Disability, Affordances, and the Dogma of Harmony: Socializing the EE-Model of Disability

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Abstract

Recent years have seen increased interest among 4E cognition scholars in physical disability, leading to the development of the EE-model of disability. This paper contributes to the literature on disability and 4E cognition in three key ways. First, it examines the relationship between the EE-model and social constructivist views that address the bodily reality of disablement, highlighting commonalities and distinctions. Second, it critiques the EE-model's focus on individual strategies for expanding disabled persons' affordance landscapes, arguing that disability policy should integrate insights from both the EE-model and social constructivist approaches. Finally, it assesses the EE-model against the "dogma of harmony." We argue that while the EE-model's focus on active human-environment collaboration is valuable, it can inadvertently perpetuate this dogma. We contend that integrating certain social constructivist insights can help the EE-model avoid the dogma of harmony.

Keywords Disability · Affordances · EE-model of disability · Dogma of harmony

1 Introduction

In the last years, there has been a growing interest among 4E cognition scholars in physical disability.[1] This interest has crystallized in the creation of the EE-model of disability, a model that emphasizes the individual bodily experience of disabled persons as they interact with an environment populated by socially shaped affordances (see, e.g., Dokumaci 2017; 2023; Toro et al. 2020; Silva and Schwab 2024).

This paper makes three main contributions to the literature on disability and 4E cognition. First, while the EE-model of disability has been compared to traditional Medical and Social Models of disability, there hasn't been any discussion of its (in our view more interesting) relation to recent social constructivist views that aim to do justice to the bodily reality of disablement (e.g., Barnes 2016; Jenkins and Webster, 2021). We identify several interesting commonalities and explain where the approaches come apart.

Second, a key insight of the EE-model of disability is that disabled individuals do not passively suffer the experienced tension between their bodily features and their environment, but actively *create* or *discover* new affordances to remove that tension. While this is an attractive idea, we argue, following our previous analysis, that focusing on individual-level strategies to expand disabled persons' affordance landscape has important drawbacks too. Instead, we propose that disability policy ought to combine insights of the EE-model and the above-mentioned social constructionist approaches.

To finish up, we evaluate the EE-model of disability *vis-à-vis* the "dogma of harmony" (Aagaard, 2021), which has been argued to plague the 4E literature. This dogma

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[1] Some authors (Toro et al. 2020; Silva and Schwab 2024) focus specifically on motor or 'movement related' disabilities, which includes conditions such as Cerebral Palsy and Parkinson's Disease. In order to compare these views to alternative models, we will treat them as concerning physical disability more broadly. For the purposes of this paper, we will set aside the question of whether these accounts can be extended to capture instances of cognitive and psychological disability.

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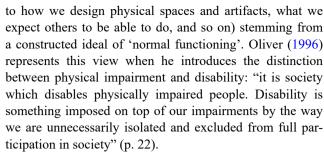
manifests as an overly optimistic portrayal of human-environment interaction, which shows up in a subtle manner in the EE-model of disability. Despite recognizing the model's focus on disabled individuals' active search for human-environment collaboration as its most valuable contribution to the literature on disability, we argue that the sort of individual-level activism championed by defenders of the EE-model must be accompanied by political actions aimed at attaining long-lasting changes in the social norms that dictate what we consider normal bodily functionality.

The structure of the paper is as follows. Section 2 introduces the EE-model of disability. Section 3 compares the EE-model with two recent social constructivist approaches: Barnes' Solidarity Model (2016), and Jenkins and Webster's (2021) Marginalised Functioning Model. Section 4, in turn, combines what we consider most valuable of the EE-model with insights from Barnes' and Jenkins and Webster's accounts to offer concrete suggestions to improve the lives of disabled individuals. We argue that it is by incorporating the insights of these recent social constructivist models of disability that the EE-model can avoid falling victim to the dogma of harmony.

2 The Ecological-Enactive Model of Disability

Traditionally, accounts of physical disability have been divided into two camps: so-called Medical and Social models of disability (Cureton and Wasserman 2020; Jenkins & Webster, 2021). The Medical Model (Daniels 1985; Buchanan et al. 2000; Boorse 2010) conceptualizes disability in terms of the dysfunctional limitations of the person's body. Consequently, this model considers disability to be a "pathological medical condition and something to be "fixed" or "normalized" by a rehabilitation professional" (Schwab et al. 2022, p. 1) and calls for "medical treatment aimed at enabling disabled persons to adjust to society" (Toro et al. 2020, p. 3).[2]

On the other hand, defenders of the Social Model (Oliver 1996; 2013; Shakespeare and Watson 1997) reject the individualistic conception of disability promoted by the previous model and conceptualize disability as a socially produced phenomenon. According to advocates of this view, disability is both a social category and the product of a series of oppressive and discriminatory practices (related

to how we design physical spaces and artifacts, what we expect others to be able to do, and so on) stemming from a constructed ideal of 'normal functioning'. Oliver (1996) represents this view when he introduces the distinction between physical impairment and disability: "it is society which disables physically impaired people. Disability is something imposed on top of our impairments by the way we are unnecessarily isolated and excluded from full participation in society" (p. 22).

As shown by Barnes (2016; see also Tremain 2002; Jenkins & Webster, 2021), both models face important shortcomings, and deliver incorrect verdicts about some paradigmatic examples. A different sort of criticism comes from defenders of the Ecological-Enactive Model, also referred to as the "EE-model" (Toro et al. 2020; Dokumaci 2017, 2019, 2023; Vaz et al. 2023; Schwab et al. 2022; Silva and Schwab 2024). According to proponents of this view, the Social and Medical models equally overlook the ways disabled people experience their own body and the world because of their physical impairments. Thus, the EE-model is born with the pretension of "doing justice simultaneously to the lived experience of being disabled, and the physiological dimensions of disability" (Toro et al. 2020, p. 1). This model, it is argued, takes into account the valuable insights offered by the other two models, but cannot be reduced to them, precisely because it foregrounds the distinctive first-person perspectives of disabled people. Let us examine this model in more detail.

Approaches united under the umbrella of the EE-model share a common root in the ecological approach to perception and action, originally formulated and developed by James and Eleanor Gibson (Gibson 1966, 1969, 1979; Gibson and Pick 2000). The ecological approach (also referred to, more generally, as "ecological psychology") can be described as the combination of four main ideas (see Segundo-Ortin and Raja 2024). The first one is that perception is a direct process, meaning that it is not mediated by unconscious perceptual inferences and constructive processes happening in the brain. According to this view, agents can be perceptually aware of (at least some properties of) the environment by detecting or "picking up" the perceptual information that non-ambiguously specifies it (Warren 2021; Segundo-Ortin et al. 2019).

The second idea is that among the properties of the environment one can perceive are the affordances. The affordances are the opportunities for action an environment offers an individual. Importantly, the very notion of affordance implies a relationship of co-dependence between the action-relevant properties of the environment, and the bodily properties, motor abilities, and skills of individuals. For instance, an inclined surface that is sufficiently extended and rigid (relative to the size and weight of the perceiver)

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[2] This description captures the Medical Model as it is most commonly portrayed. However, a more charitable reconstruction (Koon 2022) suggests that proponents of this model can coherently hold that the diversity associated with disability is valuable, and that some of the harms associated with disability result from a lack of accommodation rather than from bodily dysfunction (p. 3768).

will only afford support and locomotion to an agent with the necessary strength to climb it. For ecological psychologists, then, part of our experience of the environment is given in terms of possibilities for action. Said differently, we routinely experience the world in relation to what we can and cannot do.

The empirical evidence collected so far supports both that individuals perceive affordances over action-neutral properties of the environment (e.g., size, height, and so on) and that such perception is dependent on the action capabilities of the perceivers. For example, observers' perceptions of the point at which a vertical aperture no longer affords passing through (Warren and Whang 1987) vary accurately in situations where the body of the observer takes more space – e.g., during pregnancy (Franchak and Adolph 2014), when using a wheelchair (Franchak et al. 2012), or while carrying hand-held objects (Wagman and Taylor 2005). Likewise, the perception of affordances has been shown to change as a function of increasing fatigue (see Pijpers et al. 2007) and in individuals with similar bodily features but different skills (Lee et al. 2012). As Schwab et al. (2022) explain, the notion of affordance is very useful for the debate about disability because it "capture[s] the entanglement of the individual-environment in defining the skill-based experiences that underlie disability" (p. 3).[3]

The third idea is that perception is an active process, something that individuals *do*, instead of something that *happens* when their sensory receptors get activated. Perception is active in a dual sense. First, to perceive the environment's affordances, we must pay attention to the informational variables that specify them. This is, we must look, hear, smell, taste, etc. Second, it is often the case that the informational variables that specify an affordance are not directly available; rather, the individual must explore the environment, moving and grabbing objects, changing perspectives, and so on, in order to find it.[4]

Finally, consistent with the idea that perception is something we do, the fourth idea of the ecological approach is that perception is a skill, meaning that perceivers must learn how to perceive the relevant affordances. This idea was fundamentally developed by Eleanor Gibson (1969; E. J. Gibson and Pick 2000). According to her theory, perceptual learning is a matter of differentiation, not enrichment.

Defenders of the view that perceptual learning is a matter of enrichment begin with the assumption that all that perceivers have access to are ambiguous sensory stimuli. Therefore, they claim that individuals improve their capacity to perceive the environment as they acquire new knowledge about the world and become able to make more sophisticated inferences, ultimately resulting in the construction of a more accurate representation of the external environment. Alternatively, ecological psychologists argue that there is specific, non-ambiguous information about affordances, and that perception improves as agents get better at finding it. Perceptual learning is thus conceived as the increasing capacity of individuals to detect the information that specifies the affordances they want to perceive and actualize.

This process is far from simple. To begin with, it requires that we educate our attention so that we become able to differentiate and detect the informational properties that specify the affordances we are interested in. This education of attention is often accompanied by other processes, including the education of intention (Segundo-Ortin 2024), and the re-calibration of perceptual-motor systems due to changes in bodily dimensions and action capabilities (Fajen 2005).

As mentioned above, the ecological approach to perception and action is central to the EE-model of disability. According to Silva and Schwab (2024), when individuals with disabilities engage in goal-directed functional activities, they "often experience disruptions in their *fit* to the physical and social environments" (p. 298). This "misfit" appears as an experience of "I cannot," whereby an affordance that is easily perceived and actualized by another person is perceived as impossible or too difficult to actualize by the disabled person. These experiences, they argue, "have a common consequence: A disruption in the experience of goal-action continuity" (p. 299) which, in turn, is accompanied by a perception of the own body as an object and the external world as an obstacle.

Nonetheless, this "misfit" can often be resolved. These *resolutions* are the focus of attention of Arseli Dokumaci's theory and ethnography (2017, 2019, 2023). According to Dokumaci, disabled people do not remain passive when facing obstacles to immediate goal-directed action; instead, they explore the environment and look for alternative means to reach their goals. In doing so, people with a disability create or "enact" their own functional environments, improvising new uses for known objects or situations: "Rather than fitting or misfitting, we *retrofit* the very same environment to our emergent bodily states, needs, and singularities; we *do not adapt to anything* but actively carve out a niche for ourselves" (2017, p. 404). Thus, argues Dokumaci, people with a disability often "make up" new affordances for attaining their goals, creating new enabling conditions to their activities.

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[3] As we will discuss later, this physical notion of affordance has been extended to cover opportunities for action created or made salient by social norms. These latter affordances are termed "canonical affordances".
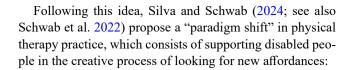
[4] This idea is captured by James Gibson when he says that the ecological approach "begins with the flowing array of the observer who walks from one vista to another, moves around an object of interest, and can approach it for scrutiny, thus extracting the invariants that underlie the changing perspective structure and seeing the connections between hidden and unhidden surfaces" (1979[2015], p. 290).

It is important to recognize that this capacity to explore and create new affordances is not exclusive to disabled people. In fact, it is considered an essential component of the processes that lead to perceptual learning (see E. J. Gibson and Pick 2000). The crucial difference, however, lies both in the capacity for, and the necessity of, creating these new affordances. To begin with, creating affordances is a pressing necessity for the disabled person, for they live in a social environment designed for the able-bodied. Despite this necessity, disabled people encounter serious limitations:

> [T]he plenitude of affordances that can be created by a disease-free, able-bodied person cannot be compared to the precariousness of the affordances made by a person with disabilities […] the person is disabled because she can live the everyday only in certain ways, not in a plenitude of possibilities […] the affordances that she makes are the only ones with which she can live the everyday. The conceiving of an affordance, in this case, is not a luxury; it is a necessity. Without its actualizations, living remains ruptured. This is how affordances made in the experiencing of diseases and disabilities differ from those created in their absence. (Dokumaci 2017, p. 407)

To sum up, the EE-model proposes that part of what it is to be disabled is the pervasive experience that the affordances usually perceived and actualized by non-disabled people are insufficient to support goal-directed activities. In other words, an essential component of being disabled is finding yourself in need of re-negotiating your environment and creating new affordances very often, a condition that is usually accompanied by a feeling of anxiety and discomfort with the external environment and your own body.[5]

Echoing this view, Toro et al. (2020) go further and define a mode of "pathological embodiment" which some disabled persons suffer. Pathological embodiment is characterized by the feeling of being unable to come up with different ways of achieving goals and the tendency to avoid situations of tension: "Instead of being open to exploring for affordances that allow for the formation of a temporary stable equilibrium with the environment, the person acts to limit to the best of their ability, situations in which they are unable to respond adequately" (p. 9). Thus, whereas the non-pathologically embodied disabled person has the capacity to explore their environment to identify new affordances, this capacity remains limited for pathologically embodied disabled individuals.

Following this idea, Silva and Schwab (2024; see also Schwab et al. 2022) propose a "paradigm shift" in physical therapy practice, which consists of supporting disabled people in the creative process of looking for new affordances:

> A physical therapy aligned with this principle would be defined by interventions designed to assist individuals with disability (1) to enhance their attunement and control over the ensemble of capacities that define their lived bodies and (2) to develop and maintain the capacities required to achieve their functional goals. (2024, p. 313)

This sort of therapy thus focuses on the first-person perspective of disabled individuals, providing them with opportunities for exploration and creativity, and fostering agency as opposed to normalization. In addition, this approach calls for including patients in the clinical reasoning processes, allowing them to take the lead in their own development and reminding therapists that universality in rehabilitation measures and outcomes among people should not be expected or assumed.

3 Comparing the EE-model and Social Constructionist Approaches

Many recent accounts of disability move away from some of the key principles of the traditional Social Model, while retaining the claim that disability is a socially constructed phenomenon. Among them are accounts developed to correct for the Social Model's tendency to "sideline the body" (Jenkins & Webster, 2021, p. 730). A shared concern of proponents of these accounts is that while social factors clearly contribute to the disadvantages and marginalization that many disabled people face, living with a disability is importantly also a "personal, embodied, and sometimes even medical" (Barnes, 2018, p. 1158) experience (see also Terzi 2004; Jenkins & Webster, 2021; Begon 2020; 2023). In short, although disabilities are not simply dysfunctional features of bodies, navigating bodily difference is a central aspect of what it means to be disabled.

While the EE-model of disability has previously been compared to traditional versions of the Medical Model and the Social Model, it would in our view be more valuable to assess it relative to these more recent social constructivist accounts. In what follows, we consider two such accounts in particular: Barnes' Solidarity Model (2016), and Jenkins and Webster's Marginalised Functioning Model (2016). This will allow us, first, to specify the differentiating features of the EE-model more precisely; and second, to identify potential avenues to enrich the EE-model.

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[5] Likewise, Toro et al. claim that "[a] key part of what disability means for a normally embodied person is, we suggest, constantly correcting for this experience of I-cannot" (2020, p. 12).

3.1 Barnes' Solidarity Model

In *The Minority Body* (2016), Barnes examines what unifies individuals with a physical disability. Dissatisfied with the Medical Model, which characterizes disability in terms of biological or statistical bodily abnormality, and with the Social Model, which takes disability to result from social prejudice towards individuals with 'non-normal' bodily features, she advances an ameliorative view. The Solidarity Model says, roughly, that an individual is physically disabled just in case they have a physical condition that the Disability Rights Movement (DRM) is promoting justice for. On this view, disability is a meaningful social kind, but only because the DRM has made this so. There is nothing that all and only disabled individuals have in common besides the fact that they stand in the right relation (i.e., a relation of solidarity) to the DRM.

Prima facie, Barnes' project is very different from that of proponents of the EE-model. Yet closer inspection reveals some interesting and surprising commonalities. In particular, Barnes' concerns about the Social Model, which inform her positive view, are echoed by proponents of the EE-model. She leverages two important objections against the Social Model. First, she argues that this model makes disability into something too far removed from bodily difference. There is more to being disabled than being treated or perceived in a certain way. Being disabled is also a matter of (objectively) having a certain kind of body. Having this kind of body may present someone with unique challenges, irrespective of whether they are (in addition) treated unjustly. Second, she claims that the Social Model is based on a problematic distinction between impairment and disability. By defining disability as a particular type of disadvantage that results from problematic attitudes towards impairment, the Social Model portrays it as entirely negative. Conceptualizing disability as a form of disadvantage is hard to square with disability pride, i.e., the idea that disability is something to be celebrated.[6]

The first concern is clearly visible in work by proponents of the EE-model. As Toro et al. (2020) point out in their assessment of the Social Model, "the lived experience disabled people have of the world *through their embodiment* is at best sidelined and ignored" (p. 4, emphasis ours).

Similarly, Silva and Schwab (2024) argue that the Social Model "lacks constructs to capture how an individual's lived experiences are shaped in meaningful ways by bodily impairments" (p.307; see also Crow 1992; Siebers 2001). The strategies employed to overcome this problem by Barnes on the one hand and by proponents of the EE-model on the other diverge significantly. Whereas Barnes proposes there is a set of rules (informing the judgments of the DRM) that determines *which* bodily differences (which may present an individual with unique difficulties regardless of social context) are disabilities, proponents of the EE-model highlight shared features of the embodied experience of disability. Still, sidelining the body is a concern shared by both approaches.

Likewise, both the Solidarity Model and the EE-model are eager to move away from a view that portrays disability as a passively suffered disadvantage. To do so, each model emphasizes an activist feature of disabled lives. The former focusses on community building and group solidarity,[7] the latter on individual affordance creation (see especially Dokumaci 2019, 2023). Thus, each model in their own way highlights disabled persons' active involvement in a "social process of world-remaking" (Silva and Schwab 2024, p. 292).

Needless to say, there are many important differences between the Solidarity Model and the EE-model. We will highlight just one such difference here. The Solidarity Model can be understood as an attempt to explain what unifies all and only people with a disability, i.e., what makes disability a genuine (social) kind. Barnes arrives at the (initially unintuitive) conclusion that being disabled *just is* whatever the DRM is promoting justice for only after rejecting many other (initially perhaps more intuitive) criteria for disability. To be precise, Barnes claim is that the rules informing group solidarity held by the DRM[8] are based on a kind of cluster-concept reasoning. If one's body has enough of the features that the rules specify as relevant (e.g., being viewed as atypical, making ordinary tasks more difficult, and so on), then one counts as disabled.

In contrast, the EE-model is best understood as highlighting a significant and overlooked aspect of disability: the individual embodied experience of 'I cannot', and the creative and explorative work that goes into re-shaping one's experience of the environment. Its proponents do not claim that this shared experience is what makes disability

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[6] Of course, as Begon (2021; 2023) points out, characterizing disability as a special kind of disadvantage is compatible with celebrating the diversity associated with impairment. Strictly speaking though, this wouldn't be a celebration of *disability* (which is defined as the suffering of some sort of disadvantage or injustice as an effect of one's impairment). Impairment is something that warrants pride; disability, on the Social Model, is an injustice to be combatted. As Barnes (p. 26) puts it, on the Social Model, "an ableism-free society is a society without disability". Many thanks to an anonymous referee for inviting us to clarify this.

[7] The DRM has not just shaped but *created* the category 'disabled people'. On Barnes' view, the fact that people with certain bodies count as disabled is itself the result of a creative process of activist organization.

[8] These rules need not be explicitly formulated, nor consciously held by members of the DRM. What matters is that there *is* a set of rules which, when everything goes right, informs the DRM's disability judgments.
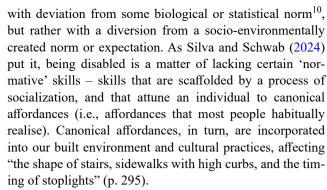
a genuine kind, but rather aim to offer "a different perspective […] that is better placed to do justice to how the body of a disabled person situates them in the world" (Toro et al. 2020, p. 5). It follows that it is in principle open to Barnes to suggest that the lived experience of disability is just one of the features associated with the DRM's cluster-concept. Following Barnes view, having this lived experience isn't the *only* or most interesting feature that (many) physically disabled persons share. Yet, if someone's body has enough other features that the DRM's rules specify as relevant, then they are disabled. We won't explore this suggestion further, but instead conclude that the two approaches, though very different in their focus, are not necessarily incompatible. The main disagreement between Barnes and proponents of the EE-model can be construed as concerning the relative importance of different aspects of the nature of disability: should we focus, first and foremost, on the relations that obtain among members of a community, or on individual people's lived experience?

3.2 The Marginalised Functioning Model

A second social constructionist model that aims to do justice to the bodily reality of living with a disability is Jenkins and Webster's (2021) Marginalised Functioning Model. This model emphasizes the relation between disabled individuals' bodily capacities and their social environment. As opposed to Barnes, Jenkins and Webster believe there *is* a criterion other than an individual's relation to the DRM that is met by all, and only by, disabled people. They propose that what unifies disabled individuals is their failure to meet expectations regarding normal functioning in the society where they are situated.

The authors are concerned specifically with expectations that serve as defaults for constructing material spaces and structuring social interactions. Take the expectation that human adults can climb stairs. This assumption clearly informs the architecture of university campuses and office buildings, meaning that, in effect, individuals who cannot climb stairs have *marginalised functioning*: they lack the bodily capacities required "to function in ways that are treated as social defaults" (p. 731) within their society.[9]

Again, this approach shares some interesting features with the EE-model. First, like Jenkins and Webster, EE-model advocates point out that disability doesn't have to do

with deviation from some biological or statistical norm[10], but rather with a diversion from a socio-environmentally created norm or expectation. As Silva and Schwab (2024) put it, being disabled is a matter of lacking certain 'normative' skills – skills that are scaffolded by a process of socialization, and that attune an individual to canonical affordances (i.e., affordances that most people habitually realise). Canonical affordances, in turn, are incorporated into our built environment and cultural practices, affecting "the shape of stairs, sidewalks with high curbs, and the timing of stoplights" (p. 295).

Crucially, both Jenkins and Webster and proponents of the EE-model stress that 'non-normal' ways of functioning (or of completing tasks) are not inherently defective. Rather, some ways of functioning and interacting with the environment are normalized, others marginalized. However, where the Marginalised Functioning Model accentuates an objective (i.e., third-person perspective) misfit between disabled bodies and environments moulded by expectations regarding normal functioning, the EE-model is concerned with the embodied experience of a misfit. According to proponents of the latter model, the fact that there are no *readily available* affordances doesn't entail that body-environment collaboration is ultimately impossible. As we argue in Sect. 4, this optimistic picture has some important drawbacks.

A second feature that is common to both the Marginalised Functioning Model and the EE-model is that disability cannot be understood without reference to a socio-environmental context. For Jenkins and Webster, disability consists in an individual's bodily *relation to* features of an environment that is structured by our social organization. Correspondingly, Nathan and Brown (2018), whose position can be considered aligned to the EE-model, conceive of disabilities as "relational features of organisms embedded in sets of environments" (p.7).[11] In a similar vein, Silva and Schwab (2024) claim that normative skills can only be described in reference to the socio-physical environment. Thus, on both views, disability is characterized in terms of a relation between the individual and their (social) environment.

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[9] Here is a precise definition: "A subject S has marginalised functioning relative to a context C iff (i) there is a set of social norms N, comprising $n_1, n_2, …, n_n$, each of which serves as a default for the purposes of constructing common social environments and structuring common social interactions in C; and (ii) there is some norm in N such that S cannot physically function in a way that satisfies it." (p. 738).

[10] Deviation from a 'statistical norm' is to be understood here as having a body that is, statistically speaking, abnormal. This approach differs from the norm-based approaches discussed in what follows, which focus on socially generated rather than merely statistical norms. Some persons whose body is statistically abnormal may nevertheless be able to meet social expectations and to act on canonical affordances. Think, for example, of people who are, statistically speaking, abnormally tall. Such individuals may, despite their statistical abnormality, nevertheless meet social expectations regarding normal functioning and get around as most other people do.

[11] They suggest this implies that disability is not a property of the individual, but since social properties are by definition relational, there seems to be no problem in saying that disability is a social property of the individual.

Let us now turn to an important respect in which the Marginalised Functioning Model and the EE-model differ. One of the most central and interesting aspects of the EE-model is the idea that there exists a "bi-directional, dynamic relation between the disabled body and the environment that is implicated" (Silva and Schwab 2024, p. 310). As pointed out above, the initial experience of tension due to body-environment misfit can often be resolved, as the individual reshapes her relation to the environment to create new enabling conditions for herself. On the Marginalised Functioning Model, the individual's objective incapacity to function in the way their environment demands is much more definitive. There is little (besides campaigning for social change) that the individual can do to change this.

This point is closely related to a second difference between the models. Whether someone has marginalized functioning is determined not by their ability to perform tasks they set out to perform, but by whether they can do so in a way that is in line with expectations regarding normal functioning. Thus, an agent who creatively establishes a new, non-normative way to complete a relevant task – perhaps with the help of some type of assistive technology – has marginalized functioning *despite* finding a way to reach her goals. Jenkins and Webster stress that, so long as the agent's way of performing a task is conceptualized as non-normal, or the tools used as special aids, they are at a special risk of marginalization. The fact that the agent is "dependent on accommodations to access and navigate certain social spaces […] renders them vulnerable" (p. 743).

In relation to the EE-model, this suggests that 'improvising more habitable worlds' through the individual enactment of newly discovered affordances doesn't necessarily make the disabled person less vulnerable to marginalization. In addition, there is important work to be done in the collective recognition of capacities different than those we are currently socialized to develop. This is an important step on the route towards more genuinely inclusive (rather than assistive) environments. In sum, the Marginalised Functioning Model suggests that ultimately, a social-level change in expectations regarding normal functioning (rather than individual creative action) is required to rid disabled persons of their vulnerability.

4 Socializing the EE-Model

Having compared the EE-model of disability to contemporary social constructionist approaches, two key characteristics that we explored in § 2 stand out. The first is the EE-model's focus on the pervasive experience of a misfit between the disabled body and the environment. The second is its emphasis on individual-level activism that consists in the creation of new affordances to temporarily overcome the experience of misfit. As mentioned earlier, this emphasis is sometimes accompanied by the recommendation that physical therapists, physiotherapists and teachers make room for the exploration of new, non-normative ways of performing relevant tasks.

While the EE-model's portrayal of disabled persons as active participants in a creative process of world-remaking is decidedly attractive, it has some important limitations too, especially if the proposed picture is offered as a guide to disability policy. Our aim in this section is to show how the EE-model of physical disability can be enriched by incorporating some insights offered by social constructionist approaches.

To begin with, recall Toro et al.'s (2020) distinction between "pathological" and "non-pathological" embodiment (p. 6–7). It is important to highlight the distinction's connection with the sort of activism the model emphasizes. According to the EE-model, being disabled implies having the experience of "I-cannot" more often than non-disabled people. However, most of the time, physically disabled people can overcome this feeling of misfit, finding alternative affordances to negotiate the environment and attain their goals. As explained earlier, a non-pathologically embodied disabled agent is "*constantly correcting this experience of I-cannot* […] by finding their way to affordances that allow them to temporally form a dynamic stability with the environment" (Toro et al. 2020, p. 12, emphasis added). This process is often described as a process of "creating" new affordances and intentionally "carving out" new environments, thus "transforming the world and its very materiality" (Dokumaci 2017, p. 393). These affordances are termed "activist" affordances by Dokumaci (2023), a name that, in the view of Silva and Schwab, "celebrates the *agency* of individuals with disability" while "highlight[ing] environmental barriers and reveal[ing] more accessible futures for themselves" (2024, p. 303).

One of the EE-model's strengths is that it recognizes a defiant kind of agency in disabled individuals, which has been neglected by previous medical and constructivist approaches. However, the model's primary focus on non-pathological forms of physically disabled embodiment may be its Achilles' heel at the same time.

To elaborate on this point, it is useful to introduce the "dogma of harmony", a notion recently coined by Aagaard (2021). According to Aagaard, optimism about human-environment collaboration is a common feature of 4E approaches to cognition, the general framework from which the EE-model stems: "4E scholars tend to paint an overly idealized picture of human-technology relations in which all entities are presumed to cooperate and collaborate" (p. 2). Notably, Aagaard does not see this dogma as an insurmountable issue

for the 4E cognition paradigm but rightly points out that defenders of this approach often treat (at least implicitly) the empirical hypothesis of human-environment cooperation as an a priori assumption.

As things stand, we believe that the dogma rears its head in the EE-model of disability as well. It does so, first, in the model's pervasive focus on those cases where disabled individuals find ways to *overcome* the experience of misfit by looking for new ways to achieve their desired goal, and second, in the emphasis on individual-level activism that follows from it.

It is important to recognize that collaboration is not attainable in all cases, and that serious political work is required to reduce the risk that instances of pathological embodiment arise. Defenders of the EE-model of disability recognize that pathological embodiment may be a product of society's expectations regarding normative embodiment, insofar as these expectations manifest in the design of common objects, public spaces, and technological aids. Living and acting within a social and material reality that wasn't built to accommodate one's bodily functioning can have demoralizing results and place a significant burden on the disabled person attempting to find new affordances. Thus, we should not overlook the possibility that finding new affordances is not always possible, and expecting that physically disabled people will be able to do so can be seen as an instance of the implicit optimism described by Aagaard (2021).

In addition, it is worth considering Jenkins and Webster's (2021) claim that whether an agent is disabled is independent from their capacity to attain their goals. The key factor, instead, lies in the fact that they can only do so in ways that are considered non-normative. Elaborating on this view, we argue that although encouraging physically disabled people to imagine new affordances may improve their day-to-day functioning, the wider recognition of the agents' new capabilities is perhaps equally important. If the agents' new way of performing a task is not recognized and valued by other members of the society, they remain subject to a significant type of disadvantage. The non-normatively skilled person will continue to be marginalized from various domains of life (i.e., work, education, leisure) so long as their way of completing a given task is regarded as suboptimal.

Both observations suggest that it is undesirable for individual performances to be the main site of disability activism. As we see it, lasting change requires a shift in social norms and expectations. It follows that encouraging disabled patients to continue to creatively explore their environment when experiencing tension must be accompanied by a broader strategy aimed at transforming what it is considered 'normal' and 'expected', thus reducing the risk

of marginalization.[12] This point is further supported by a closer look at how social factors affect individual perceptual learning.[13]

As explained above, the ecological approach conceives of perceptual learning as a process through which individuals progressively improve their ability to discriminate the affordances of the environment, thus becoming better adapted to it (see Gibson 1969; E. J. Gibson and Pick 2000). One key aspect of this learning is the education of attention, which refers to the process by which individuals learn to detect the perceptual variables that are specific to the affordances they want to perceive and exploit. Some ecological psychologists have noticed the influence that other members of society (e.g., caregivers) may have on this process (see, e.g., Reed, 1974; Heft, 2017). Accordingly, more expert individuals can scaffold the education of attention of novices, providing the right conditions for the latter to learn how to perceive those aspects of the world that are significant for particular tasks and practices.

The finding that social interactions influence which aspects of the environment we attend to is important, since it helps explain why disabled individuals often lack *readily available* affordances: the aspects of the world that are relevant for them to perform a given task may be different from those relevant for others, and, typically, less social guidance in learning to attend to these aspects is available. It also makes clear that the creation of a new affordance does not necessarily render the individual's new, private way of engaging with the environment visible to others. Whether it does, depends at least in part on the individual's social position and their ability to pass what they have learned on to others.

Besides the education of attention, we follow Segundo-Ortin (2024; see also Jacobs and Michaels 2007) in emphasizing the complementary education of intention. The importance of the education of intention becomes evident if we reflect on how we interact with everyday objects – e.g., chairs. Although a chair affords many different actions, we do not perceive all of them simultaneously, as this would be rather overwhelming and inefficient. Instead, we direct our attention to detect the variables relevant to our intentions. For example, the information variables specifying whether we could jump over the chair would be irrelevant if we intended to sit on it. Hence, what we intend to achieve determines the information we seek and, thus, the affordances we

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[12] This concern is related to recent claims that architectural and design movements aimed at improving the lives of the disabled may in turn foster (techno-)ableism and exclusion (van Grunsven 2024).

[13] It is important to note that none of the authors we discuss explicitly claim that individual resistance is the *only* way to help disabled people overcome daily challenges. Rather, our concern is that highlighting and celebrating resistance in the form of individual affordance creation distracts away from the need for a deeper, structural solution.

perceive. This idea is captured by Heft when he claims that "an affordance is perceived in relation to some intentional act, not only in relation to the body's physical dimensions" (1989, p. 13).

Yet, if perception is "controlled by a search for the affordances of the environment" (Gibson 1974[1982], pp. 387–388), it follows that novices must not only learn *how* to find particular affordances, but also *what* affordances they should pursue:

> [W]hereas the education of attention refers to the individual's training to detect the most useful variable for the sought affordance, intention is educated when the individual learns what affordances are appropriate to seek and actualize given the situation. (Segundo-Ortin 2024, p. 8)

So conceived, the education of intention is inherently social, since it rests on interacting with others and engaging in communal practices (see also Segundo-Ortin and Satne 2022). Through these interactions, we learn not only which aspects of the environment are relevant to perceive particular affordances, but also what affordances we are permitted to (and even expected to) actualize. This education of intention manifests itself both at the reflective, in the form of explicit desires, and pre-reflective level, as "[h]abit-based preferences for particular actions [and accompanying] attention habits toward certain specific information" (p. 14; see also Segundo-Ortin and Heras-Escribano 2021). In sum, we come to behave *appropriately* by learning what affordances we can exploit and how to find them simultaneously.

If intention is educated in the ways described, this further confirms that serious creative imagination, combined with a willingness to challenge social expectations and a special kind of confidence is required to engage with one's environment in non-canonical ways. Especially if disabled individuals are sometimes taught that particular activities are not appropriate for someone like them, or excluded from participating in communal practices, then engaging in these activities *nevertheless* is (in a new way) a significant task to shoulder.

Importantly for our purposes, looking at perceptual learning in more detail shows how deeply intertwined affordance perception and social expectations really are. Which affordances are readily available to an individual doesn't just depend on their body-environment fit, but also on the norms and expectations that guide the everyday activities where they are situated (i.e., how ought these activities be performed? When is it appropriate to perform them?). A strategy that aims to increase an individual's range of readily available affordances therefore needn't just focus on individual exploration: it may also focus on changing the expectations that guide a given practice. The second type of strategy aims at making practices more inclusive, to render engagement in them accessible for individuals with various ways of functioning.

Advocates of the EE-model recognize the importance of the expectations held by rehabilitation specialists and therapists. This is precisely what underlies Silva and Schwab's (2024) proposed paradigm shift in physical therapy: therapists should move away from thinking in terms of optimal and sub-optimal functioning, and instead accommodate and encourage the development of alternative ways of functioning that suit the individual patient. But it is insufficiently stressed that this change in social attitudes must ultimately come to extend beyond the physical therapy room. Moreover, getting others (therapists or not) to adjust their expectations regarding appropriate ways of functioning calls not (just) for individually improvised action, but for collectively organized social and political interaction. To emphasize: the goal should not merely be to encourage disabled individuals to create new affordances for themselves, which may not be possible in all cases, but to promote the invention and normalisation of new canonical affordances within the wider society.

The relevant political interactions can take various forms. Disability activism groups (including the DRM, which Barnes (2016) discusses) play an important role in coordinating processes to bring about the required shift in attitudes. We will not attempt to give a comprehensive overview of all processes that are important to help reduce marginalization here. *In lieu*, we list two aspects that we believe an adequate response must incorporate.

First, it will be important to counter prejudice towards and stereotypes about people with various disabilities[14], in particular when they serve to justify the individual's exclusion from a particular domain of life. Practices are unlikely to change and become more inclusive if those whom they don't suit are excluded from participation at the outset. As a concrete example, consider that disabled people still don't have the same employment opportunities as others (Oliver 2004). If many places of employment are unwilling to hire a disabled person to fulfill a particular role, the way in which the work associated with that role is carried out is unlikely to change. Relatedly, we must encourage architects and designers to create spaces and artifacts that include and are sensitive to various kinds of embodiment (van Grunsven 2024). By normalizing the provision of appropriate spaces and objects for the inclusion of disabled people in all domains of life, we can begin to get rid of the implicit assumption that there is one norm which all bodies

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[14] This may involve encouraging accurate portrayals and representation of people with different kinds of disabilities in popular culture, as well as educational campaigns.

must accommodate, and stop distinguishing between 'normal' design and 'adapted' design.

Second, given that intention and attention are socially educated, inclusive education will be indispensable. Strategies that improve the inclusivity of educational institutions may include promoting practices that help integrate physically disabled pupils, where possible, in the mainstream classroom, as well as providing the necessary tools and support for pupils with diverse (normative and non-normative) skills. Accommodating disabled pupils further has the potential to enhance the visibility of non-canonical ways of performing a task to non-disabled peers, which may help reconfigure attentional and intentional habits more broadly.

Overall, then, strategies aimed at helping disabled persons overcome the persistent experience of body-environment misfit would do well to combine insights from the EE-model and social constructionist approaches. With respect to the EE-model, we ought to take seriously the observation that disabled agents are constantly engaged in a kind of active and micro-activist resistance, which is required to perform day-to-day tasks in a society whose norms and practices are a poor fit. Importantly though, we propose that – as the social constructionist teaches us – if the goal is to create long-lasting change, these instances of micro-activism must be accompanied by a deeper, societal shift. In particular, as the Marginalised Functioning Model implies, they must be supported by changes in social expectations and norms, and (in effect) by changes in the norms that ground perceptual learning and environmental design. Foregrounding disabled individuals' lived experience need not come at the cost of neglecting the most valuable insight of the Social Model: ultimately, combatting the disadvantage that disabled people face requires advances in social justice.

5 Concluding Remarks

In this paper, we have compared the EE-model of disability with two recent social constructionist approaches: Barnes' Solidarity Model (2016), which emphasizes the importance of collective activism, and Jenkins and Webster's (2021) Marginalised Functioning Model, which characterizes disability as failing to meet social expectations regarding 'normal' functioning. We have argued that the EE-model makes a valuable contribution to the literature, as it emphasizes the political and activist dimension of individuals' search for new action opportunities. The view is appealing, in part, because it is hopeful. As Dokumaci puts it:

It is not when we encounter the fleshiness of the environment per se, but when we come up against its currently available niches that we experience fitting or

misfitting. In other words, it is the already exploited affordances of the environment (and the particular forms, shapes, designs, and meanings that have been given to them) that create fitting or misfitting. Otherwise, the environment itself if full of possibilities, no matter how limited and limiting its niches. (2017, p. 402-3)

However, by focusing especially on non-pathologically embodied disabled individuals, EE-model advocates run the risk of portraying human-environment relations in an overly optimistic manner, thus falling victim to the dogma of harmony. Pathological embodiment may result from socio-material practices that make it hard or impossible for the disabled person to explore and establish her own skilled ways of engaging with the relevant affordances, including the canonical affordances that materialize in interaction with other people. This is where the insights of recent social constructionist models of (physical) disability come in useful for defenders of the EE-model: serious social and political work is required to reduce the risk that instances of pathological embodiment arise.

Furthermore, it is important to recognize that overcoming the experience of a body-environment misfit does not equate to overcoming marginalization and exclusion. Insofar as physically disabled persons are forced to create new affordances and improvise original ways to navigate their environment, they remain at risk of being marginalized. Encouraging disabled individuals to creatively explore the environment's opportunities must thus be accompanied by broader social and political strategies to change social expectations about what it is consider normal and optimal.

In sum, we have argued that the EE-model's optimism is best received when tempered by a clear-headed image of the socio-political reality in which the disabled person's creative search for new affordances takes place. Defenders of the EE-model have created a new (and welcome) way to think about physical disability, but the approach calls for a social twist. To create long-lasting change, instances of micro-activism must be accompanied by a broader societal shift, which involves political action aimed at changing social expectations and norms, including the norms that dictate what we consider optimal and sub-optimal in perception and motor skills, perceptual learning, architecture, and design.

Declarations

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