An Ecological Approach to Modeling Disability

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Bioethics

Abstract

This article develops an analysis of disability according to which disabling conditions are properties of organisms embedded in sets of environments. We begin by presenting the three mainstream accounts of disability—the medical, social, and interactionist models—and rehearsing some known limitations. We argue that, because of their primary focus on etiology, all three models share, more or less implicitly, a problematic assumption. This is the tenet that disabilities are individual properties. The second part of the essay presents an ‘ecological’ interpretation of disability, inspired by classic and contemporary research on biological niches. Our proposal preserves many insights underlying extant approaches, while allowing a more accurate characterization of the nature and experience of disability. We conclude by drawing some general implications of our analysis.

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1 Introduction

Understanding the nature of disability is of the utmost normative and practical significance. Even in affluent countries, such as the United States, people with disabilities systematically suffer from inequality, compared to people who are not disabled. To ensure equal opportunities, participation, and flourishing—in general, ‘well-being’—for all citizens, it is crucial to identify who falls within the class of disabled individuals, and why this is the case. In short, what is required is a sound and viable model of disability.

Even a cursory glance at the relevant literature reveals that the field is fraught with disagreement. Some of this dissonance is the product of the extreme fragmentation and specialization that characterize our contemporary intellectual milieu. With a few notable exceptions, there has been an evident disconnect between socio-political studies of disability and discussions in the philosophy of science on related issues such as biological function, normality, and human nature. This is unfortunate as these fields have the potential to inform one another. Without the pretense of solving all outstanding disputes, this article is intended as a step towards demonstrating the benefits of a more unified and interdisciplinary approach.

This essay develops an analysis of disability that draws on ecological research. We begin by presenting three mainstream accounts of disability and rehearsing their limitations (§2). Next, we diagnose and explain a problematic, often overlooked assumption underlying these accounts: the tenet that disabilities are individual properties (§3). We then sketch an ‘ecological’ interpretation of disability, inspired by biological research on niches (§4). We conclude by discussing some general implications of our proposal (§5).


2 Three Models of Disability

Philosophical definitions of disability typically have two main features. First, the definition picks out some sort of biological and psychological characteristic that is identified as an *impairment*. Impairments are broadly understood as problems in bodily function or alterations in bodily structure, such as paralysis or blindness. Second, this impairment is connected to some sort of social or personal *limitation*. The concept of ‘social or personal limitation’ is admittedly vague, but the condition itself is usually significant enough to cause or be linked to some evident disadvantage. Common limitations include partial or total restrictions on basic bodily movements (walking, talking, grasping an object), more complex physical activities (driving a car, playing a musical instrument) and social activities (working, learning, communicating effectively). Many scholars maintain that the limitations associated with disabilities are connected to reductions of well-being, and therefore have substantial social, political, and ethical implications.

It is customary to distinguish three different models of disability in the relevant literature: the ‘medical’ model, the ‘social’ model, and the ‘interactionist’ model. This section presents and discusses them, in turn.

According to the *medical model*, disability is a direct consequence of impairment, which may be caused ‘internally’ by an individual’s biological endowment or by some sort of ‘external’ accident, such as a traumatic impact or a viral infection. Implementations of this model typically have two characteristics. First the source of disability is located within the body. Second, impairment is the primary cause of social or personal limitation.

Intuitive as it may seem, most contemporary scholars reject the medical model because it mischaracterizes the relation between impairment and disability. The problem, in brief, is that biological impairment, in and of itself, does not guarantee that any individual affected by it will be limited, let alone disadvantaged. To illustrate, the medical model is based on the

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idea that the limitation faced by, say, wheelchair users, compared to people who are able to walk, resides primarily in the intrinsic incapacities of the former group of individuals. This is questionable, to say the least. If all buildings were wheelchair-accessible, then wheelchair users would arguably not be limited in any significant respect. The point is that functional limitations are neither necessary nor sufficient for disadvantages, which are often due—at least in part—to architectural barriers, unjustified biases, and other kinds of social and environmental impediments. This being so, it is unjustified to assume that limitations are entirely, or even primarily, the result of physical or mental impairment. The medical model’s main shortcoming is that it ignores the social dimension of disability.

The social model recognizes the limitations of the medical model, especially from a socio-political perspective, and provides a strategy to overcome them. On this view, disabilities are conceptualized as a type of social limitation—wholly or primarily caused by social forces, such as morally impermissible attitudes, neglect, or architectural barriers—unfairly imposed on people with impairments. There are two broad ways to flesh this out. First, the ‘minority group model’ identifies people with disabilities with historically-oppressed minority groups subject to prejudice, stigma, and exclusion. Second, on the ‘human variation model,’ people with disabilities face limitations because of a mismatch between impairments and physical or social contexts. An impaired individual who finds herself in a ‘poor fit’ environment is more likely to encounter hardship and limitation. These variants of the social model are not mutually exclusive, as they capture different ways in which social and physical environments may lead to disadvantage.

Despite its popularity and significant socio-political accomplishments, the social model has been criticized based on its metaphysical presuppositions. A widespread objection is that social models underplay the role of

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9The social model is primarily motivated by a social and political agenda, which aims to remove oppressive social and structural barriers. By shifting the focus of disadvantage from personal deficit to oppressive social structures, it has a positive effect on the identities of disabled individuals. C. Riddle. 2013. Defining Disability: Metaphysical Not Political, Med Health Care Philos 16: 377-384; T. Shakespeare. 2014, 2018. Op. cit. note 2.
imPAIRMENTS AS A SOURCE OF LIMITATION. THE CONCERN, SIMPLY PUT, IS THAT EVEN IN A FULLY-ACCESSIBLE ENVIRONMENT, SOME PEOPLE WITH DISABILITIES MAY STILL FACE DISADVANTAGE. FOR INSTANCE, IN A SOCIETY WHERE ALL TEXT IS AVAILABLE IN BRAILLE, IN AUDIO, AND IN PRINT, A BLIND PERSON WOULD HAVE ACCESS TO ALL SOURCES AND RESOURCES. HOWEVER, BLINDNESS WOULD ARGUABLY REMAIN A RESTRICTION, IN THE CONTEXT OF READING. A RELATED CONCERN IS THAT DISABLED PEOPLE’S WELFARE MAY BE LESS SECURE OR ROBUST THAN THAT OF OTHERS. EVEN IF ALL INDIVIDUALS ARE GIVEN A CHANCE TO FLOURISH, PEOPLE WITH DISABILITIES MAY REQUIRE MORE EFFORT OR LUCK TO DO SO, OR MAY BE AT A GREATER RISK OF SECURING THE MEANS TO FLOURISH, FUNCTION, AND THRIVE. FINALLY, THE DISABLING IMPLICATIONS OF SOME CONDITIONS, SUCH AS CHRONIC PAIN, CANCER, OR SEVERE DEPRESSION ARE UNLIKELY TO BE COMPLETELY OFFSET BY ENVIRONMENTAL MODIFICATIONS.

THE THIRD APPROACH TO DISABILITY IS AN ATTEMPT TO INCORPORATE THE INSIGHTS OF MEDICAL AND SOCIAL ANALYSES, WHILE AVOIDING THEIR RESPECTIVE SHORTCOMINGS. INTERACTIONIST MODELS HOLD THAT PERSONAL IMPAIRMENTS AND SOCIAL FACTORS ARE BOTH NECESSARY AND JOINTLY SUFFICIENT FOR PRODUCING THE LIMITATIONS WHICH ARE CONNECTED TO THE EXPERIENCE OF DISABILITY. INTERACTIONIST MODELS ARE POPULAR. TO WIT, THE WORLD REPORT ON DISABILITY ENDORSES A FORM OF INTERACTIONISM ACCORDING TO WHICH: “DISABILITY IS THE UMBRELLA TERM FOR IMPAIRMENTS, ACTIVITY, AND PARTICIPATION RESTRICTIONS, REFERRING TO THE NEGATIVE ASPECTS OF THE INTERACTION BETWEEN AN INDIVIDUAL (WITH A HEALTH CONDITION) AND THE INDIVIDUAL’S CONTEXTUAL FACTORS (ENVIRONMENTAL AND PERSONAL FACTORS).”

INTERACTIONISM ARGUABLY SOLVES THE MAJOR PROBLEMS WITH MEDICAL AND SOCIAL ACCOUNTS, BY RECOGNIZING THAT DISABILITIES ARE TRIGGERED BY A COMBINATION OF BIOLOGICAL AND ENVIRONMENTAL CONDITIONS. LIKE THE SOCIAL APPROACH, INTERACTIONISTS ACKNOWLEDGE THE SOCIAL DIMENSION OF DISABILITY. AT THE SAME TIME, INTERACTIONISM INCORPORATES THE INTUITIVE ASPECT OF THE MEDICAL MODEL, BY ATTRIBUTING A ROLE TO IMPAIRMENT IN THE PRODUCTION OF DISABILITY, WITHOUT COMMITTING TO IMPAIRMENTS BEING THE SOLE, OR EVEN THE PRIMARY FACTOR.

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15 World Health’s Organization. Op. cit. note 1 p. 4. In this context, ‘activity restrictions’ are conceived as difficulties in executing specific tasks such as walking, eating, or sleeping. ‘Participation restrictions’ are broader social problems, such as discrimination.
Even this strong ecumenical endeavor, however, leaves some stones unturned. Specifically, interactionism runs into trouble when providing a distinction between conditions underlying genuine disabilities and those reflecting mere non-talents or lack of superabilities.

Consider the following examples. First, a student in a wheelchair schedules an appointment with her professor. However, since the building is not wheelchair-accessible, she is not able to get into the office. Second, an individual would like to get to the top of a hill to enjoy the view, but she is too out of shape to hike all the way up. Third, an amateur mountain climber desires to reach the top of the Nanga Parbat without using oxygen tanks, but lacks the psycho-physical means required for the quest. Note the structural similarity between these cases. In all three scenarios we have a person who is unable to reach a desired destination because of a combination of biological and environmental conditions. However, these examples are different in status. The first is a case of a *bona fide* disability, which raises important normative considerations. According to most theories of justice, the student has been done wrong. Universities ought to provide equal access to all spaces. The second example is less clear-cut. Without further information about the hill and why the individual is ‘out of shape,’ it is hard to determine whether this case should be classified as disability or non-talent. The third example is a clear case of lack of superability, which is not a disability and, therefore, warrants no accommodation or compensation.

How does one distinguish genuine disabilities from non-talents or lack of superabilities? Interactionism, as it is traditionally presented, struggles to provide a non-ad-hoc solution. The reason should be evident. Drawing a distinction between personal and environmental triggers, in and of itself, is insufficient to solve the issue because, as the above examples make clear, in all instances there is a limitation (not being in a position to reach a desired destination) produced by a combination of ‘external’ and ‘internal’ factors. The crucial problem becomes determining *which* personal and environmental factors produce true disabilities—thereby grounding normative claims for reparation, compensation, or accommodation—and which conditions do not warrant any normative intervention.

The significance of this problem should not be overstated. Disability scholars are well-aware that distinguishing disabilities from non-talents is a substantial question that has no straightforward answer.\[16\] Raising this as an

objection poses an unfair burden on general models of disability. Disabilities and non-talents lie on a continuum, and the relevant distinctions should be determined on a case by case basis, on political, social, and other practical grounds. Requiring that our models draw a line ‘from the armchair’ is unreasonably demanding.\footnote{We are grateful to an anonymous reviewer for bringing this issue to our attention.}

We agree. Providing a principled distinction between disability, non-talent, and lack of superability is an important endeavor that requires a painstaking combination of conceptual and empirical work. For this reason, we should stress that the limitation discussed above, by itself, does not provide a reason to abandon interactionism. At the same time, we would obviously welcome a model of disability that provides some general guidelines for how to demarcate disabbling conditions (not being able to walk), which call for accommodation, from non-disabling conditions (out-of-shape hikers or inexperienced climbers), where there is no obvious normative claim for intervention. The goal of this essay is to develop a strategy for integrating extant models of disability with an effective way to do so.

3 Disability: Etiology vs. Constitution

§2 surveyed three mainstream approaches to disability: medical, social, and interactionist models. All these accounts hold value and capture important political and metaphysical features of the experience of disability. Yet, no one is devoid of controversial implications. The medical and the social model have specular limitations. The former ignores the social dimension of disability, and the latter underplays its biological component. Interactionism fares much better on this score, recognizing that disabilities are triggered by a combination of both types of factors. However, this ecumenical effort is confronted by some difficulties distinguishing between genuine disability, non-talent, and lack of superability. As noted, this is not a decisive objection against the entire class of models, as drawing a principled distinction between these conditions requires a biological and social examination on a case by case basis. Still, a model of disability which provides some guidance on how this is done would be a step in right direction. Can we integrate extant models with a way to do so without eschewing all the progress and insight that have been made? The goal of this article is to argue in the positive. This section provides the pars destruens, presenting a core assumption that is presupposed, more or less explicitly, by all three models. Next, §4 builds on this discussion to spell out a constructive proposal.
We begin by stating the punchline. Advocates of the three mainstream models tend to focus on what causes disability. As a result, it becomes natural to conceive of disabilities themselves as individual properties. This, we argue below, might be a mistake. First, however, our observation must be substantiated.

From the standpoint of the medical model, the presupposition that disabilities are features of individuals seems obvious and is typically taken for granted. After all, the medical model defines disabilities as conditions directly triggered by biological or psychological impairments. And these impairments are, generally speaking, internal to a person. If Jane tends to suffer from severe chronic migraine and Jim had his left foot amputated, then the tendency to suffer from severe chronic migraine and having an amputated limb are properties that are satisfied by Jane and Jim, respectively, regardless of their location, habits, and social contexts.

Less obviously, a similar assumption is also shared, more or less implicitly, by supporters of the other two accounts. This claim requires evidence.

First, consider the social model. The founding statement of the Union of Physically Impaired Against Segregation, which provides one of the starkest interpretations of the social model, defines disability as:

“the disadvantage or restriction of activity caused by a contemporary social organization which takes no or little account of people who have physical impairments and thus excludes them from participation in the mainstream of social activities.”

As this quote makes clear, the impairment is claimed to play no causal role in the production of disadvantage or restriction, which is the result of social forces. More recently, disability scholars Oliver and Barnes explain that:

“This social model breaks the causal link between impairment and disability. The reality of impairment is not denied but is not the cause of disabled people’s economic and social disadvantage. Instead, the emphasis shifts to how far, and in what ways, society restricts their opportunities to participate in mainstream economic and social activities, rendering them more or less dependent.”

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18 One way to clarify our claim that disabilities are ‘features of individuals’ is to appeal to intrinsicality and absoluteness. Given the theory-ladenness of these concepts, and the resulting metaphysical controversies, we opt for a more neutral formulation.


As both quotes illustrate, the social model explicitly disagrees with the medical model on what triggers the disabling experience, on the causes of disability. The medical model identifies impairment, broadly construed, as the primary disabling factor. The social model, in contrast, shifts the focus to social and environmental forces. Hence, these analyses provide very different—indeed, diametrically opposite—accounts of why impaired people experience disability. Nevertheless, both models claim, presuppose, or can be reconciled with the idea that disabilities are individual properties. This is likely to raise a few eyebrows, as social theorists explicitly deny the role of individual impairments in causing disability. Allow us to elaborate.

The key to understanding our claim is to draw a distinction between two different, but equally significant questions. On the one hand, one could ask what causes a disability. On the other hand, one could be asking what constitutes a disability? Specifically, who is the bearer of a disability? A trait? A person? A group of individuals? An entire society? Advocates of the social model are adamant with respect to the first issue: personal impairments play little or no significant role in the production of a disability. However, disability scholars tend to be vaguer with respect to the second question. For example, Bickenbach maintains that:

“neither the strict social model advocates nor their bête noire, the followers of the medical model, would deny that, whatever else it is, disability is a state or experience of individuals associated with their bodies and how their bodies function that is often a disadvantage or problem that interferes with their life plans.”

Note that by explicitly identifying disability with ‘a state or experience of individuals,’ Bickenbach introduces an analogy between the social and the medical model, which is exactly the analogy that we are drawing attention to. Others are less explicit on this score. Thus, Elizabeth Barnes recently provides the following interpretation of the social model:

“disability just is the negative net effect of having an impairment in a society that discriminates against those with impairments.”

Unlike Bickenbach, Barnes does not explicitly interpret the social model as identifying disabilities as properties of individuals. Yet, her characterization—disability just is the negative effect—is consistent with alternative readings. Specifically, disabilities could be properties of impaired individuals caused by

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by a discriminatory society, or properties of impaired individuals in a dis-
criminatory society. We shall provide a defense of the latter reading, and
discuss its implications for disability studies. First, however, we show that
this ambiguity also characterizes various forms of interactionism.

Interactionism provides a distinct strategy from both medical and social
approaches, by identifying the source of disability with a thicket of causal
variables, including a combination of factors, both ‘internal’ and external' to
the organism. At the same, just like the previous models, interactionists
tend to focus on the etiology, the causal production of the disability:

“Put simply, the experience of a disabled person results from the rela-
tionship between factors intrinsic to the individual, and extrinsic fac-
tors arising from the wider context in which she finds herself. Among
the intrinsic factors are issues such as: the nature and severity of her
impairment, her own attitude to it, her personal qualities and abili-
ties, and her personality. I accept that contextual factors will influ-
ence these intrinsic factors: impairment may be caused by poverty or
war; personality may be influenced by upbringing and culture, etc.
Among the contextual factors are: the attitudes and reactions of oth-
ers, the extent to which the environment is enabling or disabling, and
the wider cultural, social and economic issues relevant to disability in
that society.”

The bottom line is the same. Standard interactionism treats disability as
causation, in part, by biological factors internal to individuals and, in part,
by the relation of organisms to their social environment. Yet, just like the
medical and social models, the disability is, explicitly or implicitly, conceived
as a state of the individual—or it can be typically reconstructed as such.

In sum, extant proposals disagree on what produces a disability. Yet, all
three models converge in either treating disabilities as features of individuals
or not taking an explicit stance on this score. The following section argues
that a clear rejection of this seemingly innocuous presupposition opens the
path for a more explanatory definition and analysis of disabling traits.

4 Disabilities, Phenotypes, and Niches

The widespread tendency to conceive of disabilities as individual properties,
discussed in §3, can be illustrated by drawing an analogy between disabili-
ties and phenotypic traits. Simple bodily features, such as having blue eyes
or brown hair, are produced by a combination of two kinds of factors, which

have received various labels: ‘internal vs. external,’ ‘biological vs. social,’
‘nature vs. nurture,’ etc. While both kinds of influences are necessary (and
jointly sufficient) for the development of such traits, a precise assessment of
the relative contribution of each set of influences is the subject of longstand-
ing controversy. In brief, Genetic determinists stress the causal influence
of genes and other varieties of biological endowments. Social determinists
emphasize the role of environmental conditions in producing phenotypes.
Interactionists adopt a more balanced position, according to which traits
are produced by both sets of factors.

Note the close connection between these biological frameworks and the
above accounts of disability. Like genetic determinism, the medical model
stresses the biological contribution to the experience of disability. Like social
determinism, the social model focuses on environmental triggers. Both kinds
of interactionism adopt an intermediate standpoint, according to which phe-
notypes and disabilities are the result of internal factors acting against the
backdrop of an external environment.

This connection between disabilities and phenotypes is intuitive and
helpful. For instance, it shows how advocates of the medical and social
models need not—and should not—endorse the untenable claim that im-
pairments and environments, respectively, play no role in developing a trait.
Like sophisticated genetic and environmental determinism, they should stress
the prominence, not the exclusivity, of these sets of influences.

At the same time, the similarity between disabilities and phenotypes
should not be stretched too far, as it may become potentially misleading.
No one seriously disputes that traits are properties of individuals. Sure,
environmental factors are partially responsible for Mary’s blue eyes and
John’s brown hair. Nevertheless, once we set aside questions of etiology—
how these traits are produced—blue eyes and brown hair are independent
of environments. Mary has blue eyes and John has brown hair regardless
of whether they live in New York or California, regardless of whether they
like them or not, and regardless of whether these traits become a source of
discrimination. These are features of their physical constitution. The same
cannot be claimed for disabilities.

Rather than comparing disabilities to phenotypic traits, a more apt anal-
ogy is with the concept of biological niche. Allow us to elaborate.

What is a niche? Oversimplifying a bit, one finds (at least) two al-
ternative concepts of niche in the relevant ecological literature. The first
one corresponds to Elton’s classic definition, according to which a niche is
a particular way of making a living in an ecological community. This characterization fits in well with the traditional view of environments posing selective pressures on organisms which, in turn, respond by adapting. ‘Eltonian’ niches exist independently of the organisms that inhabit them. These entities are defined functionally, which means that the same niche can be occupied by different species in different environments, as long as the organisms in question play the same functional role. For instance, the ‘large-carnivore niche,’ can be implemented by lions in the African savannah and by tigers in the Indian subcontinent.

On a second, alternative reading, niches can be viewed as volumes in multidimensional spaces, intended to capture the interactions between populations and their environments. On this view, first advanced by Hutchinson and subsequently developed by Lewontin, the identification of the occupied region inherently depends on the population of reference. Setting subtleties aside, the dimensions of a niche depend, at least in part, on the particular organisms that inhabit it. If lions and tigers interact with their ecosystems in different, species-specific ways, such variations will generate differences in how the large-carnivore niche is implemented by each species. In short, on Hutchinson’s view, a niche cannot be specified independently of its occupants. As Lewontin famously put it, niches are ‘made,’ not ‘found.’

In sum, there are two main concepts of ecological niche. Both definitions converge on a fundamental point. One cannot meaningfully talk about niches independently of the environment, the ecosystem in which they are embedded. This is not because the niche is caused or created, in part or entirely, by the surrounding environment. This is true, but it is beside the point. The issue is that niches are constituted, in whole or in part, by reference to specific environments. Paraphrasing and readapting a famous image by Gilbert Ryle, talking about a niche independently of its environment would be like acknowledging that a person is wearing a right glove and a left glove, while denying that said person is wearing a pair of gloves. This is a ‘category mistake.’

How is all of this connected to disability? We suggest that disabilities are better understood by comparison to niches than phenotypes. The reason is simple. As noted, it is perfectly meaningful to talk about phenotypic traits without specifying any particular context. I can describe Mary as having blue eyes, without specifying whether she is in New York or California.

Similarly, one can depict John as being six feet tall, regardless of whether his society assesses such trait positively or negatively. In contrast, referring to a condition as a ‘disability,’ independently of the underlying context of reference, is elliptical and, therefore, strictly speaking meaningless.

Many advocates of social and interactionist models will likely agree on this point. Disabilities are, indeed, context-dependent. The reason is that disabilities are caused in part, says the interactionist, or in full, says the social theorist, by features of the environment. What is the news then? What is added by drawing an analogy with niches?

The significance of our ‘ecological’ approach to disability is best understood by appealing to the distinction drawn in §3. On the one hand, one can ask etiological questions. What causes condition *x*? What causes a disability? What causes a phenotypic trait? How is an ecological niche produced? The general answer is the same in all these cases. Niches, phenotypes, and disabilities are all caused by a combination of biological and environmental factors.

On the other hand, one can also ask a different, constitutive question: what constitutes condition *x*? And here, we argue, the analogy between disabilities and phenotypes breaks down. As noted, setting etiological issues aside, phenotypes are independent of contexts. In contrast, referring to a disability independently of its underlying environment is incomplete because a disability can only be identified or defined by specifying the underlying environment of reference. Once again, this is not because the environment contributes to the production of the disadvantage, as stressed by social theorists and interactionists alike. This is true, but it is beside the point. Just like ecosystems (wholly or partly) constitute the conditions of existence of an ecological niche, socio-political environments (wholly or partly) constitute the conditions of existence of a disability. It makes no sense to talk about the large-carnivore niche without presupposing an environment in which there are prey. Similarly, referring to a person as a ‘wheelchair user’ is, strictly speaking, elliptical. In doing so, we are tacitly relativizing this condition to an environment or sets of environments. In short, disabilities are more akin to niches than phenotypes. Like ecological niches, disabling conditions cannot be described, let alone assessed, by focusing on proper-

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27To be sure, when talking about disabilities or niches, we do often omit an explicit mention to the relevant environments. Indeed, people often talk about ‘predator species,’ or a person being ‘a wheelchair user’ or being ‘legally blind’ tout court, without specifying any context of reference. Yet, this is not because the relevant environment is absent or deemed unimportant. Rather, it is because it is tacitly presupposed or pragmatically implied by the underlying circumstances or conversational context.
ties of individuals. They are individual properties contextualized to specific environments.

The ecological metaphor provides a useful framework for modeling disability and characterizing the differences between alternative approaches. The insights of the social model are captured well by the ‘Eltonian’ concept, where the niche is picked out in terms of functional roles of ecosystems, independently of organisms. In contrast, the Hutchinson-Lewontin perspective corresponds to a more interactionist approach, where the population of reference plays a role in determining the nature of the niche itself.

The concept of niche also explains why traditional models falls short of an adequate and general analysis of disability. Recall how the shortcomings of the medical and the radical social models are specular. The former fails to recognize the role of the environment in causing a disability. The latter underestimates how physiological and psychological conditions may have some debilitating effects, which cannot be completely addressed from a social, ‘external’ perspective. Interactionist models combine both insights to provide a broader and more widely applicable conception of disability. However, without a principled distinction between true disabilities, non-talents, and lack of superabilities, the model lacks explanatory power.

We now have the conceptual resources to pinpoint the difficulty and to sketch a solution. The common root of all these problems is that the environment does not merely play a role in causing a disability, as recognized by both social and interactionist models. In addition, the environment characterizes the nature of the disability itself. While all three models have the resources, in principle, to draw this distinction, none of the traditional discussions have made this observation explicitly.

The analogy with niches suggests a simple, effective strategy for overcoming this problem. Disabilities cannot be reduced to the experience of an individual, caused by biology, society, or a combination of both. This is because, just like niches, disabilities are not properties of individuals. They are relational features of organisms embedded in sets of environments. That disability cannot be causally explained without including environmental features is well-known. This is true, but it is only part of the story. The rest is that disabilities cannot even be analyzed independently of their underlying context, implicitly or explicitly specified. Because of this neglected context-dependency that makes disabilities analogous to niches, we call our approach ‘ecological.’

The remainder of the article focuses on some implications.

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28 In dubbing our approach ‘ecological,’ we must be mindful of distinguishing the present proposal from other ‘ecological’ models of disability found in the literature, all of which falls
5 Implications

Let us take stock. §3 argued that the three mainstream approaches to disability—medical, social, and interactionist models—tend to conceive of disabilities as individual properties, that is, properties that an individual may or may not have, regardless of the environment of reference. As noted, social and interactionist models are not explicitly committed to this tenet and many scholars will likely want to reject the claim in question. However, by privileging etiological issues about what causes disabilities over constitutive questions about what disabilities are, extant models lack clarity on this score. §4 suggested that the difficulty might be due, at least in part, to a tendency to liken disability with phenotypes. Traits like having blue eyes or brown hair are produced by a combination of biological and environmental factors. However, it is possible to characterize these features independently of any particular environment. We argued that a better analysis of disability might connect these important traits to ecological niches. Contrary to phenotypes, one cannot describe a niche independently of the environment of reference. This context-sensitivity, we maintain, is a salient aspect that niches share with disabilities. Let us further elaborate this significant point.

Contra the medical model, blindness, deafness, or inability to ambulate can only be categorized as disabilities when understood against the backdrop of a given environment. Even conditions that are disabling across a multitude of environments, such as Tay-Sachs syndrome and Epidermolysis Bullosa might not count as disabilities in all conceivable contexts. Future biomedical advancements will hopefully find ways to forestall their debilitating effects, essentially providing less-harmful ‘social niches.’ At the same time, contrary to the social model, it does not follow that impairments never trigger disability. Even in a fully accessible society, people with disabilities may still face disadvantages, and such conditions may interfere with performing potentially beneficial actions that enhance well-being. Finally, we agree with interactionists that disabilities cannot be reduced exclusively to physical or environmental causes. Both sets of conditions play a necessary and jointly sufficient role in triggering a disability. However, we also stress that this important etiological insight is only part of the story. Our ecological metaphor goes beyond interactionism, as it is traditionally presented, in emphasizing that disabilities are not only caused by biological and social

factors. In addition, disabilities are constituted by both sets of conditions. In this final section, we discuss how supplementing extant models with this conceptual point contributes to the study of disability.

We begin by going straight to the heart of the problem: the distinction between disability, non-talent, and lack of superability. Interactionists point out that disabilities are brought out by a combination of biological and social factors. But not all disadvantages produced by a combination of biology and society are disabilities. Theoretical models should provide a principled distinction between true disabilities and non-disabling differences. Merely distinguishing between kinds of causal factors here is unlikely to do the trick.

The deep moral of social models is the contextual nature of disablement and its socio-political implications. Some contexts are better suited than others for human flourishing, and several sorts of inequality can be corrected by changing environments appropriately. The analogy with ecological niches provides the key insight, which is to distinguish etiological and constitutive implications of this observation. The strategy for identifying bona fide disabilities is neither to completely discount the role of impairments, as we find in traditional social models, nor to distinguish between biological and social factors, as suggested by standard interactionism. As our discussion of phenotypes makes clear, virtually all conditions, disabling and non-disabling alike, are produced by a combination of both sets of variables. The solution is to recognize that the environments of reference should be incorporated into the characterization of a specific disability. There is no such thing as being ‘deaf,’ ‘blind,’ or a ‘wheelchair user’ tout court. There is only ‘being deaf in environment $x$,’ ‘being blind in context $y$,’ ‘or requiring a wheelchair in situations $w_1$, $w_2$, and $w_3$.’ In this respect, social theorists had the right insight. Our goal as a society should be not to eliminate the causes of disability, but to eradicate the disadvantage itself.

We stress, once again, that one cannot determine from the armchair which conditions count as disabilities and which do not. No theoretical model can replace the required painstaking combination of empirical, theoretical, and social work. Thus, how does our suggestion differ, in practice, from extant models? We conclude by discussing how the ecological approach contributes to addressing and dispelling five longstanding concerns.

First, the class of recognized disabilities is broad, including limited or absent functioning (paralysis), disease or disease-like conditions associated with pain and suffering (chronic migraine), absence of sensory function (deafness) and psychological limitations (autism). A model of disability should explain what is shared by all these conditions. This is no trivial task. From a physiological standpoint, these conditions have little or nothing in com-
mon, making disability a heterogeneous, multiply-realizable class. Things look no better from a socio-political perspective, as these limitations call for myriad interventions and accommodations, ranging from medical treatment (gout, myopia), to biotechnological innovation (Alzheimer’s), to personalized educational strategies (autism, dyslexia). To make things worse, the class of disabilities should discount non-talents (not being able to play the violin) and lack of superability (not having Usain Bolt’s speed). In short, providing a general causal account is a daunting task. Things, however, look much better, if all these conditions are relativized, implicitly or explicitly, to a context or environment. Consider a real-life example. When computers switched from DOS to Microsoft, Windows became no longer compatible with voice output software. Consequently, many visually-impaired people could no longer use their personal computers for productive activity. Determining what makes lack of appropriate software a disability, as opposed to non-talent or lack of superability, is not easy. Yet, explaining what makes lack of voice output software a disability, relative to a context where the technology was previously available, is more tractable.

Second, the ecological approach leaves out any reference to some baseline of biological ‘normality.’ An influential strategy in contemporary philosophy of medicine is to conceive of health and disease—and, derivatively, of ability and disability—by appealing to some notion of normal function, grounded in the statistically typical contribution of an organ or trait to members of a reference class. The problem is that, given the variation in both level and mode of human performance, biostatistical analyses are controversial. By avoiding any talk of ‘normality,’ our proposal allows one to explain why non-pathological impairments that do not interfere with biological function, such as achondroplasia or facial disfigurement, may still count as disabilities, in some environments. Similarly, disabling conditions may be statistically rare (Lesch-Nyhan syndrome), statistically common (acne, obesity), or virtually universal (mild tooth decay). The key, again, is to relativize disabilities to specific environments or sets thereof. Unlike biostatistical analyses, the reference class here contributes to the characterization of the disability itself, not to the classification of a condition as (ab)normal. On a related note, our focus on niches also suggests that the ongoing debate about whether disabil-

30 An influential account of health along these lines is C. Boorse. 1977. Op. cit. note 3.
Third, our account captures the intuition that some conditions are disabilities in some environments and not in others, without completely severing the link between impairment and limitation. As many social theorists note, it is challenging to find impairments that do not prove beneficial in any environment, which suggests that disabilities are social, as opposed to biological conditions. Athletes on wheelchairs can complete a marathon faster than any runner and mildly dangerous heart conditions could increase your chances of long-term survival by getting you out of a war draft. Some scholars have taken this to show that disabilities are neutral conditions that do not inherently cause harm to its bearers. This implication is controversial. We take it that conditions such as blindness are potentially harmful. However, would it still be a disability if no one could see? This presents a dilemma. Answering in the positive has the counterintuitive consequence that lack of superabilities (lack of regeneration of lost limbs, tele-transportation, etc.) would also become disabilities, since many of us would welcome these stupendous powers. Answering in the negative severs the intuitive connection between disability and well-being, since these, and similar, traits would play an instrumental role in human flourishing. Along similar lines, would blindness in a permanently dark universe count as a disability? What about blindness in a universe where a vicious tyrant decides to persecute all individuals with vision? On our account, these thought experiments become hardly problematic. If disabilities involve an implicit contextualization to environments, lacking the same condition—blindness—can be a disability in our world, a neutral condition in a light-less universe, and it could actually be advantageous in the ‘vicious tyrant’ scenario. In short, the same capacity can be non-problematically beneficial, neutral, or disabling depending on the context of reference in which it is embedded.

Fourth, and relatedly, our ecological approach captures why some disabilities matter for social policy, whereas others are marginal. We live in a society where reading, traveling, and being joyful happen to be desirable and achievable by humans. In contrast, having perfect pitch or having a photographic memory does not make a comparable difference to most of us. This is why the former conditions call for action, while the latter do not. Similarly, flying, tele-transportation and regenerating amputated limbs would be important. Yet, since they are currently out of human reach, they are of

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little theoretical and moral concern. Nonetheless, which environments are ultimately more or less desirable is a socio-political question that requires painstaking normative assessment together with accurate empirical analysis.

Fifth, and finally, the ecological metaphor emphasizes why eliminating the effects of a disability $x$ is not enough to ensure that no individual actually suffers from $x$, which is another significant insight of the social model. To illustrate, suppose that all carnivores went extinct. Under these hypothetical conditions, the ‘large carnivore’ niche would be left empty. However, from an ecological perspective, it would still exist as a way of making a living. This entails that other species could fill this void, unless prevented by environmental changes. This shows that, to eradicate disability $x$ entirely from our society, it is not sufficient that no one suffers from $x$. One must also ensure that such ‘ley de vida’ is no longer sustainable in our community, to avoid the possibility of its resurfacing in the future.

In conclusion, we stress that the relation between disability and ecology deserves to be discussed more systematically. Our goal was, more modestly, to draw attention to the promise of connecting models and theories in the philosophy of science with bioethics and social and political philosophy.