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ARTICLE

‘My body was no longer a problem’: Electric mountain biking, disability, and the cultural politics of green exercise

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Abstract

Disability is often overlooked in discussions of green exercise. Consequently, we still know little about how ableist ideologies might play out in the context of nature engagement, or the forms of pleasure that disabled people derive from participation in green spaces. In this paper, we address this gap in the literature by exploring the relationship between electric mountain biking and disability in England (UK). Adopting the work of Bernard Stiegler, we highlight the superficiality of existing ideologies of nature, analyse the myriad ways that e-mountain bikes can challenge ableist attitudes towards outdoor recreation, and explore the freedoms and constraints that accompany the assemblages between e-mountain bikes and ‘disabled’ bodies. Drawing on data from 20 online interviews, we highlight the social contexts and interactions that shape technological choices, adaptations, and outcomes within the disabled e-mountain bike community. Our analysis reveals that, while e-mountain bikes are stigmatised in green spaces, the enhanced level of social interaction that is afforded by the presence of such technology allows participants to de-emphasise their perceived physical inadequacy and, instead, focus on promoting a more empowering image of the socio-technical disabled body that is active, capable and self-determined.

KEYWORDS

disability, electric mountain bike, green exercise, online interviews, Stiegler

1 | INTRODUCTION

Over the last decade, there has been a burgeoning body of research on the physical and mental health benefits of green exercise and nature exposure (see Brymer et al., 2021; Hitchings & Latham, 2016; Jimenez et al., 2021). However, as the emphasis on green exercise as a panacea for physical and mental illness has gained momentum, the social and cultural significance of nature has been marginalised from public debate (Rogerson et al., 2021). Consequently, we still know little about how ableist ideologies might play out in the context of nature engagement, or the forms of pleasure that are derived

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from disabled people's participation in green spaces. In this paper, we address this gap in the literature by exploring the relationship between electric mountain biking, and disability in England.

Drawing upon interview data from a broader sample of (30) e-mountain bike users in England, we analyse the socio-natural and socio-technical tensions that exist between e-mountain bike use and other users (Cherrington, 2024; Cherrington & Black, 2023) as well as the implications that such relations may have in encouraging alternative conceptualisations of 'disablement'¹ (Bell, 2019, 2021; Mitchell, 2021). Here, we put scholarship on disability and green exercise in conversation with the work of Bernard Stiegler (1998, 2013, 2018, 2020) to highlight the superficiality of existing ideologies of nature, understand the myriad ways that e-mountain bikes can challenge ableist attitudes towards outdoor recreation, and explore the freedoms and constraints that accompany the assemblages between e-mountain bikes and 'disabled' bodies.

2 | DISABILITY AND GREEN EXERCISE

Green exercise is defined as any physical activity which takes place whilst directly exposed to nature (Veloso & Loureiro, 2017), such as parks, forests or the countryside. Activities that are aligned with green exercise include (fell) running, cycling, walking and climbing, as well as more urban pursuits such as gardening. Unlike nature sports, where the emphasis is on competition (with self and others), skill development and (individual/collective) challenge (Melo et al., 2020), green exercise involves the combination of physical activity with the natural environment to promote overall health and wellbeing. Thus, while there can be variances in both the intensity of exercise undertaken and the level of nature engagement, the main goal of green exercise is to leverage the restorative qualities of 'nature' to enhance the benefits of physical activity.

Against a backdrop of declining levels of physical activity in western, developed nations, a growing body of evidence suggests that green space can play an important role in promoting physical activity and improving health (see Mao et al., 2012). However, as the emphasis on 'Nature' as a panacea for physical and mental illness has gained momentum, the social and cultural significance of nature has been marginalised from public debate. In the process, green exercise has been reduced to a 'one size fits all' ideal, in which all participants are said to benefit evenly from its influence, without recourse to the material, structural or institutional factors through which nature is, or isn't, being accessed. This view, often referred to as a realist account (White et al., 2016), is one in which nature is perceived as being no more than the sum of its parts, identified only through a series of universal, observable and quantifiable laws upon which decisions about the management and administration of nature can be processed.

Critics such as Bell et al. (2018) point to the danger of realist narratives, particularly when it applies to the improvement of human health. Indeed, the manner in which nature is incorporated into discourses of health promotion suggests that the term is permeated with ideological meaning (i.e., the healing qualities of Nature) that is filtered through powerful and medical(ising) institutions such as the National Health Service and The National Trust. Such institutions have a great deal of influence over our access to (i.e., the use of scientific evidence to prohibit access to certain spaces), and enjoyment of (i.e., the way in which cartographic practices help to map various landscapes) such environments. Thus, scholars working at the intersection of geography and health warn that care must be taken not to promulgate ableist assumptions regarding the hyper-fit, independent and self-disciplined body (Bell, 2019). For Ray (2009), challenging these ableist legacies in green spaces is important, since the archetype of the intrepid explorer (i.e., of 'wild' or 'green' spaces), which emerged during the nineteenth century, is often explicitly aligned with a form of social Darwinism, in which life is portrayed as a contest for genetic and national survival, and the figure of the disabled exerciser is condemned as an example of what could otherwise be.

Mitchell (2021) contends that this process is part of an explicit *regard* for the dehumanising stereotype of the grotesque, dysfunctional body in contemporary societies, which results in a range of psycho-emotional exclusions that lie not in the individual bodies of disabled participants, but in the design and organisation of societal functions, which can include socio-cultural factors such as the attitudes and expectations of other land users. For example, Cherrington's (2024) research has shown how disabled e-mountain bikers are often subject to small, almost unremarkable occurrences, such as staring, 'tutting' or eye rolling, which serve to both 'other' disabled bodies and produce feelings of not-belonging. Taken together, these various forms of exclusion can result in the internalisation of ableism; a process whereby disabled people judge themselves by non-disabled ways of moving and acting in green spaces, blaming themselves when they cannot conform to such expectations (Campbell, 2009). Resultantly, disabled people can end up distancing themselves from their disability, thereby not fully acknowledging barriers that are *outside* of their control.

These forms of stigmatisation are complemented by a process of ableist forgetting or societal *disregard* for the tacit, and at times unextraordinary relationships between impaired individuals and their surroundings (Kafer, 2013). Indeed, it is this aspect of green exercise that has long been ignored in public or academic accounts of disability (Bell et al., 2018); something that this paper explicitly seeks to address. Here, Burns et al. (2009) suggest that while identifying barriers to the outdoors is essential to transgressing problems faced by disabled people, there is also a need to understand why these individuals and communities are prompted to visit green spaces, and more importantly, what identities, experiences and forms of enjoyment are afforded by the landscapes and environments that they visit. Furthermore, 'given the often-exclusionary dimensions of "nature" and "wilderness", it is crucial to recognise how those considered out of place find ways of interacting and engaging' (Kafer, 2013, p. 130). By identifying the small but significant gestures and movements, or activist affordances (Dokumaci, 2023), that underpin disabled people's enjoyment of green spaces, and (re)framing accessibility as an active rather than a static practice, we can ensure that everyone, regardless of ability, can benefit from the therapeutic qualities of 'nature'.

Against this backdrop, scholars have called for a more progressive identity politics which shifts emphasis away from undesirable medical interventions or oppressive social relationships. In critiquing the politics of cure, for example, Clare (2017) reveals how some body-minds are valued whilst others are devalued; some lives are saved whilst others are ended, promulgating normative understandings of what it is to be human. Furthermore, by focusing on a *future* cure, attempts to promote access and social inclusion for disabled people in the *present* are inhibited. Such a shift in thinking extends to research in green spaces and outdoor leisure, in which calls have been made to foreground human variation and the complex biographical temporalities of lively and embodied human–nonhuman encounters in the pursuit of enhanced wellbeing (Bell & Foley, 2021).

In this context, Bell (2019) examines how people with sight impairment describe and experience a sense of wellbeing with nature throughout the life course. In doing so, she highlights how nature encounters can promote feelings of freedom from ableism, whilst providing moments of curiosity, exploration and upskilling. Respondents detailed how, in adapting to their environment, emphasis shifts away from the idealist and ocular-centric aspects of nature immersion, towards more sophisticated, multi-sensory engagement with a range of textures, objects and landscapes. Thus, despite the powerful expectation to see and move in ideological ways, Bell's (2019, 2021) work illustrates how impaired users of green space can learn to challenge medicalised and tragic conceptualisations of disability and imagine new corporeal worlds that are not bound to an existing set of ableist ideologies.

3 | GREEN EXERCISE, SOCIO-TECHNICAL HYBRIDS AND 'TECHNOSPHERIC METABOLISM'

In addressing these experiences, this paper asks whether, and if so, how, e-mountain bike technology might offer potential for liberation, empowerment and emancipation from guiding normative and humanistic ideologies that negatively position the disabled body in green spaces. Despite accounting for approximately 20% of all e-bike sales globally, little is known about peoples' reasons for buying e-mountain bikes or the impact that such technologies may have on cultures of off-road cycling (Ingram-Sills, 2024). This is an important omission, since e-mountain bikes have been found to increase the accessibility to the outdoors for riders who would otherwise be socially or physically excluded, whilst acting as an equaliser between the cycling competencies of different individuals (Cherrington, 2024). At the same time, the growing popularity of e-mountain bikes poses a unique set of social, political and infrastructural questions relating to the human significance of natural spaces and outdoor environments (Cherrington & Black, 2023). This is especially relevant to disability studies, where the very notion of 'disablement' and 'assistance'² in the context of green exercise raises important questions relating to ideological notions of 'nature', 'risk' and 'adventurous' activity, since disabled users who require technological intervention are frequently positioned as an aberration (Kafer, 2017).

In analysing the success of an adaptive hiking programme in British Columbia, for example, James et al. (2018) report a range of personal and social benefits of using an aluminium-framed chair to enable access to the outdoors, including staying fit, accessing the outdoors after a period of absence and sharing these experiences with others. Concomitantly, however, feelings of inadequacy and disablement were found to be compounded as users become frustrated about their lack of autonomy (i.e., when compared with non-disabled users) and their (negative) encounters with members of the public, who perceive the presence of the adaptive bike as a technological aberration which contaminates an otherwise 'natural' space.

According to Stiegler (1998), such instances indicate that technology is not merely a tool but a form of mediation that profoundly influences our perceptions, interactions and possibilities (i.e., of how people should move and behave in green spaces). This suggests that a significant portion of our humanity is necessarily located outside of the body within various external organs, including the technologies and forms of assistance that we ('able bodied' or otherwise) turn to in our everyday lives (Stiegler, 1998). Stiegler's contention, therefore, is that we must recognise that all humans, regardless of how they perceive their 'ability', have a shared dependence on technology and are thus equally vulnerable to the consequences of its use. It is here where the pharmacological qualities of human existence can be located, and hence, how the myriad relationships between green spaces and technologies can be better understood, since the coming together of humans and technologies in green spaces creates both negative and positive potentials that are a by-product of socio-technical indeterminacy (Stiegler, 2013). Rather than technologies such as wheelchairs, e-mountain bikes or tents being universally 'good' or 'bad', Stiegler proposes that their very implementation necessitates a consideration of both, since the 'conditions of possibility and impossibility are one and the same' (Howells & Moor, 2013, p. 12).

Accordingly, Stiegler notes that 'nature', 'culture' and our sense of 'humanity' have always been ontologically imbricated; the problem is that philosophers and scholars working at the intersection of technology, embodiment and society have failed to properly acknowledge this. At the same time, forms of care and attention that we would once have dedicated to understanding these relationships are increasingly being hijacked and fragmented by the proletarianisation of knowledge (Stiegler, 2017); a process that is expedited by a new era of computers, phones and social networking sites. The growing ubiquity of these media has had profound consequences for our individual and collective consciousness, resulting in a shallower mode of engagement with the world and a diminished capacity for critical thinking, something that he has elsewhere described as 'entropy' (Stiegler, 2018). This has had a particularly harmful impact on the lived environment, since our reliance on technology has both accelerated our use of natural resources and disrupted our ability to intervene in capitalist processes of accumulation.

In response to these challenges, Stiegler (2018) calls for a revaluation of attention and the development of practices that cultivate deep, focused engagement with the technological artefacts that constitute human consciousness, memory and identity; something that Krzykowski and Linberg (2021, p. 198) call a 'new technospheric metabolism'. This echoes broader calls within (political) geography and the (environmental) humanities to recognise that humanity has progressed from normative and dated conceptualisations of what it is to be human (Lapworth, 2019; Williams et al., 2019). In disability studies, Goodley et al. (2021) term this movement post-human disability studies, which they see as a means of challenging dominant understandings of the humanist human that is 'premised on an unacknowledged white, male, heterosexual and of course able-bodied subject that dances to the rhythm of ableism' (Monforte et al., 2022) limiting and downgrading other forms of humanity.

For Stiegler, this shift in thinking (and acting) requires that we radically re-frame the human condition, and thus human evolution, as being profoundly influenced by the development and utilisation of external tools and technologies, and their attendant cultural practices. Here, emphasis is placed on reclaiming control over our attention by becoming more aware of the manipulative techniques employed by attention-seeking technologies and, in the context of disability studies, to expose the ableist and techno-social ideologies that have, often explicitly, been a central tenet of political decision-making regarding access to, and experiences of, public space (Mitchell, 2021).

In recognising and unpacking these complex techno-social relationships, disability researchers can explore how various forms of assistive technologies, adaptive devices and prosthetics mediate and transform the experiences and identities of green exercise for disabled people. In developing new forms of technospheric metabolism, existing understandings that position technological or motorised assistance (i.e., via wheelchairs or e-bikes) in outdoor spaces as the epitome of technological alienation are subject to sustained critical scrutiny (Ray, 2009). For, if the human condition is technological compensation for an inherent ontological vulnerability, then everyone is lacking, and none are complete. Furthermore, the only difference between those whose bodies are deemed atypical and those that are not (i.e., in seemingly 'natural' spaces) is that the former are stabilised within a particular set of associations which afford these bodies certain freedoms, whilst the latter are not. Thus, whilst able-bodiedness in Western neoliberal culture is typically defined by an absence of attachment, Stieglerian thinking allows us to highlight how freedom, in contrast, becomes 'a matter of being well-attached [i.e., to situated technologies] ...and agency is realised with, rather than escaping, attachments' (Mitchell, 2021, p. 29).

In the context of the present study, this raises the possibility that 'disabled' e-mountain bike users are well placed to usher in the new forms of technospheric metabolism that Stiegler and his colleagues describe, since both the embodied use (i.e., prosthesis) and cognitive burden (i.e., stigma and abuse) of using assistive technology in green spaces necessitates a struggle against the narrow (and harmful) way in which certain human–nonhuman relationships are imposed and

understood within the (Neg-) Anthropocene (Stiegler, 2018). At the same time, insights from e-mountain bikers can be employed to challenge ableism by rejecting the perceived binary opposites of dis/abled, healthy/unhealthy and normal/abnormal and move beyond dualistic understandings that contribute to the demarcation and domination of the 'Other' (e.g., Goodley et al., 2014). Accordingly, Stiegler's ontology allows us to celebrate, rather than denigrate, the intermeshing of e-mountain bikes, nature and the ('disabled') body in a way that might usher in new hybrid practices, emotions and subjectivities.

4 | METHODS

The data included in this paper are drawn from a wider study which examined experiences of e-mountain biking from the perspective of different user groups in England. The focus of this study was on skill development, health promotion and the impact of technological developments on 'natural' environments. England was chosen as a key geographic location for the recruitment of participants as e-mountain bike use is currently a topical point of social, ethical and political debate, and commonly intersects with related notions of access and public rights of way. Indeed, compared to countries such as Scotland (responsible open access) and Wales (recently engaged in public consultation regarding the possibility of responsible, open access), the use of England's green spaces by mountain bikers and mountain bike trail-builders continues to be vehemently contested, leading to tensions with other user groups (see Brown, 2012). Interviews with English participants were therefore expected to yield a rich data set that would help us to unpack the contested nature of e-mountain bike use in green space.

To recruit participants, the researchers initially drew on a convenience sample (Emerson, 2015) that comprised 10 existing contacts of the lead researcher, who is an active member of the mountain bike community. Existing participants then acted as gatekeepers, referring five people they thought were of interest. This proved a particularly useful part of the process as it afforded the opportunity to recruit participants who might not otherwise have come forward due to the contentious nature of their activities. As more participants were required for the study, a further five were then recruited through the strategic placement of promotional messages on the websites and forums of national advocacy groups. Specifically, a link was posted across the lead author's 'X' and Facebook social media sites to gain attraction from a larger group of people. A combination of convenience and snowball sampling thus allowed the researchers to inexpensively and efficiently draw on a sample that had a wide geographical and demographic spread.

Participants included women (7) and men (23) and involved individuals from across the lifespan (21–29 years ($n=10$); 30–39 years ($n=12$); 40–49 years ($n=2$); 60+ years ($n=8$)). Significantly, 20 of these participants also reported experiencing long-term impairment³ (physical, sensory and cognitive) and identified as disabled. Furthermore, all 20 of these participants defined their e-mountain bike as a mobility aid, that is an assistive product that can 'help maintain or improve an individual's functioning ... thus enabling their health, well-being, inclusion and participation (World Health Organization, 2024, n.p.). Following an emergent inductive research design, it is these responses that we shall be focusing on in the following sections of analysis.

Between June and July 2020, 30 Zoom interviews were conducted with a range of riders, with varying experiences of e-mountain bike use. Originally, we had not intended to use video conferencing software to conduct the interviews. However, the changes brought about by the global pandemic necessitated a more flexible, socially distanced and accessible method that was convenient for both the participants and the researchers (Lobe et al., 2020). Though this was initially seen as an inconvenience, we quickly realised that this did not mean compromising on the richness or quality of our data. Indeed, notwithstanding the occasional disruption of the participants' video feed due to a poor internet connection, our experience of using Zoom was largely positive, allowing for a series of free-flowing, and in-depth conversations between us and the participants (ibid.). In particular, we noticed that certain sounds (i.e., car horns, builders digging outside) or general 'goings on' (i.e., children shouting/crying, music playing) around the participants' homes initiated unrelated conversations throughout the interviews, which lead to measurable improvements in rapport.

In this sense, we feel that there were therapeutic as well as academic benefits to the interview process. Given that disabled people are at increased risk of experiencing 'emotional loneliness and social isolation' (Macdonald et al., 2018, p. 1138) compared to non-disabled people, we recognised that the pandemic was a particularly challenging time for our participants. As Shakespeare et al. (2022) determine, the pandemic further created social dislocation and a sense of abandonment, exposing the structural inequalities impacting disabled people and how their human rights have been compromised in ways which question their very existence. Undertaking research during this time was therefore important

in exploring if e-mountain biking was socially enabling as well as providing an opportunity for participants to voice the challenges, dilemmas and frustrations encountered in using green spaces.

Issues of rapport and reflexivity were also important to considerations as both researchers identify as non-disabled and were required to navigate participants' stories of impairment and identification with participants being disabled as they emerged in interviews. Debates in disability studies have raised concerns about the motivations of non-disabled researchers and the (conscious or unconscious) reproduction of ableist and exploitative research practices and assumptions (e.g., Stone & Priestley, 1996). Accordingly, researchers' ideological underpinning, their positionality in relation to research participants, and evidence of being reflexive were considered in relation to a range of methodological and ethical dilemmas throughout the research process (Inckle et al., 2023). For example, as participants in this study told us about their stories of impairment, we resisted the implicit impulse to ask, 'What happened?', risking defining them primarily by their disability, evoking sympathy and perpetuating medicalising and tragic understandings of disability (see Sparkes & Brighton, 2020). Instead, on learning about impairment, researchers sought to prioritise the participant's voice and agency by providing them with the power to talk about impairment if they wished, how they wished. Placing participants at the centre of knowledge construction in this way fostered a more collaborative approach to research and assisted attempts at empathy.

Following Zoom interviews, the data were subject to a dialogic narrative analysis (Smith & Monforte, 2020). Here, our focus was on the points of convergence between human, material and technical worlds, and the ways in which these complex entanglements came to bear on the participants' narratives. Specifically, we drew on the three aspects of an organological analysis outlined in the work of Stiegler (2020), namely: (1) how bodily organs and their respective proprioceptive, kinaesthetic and sensorial capacities are incorporated into the experience of riding an e-mountain bike; (2) how artificial organs, or forms of prosthesis, such as a motor and a digital computer, might facilitate certain movements and interactions; and (3) how certain social groupings are mobilised around different technological assemblages. By paying attention to a range of material-semiotic assemblages that are formed between the participants and their e-mountain bikes, we were able to identify distinctive themes within the data, and to use these to arrive at specific analytic judgements regarding the socio-technical significance of specific human–non-human relationships.

In what follows, we detail how this methodology led to the development of three narrative themes: (1) The stigmatisation of e-mountain bikes in green spaces; (2) The affordances offered by e-mountain bikes, and (3) Embracing the socio-technical and socio-natural self.

5 | ANALYSIS

5.1 | The stigmatisation of e-mountain bikes in green spaces

In the context of e-mountain biking, experiences of motorised assistance have been shown to be contingent upon societal values, beliefs and power dynamics, relating to fairness, professionalism and equality (Ingram-Sills, 2024). In this study, this is evident in the way that participants describe being subjected to an explicit and often violent form of 'regard' (Mitchell, 2021, p. 30) by other users of the outdoors:

I think banter is probably too kind for the words that I got when I first got my e-bike and I used to get really upset because I knew why I had my e-bike and I wasn't entirely comfortable with how I felt about myself at the time. I felt super disabled and like incapable and people would say that I was lazy and that I should get a real bike, which made me feel even worse about myself.

(Becky)

Becky's reflection underscores the importance of understanding the social contexts and interactions that shape technological choices, adaptations and outcomes. Here, Stiegler (1998) emphasises the importance of external memory, which is inscribed in technical objects, and partially lies outside of the human mind or body. In this instance, for example, we see how the growing role of technology within (off-road) cycling enters into conflict with ideological notions of green space, which for other users of the outdoors, is strongly associated with images of serenity, wilderness and an unspoiled nature.

What is especially interesting, in this respect, is the dual and often contradictory connotations of e-mountain bike technology among non-disabled users of the countryside. Significantly, whilst e-mountain bike use is celebrated for allowing unparalleled access to outdoor spaces, it does so through the 'supercrip' narrative of disability in which there is

emphasis on disabled people ‘overcoming’ the ‘tragedy’ of their impairment through demonstrating hard work, courage and determination and abilities beyond those that would be expected of them and leading a ‘normal’ life (Howe, 2011; Silva & Howe, 2012). Whilst appealing for the non-disabled majority, the supercrip narrative belittles and trivialises disabled people’s achievements, feeding the ‘illusion that disabled people’s lives can be controlled by human agency’ (Silva & Howe, 2012, p. 190). This further exposes how e-mountain bike use can simultaneously result in feelings of unease, anxiety or panic that stem from concerns about the shifting dynamics of athleticism, the impact of technology on sporting performance, and changing perceptions of ability (Howe, 2011). In being deemed to gain an unfair and non-human advantage, therefore, disabled people are further dehumanised.

These attitudes appear to be especially problematic for disabled e-mountain bike users, whose bodies and accompanying prosthetics are *regarded* as going beyond ‘natural’ capabilities; challenging human normativity (e.g., Burkett et al., 2011). Resultantly, disabled exercisers often find themselves placed under surveillance and dehumanised, contributing to a worrying reproduction of ‘enfreakment’ (Peers, 2012, p. 308). The types of regard that participants received for riding an e-mountain bike can be further subdivided into two categories. The first was related to the public’s perception that use of their bikes was a form of ‘cheating’, that at times resulted in verbal abuse from other users of green space:

...it was sunny, so everybody was sitting outside a café, and I was going past, and this bloke shouted that I was a ‘cheat’.

(Julie)

I went to X woods once. I was riding past a group of kids and they all shout ‘cheat, cheat, cheat’. I thought ‘they don’t have a clue ... wait till your 42 and you’ve got arthritis’.

(Kelly)

The second is the idea the e-mountain bike users were somehow ‘lazier’ than those who did not use a motor:

My friends say I’m a lazy old man doesn’t want to peddle anymore.

(Kai)

People say like you don’t burn as many calories on an e-bike, so you won’t be as fit.

(Kelly)

They (friends) say they’d feel a bit soft if they had an e-bike.

(Harry)

These responses reflect two dominant but related tropes in ableist discourse. Firstly, they illustrate how the disabled body is negatively stereotyped as being less capable or productive, perpetuating the belief that they are somehow deficient compared to non-disabled⁴ individuals (Powis et al., 2022). Secondly, the disabled body is positioned as passive and weak, relying on assistance from (human and non-human) others rather than being active agents in their own lives (see Barnes, 1990).

In these instances, disabled people are pitied or perceived as helpless, or, as we have seen in the above excerpts, have their bodies publicly ‘othered’ in green spaces. Such worries are consolidated by a wider concern regarding the dehumanisation that is experienced by athletes and exercisers who are being exposed to more frequent technological intervention. In the case of e-mountain biking, it is assumed that greater levels of mechanisation, such as those that we increasingly witness in green spaces, are bringing about increased levels of automation, and thus, increased levels of alienation from our minds and our bodies.

Of note here is the suggestion that the level of abuse participants received was directly proportionate to the (in)visibility of their disability, in which their athletic success minimises or hides the appearance of disability (DePauw, 1997), and their perceived reliance on technology. For example, Becky, who has a heart condition, reflects on an instance of abuse on the trail, which she puts down to others not being able to ‘see’ her disability:

From the outside it looks like I’m cheating because I’m not out of breath. But on an e-bike it’s more controlled breathing, rather than, so you’re not like totally heart failure, out of breath.

In another conversation Dan, whose condition is more ‘visible’ (but only when he dismounts the bike), provides a comparable anecdote:

I just popped it in turbo to go up this fire road and I went past this guy who as I went past shouted ‘cheat’. So, I knocked it back into eco and dropped back to confront him. As I got off the bike, he obviously saw the way I was walking and said, ‘oh Jesus I’m so sorry, I didn’t realise that you were disabled’.

These excerpts offer useful insights into the dual connotations of motor-assisted mobility in the context of green spaces. E-mountain bikes are widely celebrated for their ability to help disabled exercisers to regain, albeit temporarily, a sense of ‘normality’ through physical activity, socialisation, a shared appreciation of nature and the recapturing of their independence. Yet, this process of normalisation is tacitly informed by a dominant cultural imaginary in which self-sufficiency, autonomy and independence are valorised in favour of connectivity, community and cooperation (Bell & Foley, 2021). Contra the intentions of many e-mountain bikers, the above accounts therefore elucidate the manifold ways that the use of e-mountain bikes can reinforce a medicalised view of disability among members of the public, in which disability is enacted as a biological defect localised in a pathological individual body.

5.2 | The affordances offered by e-mountain bikes in green spaces

Despite the stigmas attached to e-mountain biking, there are also certain affordances that are offered by this emerging technology. This mirrors the findings of Sparkes et al. (2017), who illustrate how athletes enrol different technologies to develop strong and efficient athletic movements as disabled sporting cyborgs. For example, participants articulate how the motor became a physical extension of their body that allowed them to lessen the perceived effects of impairment, demonstrating medicalised understandings of their own bodies. Hannah breaks the beneficiaries of this down into three specific groups:

I think there's three different strands. There are people who have lost limbs or whose fitness has been massively impacted by an incident. There's a large group of people whose fitness isn't where they want it to be ... And older people. For example, our friends who are in their 60s have just bought e-bikes because their knees are pretty much shot.

Across all three of these groups, individuals feel much less limited by the long-term impact of health conditions. Nayar (2014), suggests that this is indicative of the contemporary posthuman condition, whereby our consciousness and physiology are increasingly shaped by tools and technologies such as the e-mountain bike, providing a potential challenge to dominant notions of ‘illness’ and ‘normalcy’. Psychologically, the use of the motor boosts the participants’ motivation to ride, as it allowed them to ‘do more with less effort’ (Alex, Graham), focus on moving their legs instead of worrying about the pain in their knees (Adrian, Mike, John), ‘not worry so much about falling behind on group rides’ (Doug) and ‘learn how to ride for the first time’ (Betty). Furthermore, for those participants that have witnessed age-related decline in their physical ability, the e-mountain bike was said to allow people to ‘extend’ their life as a biker (Mike).

Another dominant theme is that of ‘choice’. This is a common discussion point in disability studies, as research finds that people living with physical and psychosocial disability face a multitude of personal, institutional and cultural factors that impede them from exercising genuine choice and control within certain sporting, health, medical and political contexts (Hamilton et al., 2023). As we have previously highlighted, this is especially problematic in relation to outdoor recreation, as intrapersonal, interpersonal and structural constraints continue to ‘other’ and exclude disabled bodies (Burns et al., 2009). For disabled e-mountain bikers, having choice and control is therefore deemed important as it allows them to make decisions about their own style of riding and to access green spaces in their own way.

For example, Darren explains the benefit of the various ‘modes’ that are available on his bike:

You've got eco which is kind of no fun at all. It's quite handy when you're struggling to get home. There's trail mode or MTB mode, which is what you should always be using off road really unless you're really bored on a hill. Then you have boost, that will just get you up the boring hill and make you smile while you're doing it.

Similar sentiments are also expressed by Andrea, who talks about ‘turning the boost mode on when you get tired’, Becky, who enjoys ‘being able to enjoy the ups as well as the downs’, and Edward, who feels that his e-mountain bike enables him to ‘ride in the winter as well as the summer’. Interestingly several riders also mentioned risk avoidance, which is often perceived to be accentuated for disabled users of the outdoors (Burns et al., 2009). Specifically, two of the participants note how the option to get off the roads and away from traffic was highly valued, since a car accident had been the source of their physical impairment.

A knock-on effect of this ability to choose, and one that is rarely talked about in discussions involving e-cycling technology, is the impact that the different levels of assist have on the participants’ social lives. We see this, for example, when William talks about riding in a group:

In my experience e-bikes can be a bit of an equaliser. For example, in my riding group there is one guy who is actually quite fit, but he’s got some medical problems so he’s a bit anaemic. Another lad is getting on a bit and he’s probably a bit heavier than he should be, so he can really struggle. But having an e-bike allowed us all to ride together and have a laugh, without worrying about how fit we were.

In Stieglerian terms, these interview responses imply that the e-mountain bike is a medium for ‘noodiversity’ (Stiegler & Ross, 2021, p. 4); a shared form of signification through which groups cultivate themselves through common practices relating to, for example, technology, bodies and the environment, whilst at the same time bringing these practices in confrontation with one another. Thus, although disabled bodies are often disavowed in ways that ‘shift attention from the myth of one’s able corporeality (the lacking real body that fails to match the image in the mirror and the I of the symbolic) to the realities of disabled others’ (Goodley, 2012, p. 186), the presence of the motor introduces a form of ‘concrete universality’ (Žižek, 2018), highlighting that there are no universal rules (or reasons for ‘needing’ or ‘wanting’ assistance), and that ‘all we are dealing with is exceptions’ (ibid., p. 4).

Perhaps the most useful (social) affordance offered by the e-mountain bike is that it allows riders to interpassively delegate their own enjoyment to a technological object (Pfaller, 2017). In delegating physical output to the e-mountain bike motor, participants can focus on the social aspects of riding, which is evidenced in a conversation between the interviewer and Rob:

Interviewer: It’s almost like a conduit for other things isn’t it?

Rob: Yeah, and that’s literally the most important thing. The time I can spend with my son now is just priceless and the e-bike has been a massive enabler of that.

To which Kelly added:

I had a lot of mental stress, I got made redundant from work, I had a few relationship problems and I’ve put on like seven stone. But with the e-bike that doesn’t really affect me anymore. I just get on with enjoying the views and spending time with my friends.

Every one of the participants in this study describes similar social benefits, including spending time with partners (Becky, Harry), children (Brendan, Doug), and grandkids (Tony), encouraging a more inclusive atmosphere (Alex, Becky and Graham, Pete), taking the time to learn skills from friends (Becky), having more time to chat and socialise (Ben), and accommodating others with injuries (Ben) and/or long-term medical issues (William).

In this sense, the local possibilities enacted by interpassivity provide the potential for what Stiegler describes as negentropy (Stiegler, 2018), or the struggle against entropy, a process where the ideological affiliations between sport/leisure and the natural environment are de-emphasised, and replaced instead with a culture care, creativity and attention. Politically, interpassivity would appear to be an important aspect of e-mountain bike culture as it reveals underlying power dynamics and social structures in both sport and outdoor recreation. By examining the ways in which individuals delegate their enjoyment, the above analysis provides insights into the broader cultural and political systems that shape our desires and behaviours. Specifically, participant responses reveal how interpassivity and negentropy may be linked to larger issues of ableism, social (in)justice and a lack of access/infrastructure in outdoor settings. In the following section, we extend these observations to show how, when understood as being mutually constitutive, both the stigmas and affordances that we have highlighted above may lead to more critical engagement with green space.

5.3 | Embracing the socio-technical and socio-natural self

A common sentiment echoed in many of the interviews is that e-mountain bikes made users feel ‘superhuman’:

I mean my initial reaction was when I first started to ride it, I was just grinning all the time. I was just like: ‘this is fantastic, everything is so easy, I feel like I’m superhuman’.

(Alex)

The motor, the battery, the way it feels when I ride it. Everything about it made me feel like my body was no longer a problem; like I was superhuman.

(Hannah)

Such responses reflect how the disabled body-selves in green spaces are ‘technological textured’ (Butryn & Masucci, 2009, p. 289) by objects such as bikes, medicine, GPS tracking devices and physical infrastructure. Indeed, though both ‘able’ and ‘disabled’ bodies enrol certain prostheses in the act of exercising, they do so in different ways, and with different intensities (Mitchell, 2021). In this study, the object of the e-mountain bike is not only seen as a physical extension of the embodied self but plays a central role in the sensuous experience of rolling over textured terrain, and the heavily somatic and haptic sensations of doing so. This highlights the importance of embracing differential mobilities within the context of healthy mobilities (Bell & Cook, 2021). Recognising the finely tuned movement repertoires developed between disabled (and non-disabled) individuals and the objects (or actants) with which they interact, can help to foreground how health, in the context of green exercise, takes shape differently among diverse living entities in motion.

In such cases, there is of course a danger (see above) that participants may unconsciously accept medical or supercrip narratives to exercise and rehabilitation, which sees their normalisation and subsequent inclusion in green spaces as the result of sheer willpower, determination or technological prosthesis. However, whilst reductive and ideological understandings of ‘nature’ and ‘technology’ carry much weight in the context of green exercise, they are, at the same time, explicitly problematised by many disabled e-mountain bike riders, on the grounds that they validate certain techno-human hybrids (agricultural, able bodied, capitalist) whilst subjugating and excluding others (Kafer, 2013). Indeed, many of the participants described instances of entropy (Stiegler, 2018) suggesting that many people ‘lack understanding of what e-mountain bikes actually do’ (James, Harry, Mandy, Andrea, Betty). Alex, George and Jenny also told us how they have responded to angry confrontations by pointing out that there are other examples of human intervention such as dams, tractors and cafes that tend to go unnoticed, garnering much less attention than e-mountain bikes.

By way of response, participants emphasised the complexities of ‘en-wheelment’ (Papadimitriou, 2008), that is, a process through which using an e-bike becomes part of their embodied existence. Numerous participants expanded on how this impacted the experience of riding, specifically *how* they learnt to ride specific features of a mountain bike trail:

I mean climbing is quite different because you’ve got professional levels of power on tap without professional legs.

(Darren)

I felt like a hero to begin with because, you know, all of a sudden I could ride round corners twice as fast, well not twice as fast ... but it felt like I had a lot more grip and the low centre of gravity was, you know, was very beneficial when I was riding it.

(Harry)

These responses demonstrate how sensitive techno-natural encounters can promote feelings of freedom from ableism (i.e., feeling like a ‘hero’) among people with physical impairments. Moreover, riding an e-mountain bike offers opportunities for curiosity and exploration, pleasurable sensory immersion, and what Bell (2019, p. 306) refers to as ‘skilling up’. Here, riding electric mountain bikes off road accentuates the corporeal pleasures of riding climbs and berms, but only once the riders have acquired new strategies of perception and navigation that enable them to do so.

In line with broader work in posthuman/new materialist disability studies, these conversations illuminate how the mechanical assemblages that are formed between humans and technology can provide valuable opportunities for criticism and transgression (Goodley, 2011), whereby transgression means going beyond modern understanding of what constitutes ‘properly human’ or ‘technical’, redefining the very notion of dis/ability. Here, participants articulate how the

incorporation of e-mountain bikes into their embodied sense of self helps them to counter the common medico-tragedy conceptualisation of disability, particularly when they are abused for being 'lazy' or 'a cheat':

It might be cheating in that I can get to that trail head quicker than you or I could do 30 laps at X while you only do 10. Is that cheating? I don't know, because I've put in three times more effort going down the stuff.
 (Pete)

It's a heavier bike. You've still got to manoeuvre it. The power of the engine doesn't get you up something. It's the skill and position of the rider that does that.
 (Hannah)

In these excerpts we can see how technology is used and adapted as part of a 'conscious strategy against pity' (Apelmo, 2012, p. 404), to challenge to discursive construction of disabled exercisers as invalid, passive and abnormal. Through a process of deproletarianisation (Stiegler, 2018) participants explicitly challenge common understandings of ability/disability, in which ability is the capacity to do things voluntarily and independently and disability is attributed to those who depend upon prosthetic technologies to artificially compensate for the autonomy they lack. Instead, the individuals cited above highlight how their bodies become one with technology to develop strong and efficient athletic movements as disabled sporting hybrids, destabilising essentialised categories of normal/abnormal and able/disabled.

Ecologically, this is also significant, as disabled e-mountain bikers become highly conscious of the impact they are having on various surfaces and landscapes:

If you're bezzing about and putting it on turbo up a hill then you will spin out and you could damage your trail.
 (Darren)

I mean it's a driven wheel, so there'll be more torque going through your wheel so it will cause more friction. So, if it's wet or if it's peaty then yes it will cause more damage but if you're considering it when you ride then I don't think it matters,
 (Jenny)

In light of this, a number of participants talk about offering support to local advocacy groups and trail associations:

Yeah it is a slight concern that the heavier the bike the more damage it might do to the trails, and I actually have volunteered on dig days with X (local advocacy group) for this reason. As an e-mountain biker I'm especially keen to give something back.
 (Ben)

One of the most pressing issues in contemporary techno-centric societies is that both knowledge and practice relating to technological adoption have been subject to automation, which has eroded our ability to care (Stiegler, 2018, 2020). Overall, the responses analysed in this section highlight that participants are highly aware of the dangers posed by the technologisation of green space and the need for deliberate efforts to counteract the increasing disorder and fragmentation of social and cultural systems. They also highlight an astute awareness of the superficiality of existing ideologies of nature, and the process of ableist forgetting from which such ideologies might derive (Kafer, 2013). Through self-reflection and self-conscious reinvestment, the participants not only recognise the encroachment of technology upon 'nature' but develop specific ecological mechanisms for adapting to this in transformative and negentropic ways.

6 | CONCLUSION

Public awareness of the barriers to green exercise is growing, and in the UK, policy initiatives such as The Countryside Rights of Way Act (2000) and the updated Countryside Code (2022), have, to some extent, improved access for those with mobility issues. In the context of electric mountain biking, this focus has been reflected in the Cycling UK-backed scheme 'My cycle, my mobility aid' (Cycling UK, 2019) the aim of which is to raise awareness of the

challenges that many disabled cyclists face in accessing sanctioned cycling tracks. Here, there is some evidence to suggest that such campaigns have contributed to a more inclusive and accommodating attitude among the public, as well as an increased willingness by landowners to widen access and extend the existing network of cycle trails (Groundwork, 2021). However, despite some progress, empirical research continues to show that the countryside is an inaccessible and unwelcoming place for disabled exercisers, especially when their disability requires the use of ‘artificial’ prostheses (Burns et al., 2009).

In this paper, we have shown that the relationships between e-mountain bikes and their (‘disabled’) users may, under certain conditions, provide a blueprint for change. Furthermore, we have illustrated the ways that (disabled) humans and technologies can positively co-evolve in green spaces. Indeed, though data suggest that e-mountain bike use is subject to a stigmatising *regard* for technology, and a *disregard* for the affordances that such technology might avail, it also showed that the choice and sense of control that is afforded by e-mountain bike technology can allow users to broaden their social horizons, challenge stereotypes and promote a more positive and empowering image of the disabled body as strong, active, capable and self-determined. As such, we consider our work to have made an important contribution to disability studies and onto-political analyses of green exercise, illustrating how socio-technical identities and socio-natural indeterminacy can serve to challenge the material oppression experienced by disabled users of green space.

Methodologically, the use of qualitative data and reflexive analysis has ensured a deep exploration of marginalised perspectives, amplifying the voices of participants with physical impairments. Here, implications arise from challenging ableist assumptions and exploring the intersection of technology and natural environments. Indeed, we are mindful that although the disabled body *can* act as a prime site for cyborgification, disabled peoples’ relationships with technology are not always ‘desired, chosen nor productive’ (Goodley, 2014, p. 107). As such, we support the call by Sawchuk (2014) for differential accounts of mobility that recognise and integrate the diverse ways people use and access green spaces. In extending this call, we urge scholars and practitioners working at the intersection of disability and green exercise to explore ways of thinking (and experiencing) beyond the binaries of ability and disability, and to challenge those forms of life that limit and restrict expressions of technophysical difference. Politically, this will help to shift emphasis away from top-down, one-size-fits-all solutions to green exercise and countryside administration, and towards an approach that promotes the active involvement of diverse community members in the promotion, administration and management of green space (Sawchuk, 2014).

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ENDNOTES

¹ The process of acquiring impairment and becoming disabled.

² Assistance refers to the practices that support the independence and social inclusion of disabled people (Mladenov, 2012).

³ A list of participants and specific impairments has not been provided as we deem this objectifying and medicalising.

⁴ We have adopted Powis et al.’s (2022) use of ‘non-disabled’, which is consistent with current disability politics in the UK.

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