into a new light in our everyday lives' (Parviainen 2010:325).

Particularly where there is a pressing need for individuals to engage with social, technological and environmental issues, non-expert conceptualisations of ideas and experiences can be of significant value. With their expertise in the fields of conceptualising experiences and emotions, artists have significant potential to effect engagement and thus any social transformation that follows from such engagement (Duxbury 2010). Non-expert conceptualisations can be broadly categorised into three methods by which artists are able to effect transformation: mediation, revelation, and proximity.

Art can function as mediator of expert knowledge by transcending techno-speak and language barriers through its methods of non-verbal communication (Duxbury 2010). To the extent that artists are able to translate scientific knowledge and data into forms more broadly understandable, they can also facilitate alternative understandings of science and technology (Duxbury 2010).

Just as the famous *Earthrise* photograph taken by Apollo 8 astronaut William Anders of the Earth rising against the foreground of the Moon served to conceptualise the 'homeness' of our planet in a non-expert way, art has a revelatory quality that often transcends matters that only

experts are usually able to communicate. Amongst other art forms, photography can capture ideas and images that resonate well beyond the locality of their settings.

Particularly in relation to phenomena that are unpalatable to the general public and almost beyond human grasp, such as the scale and impact of climate change, the arts are held up as a possible way of conceptualising the unimaginable without alienating the public, and thus as a way of galvanising people to take action (Duxbury 2010). Curtis, Reid and Ballard (2012) have demonstrated the value of performing and visual arts in communicating complex scientific issues such as those related to ecological science. For example, it is claimed that the arts can produce an atmosphere conducive to community-building and community-mobilisation because they provide tools for alternative ways of thinking and stir people's emotions towards taking action on climate change. In this perspective the arts may be said to spark eco-care, inspiring a sense of responsibility for the protection and preservation of the natural environment. David Curtis (2009) has also emphasised the eco-care dimension of the arts, arguing forcefully that the arts foster 'empathy for ecological restoration' by creating 'chains of inspiration', finding that nearly all the respondents in his study, (i.e. conservation specialists and environmental activists) said they had been inspired by visual and performing arts in their activist work. Curtis (2011) thus emphasises the pharmacological properties of the arts in positively and beneficially influencing pro-environmental attitudes and raising people's awareness of impending ecological catastrophe. In relation to this claim a new genre of climate or environmental fiction that focuses on climate change has even been credited with the potential to resuscitate our waning imagination – especially in the West – of how to tackle the climate disaster and its consequences. Such climate fiction compels readers to imagine, vividly and viscerally, the often unimaginable dystopic conditions of a future lived in the shadow of environmental disaster (Schneider-Mayerson, 2018).

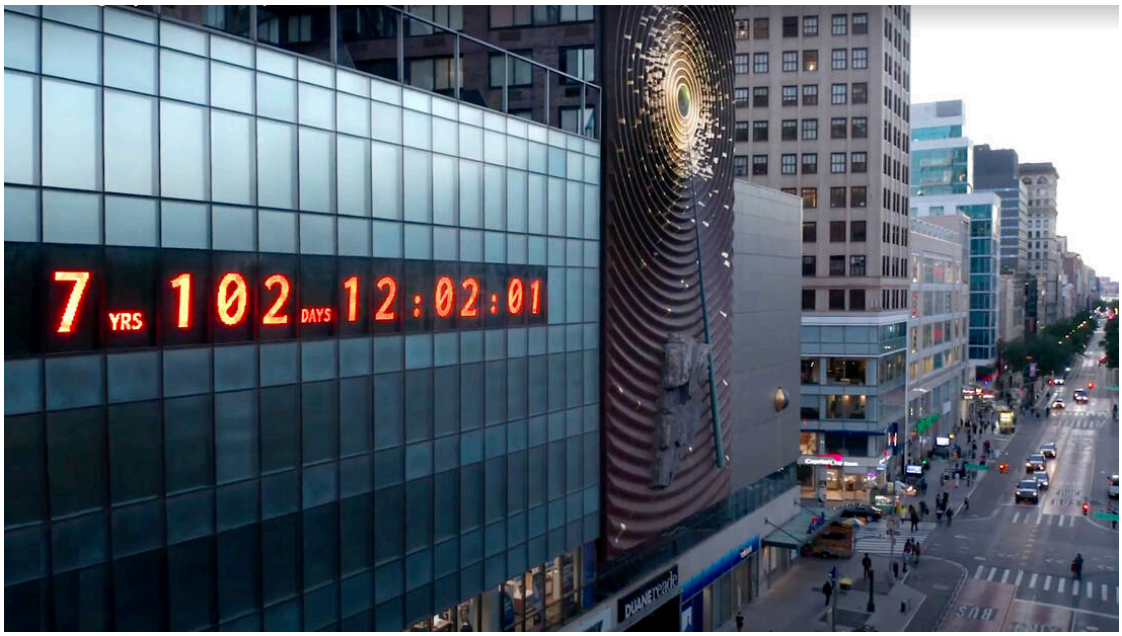

Figure 8: climateclock.world: Climate Clock, NY, 2020. Open source modifiable project that indicates the years left for humans to curb energy consumption so as not to exceed 1.5C.

2.6. Capabilities: the arts as a prescription for critical citizenship

In educational contexts in particular, the humanities and the arts have long been recognized as developing critical reasoning skills, empathetic thinking, a sense of history and an overview of the global political economy – skills and knowledge that are important to democratic citizenship (Nussbaum 2011). Rita Felski (2009), for example, argues that becoming a critical reader implies both an intellectual education, whereby the individual learns to approach common knowledge with scepticism and to read against the grain, and a sentimental education, whereby the reader learns to be detached and disenchanted from forms of language. Beyond formal educational settings, contemporary art often ask viewers to engage in independent, critical and creative thinking as an end in itself (Duxbury 2010). Critical contemporary art – and transgressive practices in particular – have a tradition of breaking taboos regarding the body, sexuality, religion, politics and other social conventions. When art encourages a degree of critical reflection in the viewer's own understanding, direct provocations of common knowledge and norms are often constructive (Schneider 2016). Wolfgang Schneider (2016) uses the term 'watch dog' to describe what artists do in identifying and communicating inhibitors of change through provocations.

The distrust of common knowledge characteristic of critical reasoning can be related to concepts of emancipation, empowerment and democratisation, while breaking dominant narratives opens greater opportunities for the marginalized to speak and position themselves within their own narratives (O'Neill 2008). Telling their own stories and generating their own meaning from lived experiences moves the marginalized and disempowered in the direction of emancipation and less unequal power relationships (Sonn and Baker 2016). The arts can thus play a role here by providing spaces and platforms for the expression of individuality, self-determination, and storytelling. Maggie O'Neill (2008) uses the term 'ethno-mimesis' to capture the practice of re-telling life narratives in artistic forms that capture the more sensuous meanings involved in the narration. For example, a health worker or a migrant could find ways of re-presenting their own stories via this kind of artistic collaboration.

Mirroring the finding that local icons generate more emotional connections than global icons, art's ability to capture the local and personalised and to relate this to the bigger picture means it may be better placed to stimulate engagement than de-personalised expert knowledge (Duxbury 2010). In many instances art does this by giving form to lived experiences. For example, O'Neill (2008) argues that art is able to convey the personalised lived experience of refugees by combining biographical narratives with artistic representations of migrants' experiences.

Performative arts practices offer scope for longer-term and participatory audience engagement and are thus also held to offer enhanced transformative potential. This is partly achieved through opportunities to enact critical resistance and draw attention to power imbalances in performances. As Norman Denzin (Denzin 2003:14) has stated: 'As pedagogical practices, performances make sites of oppression visible. In the process, they affirm an oppositional politics that reasserts the value of self-determination and mutual solidarity.'

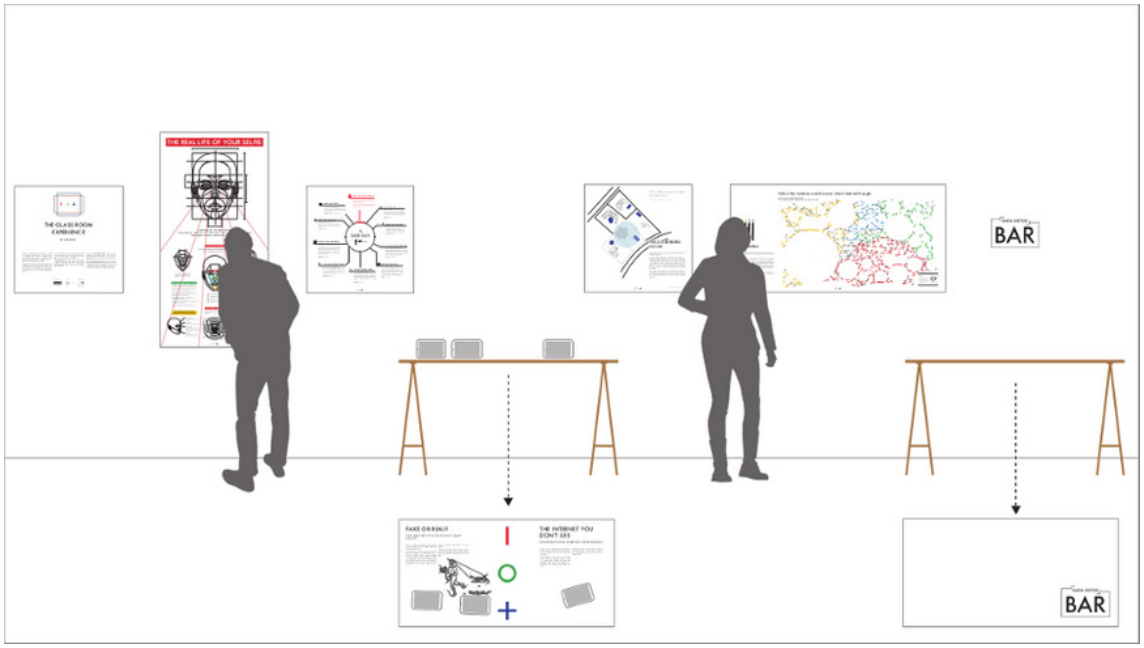

Figure 9: https://theglassroom.org/ describes itself as a public intervention that provides an interactive, fun, and challenging experience, bringing to life the most pressing challenges facing people and the tech industry today. The Zuckerberg House presents a model of the house owned by Facebook founder Mark Zuckerberg, which helps visitors understand what privacy means today and who can afford it.

3. Arts as a remedy and stimulus for digital transformations

How can the arts recuperate and restore ideals of privacy, freedom, equality, and independence that have been impaired, incapacitated and sedated by digital technologies and their powers of surveillance and discriminatory and attention-sapping logic? Equally, how can the arts enhance or accelerate the participatory, democratic, innovative, sublime, or even environmentally sustainable aspects of digital transformation?

As we have seen, Bernard Stiegler (2010) argues that digital technologies are both the cause of the misery of the present and potentially the means of salvation from its detrimental impacts. It is only through an artistic avant-garde who can repurpose and reclaim digital technologies that the technological world can be re-enchanted. In this view, technological innovation can only come about through artistic intervention: 'Only the digital itself, insofar as it can be a remedy, enables an affective struggle against the poison which it also is, and this is without doubt a key to the 21st century' (Stiegler 2010:19).

Surveying the methods, characteristics, and challenges of arts-based research in technology offers insights into the nature of art-based research, highlighting the methodological differences between technologists and scientists and identifying complementary and frictional aspects in the work of artists and technologists.

3.1. Digital re-enchantment

As of March 2020, the open-source web browser Firefox began offering its users a 'Facebook container' extension. The underlying logic behind this decision perhaps went something like this: we have come to rely on Facebook for our social and professional lives but we are uneasy about several aspects of how it operates, including the scope of data that Facebook collects and how it is commercially used; nevertheless, we begrudgingly accept its economic and political terms with a few added protective measures. This example broadly fits with the narrative of techno-social disenchantment described by Jane Bennett as follows:

> *There was once a time when Nature was purposive, God was active in the details of human affairs, human and other creatures were defined by a preexisting web of relations, social life was characterized by face-to-face relations, and political order took the form of organic community. Then, this premodern world gave way to forces of scientific and instrumental rationality, secularism, individualism, and the bureaucratic state – all of which, combined, disenchant the world*. (Bennett (2001:7)

In a context where society demonstrates little enchantment for digital technologies, or alternatively disenchantment, art can play a role in re-enchanting techno-social realities that otherwise may lack form, visibility, or concrete sites of activity. In simple terms, technological re-enchantment can mean recapturing a sense of wonder and mystery associated with the ways that humans and technologies interact. Indicating how the arts can do this, Duxbury (2010:297) writes that artworks 'can offer ways of imagining and encountering the world without conclusion', implying that the role of contemporary art is neither to cast judgements nor present utopian outcomes with respect to digital technologies but instead to use experimentation and exploration to present models of action within existing reality that have the potential to invoke a sense of wonder.

In relation to the potential of the arts to enchant it is relevant to ask whether the arts and artist need to be positioned at the forefront of technological development to have a role in shaping digital society (Jefferies 2016). This issue is problematised, however, by the fact that digital culture is expanding at such a rate that the arts are challenged to keep apace in integrating new activities and practices into the broader concept of the arts field (Jefferies 2016).

To respond to this challenge, it is useful to begin by mapping the range of positions on the meaning of artistic research. Henk Borgdorff (2013) draws an initial distinction between arts-based research that contributes to the development of a particular art form (i.e. art-based research about art) and arts-based research that contributes to the development of new products and to our understanding of the world beyond art (i.e. applied research). This is an important distinction because, as will be discussed later, arts as applied research is closer to the approach of technologists due to the more closed experimental system within which such research is undertaken. Reflecting the view that artistic research is a not a value-free term and that the term's usage is often related to specific needs of an artist, Scrivener and Clements (2016) provide a taxonomy of four perspectives on artistic research based on the contested issue of knowledge production: 1) art is not knowledge and therefore artistic research is different to artistic practice; 2) artistic practice may contribute to the acquisition and communication of knowledge, but art

does not arise as a consequence of these; 3) knowledge production can arise from art, just as art can arise from knowledge production; and 4) art is knowledge.

There is little to suggest that any specific perspective on artistic research in relation to knowledge dominates in relation to what artistic activities (or language) have the greatest potential for enchanting socio-technical relations. There are ample examples, however, of artworks effecting technological enchantment from practices that resemble traditional studio activities using existing and low-threshold technologies. As Beryl Graham (2016:174) has stated: 'Methods using ICT tools can be very powerful, but they only need to be powerful enough to answer a particular research question […] Sometimes, there is no need to re-invent a method when an off-the-shelf solution is available. Sometimes, all you need is a hammer.'

Christian Marclay's work *The Clock* serves as an example that artists do not need to be at the forefront of technological development in order to enchant. *The Clock* is a 24-hour long montage of scenes from film and television that references the specific times of day on which the film was shown throughout a 24-hour cycle. The installation, which is essentially a screening arranged to allow audiences to come and go, is a reflection on cinematic history, a narrative of the flow of a day, and a meditation on time as a technology (Jacques 2018). As Marclay writes: 'A lot of *The Clock* is about recognizing the film, or the actors' (Jacques 2018:8). Despite the comfort of recognition and the use of established technologies, however, the viewer is instilled with a sense of wonder as to how Marclay ever sourced the material to complete the film. On another level, too, there is a wonder that emerges from the notion that in the speed of the digital age we might ever have time or patience to sit through and absorb what the artist has created.

Figure 10: *Christian Marclay: "The Clock", 2010. MoMA.*

As well as enchanting, art can also serve to set up the necessary conditions for re-enchantment. One of the ways art does this is by showing us how to re-engage with issues that otherwise overwhelm us without any accompanying sense of wonderment. The challenge for artists in fulfilling this role, according to Duxbury (2010:297) 'is to alert populations to our desperately urgent circumstances without alienating them completely'. The art of the Danish-Icelandic artist Olafur Eliasson, known for artistic practices that encourage conversations about humans, technology, and the environment, illustrates this process in action. In *Ice Watch* (2014), for example, Eliasson placed twelve blocks of ice from Greenland in the public square in front of Copenhagen's City Hall as a none-too-subtle reminder of the ephemerality of ecological conditions we otherwise take for granted. In *Riverbed* (2014), the artist reconstructed a rock riverbed that audiences were invited to walk on, change, or even destroy, as a participatory reminder of our ecological footprint, including that left by the act of producing and consuming culture.

***Figure 11**: Olafur Eliassson: "Ice Watch", 2014. Image courtesy of artist's website.*

More modestly, artists intervene in technology and prompt engagement with it by exploring and communicating *responses* to contemporary technologies. Michelle Tillander captures this sentiment when she writes that

> While contemporary new media artists offer engaging insights on technology, we should encourage artworks by young people that creatively adjust to, explore, and illuminate responses to contemporary technologies. Their responses can creatively

> push and pull ideas while illustrating constraints and new possibilities created by those technologies in real world experiences. *(2011:45)*

Artist can enchant techno-social realities by giving technology a human quality. In the process, artists show that mystery and wonder is not the sole preserve of humans, gods and nature but can also be imbued in technology. How do artists do this? Billy Klüver , the founder of Experiments in Art and Technology (EAT), offers one explanation via a description of what happens when artists and engineers meet: 'The engineer expands his vision and gets involved with problems which are not the kind of rational problems that come up in his daily routine' (Candy, Edmonds, and Poltronieri 2017:7). For Klüver, art brings out consciousness in technology that is otherwise untapped (Candy et al. 2017). As part of Apple's 2011 launch of iPad 2, for example, Steve Jobs expressed an economic take on the value of making technology more human: 'Technology alone is not enough – it's technology married with liberal arts, married with the humanities, that yields us the result that makes our heart sing' (Dediu 2011:2). It is easy to interpret 'that which makes our heart sing' as what Kant termed 'adherent beauty' (Kant 1987:16), i.e. a form of beauty subjugated to the particular purpose that the type of good serves. While adherent beauty can make the heart sing, giving technology a human quality can be more potent. For Bell Labs, to make our hearts sing means moving beyond issues of speed and quality in audio, video and text towards developing technologies that capture and transmit emotion (Stinson 2018).

The development of such technologies is still at an early stage, but artists are collaborating with technologists to visualise how machines might respond to emotions captured by temperature, heartrate and facial gestures (Stinson 2018). On a much broader scale, the arts also employ more metaphorical means to give technology a human quality, and this is by no mean a recent phenomenon. Jean Tinguely's *Homage to New York* made in collaboration with Bell Labs in 1960 was of a non-functional machine sculpture that self-destructed before an audience in the sculpture garden of the Metropolitan Museum of Modern Art. Rather than being a critique of technology, the work imbued technology with three very human traits – playfulness, poetry and fragility (Goodyear 2004). A more recent example is Christian Mio Loclair's installation *Narsiss* from 2018. Utilizing Google's Tensorflow machine-learning technologies, in this work a camera looks into a mirror in a quest to make sense of itself. Even though we can only participate in this quest from the screen-based textual readout of the learning process, we can nevertheless empathise with a very human-like struggle taking place.

Figure 12: Christian Mio Loclair: "Narciss", 2018. Image courtesy of artist's website.

3.2. Care against technological carelessness

Contrary to art-market-savvy stories in the media of poorly treated studio assistants or the instrumental exploitation of artworks, and in spite of contemporary narratives of individualised project workers, or even older romantic notions of the artist's singular and highly individualistic vision, artists do in fact commonly engage in practices of care (Alacovska 2020; Alacovska and Bissonnette, 2019). As will be discussed below, by working with open-source technologies, being part of hacker or maker communities, acting as agents in building and strengthening participative communities, and using digital technologies to draw attention to more destructive elements of those tools, artists carry out a wide range of practices of care that have a potentially transformative impact on digital society.

Artists who act as technology hackers and practitioners of technological *détournement* often display an underlying reparative quality in their acts. Participation in and promotion of open-source technologies, for example, is a widely used method of disrupting the notion that technology implies private economic goods and the shortcomings of the economic logic that dominates so much of how society engages with digital technology. Although such practices are by no means limited to artists, Baker (2014:91) summarizes the view that the arts play an important role in developing and promoting the treatment of digital technologies as a commons good:

Musicians, artists, software developers and technologists have been making their own open-source tools and applications for their projects and performances for many years now. Digital art and technology festivals have been sponsoring 'hack' events for a few years, for artists and technologists to meet and develop ideas, skills and projects with only their laptops or DIY electronics kits, building something together by the end of the day.

Beryl Graham (2016) takes a more conservative view of the impact of the open-source ethos on the arts, suggesting that the method does not fully translate to areas other than software production. However, she notes that the use open-source technologies, whether in the form of software or as a method of production, reflects a methodology built into production. Both the development and usage of open source-technologies foster collaboration, power-sharing, and user-adaptability to different needs.

Connected to this ethos of openness, participation in and sharing of digital knowledge, artists have also been active in the emergence of 'maker' communities and spaces around the world that facilitate technology-oriented projects beyond traditional corporate and academic research environments (Baker 2014). Such spaces have been heralded as means of giving control over sociotechnical systems to a more diverse group of people and thus contributing to the democratization of technical production (Barba 2015). Maker collaborations have further been shown to increase innovation and to enhance and encourage creativity (Baker 2014). However, maker spaces and hack initiatives have also been criticised for lacking openness, with critics claiming the technology is not neutral, that social and technical problems are not really being solved by these initiatives and thus are not bringing about social change (Davies 2018; Troxler and Maxigas 2014). Sarah Davies (2018) argues that for ordinary non-expert participants, such maker and hacker activities achieve network and relational outcomes rather than political changes. Notwithstanding these criticisms, in the context of the dissolution of traditional collectives maker spaces can still serve the more modest function of resisting individualised modes of production and consumption (Alacovska 2020; Beck 2002).

A significant category of care practices fall into the broader grouping of socially engaged art. Socially engaged art comprises art practices that engage with specific groups of people whose social and cultural concerns are often geographically tied (Cartiere 2016; Olsen 2019). Socially engaged art can facilitate reflection on and potentially change 'taken-for-granted spatial orderings of the world' and 'provide alternative urban imaginaries that place in bold relief the constructible and destructible nature of social habits and urban structures alike' (Olsen 2019:986). In the context of socially engaged art, digital technologies may constitute constructed and politicised virtual spaces where social activity occurs (Zebracki 2017), offering virtual representations of contemporary or alternative but achievable future scenarios (Lefebvre 2003; Olsen 2019). Furthermore, digital technologies can serve as tools for mobilizing and amplifying messages and networks to produce action within and beyond specific communities (Olsen 2019; Schradie 2018).

When digital technologies are treated as a constructed and politicised virtual space, artists can use these technologies to reveal the constructedness of digital architectures, to bring associated injustices and contradictions to light, and to highlight what Garoian (2019) terms the 'disconnected-connectivity' of social media. As an example, in Amalia Ulman's 2014 work, *Excellences and Perfections*, the artist created an online persona and, without informing her followers, staged a three-part performance work on Instagram to raise questions about mechanisms in virtual space that reward or encourage particular representations of female gender. In the narrative she created, Ulman's online persona replicated the narrative of breakdown, apology and rescue that drives the 'attention economy' of Instagram and other social networking sites (Kinsey 2016).

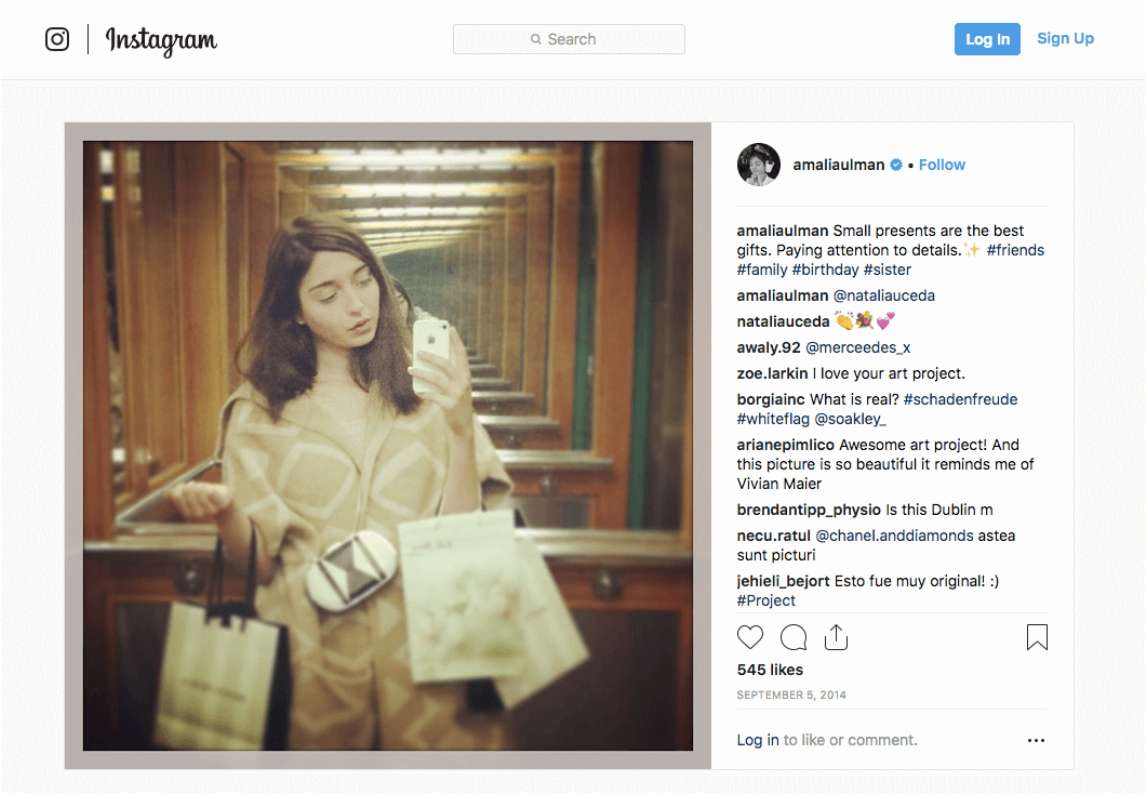

Figure 13: *Amalia Ulman: "Excellences and Perfections", 2014. Instagram Update, 5th September 2014.*

As the success of the gaming industry attests to, digital technologies are often employed to represent a range of interpretations of contemporary or future societies. Rather than transformation occurring through the achievement of consensual dialogue that emerges from the specific set of relations presented in the virtual sphere, however, Bishop (2004) argues that the transformative potential of digital technologies lies in the antagonism and conflict generated by exposing semblances of harmony. Illustrative of this type of socially engaged practice, Alejandro G. Iñárritu's work of 2017, *Carne y Arena (Virtually Present, Physically Invisible)*, uses virtual reality to give audiences the experience of crossing the desert from Mexico to the US while being hunted by US border patrol agents. In this work the technology creates an experience that disrupts the viewer's emotional distance, and perhaps narrative fatigue, to prompt reflections on our stance towards migration and how it is mediated by technologies.

3.3. In the imagination laboratory: creating a better technological world

Responding to both the challenges and opportunities of digital society, art's open experimental methods permit a freer and less constrained form of inquiry that validates play, provocation, non-conventional methods, nonsense, speculation, and both ethical and unethical responses. In their imaginatory laboratory, artists do not confine themselves to exploring innovative uses and misuses of technology but also reveal technology's hidden possibilities (Tillander 2011). From our survey of the literature it is clear that art's potential to transform digital society though imagination can be distilled down to its unencumbered free-thinking approach and its potential for generating tacit or practical knowledge.

To understand the potential of the arts for imaginatory interventions in digital society it is useful to revisit some of the key distinctions between the practices of artists and technologists in order to identify which aspects of their different approaches to research might align. On a basic and yet philosophical level, artists and technologists both typically work with something concrete with the ambition of transferring it into some yet to be realised potential (Borgdorff 2012). By incorporating qualities such as instability, intuition, serendipity and improvisation, Rheinberger, Bruno Latour, and Karin Knorr Cetina have demonstrated that scientific laboratory experiments can be far less method-based and embody qualities typically associated with artistic discovery (Borgdorff 2012:191). Nevertheless, there may be value in distinguishing between *technology* and *science*, given the sceptical stance long taken towards collaborations between art and science on account of a perception that the epistemologies underlying these fields are mutually incompatible. Billy Klüver perceived a clear delineation between technology and science, for while he regarded the theoretical nature of science as incompatible with the physical, humoristic, playful and nonsensical nature of art (Goodyear 2004; Kaprow and Klüver 1962), he saw the focus of engineering on manipulating technological materials as having a natural affinity with artistic activity. Describing Jasia Reichardt's early book on the subject of the computer in art, Candy, Edmonds and Poltronieri (2017:4) drew a similar conclusion: 'Sometimes it was hard to know who was the artist and who was the technologist, a distinction that was, perhaps, irrelevant in any case.'

Given this potential for a likeminded approach to research and discovery, how does art function as an 'imaginationary' or an imagination laboratory to contribute to the work of technologists and resulting technologies? The answer to this question rests in part on the proposition that art's unencumbered and free-thinking experimental approach is a key feature of how knowledge is generated. This proposition is based in turn on three assumptions. Firstly, it assumes that experimentation is central to artistic methods, i.e. in line with an epistemological understanding of art-based research, experimentality results from art's ability to open new perspectives (Borgdorff 2012; Schwab 2015). Secondly, this proposition implies that experiments act as generators of knowledge rather than vehicles to confirm or reject knowledge that is already theoretically grounded (Borgdorff 2012). Thirdly, it assumes that art is sufficiently free from the pull of established methodological procedures to ensure that whatever experimentation occurs will 'allow these indistinct things to come into view' since 'enough space must be present to produce what we do not yet know'. (Borgdorff 2012:190). A key facet of art's ability to generate knowledge in relation to technology thus lies in its differentiation from the more closed experimental systems of industrial production processes where outcomes are more likely to be anticipated and controlled (Schwab 2015). Once epistemic ideas and object have become stable, they become 'technical objects' for future controlled experimentation, or things to be commodified for financial or social benefit (Schwab 2015:122).

Not being held to the same rules or methodological traditions as technologists or scientists, artists can do what otherwise may be considered unacceptable in the former professions. This sentiment is echoed by Candy et al. (2017:123), who suggest that artists working within a digital medium can 'push the limits beyond what is seen as acceptable with that medium", and that they "may ask the kinds of questions specialists wouldn't raise'. This quality can be illustrated in the artist Fré Ilgen's account of his experience working with an expert in virtual reality systems:

He tried to persuade me to use four walls. I said "Get rid of all that. Let's start with a black hole!" The expert thought that without walls, I would lose my sense of direction. You don't. Who cares about gravity in virtual reality? *(Candy et al. 2017:123)*

For this very reason it is not unheard of for artists to be included in R&D departments in large organisations through residencies and other arrangements in the hope that they will act as catalysts for innovation and provide novel, aesthetic, and critical approaches to technological innovation and development (Baker 2014). When successful, such collaborations also offer non-artists exposure to the kind of non-rational problems that engineers, technologists and scientists do not typically encounter (Candy et al. 2017). In the best instances, the non-artists thus expand their vision and become committed to a 'fascinating technological problem that nobody else would have raised' (Candy et al. 2017:7).

In addition to its open experimental quality, art-based research offers the potential for tacit, practical knowledge that is materially grounded. Put simply, this is the outcome of arts non-discursive quality and the materiality concerns underlying many artists' practices. The artist Chuck Close captures this sentiment, for example, when reflecting on his own artistic concerns:

Things very much came out of the idea that the way to liberate yourself from the conventions and traditions of the past was to find a material that didn't have historic usage and see what it would do. What does rubber do? What does lead do? You wouldn't have wanted to use bronze, you wouldn't have wanted to use any traditional art material when the idea was to find a process and go with it. *(Storr 1998:88)*

In the context of interactions with technologists, artists are able to utilise this particular approach to knowledge-creation to offer scientists, engineers and designers "opportunities to experiment with and test materials and practices in contexts and conditions they might not encounter in their everyday work", and in this way, (Harvie 2013:38) argues: "Not only can they address different audiences, therefore, they might also make new discoveries."

As a more conventional example of how artists materialise digital technologies, Janis Jefferies (2016) has described a research project on 'Textile Transmission and Translation' in which she and other artists worked with scientists to create clothing and which became a catalyst and filter for retrieving biological data. In another work, Heather Dewey-Hagborg's *Stranger Visions* (2012–2014) used digital technologies to analyse DNA from found cigarette-butts that was subsequently combined with face-generating software and 3-D printing to materialise the data captured. Christiane Paul (2015) describes the rise of artists working with 'neomateriality', a concept that captures 'the confluence and convergence of digital technologies in various materialities; and second, the ways in which this merger has changed our relationship with these materialities and our representation as subjects' (Paul 2015:2). Artists working with neomateriality counter the idea that the digital implies dematerialization by asserting that code is the medium (Dufva and Dufva 2019; Paul 2015). Even if only to draw attention to the 'thing' lurking behind the digital interface, art's materially grounded interest has the potential to alter our relation to the digital.

Artists' imaginative interventions in technology settings also run a high risk of failure. With their training and expertise oriented towards providing efficient and economical solutions to problems, technologists who have no knowledge of artistic practice can make poor collaborators

with the arts (Candy et al. 2017). Likewise, artists can be unwelcoming of technologists' concerns for efficiency constraints in the experimentation process or of premature solutions offered to a problems only perceived by the technologist (Candy et al. 2017). Furthermore, both artists and technologists come from traditions that champion individualism and strong will – qualities that can hinder collaboration when each sits on different 'methodological sides' of the research fence (Candy et al. 2017). Other barriers to collaboration include perceptions of power imbalances that prevent effective idea-sharing. As Camille Baker (2014:92) has observed: 'Artists don't like environments in which they are an afterthought, getting a pat on the back for making technology or science look pretty; and technologists don't appreciate being brought into creative projects just as technicians'.

3.4. Technological capabilities: enhancing digital citizenship

By nudging, educating, calling for and enabling forms of social participation, art's ability to enhance digital citizenship has transformative potential. As will be discussed below, however, the literature also points to the importance of power structures and their transparency in determining the success of artistic interventions in society.

Art has the potential to make subtle but meaningful interventions to advance conventional knowledge about digital society. Rather than achieving this through the disruptive shock of aesthetic experience, Lucy Lippard argues that this comes about through subtler incursions:

> *Artists cannot change the world […] alone. But when they make a concerted effort, they collaborate with life itself. Working with and between other disciplines and audiences, and given the chance to be seriously considered outside the rather narrow world of art, they can offer visual jolts and subtle nudges to conventional knowledge. (Lippard 2007:6)*

The impact of these subtle interventions are enhanced by art's ability to communicate with large audiences through a combination of artists' capacities to synthesize and convey complex scientific information, linking messages with emotional response, and art's often celebratory quality (Curtis et al. 2012).

At least two important issues arise when art takes on an interventionist role. Firstly, art and artists risk being accused of propaganda if their artistic activities show overtly political or socially reformist intent. Secondly, it is almost impossible to trace the causal links between art's nudges and how we think and feel and how this impacts political engagement or behaviour (Bunting 2010, cited in Doyle, 2018, p. 154). Responding to these challenges, art may have the greatest social impact when existing works are reinterpreted through the lens of political or social issues or when art is inspired by such issues without obviously serving as an instrumental message (Doyle 2018).

Film, which spans both art and entertainment, provides ample examples of artistic practices able to make subtle interventions that both alter and reaffirm conventional knowledge about digital society. When released in 2005, Miranda Joly's *Me and You and Everyone We Know* brought audience attention to loneliness and relational dysfunctionality in the digital age, and these issues have become more generally recognised in the years since the film's release. As

another example, although Spike Jonze's *Her* (2013) was not novel in depicting themes of emotional and romantic human-machine dependence the film did serve as a timely nudge towards greater consciousness of emotional attachment to digital technologies in the era of handheld devices and now Apple's Siri and Amazon's Alexa. Film and television's critical and educative role in digital society is not an automatic outcome of the medium, however, and can just as easily function to deactivate critical evaluation among audiences. The television series *SKAM Austin* (2018–2019) provides a particular example of such uncritical 'art', with its plot structured around the parallel coming-of-age narratives of a group of high-school students whose social media screens are central to their difficult but always interesting lives. Rather than penetrating deeper critical aspects of digital society, the show's producer, Facebook, invites viewers to supplement their entertainment experience by connecting with the characters on Facebook's Instagram while consuming the series.

Art further has the potential to effect social transformation by acting as a pathway to engagement with technological issues. As a vehicle for communication and participation, art can function as an alternative to educational or industrial routes to engagement in science and engineering (Harvie 2013:43). It has further been argued that art can offer a holistic view of the social and ethical issues surrounding technology, that it can help convert knowledge into meaning, and that communities can play a participatory role in ITC policy and social outcomes through ICT-enabled communication channels (Baker 2014).

Using a related concept they term 'digi-grapsing', Dufva and Dufva (2019) provide insights into some of the ways art can assist in creating embodied meaning. With an emphasis on technology sense-making over knowledge, Dufva and Dufva (2019:21) define digi-grasping as 'skills that cannot be measured in terms of the more common digital talents, such as code skills, software skills or electronic skills'. Noting that technical knowledge does not necessarily assist in understanding the wider impacts of technology, they also describe digi-grasping as 'a concept for thinking about and analysing the embodied experience of digitality' (2019:23). In their view the arts can play an important role in digi-grasping by enabling the reclamation of agency in the interfaces between the physical and the digital. 'Creative coding', a form of computer programming where the aim is expression rather than functionality and where digital technology becomes the artistic medium, is cited as an example of how art can facilitate a more embodied experience of the digital.

'Delegated art practices' are artistic activities in which a typically unremunerated audience is required to engage, negotiate and collaborate as a co-producer in the artwork (Harvie 2013). These practices have the potential to cultivate awareness about social interaction and hierarchies (Harvie 2013), including those mediated by digital technologies. Social media, in particular, has become an important tool for generating and communicating delegated and socially engaged art practices. Since 2010, crowdsourced exhibitions and artist 'takeovers' of museum social media accounts have attempted to draw attention to the hierarchical control of who and what gets seen and heard in heritage institutions, thereby possibly exposing the shortcomings of the so-called 'participatory turn' in museology and the arts more generally. Artists such as Spencer Tunik have employed social media in recruiting participants for artworks, in his case for photographs of large-scale collective nudity. Less visible than the work of celebrity artists but no less significant are what Hansson (2015) terms 'agents', meaning a particular type of artist that

embraces digital and social media with a view to developing networked and collective processes, collaboration, control over their own narrative, and a degree of independence over art's traditional power structures.

Despite enthusiasm for the use of digital tools in collaboration with art to provide a 'platform' for social engagement in digital society, these practices have also attracted criticism for often offering only simulated or false participation (Gillespie 2013). The term 'platform' embraced by digital corporate giants invokes a raised stage, i.e. a space for articulating one's beliefs or stance – an egalitarian arrangement and a place for plain speak (Gillespie 2013). Against this rhetoric, the profound role that digital architecture plays in shaping and filtering users and communities is often overlooked (Van Dijck 2009), meaning the scope for participation is highly moderated and easily overstated. For similar reasons, the role played by digital technologies in what is termed the 'participatory turn' in museology has also been criticised as being mythic and yet to be adequately substantiated (Kidd 2016).

4. The way forward

4.1. Summarizing the transformative potential of the arts

This review has surveyed the dominant processes and actions by which the arts can effect degrees of social transformation. With an eye to the role the arts might play in shaping our digitized future, emphasis has been placed on the past achievements and future potential of the arts in transforming society in the context of digital technology.

In the following table we summarize the major transformative arts processes and actions in relation to technology:

Pharmakon (cure)	Mode of arts-in-action	Agent (the transformed)	Transformation
Re-enchantment (therapy)	Aesthetics that enchant	Arts audiences	Cognitive reorganisation
	Enchantment via human qualities	Technology users	Illuminating (quasi) consciousness of technology
	Aesthetics that reengage	Arts audiences	Reengage with urgent circumstances
	Communicating responses to technology	Artist, arts audiences	Illustrate constraints and new possibilities, personal responses to technologies
	Arts-based therapies (ills related to digital-society)	Health and trauma sufferers, the elderly, prison inmates	Decreased anxiety, pain relief, maintenance or development of a positive identity, grief management, stress and anxiety relief
Care	Conscientization and public pedagogies	Marginalized and disempowered communities	Critical awareness, consciousness-raising, participation, co-research
	Relational aesthetics	Art audiences	(Re)development of social relations
	Participatory practices	Arts and non-arts audiences	Agency, long-term change outcomes

	Arts as hacking, making, and open-source technologies	Arts participants	Common goods, innovation, collectivised production and consumption, social relations, collaboration, power-sharing, agency
	Socially engaged arts	Arts participants	Alter taken-for-granted spatial or knowledge orderings
	(Self-revelatory) digital arts	Arts and non-arts audiences	Exposure of digital power structures and mediating logics
Imagination	Arts producing and disseminating alternative knowledge	Broader society	Discuss the difficulties of expressing and giving a concrete formulation of socially progressive questions, reframing important issues in human terms
	Arts as an 'imaginationary laboratory'	Technologists, broader society	Generate 'knowledge' beyond closed experimental systems, push the limits of a medium, catalyse innovation, raising non-rational problems
	Arts as producer of tacit or practical knowledge	Technologists, broader society	Materialise otherwise hidden properties of digital technologies
	Arts evocation of bodily ways of perception	Arts audiences	Articulation of formless intuitions
	Non-expert conceptualisations	Broader society	Mediation of expert knowledge, reveal difficult concepts, non-alienating conceptualisation of the unimaginable, awareness-raising
Capabilities	Arts demanding critical thinking	Broader cultural consumers	Critical reasoning skills, taboo-breaking, self-reflection, identify inhibitors of change,
	Arts as alternative education	Arts participants	Alternative routes to engagement in science and engineering, 'digi-grasping'
	Ethno-mimesis	Artist, participants	Self-determination, agency
	Delegated arts practices	Arts participants	Awareness of the mitigating effects of digital technologies, collaborative practices, agency

Table 1: Arts in action: major transformative effects of the arts on digital society

Having surveyed some of the important mechanisms by which the arts' transformative powers are realised, and recognizing that we are at an early review stage in this *Artsformation* project, we conclude by reflecting on the immediately identifiable challenges to the potential role of the arts in transforming today's digital society into a more inclusive and sustainable society.

4.2. Challenges to enacting the transformative potential of the arts

Policymakers, corporate leaders, and social services are inclined to embrace, celebrate and extoll the curative pole of the *pharmakon* of the arts. As our review has shown, the arts have been prescribed for the treatment of a wide range of symptoms and have long been cast as a cure-all for a plethora of problems, including societal ills, psychological torment, urban decline and community malaise. Artistic interventions in ailing communities, imagination-deficient companies

and devastated neighbourhoods have proliferated in recent decades (Harvie 2013). Feminist theorists have also argued for the 'reparative potential' of the arts that can be prophylactically deployed to 'heal' profoundly painful experiences of difference, outsiderness and exclusion. Putting the arts to reparative ends in these ways, it is claimed, forges attachments of love, solidarity, affection and gratitude (as opposed to rejection, subversion and disruption proselytised as the beneficial effects of the arts in the dominant Adornian tradition of the Frankfurt School (see Sedgwick 1997; Wiegman 2014).

However, the destructive pole of the pharmakon is often excluded from these discussions of the reparative potential of art. Berthoud and Elderkin (2013) have even captured the sometimes absurdly high hopes placed in bibliotherapy, for example, in their now classic book The Novel Cure: An A-Z of Literary Remedies, proposing self-mockingly patented self-medication methods for a host of social and personal ailments, ranging from 'impotence' to 'fear of motorways'. As Matarasso and Landry (1999:18–19) have contended, perhaps 'we are not yet so ready to acknowledge that art may be used to celebrate and inspire, or to exclude and indoctrinate. […] Good science may be used to bad ends: good art may equally be used to promote anti-democratic values.'

These ambivalences lead to a second challenge regarding the potential transformative potential of the arts: *Why should arts professionals want their art to fulfil a specific interventionist role?* One answer to this question is that artists already commonly engage in practices of care (Alacovska 2020; Alacovska and Bissonnette, 2019). Donna Ladkin (2011) even suggests that the skills essential to moral perception, i.e. of seeing both what *is* and what *isn't* there, are closely related to the core artistic processes of 'seeing afresh'. Artists and arts mediators could also be incentivised to apply their disciplines in an interventionist manner.

Aside from any intrinsic and structural motives for art to take up the societal challenge of working towards a more inclusive and sustainable digitized future, moral responsibility is *not* a necessary condition of art (Bishop 2006). Furthermore, there are numerous logics and processes of consecration within the varied subfields of the arts (Bourdieu 1993), and depending on the particular subfield in which an arts professional is positioned, any artistic activities that display overtly political or social intent may be labelled as uninteresting or propaganda, either of which may cause reputational damage (Doyle 2018). Art that adheres to a more narrowly defined intent, moreover, can also lack the open experimental quality that contributes to art's uniqueness. In addition to diminishing the arts, the loss of this quality limits the transformative 'toolkit' at artists' disposal. Responding to the erosion of the arts by ascribing art a direct interventionist aim has negative aesthetic consequences, argues Bishop (2006:179), since in 'Reducing art to statistical information about target audiences and "performance indicators," the government prioritizes social effect over considerations of artistic quality'. Thus even though we can identity the processes by which the arts effect transformation, the important challenge is what to do with this knowledge in order to ensure it can be of real use to the arts, artist and other interested parties.

Taking a meta-view of the literature surveyed, several further challenges emerge. One of these is that the transformative potential of the arts is typically advocated by those with an

existing stake in the field, such as artists, aestheticians, arts sociologists, and those with an existing interest in the arts. Although this is not surprising, since research is usually driven by interest, the transformative potential of the arts has little profile beyond the arts apart from a small number of studies emerging from the fields of psychology, technology, and business. This potentially reflects a deeper lack of awareness, uncertainty or even scepticism among 'outsiders' about using the arts for transformative effect. Better knowledge of which of these explanations holds true will be of value in formulating a response for the arts.

Another theme emerging from closer investigation of the various projects discussed in the literature surveyed is that arts projects have a high rate of failure, depending of course on how success is defined. On the one hand such a rate of 'failure' is representative of the arts' experimental quality; indeed a successful project might be one that pushes boundaries (creative, material, relational boundaries, etc.) to such an extent that a level of failure is a likely and even acceptable outcome. On the other hand, such 'failure' is reflective of the level of expertise, experience, intuition and sometimes sheer luck required to put art successfully into action. While we have taken some first steps here to identify processes by which the arts can effect social transformation, we are challenged by the question of whether a more precise characterisation of these processes would make them any easier to successfully put in action.

4.2. Future steps

Based on the findings of this report and the key challenges identified above, the following future steps are recommended, grouped according to two related themes:

- Firstly, *empirical confirmation* of our initial findings could involve further desk-based research supplemented by interviews with artists and stakeholders to provide further empirical support for the modes of art-in-action identified in the literature. This process may lead to the identification of new modes of art-in-action or further refinement of existing modes.
- Secondly, a *mapping activity* would provide more nuanced information on the findings of our literature review. A mapping of arts initiatives related to digital transformation could be based on some or all of the following criteria: i) relationships among agents; ii) modes of art in action; iii) incentive structures, including artistic mechanisms of consecration; and iv) the positive and negative effects of arts initiatives.

It is proposed that these steps, together with the report of our findings, be undertaken in *Artsformation* Task 2.2: *Mapping the Arts in the digital transformation*.

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