Instrumental Reason and Environmental Justice. On epistemological injustice and the entangled domination of humans and nature

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Abstract: This contribution starts with the observation that instrumental reason structures several institutions that are today at the foreground to solve the entangled ecological and social crises but are at the same time said to have produced environmental injustices. In a discussion of critiques of instrumental reason in the tradition of the Frankfurt School the case of this paper is to show that instrumental reason not only involves a domination of inner and outer nature by humans. Drawing upon intersections of decolonial, feminist and ecocentric critiques, it argues that instrumental reason is epistemologically grounded on the devaluing of and separation from racialised and gendered bodies. Instrumental reason therefore incorporates a generalisation of a particular cosmology that relies upon a dualist worldview, the idea of an autonomous subject and the claim for a totalising objectivity – simultaneously marginalising more convivial forms of relating. In contradiction to efforts for environmental justice, instrumental reason remains not neutral but implies multiple epistemological injustices and an entangled domination of humans and nature.

Introduction

Global struggles for environmental justice have stressed that the current environmental crises are undergird by social structures of domination. In order to overcome conditions that are both unethical and dysfunctional for a convivial life in this cosmos, plural and collective efforts to understand the logics that uphold these conditions are essential. This contribution starts with the observation that one of such logics has been that of instrumental reason, organising multiple social institutions that are intimately linked to environmental injustices. Instrumental reason, as emphasised by a long tradition of European critical theory, discards negotiations on ends and sets the focus on finding suitable means to given ends. In capitalism for instance instrumental reason involves the ethical essence of relations, normalising the exploitation and commodification of humans and nature (Lukács 1922). Bureaucracy, as the "institutionalisation" of instrumental reason has rationalised the domination of human and non-human subjects through hierarchical control and fixed categorisation (Allen 2017; Bauman 1989). In science and technology, instrumental reason signifies the objectification of natural and social aspects, detaching an idea of progress from its moral values (Marcuse 1964). Movements and scholarship of environmental justice have highlighted that these institutions, and with them instrumental reason, shape relations between human and non-human subjects until today. By conceptually and practically connecting struggles for social justice and environmental concerns, they have highlighted that mechanisms of capitalism, bureaucracy, science and technology have not only historically been involved in the production of the current socio-ecological crises. They remain contested as they are equally part of dominant solu-

tions proposed to solve the same crises. Understanding instrumental reason therefore is relevant to perspectives of environmental justice as instrumental reason has been involved in producing socio-ecological atrocities while equally forming approaches for socio-ecological transformation. Past examinations of socio-ecological implications of instrumental reason largely drew upon a tradition of Eurocentric critical theory. While acknowledging their valuable contributions, I will consequently argue that they have missed to explain central aspects that define the relation of instrumental reason and environmental justice.

With the following considerations I attempt to contribute to a better understanding of the relationship between instrumental reason and environmental justice. I centrally ask whether or how instrumental reason is compatible with environmental justices. Aiming to bridge discourses on environmental justice and instrumental reason, this contribution is consequently guided by two connecting quests: How can a perspective of environmental justice contribute to a better understanding of instrumental reason? And how can such specified critique of instrumental reason contribute to knowledge practices for environmental justice? Following this path, I firstly formulate what I mean by environmental justice. Drawing upon decolonial and feminist perspectives on environmental justice, I understand environmental justice as the serving of context specific capabilities that relies on three pre-conditions: the tackling of historically rooted inequalities, the recognition of plural epistemologies and the overcoming of oppressive relations between subjects. I then examine existing work on instrumental reason with special regard of environmental issues, notably re-evaluating contemporary scholarship that draws upon the legacy of Horkheimer and Adorno, Marcuse and Habermas. While their valuable works differently highlight the domination of humans over nature and humans in instrumental reason, they largely miss to shed light on the marginalisation of plural epistemologies. Since this arguably has to do with the Eurocentric and male-centred outlook of their theories, I turn to decolonial and feminist critiques to contextualise the epistemological roots of instrumental reason. Acknowledging its entanglements with colonial and patriarchal epistemologies stresses that instrumental reason relies upon hierarchically dualist conception of the world, the idea of an autonomous subject and the conviction of a totalising objectivity. This eventually unveils that instrumental reason not only produces an objectification of humans and nature, but also their generalisation – essentially based in the construction of, devaluation of and division from an "other". Historically this "other" has not only been nature, but also racialised, gendered and proletarised humans. I conclude by outlining implications for environmental justice, putting an emphasis on epistemological injustice and exchange valuation implied in instrumental reason.

Environmental Justice

Shaped by a long and globally diverse history of struggles against the entanglements of environmental destruction and social oppression under the colonial expansion of capitalism, the framework of environmental justice evolved in protests by Black and Latino communities against hazardous pollution in the United States of America during the 1980s. They pointed at the unequal distribution of environmental burdens which racialised groups had been disproportionately exposed to. In the coming years, the phenomenon that environmental movements in the Global North had missed to consider was coined as "environmental racism" by activists, later captured in studies (see United Church of Christ 1987; US General Accounting Office 1983) as well as in a formative congress, the First National People of Color Environmental Leadership Summit under the term "environmental justice" (Bryant and Mohai 1992; Bullard et al. 2007). The concept of environmental justice subsequently experienced a wide dissemination in movements around the world

(Martinez-Alier et al. 2016; Perez et al. 2015) as well as a thorough theorisation. It soon not only signified the "unequal distribution of environmental degradation along class, racial, cultural and gender divides" (Álvarez & Coolsaet 2020, 4-5), but became a more general reference to the "conceptual connections and causal relationships between environmental issues and social justice" (Figueroa & Mills 2008, 427). In reference to theoretical considerations on justice by Fraser (1995; 2008) and Young (2011), a three-dimensional concept of environmental justice popularised, expanding questions of distribution by those of recognition and participation (Schlosberg 2007). Distributive justice is commonly seen as the equitable sharing of environmental risks and access to environmental goods (Kaswan 2021). Recognitional justice is often framed under the respect of lived realities by all relevant actors, notably its legal affirmation by governing entities like the state (Colsaet & Néron 2021; Whyte 2017). Participative justice, sometimes also termed representational or procedural justice, mostly means the equitable access to partaking in decision making processes (Bell & Carrick 2017; Suiseeya 2021). In reference to Sen (1999) and Nussbaum (2000), the three dimensions have soon been expanded by a fourth dimension, capabilities. Sometimes framed as an overarching aspect, justice as the realisation of capabilities usually puts a focus on the conditions for the achievement of collective and individual well-being (Holland 2021; Day 2017). While these conceptions of environmental justice have steadily globalised and applied in academia and social movements, this paper starts from several of their shortcomings that have been increasingly addressed.

Common conceptions of distributional justice have been critiqued from decolonial and feminist perspectives as they ignore the oppression that happens before distribution (Gaard 2017; MacGregor et al. 2020; Temper 2019, 97-99). Álvarez and Coolsaet for instance stress that "distributive equity implies that nature can be objectified, exploited and turned into a distributable good, a conception challenged by relational modes of life" (2020, 7-8). Indigenous struggles for instance mark segregating conceptions of property between subjects as incompatible with a functioning co-existence (McGregor et al. 2020; Temper 2019, 106). Rather, in reference to post-extractivist struggles, environmental justice here would mean much less the "distribution of risks and impacts," but [...] the right to live 'in relation to one another and the natural world in nondominating and nonexplotative terms'" (Coulthard 2014, 13 in Álvarez & Coolsaet 2020, 8). This point is intimately linked to a critique of unconditional meanings of recognitional justice. According to scholars and activist engaging in indigenous environmental justice struggles, the particular forms of relating must be recognised beyond an integration into the dominant system, such as the state. As a precondition, different epistemologies must be acknowledged in their own terms (Vermeylen 2019). This again requires a form of "critical knowledge production" (Svarstad & Benjaminsen 2020, 6) and epistemological justice (Temper 2019, 106-107), transcending colonial and patriarchal hierarchies between ways of knowing the world. Such liberatory process would allow for subjects to engage in a "re-valorisation of one's mode of life" (Álvarez & Coolsaet 2020, 12). As a further point of critique, the necessity for "self-recognition" as well as the investigation of social power structures has said to be missing in elaborations on questions of participation (ibid, 15). Further, some scholars highlight that participation and representation in a narrow sense miss the point of self-determination, stressing the necessity of self-governance or radical democracy as an essence of procedural justice (Temper 2019, 104). The question of power eventually also penetrates the dimension of capabilities, where not only the historically grown power structures outside of groups remain as conditions to well-being, but also those between individuals within groups (Pulido & de Lara 2018; Rodríguez & Inturias 2018). Eventually several scholars stress the context specific, subjective sense of justice (Álvarez & Coolsaet 2020, 12; Svarstad & Benjaminsen 2020, 4-5). Many authors thus advocate to refrain from perceiving environmental justice as a singular frame-

work, but to allow for plural environmental justices (Martin et al. 2020, 27).

For my subsequent analysis of instrumental reason, I draw upon a framework of environmental justice that is based in these decolonial and feminist critiques of the more commonly used four dimensions. As a first overarching dimension the focus on capabilities remains important here. Environmental justice as the realisation of capabilities must always centre the context specific conceptions of well-being and the particular conditions in which the capabilities to realise it are grounded – for both collectives as well as individuals (Schlosberg & Carruthers 2010). This underlines the plurality of environmental justices (Martin et al. 2020). Secondly and relatedly, recognition must incorporate the affirmation of context specific knowledge practices. This presupposes overcoming colonial and patriarchal hierarchies between epistemologies and the consequent recognition of the plurality of knowing and relating – for both the knowledge bearers and those interacting with them (Álvarez & Coolsaet 2020; Vermeylen 2019). Thirdly, not only an equitable distribution of environment goods or bads is required, but more importantly the overcoming of oppressive relations to the environment in the first place. Oppressive relations such as objectification, exploitation, expropriation or exclusion of humans and nature is to be prevented at their roots (Álvarez & Coolsaet 2020; Temper 2019). Central is thus that social conditions in themselves already provide for the needs of all subjects – explicitly including those of non-human subjects (Rodríguez & Inturias 2018). What might be termed as relational justice, requires a convivial form of relating, a making of kin (Whyte 2020). Fourthly, participation or representation remains an essential aspect of environmental justice. To realise self-determination through an equitable access to decision making processes for all, historically grown power structures between participants must be jointly investigated and tackled (Pulido & de Lara 2018; Temper 2019). While they might have already become clear in the discussion of the four dimensions, I eventually want to highlight three preconditions that cut across the different spheres of environmental justice. Firstly, convivial ways of relating between subjects must be realised. Secondly, a plurality of convivial ways of relating must be respected. And thirdly, historically grown power structures between groups and individuals must be addressed – especially discrimination along intersecting constructed categories like race and gender.

In the following I will examine whether or how instrumental reason can fulfil these manifestations of environmental justice and their preconditions. To do so I subsequently discuss existing critiques of instrumental reason to then expand on their shortcomings in an engagement with decolonial and feminist epistemologies.

Instrumental Reason

To start with: What do I mean by the term instrumental[2] reason[3]? In this contribution instrumental reason refers to a form of distinguishing whether something is good or bad through examining whether some chosen means are suitable to given ends. In other words, someone is instrumentally reasonable, when they adopt suitable means to certain ends. Ends here refer to an intended goal that can be a status or an action. Means can be anything that brings about an end: intentions, decisions, actions (see Kolodny & Brunero 2013). Central to instrumental reason is the focus on means in means-ends relationship. Here, the quality of the ends for themselves are not considered. Strictly following this logic, neither the way the ends are determined nor the moral or functional quality of the ends themselves are up to debate (Halbig & Henning 2012a). Relevant for this contribution is that it describes a distinct form of reasoning, that has, according to various scholars, historically become a dominant way of distinguishing whether something is

good or bad in euro-western modernity. Horkheimer for instance observed that while reason used to be largely an action of understanding and reflecting on ends of earthly coexistence, reason meanwhile, "having regressed to instrumental rationality, combined in the present era with the domination of nature and social control to form a quasimythical compulsion" (Schmid Noerr 2002, 232).

Eurocentric Critiques of Instrumental Reason

There is a long history of debate around what is now framed under instrumental reason in European philosophy. For instance, Aristotle had already pointed at a specific form of reason that is concerned with the means-ends relationship (see Aristoteles 1985 in Halbig & Henning 2012a). Hume is frequently cited questing whether ends themselves can be subject to reasonable considerations, stressing the task of reason to detect causal mechanisms to reach given ends (see Halbig & Henning 2012a; Korsgaard 1997). Later prominence in this context reached somewhat different deliberations by Kant on practical reason. Kant again emphasised the importance of means-ends considerations, but equally warned of detaching it from normative thinking about ends (see Korsgaard 1997). In the 19th century critical European theories started to observe an increasing importance of instrumental reason and questioned its social consequences. In Marx's work for instance instrumental logics have been criticised as a central thought structure of a capitalist society, evoking a disenchanted exploitation of humans and nature. According to Marx, capitalist commodity production had inverted ends and means, shifting the focus on means while constraining societal reflections on ends. While previously production served the fulfilling of needs, in capitalism it merely served the realisation of an exchange value and the accumulation of capital (Marx 1968, 49-98). Consequently, the original ends of production, the orientation along social or environmental needs, was rendered a means to realise an optimised production. Weber later attested a dominance of instrumental logics not only in an economic sphere, but in various social realms in the Europe of their time (see also Giddens 1971). Particularly for bureaucratic social organisations, Weber shaped the understanding that instrumental rationality functioned as its central logic. But also beyond, Weber observed a "rationalisation", which centrally incorporated the shift from "value rationality", from continuous reflections on the values of ends, towards "instrumental rationality", to reflections on the purposes of means (Weber 1922, 11-23). The turn to instrumental rationality according to Weber involved a renunciation of logics following a "conscious belief in the [...] unconditional, intrinsic value", "affect, especially emotion" or "tradition: through settled habituation"[4] (1922, 11). While Weber warned of a disenchantment of earthly relationships implicated in this development, they were also convinced of instrumental rationality's superiority to other forms of reason and determined it as a supposedly natural step within a universal teleology (see Lee 1997, 7-8 & 37-39; Rehbein 2015, 41-54). Connecting Marx's and Weber's analyses, Lukács further observed a reification of social relations that came with the dominance of instrumental rationality (1922).

Drawing upon Marx, Weber and Lukács, a critique of instrumental reason was then centrally picked up by various European scholars from the first half of the 20th century who would later be connected to the Frankfurt School of critical theory (Schecter 2010; Smulewicz-Zucker 2017). Broadening the scope of research, they engaged with the implications of instrumental reason's key role in European modernity. Benjamin searched for non-instrumental modes of contestation against violence as means that have structurally been legitimised by fungible ends within an institutionalised, juridical system of the capitalist nation-state (1921). In their collaborations Horkheimer and Adorno considered the instrumentalisation of reason to be a central mechanism evolving as a dark current from the European enlightenment into the capitalist and nationalist

societies of their times, which they saw deeply involved in the systematisation of cruelties in the Nazi organisation of the Holocaust (2002). For Horkheimer specifically the critique of instrumental reason became a core method of their subsequent analyses of society (2004; 2013), making them until this day a major critical theorist that is referred to with regard to instrumental reason (see Schecter 2010; Smulewicz-Zucker 2017). According to them, while "'reason' for a long period meant the activity of understanding and assimilating the eternal ideas which were to function as goals for [humans][5]", it has meanwhile become the "essential work of reason to find means for the goals one adopts at any given time" (Horkheimer 2012, vii). Horkheimer distinguished between two forms of reasoning of which the second became its dominant form. Firstly, what Horkheimer termed objective reason is a logic that is based "on the idea of the greatest good, on the problem of human destiny, and on the realization of ultimate goals" (Horkheimer 2004, 4). Different from what is commonly understood under the term "objectivity", Horkheimer's concept of the objective reason did not assume that a singular, universal truth can be accessed by a human individual. Rather, objective reason in their sense had been a tool for reconciliation with a cosmos that ordered nature and society (see Angus 2007, 1-3). The second, instrumental, subjective reason is shaped by the idea of a generalised self-interest of humans and by a formalisation of reason, detaching it from cosmological meanings of the good life (Horkheimer 2004, 3-10). According to Horkheimer and Adorno instrumental reason then signifies "the organ of calculation, of planning; it is neutral with regard to ends; its element is coordination" (Horkheimer & Adorno 2002, 69). Marcuse drew special attention to instrumental reason as a vehicle for the depoliticisation and technologization of society, shaping the term technological rationality (Marcuse 1941 in Smulewicz-Zucker 2017, 198-199; Marcuse 1964). Habermas later differently drew upon Adorno and Horkheimer, equally observing the negative consequences of a dominance of instrumental reason. However, in Habermas' analysis, instrumentally rational reason is not per se adverse but only develops fatal consequences when applied without normative negotiations on ends (1981a; 1981b). For Habermas what they termed "instrumental cognitive rationality"[6] had not been essentially linked to the self-conception of the modern, individualised subject (1981a, 489-534) but rather developed its own logic in a specific sphere of society, that they called system (see Honneth 2006). In the system – encompassing the capitalist economy and the legal, executive system of the nation state – actions are valid if they are effective (1981b, 489-547). Habermas did not critique such instrumental logic per se but critiqued its "colonisation" of a second and originally elementary sphere for human society: the life world (1981b, 522). Thereby the lifeworld is deprived of collective linguistic negotiations over the composition of the world, a form of reason that Habermas termed communicative reason and located as the core mechanism that binds social actors together in all their complexity and constitutes society (1981b, 229-294). While Habermas' theoretical depreciation of fundamental critiques of instrumental reason has been countered by various critical theorists (Eckersley 1990; Feenberg 1996; Jaeggi 2017) thorough engagement with instrumental reason decreased for some time. However, in more recent years not only critical theory has seen a revival of work engaged with instrumental reason (see Schecter 2010; Jay 2016). Another philosophical strand has also devoted quite profound work to instrumental reason. Scholars in the tradition of analytical philosophy have questioned the logical coherence of pure instrumental reason (see Bratman 1981; Wallace 2001) and its independence from normative considerations about ends (Koorsgaard 1997; Raz 2005).

Then, what precisely do these analyses unveil about instrumental reason's implication for environmental justice? Against the limited scope of this contribution and against the vast existing work on instrumental reason[7] I will followingly focus my core analysis onto a selection of theoretical approaches that deal with instrumental reason's implications for human-environment relationships in the tradition of the Frankfurt School: notably Horkheimer's, Adorno's, Marcuse's,

and Habermas' work. After connecting and differentiating several aspects, I will argue that applying a lens of environmental justice highlights shortcomings that particularly ask for decolonial and feminist contextualisations.

Socio-Ecological Critiques of Instrumental Reason in Traditions of the Frankfurt School

Questions delving into the human-nature relationship are at the core of diverse theoretical considerations of instrumental reason that critically draw upon the work of Horkheimer, Adorno, Marcuse and Habermas. The dominance of instrumental reason in modern western thought and its inherent deprivation of deliberations on the quality of means from the quality of ends has been differently traced to the domination of humans over nature and other humans. The necessity for negotiations on ends has notably been discarded by the constructed access to totality by the individual subject that Horkheimer and Adorno for instance locate both in ancient European philosophy and its reconfigurations during the European Renaissance and Enlightenment. While previously myths had still regulated relations between humans and humans and nature which remained ungraspable for the individual, the European Enlightenment replaced them with a supposed scientific objectivity that rendered the world individually understandable (2002, 28). Drawing upon Husserl, Angus expanded their considerations and connected totality with the formalisation of knowledge production about nature and humans under ideas of Bacon, Descartes and Galileo in Europe (1984, 4-11). With regard to a modern idea of technology, Marcuse highlighted that such construction of a totalising objectivity led to the conviction that certain categories can or should be free of value (1964). It unveiled that a systematising logic behind instrumental reason prevents constant democratic renegotiation of ends (Angus 2017, 74; Dryzek 2005, 84-86; Eckersley 1990, 744). Instrumental reason then signifies "the organ of calculation, of planning; it is neutral with regard to ends; its element is coordination" (Horkheimer & Adorno 2002, 69). According to Horkheimer and Adorno, the kind of objectivity involved in the installation of an instrumental reason has not liberated humans from arbitrary rule but itself reduced the world into an object that could be subjugated and manipulated (Horkheimer & Adorno 2002, 42-43). In their view domination in human-nature relationships is therefore not overcome by instrumental reason but newly configured as a supposedly objective form of control. This also becomes clear in Eckersley's account of Habermas, stating that humans "have noninstrumental encounters with nature (e.g., aesthetic experiences) but these encounters do not produce efficacious results in the way that instrumental reason does through its systematic observation, objectification, manipulation, and control of natural phenomena"[8] (Eckersley 1990, 755).

This particular objectivity and totalisation of reason is according to Horkheimer based in the individualised constitution of the modern subject (2004, 87-109). According to de Luca, instrumental reason requires a particular subjectivation, "seeing only the human subject as capable of reason and reduces the human to a subject that uses reason as a tool for self-interest" – inscribing a form of homo oeconomicus in so far that "there is no more room for a moral subject" (2001, 320). The self-exaltation of the subject is then centrally guided by processes of othering and decontextualization. "Othering" starts with the self, as "we separate ourselves, we lock ourselves in this bag of skin and call it a self, and place everything else outside it and call it 'other'" (2001, 324). The "other" has notably been non-human nature (see Angus 1984; Eckersley 1990). While equally important for Horkheimer and Adorno, for them the "othering" already starts within the "bag of skin", with human nature.

> In class society, the self's hostility to sacrifice included a sacrifice of the self, since it was paid for by a denial of nature in the human being for the sake of mastery

> over extrahuman nature and over other human beings. This very denial, [is] the core of all civilizing rationality [...]. At the moment when human beings cut themselves off from the consciousness of themselves as nature, all the purposes for which they keep themselves alive [...] become void, and the enthronement of the means as the end, which in late capitalism is taking on the character of overt madness, is already detectable in the earliest history of subjectivity.
>
> (Horkheimer & Adorno 2002, 42-43)

Beyond human and non-human nature, an "other" has also been constructed in other humans. While many scholars remain vague which exact humans are at stake here, Dryzek attests an historical role to "patriarchy and masculine epistemology" (1990, 196) in othering women* whose forms of knowing the world have consequently been delegitimised (see also de Luca 2001, 317). In reference to Shiva (1988), de Luca further briefly refers to the colonial devaluing of non-western knowledge practices, but remains vague (2001, 312). The detachment and self-exaltation of the knowing subject implies a disembedding of reason from the particular socio-ecological context, depriving actions "their justification from conventional, situationally-specific truths" (Angus 1984, 54). As de Luca put it, "instrumental reason, by separating reason and technique from context and subject from object, led to the full realization of the domination of nature as the ethic for humanity-nature relations" (2001, 324).

At the base of this construction of a detached human ego as an objectively acting subject, a central and legitimising logic had, according to Horkheimer, been a dualist conception of body and mind that was most prominently shaped by Descartes (2004, 73). European modern thought "tended increasingly to mediate the dualism by attempting to dissolve the concept of nature – and ultimately all the content of experience – in the ego, conceived as transcendental" (2004, 73). Similar to Horkheimer, Dryzek stressed the essential role of the Cartesian dualism for the stability of instrumental reason in that

> instrumental rationality, on this account, invokes a Cartesian dichotomy between subject and object. The human mind is subject; all else – including the natural world, and other people – consists of objects, to be manipulated, therefore dominated, in the interests of the mind's desires. Instrumental rationality is therefore abstract, estranged from nature (and society) and estranging to the extent that we subscribe to it [...] which paves the way for the destruction of that world for the sake of utility and industrialization at the hands of an arrogant humanism.
>
> (1990, 196)

More subtly, the conviction that dualist divisions between body/nature and mind/humans undergird instrumental reason can also be traced in Feenberg's and Eckersley's accounts of Marcuse's critique of the domination of nature in modern ideas of technology. As an embodiment of instrumental reason, modern technology is considered detached from deliberations on its moral ends (Feenberg 2009, 209) in which "liberation of inner and outer nature demanded [...] an emancipation of the senses" (Eckersley 1990, 744). Similarly, a critique of dualist conceptions and the need for reconciliations of humans with nature displays in sketches for emancipation from instrumental reason in Adorno's negative dialectics (Adorno 1966, 16, 226). Dryzek claimed that with the dualist conception at the core of instrumental reason, the alienation of humans from nature remains essential for its functioning (1990, 197). Similarly, for Horkheimer and Adorno,

the alienating "superstitious fear of nature" (2002, 70), of an unpredictable other and the connected will to control inevitably drives instrumental reason. Dryzek thus concludes that as long as there is "instrumental action toward the environment, the less likely it becomes that we shall be able to reconcile ourselves to that environment" (1990, 198). Describing the dire consequences of such alienation, Dryzek went so far to claim that "nature was not simply disenchanted by the Enlightenment – it was killed. As a result, no longer could meanings and purposes be discerned in the nonhuman world" (1990, 198).

Frankfurt School Critiques of Instrumental Reason and Environmental Justice

The here discussed theories had quite similar conceptions of what kind of thinking instrumental reason superficially symbolised but varied in how they understood its epistemological grounds and thus also its impacts on human-environment relations. What do those accounts of instrumental reason imply for its compatibility with environmental justice? Drawing upon the four dimensions (capabilities, recognition, relationality/redistribution, representation) and their three pre-conditions (realising convivial relations, respecting plural ways of convivial relations, addressing existing power inequalities) of environmental justice specified above, the so far discussed critiques of instrumental reason provide valuable entry points but miss to explain few key characteristics. Firstly, with regard to capabilities, Horkheimer and Adorno, Angus, de Luca and Dryzek unveiled that instrumental reason presumes a decontextualisation of actions and is therefore unable to focus and provide for particular conditions of well-being. A universalisation over space and time dangerously violates against the diversly constituted and ever-changing earthly realms (see Dryzek 2005, 86). Such "standardization of the intellectual function through which the mastery of the senses is accomplished" (Horkheimer & Adorno 2002, 28) corrupt the ability to strengthen contextual capabilities. De Luca warns that this epistemological confinement leads to depoliticisation and materialises in a tendency to crisis:

> Guided by instrumental reason, humans conceptualize the environment in a narrow, limited way—nature as both a storehouse of resources and a storage facility for pollution. In the context of progress, the proliferation of environmental crises appear as technical problems requiring techno-fixes. However, each new techno-fix engenders unforeseen problems, leading to a new crisis that requires another fix in an endless cycle of crisis-fixcrisis. As long as our thinking is guided by instrumental reason, we seem to be on an inexorable spiral into environmental ruin.
>
> (de Luca 2001, 325)

However, only Dryzek and de Luca briefly touch upon a connected structural hierarchisation of some ideas of well-being over others along patriarchal or colonial lines. The other authors remaining abstract with regard to societal power structures, this poses a major blank spot for the second question of recognition. Still valuable for questions of recognition might then be their realisation that instrumental reason is itself as a self-sustaining, circular logic. They observed that the underlying assumption to instrumental reason, that negotiations on the reasonability of ends are dispensable within certain realms of society, renders instrumental reasoning itself legitimate (Horkheimer 2004). Where the above critiques of instrumental reason could make a strong and elaborated point is the third question of relational and redistributive justice. Several authors point not only at the segregating epistemological roots of instrumental reason but also at its destructive mechanisms for the human-nature relationship. As Angus, Dryzek and de Luca had done in a similar manner, Horkheimer and Adorno argued that the assumed dualism between and dominance of humans over humans and nature had enabled claims for groundless objectivity.

The availability of assertions of objectivity uncritically detached from socio-ecological conditions then discarded the necessity for continuous negotiations on ends and enabled an opting for instrumental reason, while rendering nature and humans into functional means (Horkheimer 2004, 73; Horkheimer & Adorno 2002, 81-83). The instrumentally rational subject is constituted by its assumed ability to objectify both humans and nature such as that that "the ego dominates nature" (Horkheimer 2004, 73). The implicated taxonomy of the cosmos establishes clear and fixed boundaries within interlinked and fluid socio-ecological systems. Instrumental reason then produces environmental injustice as it structures a human-nature relationship in which domination, exploitation, expropriation and exclusion are normalised, as Schmid Noerr emphasises:

> In the service of an advancing rationalization of instrumental thought modeled on the domination of nature and serving its purposes, enlightened reason is progressively hollowed out until it reverts to the new mythology of a resurrected relationship to nature, to violence.
>
> (2002, 218)

Eventually however also here, positions remain vague towards existing or potential relational models of co-existence that constitute fundamental alternatives to societal constructs shaped by instrumental reason. On the fourth question of participation or representation, classical critiques of instrumental reason building upon Habermas can formulate entry points. Instrumental reason itself assumes the positions of those who have decided upon the given ends, ergo those (having been) in power and develops an increasingly independent technocratic logic of control. With regard to societal decision-making, Eckersley illustrated that the "achievement of a rational, democratic consensus by an informed citizenry concerning societal goals is being increasingly subverted by technical discussion by a minority of experts concerning means" (1990, 744). Thus, instrumental reason does not allow space for social negotiation that is central to a socio-ecologically viable co-existence on earth. As "the very definition of sustainability requires the inclusion of social considerations", Hostetler argues on the basis of Habermas' critique of instrumental reason, "the one-sided rationalization of the lifeworld along knowledge/cognitive-instrumental lines militates against sustainability" (2018, 51). Yet again, an analysis of power structures that historically formed these exclusions remains abstract, which is central to this dimension of justice. Examining the three pre-conditions to the realisation of all dimensions of environmental justice then helps to sum up the central contributions and shortcomings of classical critiques of instrumental reason to environmental justice. Concerning the first condition, pointing at the need of convivial relations between all subjects, the discussed critiques are widely elaborate on how instrumental reason produces segregation and domination of humans and nature. For the second condition however, these theories have largely missed to deal with the question of plurality and only peripherally mentioned a suppression of particular knowledge practices. Also, with regards to the third condition, the discussed studies remain too abstract to acknowledge the historically specific power structures entangled with the form of reason they describe. Particularly an accounting for intersecting, global forms of marginalisation has not been an essential part of their perspectives.

Classical critiques of instrumental reason do point at several roots of environmental injustices and might be a valuable tool to decipher faultlines for resistance and transformation. However, they structurally miss particularly an account for historically marked forms of marginalisation beyond those in the human-nature relationship that might be intimately linked with instrumental reason. Authors like Dryzek or de Luca have already pointed at possible connecting points with patriarchal and colonial forms of oppression. As I will followingly try to show, decolonial and feminist epistemologies can indeed elaborate this intimate connection between instrumental

reason and colonial as well as patriarchal social structures. Rethinking the epistemological roots of instrumental reason, I will consequently argue, poses a striking approach to understand and tackle intersecting forms of marginalisation in environmental injustices.

Colonial and Patriarchal Contexts of Instrumental Reason

Traditions of critical social theory to which the above discussed authors have been differently associated have since decades received critique by decolonial and feminist scholars. Decolonial critics have emphasised the largely Eurocentric constitution of dominant critical social theory. While some authors like Weber directly embodied racist convictions of the supremacy of European society (Zimmermann 2005), colonial views in later scholarship like Frankfurt school critical theory showed more subtly. Their core analytical focus, "the modern social, or modernity, is seen to be constituted as the outcome of endogenous processes of European history" (Bhambra 2021, 76) – discarding the multifaceted global co-constitutions of modernity[9]. Further, they have been criticised to disregard how Eurocentric thought has evolved within, re-produces and dominates a global hierarchy of knowledge practices. Eurocentric critical theory is thus seen ignorant for and unable to grasp non-Eurocentric cosmologies (Bhambra 2021, 81-82). Feminist scholars then have emphasised that critical social theory has largely missed to understand gendered dimensions of society. It is said to have remained with and decontextualised cis hetero male perspectives, thus contributing to their normalisation. Critics pointed at an ignorance of the implications of patriarchal structures as well as the particular relations and knowledge practices of women* with regard to the analysed topics (Cochrane 1998; Fraser 1985; Meißner 2010).

In light of these receptions, the classical Eurocentric critiques of instrumental reason I have outlined before largely missed to account for the impact of the entangled histories of colonialism (Allen 2016; Bhambra 2021) and patriarchy (Cochrane 2017; Fraser 1985; Meißner 2010). While arguably attributable to their male socialisation and Eurocentric outlook as well as the temporal context from which they have been writing, this poses both an ethical and functional deprivation of the critique of instrumental reason (Bhambra 2021; Fraser 1985). To understand historical and contemporary implications of colonial and patriarchal structures, decolonial and feminist approaches then become an essential tool. From a perspective of epistemological justice, Bhambra thus demands with focus to colonial structures to investigate the "ways in which colonization and slavery were integral to the Enlightenment project of modernity – structuring its knowledge claims as well as its institutions" (2021, 76).

To better understand how instrumental reason perpetuates colonial and patriarchal power structures it is thus important to understand how they are related. A historical contextualisation of instrumental reason here seems essential. When it comes to distinct critiques of instrumental reason however, feminist and decolonial analyses have with few explicit exemptions (see Cochrane 1998; Meißner 2010; Quijano 2007) remained vague or have so far treated it only in peripheral manners (see Bhambra 2021; Fraser 1985; Plumwood 1993). Yet, as I want to show both decolonial and feminist scholars very vastly formed critiques towards several underlying assumptions for instrumental reason that I tried to depict above – particularly dualisms and their hierarchisation, the subject and its individualisation, objectivity and totality of reason. From my limited perspective I followingly attempt to draw together and relate a selection of decolonial and feminist perspectives which arguably offer insights on these aspects, complexifying an idea of how and what instrumental reason marginalises.

To recall briefly, the previous examination of works in the tradition of the Frankfurt School stressed several conditions for instrumental reason. A dualism between mind and body or humans and nature in which the former masters the latter, serves as ground for the assumption that there are autonomous subjects that can understand and control objects. The gained objectivity then enables reason to total understanding, discarding the need for negotiations on ends and making way for the dominance of instrumental reason. How are colonial and patriarchal logics then implicated into this fabric of instrumental reason? I followingly draw upon decolonial and feminist epistemologies, dissecting the fabric of instrumental reason that I separated into three different aspects for analytical purposes: hierarchical dualisms, the autonomous subject and totalising objectivity.

Hierarchical Dualisms

A critical evaluation of dualisms indeed played a role in the work of the above discussed critiques of instrumental reason in tradition of the Frankfurt School. Horkheimer and Adorno located its existence already within the philosophy of ancient Greece but saw its increase in importance in post-renaissance European philosophy. Feminist and decolonial perspectives stress the role of patriarchal and colonial social structures in this process. Already in ancient Greek philosophy, Plumwood for instance points out that Aristotle "justifying slavery, links together the dualisms arising from human domination of nature, male domination over females, the master's domination over the slave and reason's domination of the body and emotions" (1993, 46). Elsewhere, the mastery of the body by the soul has been found to be engrained in Judeo-Christian-Islamic traditions, self-discipline becoming the central determinant in related ideas of morality (see Souza 2022; Wynter 2003). Feminist scholars have argued that these dualist conceptions have in medieval Europe been reinforced to legitimise the oppression, expropriation and domestic exploitation of women* (Federici 2004; Mies 1986; Plumwood 1993). According to them, compared to men, women* had been attributed to be less able to discipline their human nature while more enchanted by emotions or myths. In a consequence, reason had been conceptually deprived of its emotional, bodily connection (Plumwood 2002, 19-22). Dualisms have not only been seen to be inscribed with sexism but also with colonial racism. Maldonado-Torres for instance associates the Cartesian mind/body dualism with a legitimisation of early European colonialism (2007). They argued that dualisms are entangled in the colonial project to dehumanise the conquered population and to deploy a "non-ethics of war" to exploit land and people (2007, 247). Drawing upon Dussel, they claim that the conviction of European supremacy present in the "ego conquiro" of the conquerors precedes and becomes central to the idea of the "ego cogito" theorised by Descartes (Dussel 1996, 133 in Maldonado-Torres 2007, 244-245). The colonial oppression had, according to Quijano, been the pre-condition for a radicalisation of a dualism between reason and nature and constitutive to the dualism between subject and object: "the 'subject' is bearer of 'reason', while the 'object', is not only external to it, but different nature. In fact, it is 'nature'" (Quijano 2007, 172-173). Feminist and decolonial perspectives thus show that dualisms are not a mere dichotomy, a constructed differentiation between two opposites. Dualisms are always hierarchical in their conception, one side dominating the other. Plumwood further argues that "a dualism [...] results from a certain kind of denied dependency on a subordinated other" through which "the denial and the relation of domination/subordination shape the identity of both the relata" (1993, 41). Looking at the colonial and patriarchal power relations in which dualisms were fostered, it therefore can be stated, that dualisms have been tied to the construction, devaluation and detaching from a supposed "other" to mark and consolidate a powerful "self". The "self" has not only been the human mind controlling the human body, the human that controls non-human nature or the bourgeois human controlling proletarised humans as postulated by the aforementioned Eurocentric critical theories

in traditions of the Frankfurt School. Historically the "self" has also been the white male human and the "other" the non-white, non-male human. In this sense, the othering, devaluing and cutting off of human and non-human nature, the non-white, non-male human, have been constitutive to the subjectivation of the modern human.

The Autonomous Subject

Several of the above-mentioned authors like Horkheimer, Adorno, Marcuse, Angus, and de Luca already singled out that the individual autonomy of the modern subject is built on the mastery of human and non-human nature. Both feminist and decolonial critics have however stressed that it has equally been built upon the othering and devaluing of humans by European men. According to various authors, dualist conceptions and its othering, devaluing and cutting off of non-male, non-white humans and nature constructed a platform on which the conviction of the superiority and independence of the white male human was fostered (see Maldonado-Torres 2007; Plumwood 1993; Wynter 2003). Bhambra stresses that

> the modern (European) subject, defined in terms of self-ownership, comes into being in the con¬text of wider discourses of emancipation and is constituted through the practice of taking others into ownership and appropriating their means of subsistence and reproduction.
>
> (2021, 76)

While "the story of European identity is often told as if it had no exterior"[10], the constructed difference and material subjugation of the colonised had marked the European subject (Hall 1991, 803). By the same logic, non-European "are different in the sense that they are unequal, in fact inferior, by nature. They only can be 'objects' of knowledge or/and of domination practices" (Quijano 2007, 173-174). According to feminist critics patriarchal structures are equally relevant as the "concept of autonomy is inherently masculinist, that it is inextricably bound up with masculine character ideals" (Mackenzie & Stoljar 2000, 3). Aside the conviction of male superiority manifested in dualist thinking, it is centrally the detachment from the body and re-productive work in patriarchal societies that enables male humans to be convinced of the idea of autonomy (see Mackenzie & Stoljar 2000, 6-11). Meißner thus argues that

> the autonomous subject, that takes decisions in a free and rational manner, is the phantasmic figure of the (bourgeois, white, heterosexual) man, who is exempted from all mental and physical dependencies and who thus raises the claim to be able to self-determinedly act in a reasonable manner on the basis of inner structures of relevance.[11]
>
> (2010, 9-10)

The idea of the autonomous subject has thus been dependent on the othering, devaluation and detachment from notably women*, non-European people and nature. The "individual and individualist character of the 'subject'" is then "denying intersubjectivity and social totality as the production sites of all knowledge" (Quijano 2007, 172). Such "conviction that the notion of individual autonomy is fundamentally individualistic and rationalistic" then has implications for knowledge creation more generally (Mackenzie & Stoljar 2000, 3). The autonomous subject eventually serves as ground for the conviction that socio-ecological negotiations become disposable and traditional mythical institutions can be overcome to individually reach a supposedly objective

truth.

Totalising Objectivity

A critical assessment of the constitution of a modern understanding of objectivity, as we have priorly seen, has played a pivotal role in the tradition of Frankfurt school analyses of reason. While differently locating the idea of objective thought in western societies, capitalism, the nation state and modern sciences, the above discussed authors display a conviction that unconditional objectivity implied power and derived from the hierarchical and segregating understanding of the individualised subject in contrast to an object. Various decolonial and feminist analyses have agreed on these insights, however they have more fundamentally questioned the constitution of the subject-object relation and asked what social power it implicates with regard to race and gender. According to their analyses the just explicated othering, devaluing and detaching from non-white, non-male humans and nature involved in conceptions of dualisms and the autonomous subject enabled claims for objective knowledge. In their decolonial analysis Quijano claims that modern knowledge must fundamentally be understood "as a product of a subject-object relation" (2007, 172), that has been constituted in the coloniser-colonised relationship. Objective thought then grasps objects, "an entity not only different from the 'subject'! individual, but external to the latter by its nature [...] constituted by 'properties' which demarcate it and at the same time position it in relation to the other 'objects'" (Quijano 2007, 172). The objectively knowing subject then relies upon "a zero-point epistemology, which enunciates the object to be known while hiding the locus or place from which all words and worlds emerge", as Fúnez-Flores argues with reference to Castro-Gomez (2005) (2021, 193). That such totalising, objective thought is based in the subject-object division that detaches the mind from the constraints of the human body is also a position held by feminist scholarship with regards to gender. Haraway formulates that modern objectivity is "about transcendence and splitting of subject and object" (1988, 583). For Bordo the dualist splitting manifests in the masculinist conviction that the knower needs "to get rid of "all distractions and passions which obscure thinking" to achieve objectivity (1987, 27 in Plumwood 1993, 116). An objective "conquering gaze from nowhere" as Haraway termed it (1988, 581) is thus achieved through "freedom from the body and its deceptions, weaknesses and hindrances, its personal and emotional ties" (Plumwood 1993, 116). In this sense, analyses from feminist and decolonial standpoints stress that claims to objectivity relied on patriarchal and colonial construction of dualisms and an autonomous subject. In this view, objectivity involves both a decontextualization of the knowledge as well as an exaltation of the knowing (white, male human) subject over the devalued known (non-white, non-male human and natural) object. Objectivity thus always implies generalisation and marginalisation of such that is supposedly different to what is generalised. As deviating standpoints are already attributed less objectivity in the process, the marginalisation is consequently legitimised and veiled. The implicated but invisible generalisation and marginalisation makes way for claims that reason can access totality. In this manner the idea of a totalising objectivity eventually discards uncertainties about ends. In this light, the consequent possibility to transcend fundamental considerations on the appropriateness of ends constitutes the basis of instrumental reason.

Towards a Decolonial and Feminist Critique of Instrumental Reason

Deploying feminist and decolonial perspectives and shifting the analytical lens to gendered and racialised positions, eventually enables a more complex examination of the epistemological roots of instrumental reason to unveil sexist and racist ideologies within the deterioration of socio-ecological relations already observed by critical theorists from the early 19th century onwards. To

use the vocabulary of Mignolo (2003), racism and sexism manifest as further, darker sides of the already contested effects of instrumental reason. In light of decolonial and feminist critiques, instrumental reasoning incorporates dualist conceptions, the assumption of an autonomous subject and the claim to a totalising objectivity. Through their theorising, these perspectives on the one hand further historically contextualise the observations about instrumental reason already made by Horkheimer, Adorno, Marcuse, Habermas and their contemporary successors. By unveiling the immanent mechanisms of marginalisation and generalisation they on the other hand deviate in parts from the classical critiques of instrumental reason. Historically the turn to instrumental reason has not only implied the mastery of human and non-human nature as explicated by Horkheimer, Adorno, Marcuse or Habermas. It inseparably involved the domination of the non-white, non-male humans. Distinguishing and valuing of humans and nature has been centrally based in dualist conceptions, differentiating along a supposed ability to free the mind from the natural and social constraints of the human body – aspects that had in a minor form already been discussed in Horkheimer's and Adorno's work (Varadharajan 1995). That it entailed the exaltation and detachment of the European male human from its socio-ecological ties which fundamentally constituted the assumed autonomy of the knowing subject that instrumental reason comprises had arguably been overlooked (Meißner 2010; Bhambra 2021). Weber's observation that instrumental rationality is an action "that is neither affective (and especially not emotional) nor traditional"[12] (Weber 1922, 13) is here set into a new, dark light. Decolonial and feminist perspectives emphasised the implicit setting of sharp boundaries between subject and object as well as between objects, which has in peripheral ways already been considered conditional for logics of a taxonomy within instrumental thinking by Horkheimer and Adorno (2002, 26, 63). Eventually decolonial and feminist perspectives work out that instrumental reason does not only contain an objectification of humans and nature as already explicated by the priorly cited classical critiques but also a generalisation of the position of the subject – be it an individual or a group. Instrumental reason centrally relies on the marginalisation of a constructed, devalued and precluded "other". While Horkheimer and Adorno (2002, 42-43, 156-157) as well as de Luca (2001, 317) and Dryzek (1990, 196) had already hinted at such a relationship, feminist and decolonial critiques have been historically more precise on this point. The marginalisation of "others" marked less-dualist, less autonomous or less objectively rational then implied reason's supposed access to totality. This eventually explains the inbuilt totalitarian tendencies of instrumental reason. The above discussed critical theorists in traditions of the Frankfurt School had already warned of this tendency but did either not at all or only peripherally connect it to patriarchal or colonial domination. More fundamentally though, these authors did not grasp the inbuilt mechanism for generalisation that comes with the exclusionary form of marginalisation (Bhambra 2021, 82-84; Meißner 2010, 9-10). They had arguably not been able to criticise the generalisation incorporated in instrumental reason, as they either remained with the assumption that there is a universal reason – which mainly concerned Weber and Habermas – (see Honneth 2007), or remained within an unconfronted patriarchal, Eurocentric cosmology (see Rehbein 2015). The combined mechanisms of generalisation and marginalisation that decolonial and feminist scholarship here unearth are relevant when examining instrumental reason's dispersion and dominance more generally and – as I will consequently argue – more specifically when it comes to questions of environmental justice.

Instrumental Reason and Environmental Justice

What does the account of instrumental reason's underlying assumptions from decolonial, and feminist perspectives imply for environmental justice? The above critiques point not only at an abstract objectification which the aforementioned Eurocentric critiques of instrumental reason

already emphasised, but also at a generalisation of humans and nature. Recalling the different dimensions of environmental justice highlights that such generalisation builds upon the marginalisation of racialised and gendered subjects and their ways of relating. Invoking the first dimension of environmental justice, capabilities, the above inclusions of decolonial and feminist epistemologies stress not only differences of conceptions of well-being but also structural inequalities that prevent their achievement. It becomes clear that instrumental reason generalises "a particular subjectivity as a general human one" and thus "(re-)produces Hegemonies, hierarchies and exclusions" (Meißner 2010, 10). What these perspectives stress is that the idea of such generalisation is not ahistorical but relies upon the devaluing and detaching from a constructed "other". The inbuilt marginalisation of subjects poses a serious threat for the second dimension, recognitional justice. Not only their lived realities structurally tend to be excluded, but also particular worldviews that do not play into the epistemological assumptions of instrumental reason. Detaching from traditions and myths around co-dependencies with other humans and the non-human world, instrumental reason structurally precludes knowledge practices that do not start from a dualist understanding of the human-nature relationship or assume the domination of humans and nature. This would further exclude cosmologies that are already marginalised on a global scale[13]. Further such marginalisation of relational ideas is highly problematic in a time of social and ecological crises where knowledge practices for the reconciliation with other humans and the non-human world is direly needed. Importantly instrumental reason undermines reciprocal recognition and learning between different cosmologies. As Quijano argues, the devaluing and detaching construction of a non-European "other"

> blocked, therefore, every relation of communication, of interchange of knowledge and of modes of producing knowledge between the cultures, since the paradigm implies that between 'subject' and 'object' there can be but a relation of externality.
>
> (Quijano 2007, 174)

On the one hand, the generalisation incorporated in instrumental reason can be considered an ideological enablement of a homogenising process towards a global adaptation of Euro-American, patriarchal cosmologies. On the other hand, the totality within instrumental reason produced a heterogenization, fixing identities as well as labour relations.[14] This observation also expands instrumental reason's incompatibility with environmental justice in view of the third relational or redistributive dimension. Decolonial and feminist perspectives stressed the prior analysis that a dualist conception of the human subject in instrumental reason produces and stabilises inequalities within the human-nature relationship. In their unification in instrumental reason, Plumwood argued that

> dualism and rationalism function together as a system of ideas that justifies and naturalises domination of people and events by a privileged class identified with reason, who deserve to be in control and to be disproportionately rewarded.
>
> (Plumwood 2002, 17)

It serves as a logic for oppression and exploitation in human-to-human relationships, and – as we have seen – also in human-to-nature relationships. Extending the analysis of Horkheimer, Adorno or Marcuse, Lugones clarifies that this kind of ordering the world eventually plays into the accumulative system of the capitalist political economy:

> The cognitive needs of capitalism include measurement, quantification, externalization (or objectification) of what is knowable with respect to the knower so as to control the relations among people and nature and among them with respect to it, in particular the property in means of production. This way of knowing was imposed on the whole capitalist world as the only valid rationality and as emblematic of modernity.
>
> (2008, 8 in Ndlovu-Gatsheni 2020, 95)

Importantly, decolonial and feminist epistemologies have shown that such logics particularly hit racialised and gendered bodies, who are in most cases less responsible for but affected more by the current environmental crises. Eventually the above discussion shows that instrumental reason also reproduces inequality in the fourth dimension of environmental justice, participation or representation. It becomes clear that historically grown power structures such as racism or sexism are incorporated by instrumental logics. The epistemologically required othering contradicts the participation and self-determination of all. Instrumental reason then prevents honest open dialogue especially to those that have historically been marked other and deviate in their worldviews from the basic assumptions of instrumental reason as such. This is problematic both from an ethical point of view as it undermines epistemological justice as well as from a functional point of view as it eliminates contextual sensitivities that are essential to an adaptive socio-ecological coexistence (see Dryzek 1990, 207-210; Quijano 2007, 172). Eventually the unethical and dysfunctional structures not only concern a supposedly detached ideological or discursive sphere but marginalises people and nature in material senses.

To sum it up, how can the three aforementioned pre-conditions for environmental justice be fulfilled through instrumental reasoning? Firstly, instrumental reason does not contribute to the establishment of convivial relations between human and non-human subjects. On the contrary, it (re-)produces segregation and domination between subjects. Secondly, instrumental reason relies upon a generalisation of a dualist and totalising worldview, which inherently builds upon the marginalisation of deviating concepts of well-being. Plurality is thus not only not supported but structurally undermined. And thirdly, instrumental reason is both veiling power relations and has no access to fundamentally change the conditions on which they are built.

Instrumental Reason as Epistemological Injustice and Exchange Valuation

As an outlook, which perspectives does the here developed critique of instrumental reason open up for future research? Considering the limited frame of this contribution, I restrain this outlook to a sketch of prospects concerning two connected phenomena implied in instrumental reason's friction with environmental justice: epistemological justice and exchange valuation.

Epistemological Injustice

As we have seen "instrumental reason has become a way of knowing the world, an epistemology, and also a practice" (de Luca 2001, 320) in which power is (re-)produced. Acknowledging the historical intersection of patriarchal, colonial as well as anthropocentric discrimination inscribed in instrumental reason, the comprehensive concept of "epistemological injustice" that Bhambra proposed regards "the adequacy of the 'grand narratives' that structure the contexts within which we come to understand ourselves and others. It is these which shapes who has the power (and why) to assert their knowledge against the indications of its problematic status deriving from the

different knowledge claims of others" (Bhambra 2021, 76). Arguably the above analysis suggests that instrumental reason incorporates such systemic inequality between knowledges in several ways. Firstly, *instrumental reason stabilises the status quo of the epistemological system.* Instrumental reason implies a "bloody rationality, which [...] could hardly have been separated from the thirst for privilege" (Horkheimer & Adorno 2002, 41). To guarantee the mere focus on decisions on means, instrumental reason prevents the alteration of ends and veils connected assumptions and power structures. However, as we have seen instrumental reason cannot ensure the dominance of any kind of knowledge as it does not comply with all kinds of epistemologies. As previously outlined, instrumental reason requires the self-elevation of the subject over a constructed and devalued "other". In a context that is for instance shaped by racist, patriarchal and anthropocentric histories this would imply the continued devaluation of decolonial, feminist or ecocentric ways of relating with the world. Thus secondly, *instrumental reason requires the othering of epistemologies of historically othered and marginalised subjects.* Such devaluing othering involved in instrumental reason stresses that its logics rely upon a dualist, hierarchising worldview. Consequently, instrumental reason cannot grasp cosmologies that counter its lenses of difference and domination. This means that thirdly, *instrumental reason marginalises non-dualist epistemologies.* "Contextual, relational" worldviews and forms of nonproductive care are systematically eliminated from instrumental orders (1990, 197). Fourthly, *instrumental reason narrows space for learning between epistemologies.* Its self-preserving and expanding logic eventually requires the universalisation of its own epistemological approach. It fosters "the demise of the more congenial features of human existence and association" with other humans and nature (Dryzek 2005, 84). Against this background, instrumental reason would not be able to solve the epistemological injustice it (re-)produces but hinders dialogue and learning between different epistemologies.

Exchange Valuation

The knowledge system produced by instrumental reason not only entails a marginalisation of particular knowledges but conversely also implies preferences for certain ideas. It arguably creates a tendency for solutions that rely upon a dualist framework, upon the idea of an autonomous subject and the possibilities of a totalising objectivity – namely capitalist, Eurocentric, patriarchal and anthropocentric concepts. I here briefly want to highlight one of such ideas central to concerns of environmental justice as it functions as a bridge between the epistemological marginalisations and material oppression of humans and nature: the exchange value. As we have seen instrumental reason requires both objectification and generalisation of subjects, an "epistemology and practice, which allow nature to be only that which is mathematically quantifiable and materially exploitable" (de Luca 2001, 321). The priorly outlined detachment from and devaluation of nature as well as racialised and gendered humans not only undermined their self-determining agency but also rendered them objects ready to exploit and expropriate. Their consequent "universalization and systematization make every place, every environment, the same as every other place" (de Luca 2001, 321). According to various analyses of the political economy such exchangeability of human and natural realms functions as a pre-condition for a particular uniform, generalised value of humans and nature that is essential for the functioning of the capitalist political economy. Allowing for their alienation, exchange valuation veils the context specific expropriation and exploitation of human and natural subjects that renders them conversable into commodities for capital accumulation (Burkett 2013; Foster & Clark 2018). The tendency for exchange valuation under instrumental reason therefore poses threats to environmental justice. It essentially undermines a constant democratic re-evaluation of the needs and capacities of the respective humans and nature that are affected by certain actions and makes way for their continued exploitation

and expropriation (Prasad 2019).

The epistemological injustices and particularly the preferences for exchange values implied in instrumental reason have direct implications for questions of environmental justice from both functional and ethical standpoints. Firstly, the marginalisation of certain cosmologies that think humans and nature together produce injustice concerning an unequal representation in information and decision-making processes. Secondly, the objectified and generalised conceptualisation of nature does not do justice to the complexity of the biosphere. It bears danger both to undermine the ethical concerns for non-humans and to further harm natural life cycles. Thus, thirdly the knowledge system induced by instrumental reason does not account for the entangled relationship between humans and nature in the current socio-ecological crises. It therefore on the one hand tends to neglect that the natural crises that occur are also social crises and the other way round. On the other hand, instrumental reasoning does not reflect the limitations of the singular human's perspective in decision making stemming from their entanglement into natural and social realms. Fourthly exchange valuation fosters expropriation of people from land as well as exploitation of people and land while veiling the same for a larger public. From this point of view instrumental reason is unable to contribute to environmental justice efforts but rather to an expanding rift between social and natural metabolisms. Eventually the intimate connection between instrumental reason, epistemological injustices and exchange value remains worrisome for struggles of environmental justice as it not only contributed to the social injustices in the environmental degradation of the past few hundred years. With instrumental reason continuing to shape many institutions through which current solutions to these crises are developed, epistemological injustices and exchange valuation might further enshrine a continued oppression under the flag of salvation.

Conclusion

This contribution set out to examine the compatibility of instrumental reason with environmental justice. To sum up the former considerations, instrumental reason constitutes an unswerving focus on the most effective and efficient means to the allegedly objective ends. Eurocentric critical theories emphasised that instrumental reason contains learning within the boundaries of the means-ends relationship – marginalising a critical, collective reflection of the underlying base of the system it created. The preconditions of such disposal of space for negotiation regarding the ends of an action has historically been firstly the assumption of a dualism between body/nature and mind/humans and the consequent domination and objectification of human and non-human nature. As feminist and decolonial perspectives stress, dualist segregations and hierarchisations have historically been entangled with colonial and patriarchal oppression. Instrumental reason has thereby secondly relied on the self-exaltation of the European white male against a constructed and degraded other, the non-human, the non-male and the non-European, non-white. It is thus that instrumental reason specifically contains learning within the boundaries of dualist conceptualisations of the world, a process legitimised by a distancing and elevation against degraded others within dualist orders as well as less dualist conceptions as such. Instrumental reason fosters firstly an objectification of humans and nature and secondly a generalisation of this particular worldview that relies on the marginalisation of contradicting worldviews. Instrumental reason then only functions against a presumed "other" and produces a marginalisation of cosmologies that are less dualist as well as it draws upon the idea of exchangeability of the subjects it deals with. Instrumental reason therefore poses multiple challenges to the three pre-conditions for environmental justice defined at the beginning of this contribution. The forms of domination

and segregation constitutive to instrumental reason contradict convivial ways of relating. The structural marginalisation of non-Eurocentric and feminist knowledge practices incorporated in instrumental reason rule out respect for a plurality of concepts of the good life. And by discarding fundamental negotiations on ends, instrumental reason hinders the acknowledgement and tackling of historically grown power structures. Eventually the epistemological injustices as well a tendency to exchange values implied by instrumental reason pose serious threats to environmental justice. This critique is of relevance as both epistemological injustices and exchange valuation are present phenomena in modern institutions that are shaped by instrumental reason such as the capitalist political economy, bureaucratic administrations, and scientific institutions. Further the above developed analytical lens allows for drawing connections between and jointly criticising capitalist, colonial, patriarchal and anthropocentric logics. And its focus on relations arguably opens up possibilities to dwell into the borders of the often binary division of the ideal and material.

Ultimately this contribution also carries notable limitations which call for further sensitive research. Its arguments are based upon a limited variety of accounts of instrumental reason as well as focused on a selection of decolonial and feminist critiques. Other historical forms of marginalisation which intersect in environmental injustices need further attention. Equally important is the empirical application and refining of its analytical approach, which can inform the study of environmental justice in social institutions shaped by instrumental reason. Finally, this contribution admittedly sketches a rather pessimistic view of instrumental reason. Yet I hope it can create a comprehensible understanding of the mechanisms through which instrumental reason (re-)produces environmental injustices in order to provide a basis to raise awareness of, actively tackle and transform the foundations of its flaws.

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Notes

[1]Adrian Schlegel is part of the M.A. Global Studies Programme of the Jawaharlal Nehru University, University of Pretoria and Humboldt Universität zu Berlin. He is engaged in social research and political work on socio-ecological transformations, bureaucracy and decolonial perspectives for global cooperation.

[2]There have been discussions around translations and the aptness of the term "instrumental" in the English language. There is a dispute between translations of German work into the English language regarding the term "instrumental" in instrumental reason and instrumental rationality – where for translators of Weber for instance argued that "purposive" would be the more correct translation for "Zweck" in "Zweckrationalität". Once more looking at what is at stake in the German philosophical work on the issue known to me, authors refer to a logic that works along the relationship between means "Mittel" and ends "Zwecke" (of which I have not found any deviating form of translation). I decided to remain with the term "instrumental" as it in my understanding more directly refers to the eventual relationships between means and ends (see for instance translations of Horkheimer, Weber, Adorno & Horkheimer, Habermas).

[3]In this paper I use the terms instrumental reason and instrumental rationality interchangeably. There have been arguments, that instrumental reason is the philosophical counterpart to the term instrumental rationality, which then again refers to institutionalised forms of instrumental reason (see Horkheimer 2004, 5). However, looking at the work dealing with it, many authors have used these terms interchangeably (see Schecter 2010; Smulewicz-Zucker 2017; Habermas 1981a). In this contribution I am using both terms according to the specific contexts when discussing the work of different authors. Aiming at translating between several perspectives within this contribution, it is not so much the particular terms, but the core ideas the different authors develop around them, that I closely examine.

[4]Own translation. All non-English sources have been translated by the author.

[5]In this thesis I deliberately translate generic masculine words into a more generalised form referring to humans - such as "men" to "humans".

[6]Own translation.

[7]For an overview see for instance Schecter (2010), Smulewicz-Zucker (2017) or Jay (2016) for critical theories on instrumental reason as well as the collections by Halbig and Henning (2012b) and Kolodny and Brunero (2013) for contributions from analytical philosophy.

[8]Habermas received strong critique for using this analysis to argue that the efficacious domination of nature under instrumental reason is not only inevitable but also essential for an emancipatory project (see Dryzek 1990; Eckersley 1990).

[9]To my knowledge there are few exceptions with regard to instrumental reason. For instance, Horkheimer does connect instrumental reason to the legitimisation of slavery by the lawyer Charles O'Connor in the United States of America during the civil war; yet, he does not further elaborate on the racist epistemological entanglements of instrumental reason nor on other consequences in the western colonial endeavours (2004, 17). Another example as we have seen above is de Luca who mentions the devaluing of native cosmologies in Abya Yala to legitimise colonial oppression and the installation of instrumental reason (2001, 310).

[10]Own translation.

[11]Own translation.

[12]Own translation.

[13]See for instance de Sousa Santos (2018).

[14]It can be argued that instrumental reason contributes to the regressive side of a global dialectic between homogenisation and heterogenization, between flow and fixity, that is for instance theorised by Meyer and Geschiere in their exploration of the functioning of globalisation (1998).