# Experimental Philosophy of Medicine and the Concepts of Health and Disease

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**Abstract**

If one had to identify the biggest change within the philosophical tradition in the 21st century, it would certainly be the rapid rise of *experimental philosophy* to address differences in intuitions about concepts. Yet, it is within the philosophy of medicine that one particular conceptual debate has overshadowed all others: the long-standing dispute between so-called 'naturalists' and 'normativists' about the concepts of health and disease. It is, therefore, surprising that the philosophy of medicine has, so far, not drawn on the tools of XPhi. I shall use this opportunity to defend and advocate the use of empirical methods to inform and advance this and other debates within the philosophy of medicine.

*Keywords:* philosophy of medicine; experimental philosophy; conceptual analysis; health and disease; Boorse; naturalism

> *There is a widespread and unfortunate tradition in philosophy that the man in the street has all the empirical knowledge required for philosophizing.*
>
> – Daniel C. Dennett ([1], p. 1)

## 1 Introduction

If one had to identify the biggest change within the philosophical tradition in the 21st century, it would certainly be the rapid rise of *experimental philosophy*. What began as a small initiative to promote empirical methods within philosophy and test the intuitions of so-called 'armchair philosophers', has led to a wealth of studies on the intuitions of the public concerning a diverse range of philosophical subjects in epistemology, ethics, metaphysics, and even aesthetics. The field has quickly grown

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into a lively community, but faces criticisms from both inside and outside the philosophical community.

Owing to an array of defences by respected philosophers of science, experimental methods have become increasingly common and accepted within the philosophy of science.[2] While this has led to major changes in thinking and a more pluralist attitude towards the use of scientific tools within philosophy *of* science itself, it would be premature to call this a victory for experimental philosophy of science. Indeed, there is one sub-discipline of philosophy of science in which experimental philosophy is notably absent, i.e. the *philosophy of medicine*. We think this is unfortunate and would like to use this opportunity to remedy this omission.

Indeed, the lack of empirical methods in the philosophy of medicine is all the more surprising, since experimental philosophy has predominantly been used to challenge many of the more intuition-grounded conceptual debates in philosophy. Experimental work on scientific concepts includes early work on the gene concept [7], innateness [8-10], the economists' concept of choice [11] consciousness [12], and conceptual differences between natural and social scientists more generally [13,14]. Yet, it is within the philosophy of medicine that one particular conceptual debate has overshadowed all others: the long-standing dispute between so-called 'naturalists' and 'normativists' about the concepts of health and disease, i.e. whether (to put it into a slogan) these terms refer to value-free scientific concepts or valueladen social ones. But as the quote from Daniel Dennett at the epigraph of this paper was meant to illustrate, the very notion that we could develop a theory of health and disease without any reference to empirical data strikes me as quite weird if not absurd, and yet seems to be the dominant view in the philosophy of medicine. Here, we shall use this opportunity to defend and advocate the use of empirical methods to inform and advance this and other debates within the philosophy of medicine, a discipline that has so far resisted the empirical turn within philosophy.

The paper is structured as follows: *Section 2* offers a brief sketch of the philosophical literature on health and disease and articulates a problem for traditional conceptual analysis that we shall, following Lemoine [15], dub the *Intrinsic Limitation Problem* (**ILP**). *Section 3* introduces the methods of experimental philosophy as a necessary solution to this problem and addresses several of the objections philosophers of medicine are likely to raise, before finally, *Section 4* concludes the discussion.

[2] See [2-6].

# 2 Conceptual Analysis of Health and Disease

The central question within the philosophy of medicine is how to define and understand concepts such as 'health', 'disease', and 'pathology'. This philosophical question has garnered much attention throughout recent decades and continues to be one of the most heatedly debated issues in the field (see [16] for an overview). Traditionally, the contenders within this debate have been grouped into two opposing camps: 'naturalists', who try to ground the concepts in objective biological facts and 'normativists', who argue that these concepts cannot be purely grounded in objective facts about science, but are instead ultimately value-laden - depending on the human viewpoint - or culturally relative.[3] This is only a simplified and coarse-grained picture of this many-faceted debate, yet it will be sufficient for my present purposes, which is only to show that the traditional philosophical method of trying to resolve this debate - i.e. conceptual analysis - is likely doomed to remain unsuccessful. Here, I am not making any claims regarding the sensibility of the dichotomy in which the debate has been historically framed. Whether we should be eliminativists, pluralists, or unificationists about the conflict between normativism and naturalism in this debate, is as I shall argue, to a non-negligible extent an empirical matter. Here, it is useful to take Maël Lemoine's recent critique of conceptual analysis as a starting point.

## 2.1 The Intrinsic Limitation of Conceptual Analysis

Traditionally, *conceptual analysis*, i.e. the descriptive analysis of a concept, has been assumed to play the central, if not only, role in settling the conflict between *naturalism* and *normativism*. The two most influential 'naturalist' accounts in this debate - i.e. the bio-statistical (BST) account of Christopher Boorse [19-22] and the harmful-dysfunction account by Wakefield [23] have made explicit reference to conceptual analysis in their methods. Boorse [21], for instance, explicitly states that "[t]wenty years ago, in four papers, I offered a unified descriptive analysis of health, disease, and function" (p. 4). This is no accident. Historically, most of the contributors to the debate have paid little if any attention to the meta-philosophical questions of whether this method is an appropriate one. As Lemoine [15] points out: "all participants implicitly agree about the utility of conceptual analysis to settle the debate" (p. 316).[4]

[3] Despite the existence of these two camps, one should not think of either as particularly unified. The positions of normativists in particular share only very little family resemblance aside from their unified dismissal of naturalism about health and disease. These anti-naturalists reject Dennett's dictum of "Darwin's universal acid" [17,18].

[4] This assumption is not exclusive to the philosophy of medicine. It is very much conceived as the *modus operandi* in many conceptual debates in philosophy - indeed the general practice of philosophy itself - and has thus received an array of criticisms (see [24] for an overview).

There are a few notable exceptions, such as John Matthewson and Paul Griffiths on the naturalist side and Quill Kukla on the normativist side, who don't try to capture the meaning of the terms as used among the public but explicitly try to revise the concepts of health and disease for the purposes of science and justice respectively [25-29]. Most of what has been published in this debate, however, squarely falls into a conceptual analysis framework.

Since, I are interested in the *intrinsic limitation problem* (**ILP**) identified by Lemoine [15], I will follow his formalization of this methodology in order to make the problem visible.[5] When philosophers are interested in the conceptual analysis of a term (be it the concept of 'health', 'disease', 'pathology', 'disability', or 'illness') they start from something cognitive scientists have called exemplar theory.

Exemplar theory postulates that humans learn and apply concepts by comparing new stimuli to stored paradigm cases, such that we classify the new stimuli as a member of the class if there is enough of a family resemblance between the entities in question [30]. While this intuitive categorization may be enough for the lay folk, it is unsatisfying to most philosophers.[6] Instead of just comparing controversial cases of diseases with uncontroversial paradigm cases (Lemoine calls this set the *extension* of a term), philosophers aim to construct a definition from the latter. This definition, Lemoine [15] argues, must provide us with necessary and sufficient conditions for whether we classify something as health and/or disease, and may include exceptions to these criteria in order to prevent easily-constructed counter-examples. With such a definition in place, philosophers can then (if successful) place controversial cases either within the extension of the term 'disease' or outside. Progress, it is assumed, thus proceeds by exposing these accounts, or rather definitions, to attacks that should then lead to a revision or replacement in the hopes of finding the 'correct' account of health and disease. To do so Lemoine [15] identifies three distinct kinds of "attack":

> They consist in presenting (1) cases falling within the commonly accepted extension of the term but which do not satisfy the opponent's definition, (2) cases that do satisfy the opponent's definition but which fall outside the commonly accepted extension, and (3) cases that fall clearly inside or outside the extension but which the opponent's definition fails to classify at all.

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[5] His analysis of conceptual analysis is here based on Christopher Boorse [20-22], Lennart Nordenfelt [31], and Jerome Wakefield [23, 32].

[6] Also for policy-makers, funding agencies, and insurance companies who are faced with a line-drawing problem of which conditions should be called pathological. Biologists, on the other hand, should be much happier to embrace such vagueness since the biological world doesn't lend itself to sharp distinctions. A naturalist account of health and disease may thus permit a higher degree of indeterminacy than normativist ones.

– Lemoine ([15], p. 310)

Boorse [21] characterizes this back-and-forth as a genuine game: "to call pregnancy *per se* unhealthy would strike at the very heart of medical thought; it is the analytic equivalent of the 'Game Over' sign in a video game" (p. 44). And boy have there been a lot of contenders in this game. For instance, Boorse's decades-old BST account (first introduced in 1977; see [20]) despite surely being the most discussed work in the literature, is far from a well-accepted account. While there have been slight amendments to Boorse's original account, the continuous assault on his account in the literature is hardly indicative of an elimination process in which only one definition will prevail. One may thus question whether the participants in this debate are actually following the supposed rules of conceptual analysis, i.e. the necessity to debunk and replace existing definitions with better ones in order to "win such a debate" (Lemoine [15], p. 311).

But as Lemoine [15] shows, these rules seem to play a core role in the work of Boorse, Wakefield, and Nordenfelt. All of them "1) propose a definition of health, disease, or both, (2) give examples of actual diseases, (3) examine apparent counter-examples, and (4) offer counter-examples to the contending proposals for definitions" (p. 311). Definitions, it is claimed, are often argued to be either too narrow, excluding conditions we consider to be diseases, or too broad, including conditions we would prefer not to label as diseases, as Boorse's pregnancy example above illustrates. Lemoine argues that for such an analysis to eventually lead to success, or at least make progress, it requires consensus among participants. But since such consensus only requires consensus about the clear cases the concept is intended to capture (controversial cases can easily be dismissed as unclear by the opposite side and thus uncontroversial and damning cases are needed in order to be successful - picture a sort of philosopher's 'mic drop'), Lemoine insists that it can never lead to a definition that rules controversial cases out (or in). As he points out, "if several definitions could match the same set of uncontroversial cases, it would not matter whether they agreed or disagreed on controversial cases" ([15], p. 316). Conceptual analysis (alone) would not be able to settle the game and pronounce a winner. This is an "intrinsic limit of conceptual analysis: it cannot rule out a specific kind of stipulation" (p. 316).

Whether the solution to the conceptual controversy about health and disease finds itself in the naturalist or normativist 'camp' cannot be established if both sides can offer accounts that cover the uncontroversial cases equally well. We see no *a priori* reason to doubt that there is conceptual room on both sides for such definitions. It is thus as Lemoine [15] argues "hopelessly unlikely [that we will be able] to decide between two reasonably successful definitions of 'disease" (p. 323). That is, if we limit

ourselves to conceptual analysis alone.[7] Lemoine concludes his paper with the declaration that "[i]n order to prove naturalism or normativism right, another method has to be embraced" (p. 324). I shall follow this call for action and thus introduce another method in the philosophy of medicine in order to make empirically supported judgements about the intuitions and use of concepts in the public and the medical profession, i.e. *experimental philosophy* (sometimes abbreviated as X-phi).[8]

# 3 Experimental Philosophy to the Rescue

That Lemoine's call for an alternative method can be used to offer a defense of experimental philosophy of medicine comes as no surprise. The criticisms Lemoine brings forward against conceptual analysis have been echoed in similar form by many naturalist philosophers, and especially those that advocate the use of empirical methods. Experimental philosophers (among others) have long criticized the philosopher's tendency to rely on their own intutions to capture the meaning of a term, rather than the intuitions of the general population they are supposedly capturing [36]. Here, one may legitimately wonder whether intuitions (be they philosophical, scientific, or lay) are at all helpful to understand the reality of a concept. Why should we assume that mere intuitions can help us to settle these questions, especially those of broader (non-specialist) populations?[9]

Unfortunately, experimental philosophy is often narrowly understood as the mere use of surveys to capture the intuitions of the public, rather than a more general view of philosophy as a discipline continuous with the sciences and thus apt to use empirical data to inform its debates. This naturalist understanding of the XPhi critique of conceptual analysis turns the usual critique of XPhi on its head. Rather than criticizing the use of empirical methods to address philosophical issues as something that is "not philosophy", a naturalist criticizes philosophical debates for a lack of empirical tools. In promoting XPhi I aim to accomplish an empirical turn in

[7] This is not to deny that conceptual analysis may have contributed positively to our conceptualization of health and disease - progress that will surely be taken by some to argue for a more optimistic stance on whether conceptual analysis can solve the debate. But this further step should be avoided. For additional reasons regarding problems with conceptual analysis that I do not have space to detail here, I am rejecting this position. [See [33] for various philosophical attacks on conceptual analysis.] My primary goal is merely to convince philosophers of medicine to embrace a wider toolkit of methods in order to settle the questions they are interested in.

[8] While Lemoine intends to solve this debate by motivating a naturalist account of health and disease that actually draws on the full breath of biomedical science, I offer an alternative solution here. Nevertheless, in a conference report Lemoine et al. [34] tentatively suggested that experimental philosophy could fruitfully be applied to the philosophy of medicine. In my PhD thesis, in turn, I follow Lemoine's call for an attempt to naturalize the concepts of health and disease [35].

[9] I thank an anonymous reviewer for their suggestion to include a discussion of these points.

the philosophy of medicine similar to the one initiated by Dan Dennett in the philosophy of mind:

> [...] as a graduate student at Oxford (1963-65), I developed a deep distrust of the methods I saw other philosophers employing. That was the heyday of ordinary language philosophy, and "theories of mind" were debated on the basis of a lean diet of conceptual analysis–as if one could develop a theory of horses on the basis of nothing other than a careful investigation of the meaning of the ordinary word "horse". I decided that I had to supplement (and maybe even adjust!) the fruits of ordinary language analysis with an attempt to figure out how the brain could possibly accomplish the mind's work.
>
> – Daniel C. Dennett ([37], p. 12) [italics in original]

I am here not merely making the uncontroversial claim that empirical methods can improve the debates in the philosophy of medicine, but the more substantive one that empirical methods are necessary to make progress on our understanding of health, disease, and pathology. This understanding of XPhi as part of a larger project of naturalist philosophy makes it compatible with naturalist critiques of conceptual analysis of two distinct sorts that are often brought forward against XPhi: i) concepts are not definitions, and ii) intuitions are a poor guide to understand natural phenomena. But these issues are importantly not incompatible with naturalism. Firstly, XPhi may very well reveal that the way we categorize the world cannot be captured in simple definitions of necessary and sufficient conditions. But this only goes to show that conceptual analysis has rested on mistaken assumptions, not that XPhi fails because it cannot provide such conditions. Secondly, naturalists should be happy to make a distinction between our psychological categorizations and the way the world is. Conceptual analysis is sometimes ambiguously understood as both the search for essence or true meaning of a concept, or merely a set of "criteria of application" that actual humans use when employing these concepts (Neander [38], p. 171), but these goals are distinct. Naturalists can engage both in a scientific investigation of how we end up with and employ concepts in our own thinking and in communication with others and a scientific investigation of whether there these concepts map onto real phenomena in nature.

Whereas Lemoine [15,39], alongside others such as Matthewson and Griffiths [25], abandon conceptual analysis in favour of the latter approach - i.e. to ground these concepts within science - I use this opportunity to advocate the use of XPhi in the form of surveys of the public, medical practitioners, and scientists to advance the debate between so-called 'naturalists' and 'normativists'. Importantly, however, these approaches are not incompatible and can inform each other, especially when the intuitions of scientists and their empirical work comes apart, as Griffiths' work on the idea of innateness and the gene concept elegantly illustrates [7-10]. The once purely philosophical project of conceptual analysis is thus replaced by two distinctive

investigations: one is a investigation of the psychology and sociology behind our concepts, the other a scientific investigation into the phenomena these concepts supposedly map onto.[10] Now, while it is surely justifiable to ask why we should be naturalists and rely on empirical data at all, this is not the place to answer these concerns. This is a paper about the philosophy of medicine, a field where scientific approaches such as those of Lemoine, Griffiths, and Matthewson are rare and XPhi notably absent. Due to considerations of space, I merely want to give a *positive* account and show how experimental philosophy could be used to improve the philosophy of medicine by discussing its most famous conflict. If this approach is meant to fail, this will likewise have to be empirically demonstrated and not *a priori* asserted.

## 3.1 Conceptual Analysis requires Experimental Philosophy

The primary argument for experimental or better empirical philosophy of medicine is thus this: *successful conceptual analysis in its nature requires empirical data*. Here, the lexicographical approach is indicative and shares a close connection to traditional conceptual analysis.

What lexicographers seek is usually a list of examples of a term's usage (including paradigm examples), a list of different sub-types these examples fall into, or a definition that covers the usage of the term. The latter is often not provided, or instead is stated in quite inclusive terms so as to not exclude any cases. One reason for this is simply pragmatic: some terms are applied in very different contexts in which they have a radically different meaning, and cannot be unified by a single concept. Most take the concepts of health and disease to be radically different in that regard, assuming that there is a single 'correct' unifying concept. If the goal is conceptual analysis of a term used by a linguistic community, one cannot take one's own intuitions as a starting point, unless there is evidence that these intuitions are widely shared. Indeed, it is doubtful that one could even engage in such conceptual analysis without empirical methods. Whatever tools a philosopher uses to get a grasp on these shared intuitions, whether they rely on interviews, surveys, bibliographic data, or participating in or observing conversations about health and disease, even the very use of a lexicon to begin one's conceptual analysis is empirical – though we may prefer to call this 'light X-phi' compared to more sophisticated and empirically demanding studies (whether quantitative or qualitative).

## 3.2 Experimental Philosophy is not Philosophy

With this in mind, we can turn to a frequently uttered challenge against experimental philosophy: that while it may be useful, it doesn't constitute philosophy. One may

[10] For more detail on the second of these options, see [40], though parts of it are revised here.

thus argue that philosophers should minimize their use of empirical methods, for engaging in them would take time away from doing 'real philosophy'. This, however, is no obstacle to the necessity of the kind of work advocated and practiced within the experimental philosophy community: if empirical methods such as surveys do not count as philosophy, then neither will opening a lexicon, or reading medical papers for that matter. There is no line to draw here.

The semantic dispute on whether we call this work philosophy or not doesn't matter. It is work that needs to be done in order to make progress on the philosophical questions. But sociological, psychological, or scientometric studies on the concepts of biomedical scientists or the public are comparatively rare. That is because non-philosophers are often not interested in particularly philosophical questions (with perhaps the exception of moral psychology). But if good empirical evidence is necessary for conceptual analysis to be successful philosophers themselves may very well be forced to utilize the toolkit of science - that is, if they are ultimately interested in answering their philosophical questions, rather than just engaging in 'philosophical play'.

But how can we use experimental philosophy to address Lemoine's [15] **ILP** of conceptual analysis? At the core of any conceptual analysis of disease is a set of uncontroversial paradigm cases that the concept needs to cover. The present state of the debate suggests that the current set is too small as to allow for a determinate 'winner', nor even substantial progress, in the debate. Here, we can rely on empirical methods such as surveys to widen the set of phenomena we aim to include, particularly in talk of pathology within the biomedical sciences.

One way of doing this would be to confront the public with controversial cases of diseases at the edge of the conflict between normativists and naturalists. Another, would be to expand the list of paradigm cases by considering the intuitions of the scientific community regarding the nature of medical conditions such as diabetes, autism, or viral infections that do not cause any felt harm, but are nevertheless harmful to the organism (e.g. pathology in trees). Sophisticated surveys might even attempt to discover the more abstract reasoning behind the classification process of participants. Are they drawing on scientific facts or the values of society?

Normativists may be reluctant to adopt this procedure since the reliance on naturalistic methods may appear to unfairly shift the debate in favour of naturalism, especially when we directly investigate the intuitions of scientists rather than the public at large. By extending the set of paradigm cases to include any mention of pathology in science, one may come under the impression that the game becomes rigged, since many normativists hold the view that our definitions of health and disease should not be based on scientific practice but our common understanding of these notions. What may be called the *dice-loading problem* of naturalist experimental philosophy, however, need neither favour a naturalist nor normativist account of

these notions: the 'winner' of this game is likewise determined - as with anything else in experimental philosophy - empirically.[11]

There are two possible results for a study in experimental philosophy of medicine on the concepts of health and disease: either we find substantive agreement among the public, medical practitioners, bioethicists and biomedical scientists, or we find that there is substantive - perhaps insurmountable - disagreement. If we can widen the number of uncontroversial paradigm cases of disease (and uncontroversial paradigm cases of non-disease states) we should at least be able to foster more agreement within the conceptual literature on health and disease. Since any successful analysis would require covering these cases, we could at least minimize the **ILP**. It would only constitute a dice-loading problem if we have any a priori reasons to think that the empirical data supports naturalism. But this is not so since experimental philosophy of medicine might just as well reveal that there is barely any consensus on the concepts of health and disease. This would make the case against naturalism much stronger, favouring those normativist accounts that relativise the concept to human interests and cultural dynamics. Let me therefore turn now to examine both possibilities.

## 3.3 Pluralism and Elimination

Robinson et al. [13] and Beebe and Dellsén [14] have shown that scientists in different fields not only hold different methodological standards, but also interpret philosophical concepts such as objectivity and realism in widely different ways.[13] This is relevant for the concepts of health, disease, and pathology insofar as they could hold different meanings in medical practice, paleopathology, immunological research, bioethics, evolutionary biology, and wider public use. If we were to use experimental methods to investigate whether scientists and medical practitioners fall more into the normativist or naturalist camp, it is important to consider the nature of the questions we ask. If we were to employ a simple survey-based methodology asking participants:

[11] An anonymous reviewer objected that the usage of scientific methods might favor, rather than negatively affect the normativist position. For example, if one can empirically show that there are no necessary and sufficient conditions for a given state to be classified as a disease, then the normativist, rather that the naturalist, claim is validated. There are two replies to this. Firstly, the worry is that naturalist methods favour naturalist conclusions. If the opposite was true there wouldn't be much of a problem since naturalists should then happily endorse normativism - for it follows from naturalist reasoning. Secondly, it is not true that a failure of science to provide necessary and sufficient conditions for disease implies a failure for naturalism. The biological world simply doesn't lend itself to simple definitions in terms of necessary and sufficient conditions, so we may very well have to amend our concept of disease if it fails to map unto its counterpart in the natural world.

[13] A difference that they show to be especially pronounced between the social and natural sciences, thus making scientific integration difficult.

*Is health an objective measure?* and the large majority of participants across these fields were to respond with 'yes', we may still not have learned much about the concept of health held by the participants. This is because the concepts of 'objectivity' and 'measurement' are likely to differ between different disciplines. The behavioral economist George Loewenstein, for instance, noted that economists seem to have a much more thorough and empirically supported take on what they consider a 'theory' as compared to what psychologists seem to understand when they use the term.[12] Similarly for diverging results that may arise for different fields: what may be seen as a difference in how, for instance, paleopathologists and medical practitioners understand the concept of disease might be an artefact of differences in what they consider to be 'objective measures'. These difficulties are not insurmountable, but it is important to recognize them when designing appropriate questionnaires.

Further, Robinson et al. [13] note that such questions may be ambiguous in that it is not clear whether scientists are asked to make judgements about a concept such as the gene across the sciences or in their specific field. Such challenges should be taken seriously prior to experimental design, for they could seriously hinder the descriptive analysis experimental philosophers are trying to achieve. Their answer to this problem is that the results would still be meaningful since it would be both the natural scientists and the social scientists who interpret the question as either one about science in general or their specific discipline. But this is only an assumption. A medical practitioner might have a conception of disease that they take to hold generally across all disciplines. A paleopathologist on the other hand, might have a much more narrow understanding and see talk about disease and health as discipline-relative. A veterinarian working in the agricultural industry might understand animal health as something distinctive, relating narrowly to something that reduces farming yield.[13] Here, the usual criteria for informative scientific surveys such as sufficiently large sample sizes apply.[14]

One possible way of avoiding some of these problems, is to engage in a particular form of experimental philosophy that, as Nagatsu [45] has pointed out, has become the standard within experimental philosophy of science, i.e. *factorial surveys* as introduced into sociology by Peter Rossi [46]. These quasi-experimental survey methods employ vignettes, (i.e. concrete hypothetical descriptions) that are intended to capture the participants' implicit norms and concepts, while allowing for a sort of

[12] From personal conversation.

[13] Animal welfare has historically been understood in this narrow way of physiological health or well-functioning [41-43].

[14] Though what may be assumed to be a necessary requirement of experimental design has not stopped publication of various experimental philosophy papers with astonishingly small sample sizes [44].

experimental manipulation of variables.[15] Popularized within social psychology research, this method can usefully be applied to capture the diversity of conceptualizations in the biomedical sciences. Yet, it would take too much space to go into detail here, requiring a paper of its own.

One straightforward prospective way of testing the intuitions of participants is to confront them with descriptions of potential diseases in animals. The intuitions of the public may support either normativism or naturalism in these cases. Naturally, the views of the public may differ when compared to the views of medical practitioners, veterinarians, or evolutionary biologists. If there is no conceptual divorce between animal and human health, there will appear at least three options on the table: Either animals cannot be diseased and this is just a social construction or purely biological difference, where humans are different and we merely engage in some sort of "sympathetic digression" from man to animal (Canguilhem [47]),[16] or people will think human diabetes should be understood precisely the same as canine diabetes. One pathway for testing these issues, may be to confront participants with the discovery that there are virophages (i.e. viruses that infect other viruses) and test whether this changes their intuitions as to whether viruses can be sick, especially when we expose them to quotes by microbiologists such as Jean-Michel Claverie who argues that "[t]here's no doubt this is a living organism. The fact that it can get *sick* makes it more alive." ([52], p. 677) [italics added for emphasis]. Examples such as these are likely to be counter-intuitive to most people, even scientists not working in microbiology, undermining the idea that experimental philosophy would lead to a *dice-loading problem*. By adjusting and comparing examples in different samples, e.g. broken leg in humans vs dogs vs broken wings in birds, we should be able to test whether we are just anthropomorphizing animals with high degrees of similarity to us, or whether disease judgements prevail even in cases considered controversial in the literature (e.g. plants).

What should we do if our analysis shows that there is no consensus? Here, the idea of a *conceptual ecology* will be helpful [2]. One result we may encounter is a diversity of different conceptualizations of disease even within the different biomedical sciences. Veterinarians, for instance, may reveal a different concept of animal pathology than do evolutionary biologists. When experimental philosophy is used to reveal such differences in how different groups of people or scientists think, we can finetune the experiments to figure out what the epistemic purposes of a concept are in a particular group of scientists, i.e. the epistemic niche. If there is a unified concept

[15] See Nagatsu [45] for a longer description and analysis.

[16] Note that Canguilhem did not hold that animal diseases are a mere social construction and I have highlighted the importance of a phenomenological view of animal health and suffering elsewhere [48]. To tie the concept of health to the notion of subjectivity, however, might lead us to restrict these concepts to all and only those animals deemed conscious, thus transforming the debate into an even more perplexing one about the boundaries of animal sentience [49-51].

among veterinarians we can conceive of two extreme cases: either the concept is merely constructed for human purposes such as animal farming and slaughter, thus classifying animals as pathological would be akin to the way in which *drapetomania* was hypothesized as a disease that explained why African slaves fled from captivity; or despite the involvement of human interests and funding for research into minimizing pathologies that cause a loss of yield, we find that there is no differences in how biologists treat the concept, i.e. in a purely objective way. The possibilities are manifold.

What such an analysis would reveal, however, is that there might not be a single unified concept for health and disease. Insurance companies, politicians, medical practitioners, evolutionary biologists, veterinarians, and the public might all have different conceptions of what it means to be diseased - thus revealing that the concept serves a variety of purposes that can perhaps not be accomplished by a single concept. Normativists, such as Kukla [28], are predominantly interested in the roles the concepts of health and disease play for the purposes of justice, with some thus arguing that the purely naturalist conceptions of health and disease need to be eliminated since it is a mere misapplication/anthropomorphism of the concept. Boorse, on the other hand, has argued that we'd be better off eliminating the idea that the concept of disease has any necessary connection to concerns about who deserves treatment or not (Boorse [21,22]). Some bioethicists, myself included, have even argued that the concept of disease plays no special role regarding who deserves treatment or medical resources more generally, focusing on the notion of 'enhancement' instead [53-58], thus suggesting that a 'normativist' account of health and disease may even be abandoned.

But as Brigandt [59] argued in the case of the species concept, pluralism need not imply eliminativism. We may very well become pluralists and live with different concepts or models of health.[17] Elsewhere, I have argued for a distinction between two kinds of conceptual engineering: moral conceptual engineering and naturalist conceptual engineering [69]. Whereas these goals go nicely together in the case of a concept such as wellbeing or welfare, the concepts of health and disease may simply be used for two different purposes - thus requiring a division. Boorse [19], for instance, has initially argued that we may have different concepts of 'disease' and 'illness' respectively. One possibility would thus be to have a biological disease concept called *pathology*, while a disease concept used for purposes of resource allocation may continue to use the term disease or disability, in a sort of Wakefield-style [23] combination of naturalism and normativism, i.e. dysfunction + welfare

[17] As I have argued in the case of models for empirical phenomena more generally [60-65]. Notions such as 'autism' [66,67] and 'welfare' [65,68] may not be able to be captured within a single concept or model since the underlying phenomena are too disunified, trying to map onto both normative and natural features of the world, and the same may hold in the case of health and disease.

loss.[18] Here, it is not clear whether both normativists and naturalists should be considered winners or losers, but a divorce of the two disease concepts may not be as problematic as initially thought. If XPhi helps us to resolve the needlessly hostile dichtonomy between 'normativists' and 'naturalists' by undermining the very idea that there is a single concept out there that conceptual analysis could help us to discover, then all the better for my case for an empirical approach to these issues. Let us now turn to the possibility that our empirical investigations reveal consensus across scientists, medical practitioners, and the public.

## 3.4 Unification

Perhaps a more optimistic result of experimental philosophy of medicine would be the straight-forward expansion of uncontroversial cases of diseases. If not resolving the controversy between naturalists and normativists, such a result should bring both groups closer together. There is a sense here in which experimental philosophy of medicine would indeed support naturalist conceptions. If experimental methods such as surveys show broad agreement across different domains (including the biomedical ones), the extension of the concepts health and disease will likely become expanded to include animal pathologies. But as Matthewson and Griffiths [25] argue in their defense of naturalism, some versions of normativism would force us to accept "conceptual divorce between human disease and pathology as a biological phenomenon" (p. 451). If the naturalist account can account for all these cases in addition to the more narrow prior paradigm set, while normativism cannot, a strong case is made for naturalism. A broadening of the cases our linguistic community considers to be diseased would then imply a failure of at least some versions of normativism that have neglected talk of the pathological in the non-human realm. They could no longer claim to offer the superior conceptual analysis if they fail to capture the paradigm cases of health and disease in the non-human realm. What some normativists might thus be worried about is the possibility that disease categorizations show large conformity, undermining the idea that the concept needs to be relativized to the interests of particular communities. Yet, I am doubtful that such an analysis would rule out all versions of naturalism or normativism. What remains in such a scenario will most likely be some kind of hybrid account that requires a biological failure with some room for social considerations, because many people would not consider conditions such as vasectomy for example, to be a disease.

[18] I have reservations against Wakefield's view because it makes it hard to discuss tradeoffs of health and wellbeing that are clearly important in all kinds of bioethical debates, from something as straight-forward as the potential injuries caused in mixed martial arts [70] to something as controversial as de-extinction [71]. Many debates in animal ethics are likewise centered around the question whether it matters whether we injure and kill other animals if they cannot feel pain [72]. Health and wellbeing can come apart.

If there is a large degree of unity, such an approach may thus also allow for a bridging of naturalism and normativism by investigating "(i) which dimension(s) weigh more and (ii) whether and how different dimensions are interacting" (Nagatsu [45], p. 266). Indeed, we view this investigation of conflicting intuitions as the most interesting avenue for future empirical work in the philosophy of medicine. Having discussed the potential outcomes of experimental philosophy of medicine, let us now place them in their broader context and conclude the discussion.

# 4 Discussion

A core motivation of experimental philosophy is to shift the philosophical community's perception of philosophy itself away from the methodological idea that philosophy is about a specific set of tools and towards a more content-based conception of philosophy as a discipline that is interested in more abstract and conceptual questions. In this paper, I have argued that it was a mistake to think of what is perhaps the oldest debate within the field - i.e. the question of how to understand health, pathology, and disease - as a debate that could be solved with conceptual analysis alone. Indeed, it is doubtful that pure intuition-play is what many philosophers are really interested in (despite statements to the contrary). When philosophers claim to use conceptual analysis, but proceed to engage in what Lemoine [15] calls *extensional stipulation*, i.e. the inclusion of "cases of consensually healthy conditions" [e.g. pregnancy] or an exclusion "consensual diseases from the set of diseases" [e.g. cancer] (p. 318), they cannot be engaged purely in conceptual analysis – they are doing something else.

Fields such as bioethics and medical ethics originally had a very strong connection to the philosophy of medicine, yet have become much more empirical over the years, drawing on surveys, interviews, and other scientific tools to improve their investigations. Philosophers of medicine are well-advised to follow suit. While I have only discussed surveys here, partially because they are the method most directly associated with experimental philosophy and have a straightforward use in the philosophy of medicine concerning the concepts of health and disease, we should be wary not to narrow the possible empirical tools philosophers of medicine could import. Machery [6], for instance, highlights that experimental philosophers can also rely on a diverse range of cliometric and bibliometric techniques (e.g. machine learning and topic modeling). A more thorough overview to how different empirical tools could be applied in the philosophy of medicine is offered in the editorial to this special issue. Much of recent philosophy of medicine is closer to the *philosophy of science in practice* and *philosophy IN science* movements that seek to be more naturalist, pragmatic, and fundamentally close to science, than hitherto purely armchair investigations. Questions such as how medical practitioners see, use, and evaluate concepts such as health, pathology, and disease, are important to the philosophy of

medicine. Yet, these questions cannot be answered by mere armchair speculation. They require investigative empirical methods. Even something as scientifically contested as anecdotes would constitute better evidence than the mere intuitions of a single philosopher [73].

Here, it is nevertheless important not to demand too much from experimental philosophy. Conceptual analysis must proceed from shared paradigm cases for it to bring forth resolution. The more shared paradigm cases there are (to which XPhi may add), the farther we can get with conceptual analysis. There is plenty of space between no influence and a complete resolution of a philosophical debate. The latter rarely occurs for most, so it would be overdemanding to criticize XPhi for failing to resolve major debates entirely. A failure of resolution is not the same as the absence of progress.

One should therefore not expect a definite and unique answer on whether normativism or naturalism is right. Experimental philosophy may very well call into question the very foundation of the debate by empirically investigating the intuitions that have given rise to it. The conflict might be settled in the favour of one side, pluralism, or unification. I don't want to commit myself here to one of these pathways precisely because this is also an empirical matter, not a purely conceptual one. That we already have all the empirical knowledge required for engaging in the philosophy of medicine is a hope that needs to be abandoned. I can only hope that others will take up this baton and move the debate further.

## References


[1] Dennett, D. C. 1965. *The mind and the brain: introspective description in the light of neurological findings; intentionality*. Ph. D. thesis, University of Oxford.

[2] Griffiths, P. E. and K. Stotz 2008. Experimental philosophy of science. *Philosophy Compass 3*(3), 507–521.

[3] Stotz, K. 2009. Experimental philosophy of biology: notes from the field. *Studies in History and Philosophy of Science Part A 40*(2), 233–237.

[4] Stotz, K. 2009. Philosophy in the trenches: from naturalized to experimental philosophy (of science). *Studies in History and Philosophy of Science Part A 40*(2), 225–226.

[5] Weinberg, J. M. and S. Crowley 2009. The x-phi(les): unusual insights into the nature of inquiry. Studies in History and Philosophy of Science Part A 40(2), 227–232.

[6] Machery, E. 2016. Experimental philosophy of science. In J. Sytsma and W. Buckwalter (Eds.), *A companion to experimental philosophy*, pp. 475– 490. Wiley Online Library.

[7] Stotz, K., P. E. Griffiths, and R. Knight 2004. How biologists conceptualize genes: an empirical study. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences 35*(4), 647–673.

[8] Griffiths, P., E. Machery, and S. Linquist 2009. The vernacular concept of innateness. *Mind & Language 24*(5), 605–630.

[9] Linquist, S., E. Machery, P. E. Griffiths, and K. Stotz 2011. Exploring the folkbiological conception of human nature. *Philosophical Transactions of the Royal Society B: Biological Sciences 366*(1563), 444–453.

[10] Machery, E., P. Griffiths, S. Linquist, and K. Stotz 2019. Scientists' Concepts of Innateness: Evolution or Attraction? In R. S. . D. Wilkenfeld (Ed.), *Advances in Experimental Philosophy of Science*, pp. 172–201. Bloomsbury Publishing.
[11] Nagatsu, M. and K. Põder 2019. What is the economic concept of choice? An experimental philosophy study. *Economics and Philosophy 35*(3), 461– 478.
[12] Knobe, J. and J. Prinz 2008. Intuitions about consciousness: Experimental studies. *Phenomenology and the cognitive sciences 7*(1), 67–83.
[13] Robinson, B., C. Gonnerman, and M. O'Rourke 2019. Experimental Philosophy of Science and Philosophical Differences across the Sciences. Philosophy of Science 86(3), 551–576.
[14] Beebe, J. R. and F. Dellsén 2020. Scientific Realism in the Wild: An Empirical Study of Seven Sciences and History and Philosophy of Science. *Philosophy of Science 87*(2), 336–364.
[15] Lemoine, M. 2013. Defining disease beyond conceptual analysis: An analysis of conceptual analysis in philosophy of medicine. *Theoretical Medicine and Bioethics 34*(4), 309–325.
[16] Murphy, D. 2020. Concepts of Disease and Health. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*.
[17] Dennett, D. C. 1995. *Darwin's Dangerous Idea: Evolution and the Meanings of Life*. Simon & Schuster.
[18] Veit, W. 2018. Existential Nihilism: The Only Really Serious Philosophical Problem – Journal of Camus Studies 2018: 211-236. https://doi.org/10.13140/RG.2.2.26965.24804
[19] Boorse, C. 1975. On the distinction between disease and illness. *Philosophy & public affairs*, 49-68.
[20] Boorse, C. 1977. Health as a theoretical concept. *Philosophy of science 44*(4), 542–573.
[21] Boorse, C. 1997. A rebuttal on health. In J. M. Humber and R. F. Almeder (Eds.), *What is disease?*, pp. 1–134. Totowa: Humana Press.
[22] Boorse, C. 2011. Concepts of health and disease. In F. Gifford (Ed.), *Philosophy of medicine*, pp. 13–64. Amsterdam: Elsevier.
[23] Wakefield, J. C. 1992. The concept of mental disorder: on the boundary between biological facts and social values. *American Psychologist 47*(3), 373.
[24] Margolis, E. and S. Laurence 2019. Concepts. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Summer 2019 ed.). Metaphysics Research Lab, Stanford University.
[25] Matthewson, J. and P. E. Griffiths 2017. Biological criteria of disease: Four ways of going wrong. *Journal of Medicine and Philosophy 42*(4), 447–466.
[26] Griffiths, P. E. and J. Matthewson 2018. Evolution, dysfunction, and disease: A reappraisal. *The British Journal for the Philosophy of Science 69*(2), 301–327.
[27] Griffiths, P. E. and J. Matthewson 2020. Diseases are Not Adaptations and Neither are Their Causes. *Biological Theory*.
[28] Kukla, R. 2014. Medicalization,"normal function," and the definition of health. In *The Routledge companion to bioethics*, pp. 539–554. Routledge.
[29] Kukla, R. 2019. Infertility, epistemic risk, and disease definitions. *Synthese 196*(11), 4409–4428.
[30] Nosofsky, R. M. 2011. The generalized context model: An exemplar model of classification. *Formal approaches in categorization*, 18–39.
[31] Nordenfelt, L. 1995. *On the nature of health: An action-theoretic approach*. Dortrecht: Kluwer.
[32] Wakefield, J. C. 2001. Evolutionary history versus current causal role in the definition of disorder: reply to McNally. *Behaviour research and therapy 39*(3), 347–366.
[33] DePaul, M. R. and W. M. Ramsey 1998. *Rethinking intuition: The psychology of intuition and its role in philosophical inquiry*. Rowman & Littlefield Publishers.
[34] Lemoine, M., M. Darrason, and H. Richard 2014. Where is philosophy of medicine headed? A report of the International Advanced Seminar in the Philosophy of M dicine (IASPM). *Journal of evaluation in clinical practice 20*(6), 991–993.
[35] Veit, W. 2020. Health, Agency, and the Evolution of Consciousness. Ph.D. thesis, University of Sydney. Manuscript in preparation.

[36] Knobe, J. and S. Nichols 2017. Experimental Philosophy. In E. N. Zalta (Ed.), The Stanford Encyclopedia of Philosophy (Winter 2017 ed.). Metaphysics Research Lab, Stanford University.

[37] Dennett, D. C. 1996. An Overview of my Work in Philosophy. In O. Kang (Ed.), *Contemporary British and American Philosophy and Philosophers (in Chinese)*. Dept. of Philosophy, Wuhan University, Wuhan, Hubei 430072, P.R. China.
https://ase.tufts.edu/cogstud/dennett/papers/Chinaoverview.htm

[38] Neander, K. 1991. Functions as Selected Effects: The Conceptual Analyst's Defense. *Philosophy of Science 58*(2), 168–184.

[39] Lemoine, M. 2015. The naturalization of the concept of disease. In *Classification, disease and evidence*, pp. 19–41. Springer.

[40] Veit, W. forthcoming. Biological Normativity: A New Hope for Naturalism? *Medicine, Health Care and Philosophy*.

[41] Browning, H. 2019. The natural behavior debate: Two conceptions of animal welfare. *Journal of Applied Animal Welfare Science*, 1–13. https://doi.org/10.1080/10888705.2019.1672552.

[42] Browning, H. 2020. *If I Could Talk to the Animals: Measuring Subjective Animal Welfare*. Ph. D. thesis, Australian National University. https://doi.org/10.25911/5f1572fb1b5be

[43] Browning, H. and W. Veit 2020. Confined Freedom and Free Confinement: The Ethics of Captivity in Life of Pi. In A. T. Bogár and R. S. Szigethy (Eds.), Critical Insights: Life of Pi, pp. 119–134. Salem Press. https://doi.org/10.13140/RG.2.2.27969.38246/1

[44] Cova, F., B. Strickland, A. Abatista, A. Allard, J. Andow, M. Attie, J. Beebe, R., et al. 2018. Estimating the reproducibility of experimental philosophy. *Review of Philosophy and Psychology*, 1–36.

[45] Nagatsu, M. 2013. Experimental philosophy of economics. Economics & Philosophy 29(2), 263–276.

[46] Rossi, P. H., W. A. Sampson, C. E. Bose, G. Jasso, and J. Passel 1974. Measuring household social standing. Social Science Research 3(3), 169–190.

[47] Canguilhem, G. 1991. *The normal and the pathological*. New York: Zone Books. Trans. C. R. Fawcett.

[48] Veit, W. and H. Browning (forthcoming). Phenomenology Applied to Animal Health and Suffering. In S. Ferrarello (Ed.), Phenomenology of Bioethics: Technoethics and Lived Experience. Springer. http://dx.doi. org/10.13140/RG.2.2.31185.76645

[49] Birch, J., A. K. Schnell, and N. S. Clayton 2020. Dimensions of animal consciousness. Trends in cognitive sciences.

[50] Veit, W. and B. Huebner 2020. Drawing the boundaries of animal sentience. Animal Sentience 29(13). https://animalstudiesrepository. org/animsent/vol5/iss29/13/

[51] New England Anti-Vivisection Society, American Anti-Vivisection Society, The Physicians Committee for Responsible Medicine, The Humane Society of the United States, Humane Society Legislative Fund, J. Jacquet, B. Franks, J. Pungor, J. Mather, P. Godfrey-Smith, L. Marino, G. Barord, C. Safina, H. Browning, and W. Veit 2020. Petition to Include Cephalopods as "Animals" Deserving of Humane Treatment under the Public Health Service Policy on Humane Care and Use of Laboratory Animals. Harvard Law School Animal Law Policy Clinic, 1–30. https://doi.org/10.13140/RG.2.2.27522.30401

[52] Pearson, H. 2008. 'Virophage' suggests viruses are alive. Nature 454(7205), 677.

[53] Savulescu, J. 2009. Genetic Interventions and The Ethics of Enhancement of Human Beings. In B. Steinbock (Ed.), *The Oxford Handbook of Bioethics*. Oxford University Press.

[54] Savulescu, J., R. Ter Meulen, and G. Kahane 2011. *Enhancing human capacities*. John Wiley & Sons.

[55] Veit, W. 2018. Cognitive enhancement and the threat of inequality. Journal of Cognitive Enhancement 2(4), 404–410. https://doi.org/10.1007/s41465-018-0108-x

[56] Veit, W. 2018. Enhancement technologies and inequality. In C. Saborido, S. Oms, and J. G. de Prado (Eds.), Proceedings of the IX Conference of the Spanish Society of Logic, Methodology and Philosophy of Science, pp. 471–476. https://doi.org/10.13140/RG.2.2.21932.08326

[57] Veit, W. 2018. Procreative Beneficence and Genetic Enhancement. Kriterion – Journal of Philosophy 32(1), 75–92. https://doi.org/10.13140/RG.2.2.11026.89289

[58] Veit, W., Earp, B.D., Faber, N., Bostrom, N., Caouette, J., Mannino, A., Caviola, L., Sandberg, A. & Savulescu, J. 2020. Recognizing the Diversity of Cognitive Enhancements. AJOB Neuroscience, 11(4), 250-253, https://doi.org/10.1080/21507740.2020.1830878

[59] Brigandt, I. 2003. Species pluralism does not imply species eliminativism. Philosophy of Science 70(5), 1305–1316.

[60] Veit, W. 2019. Model pluralism. *Philosophy of the Social Sciences 50*(2), 91–114. https://doi.org/10.1177/0048393119894897

[61] Veit, W. 2019. Modeling Morality. In Ángel Nepomuceno-Fernández, L. Magnani, F. J. Salguero-Lamillar, C. Barés-Gómez, and M. Fontaine (Eds.), *Model-Based Reasoning in Science and Technology*, pp. 83–102. Springer. https://doi.org/10.1007/978-3-030-32722-4_6

[62] Veit, W. 2019. Evolution of multicellularity: cheating done right. *Biology & Philosophy 34*(3), 34. https://doi.org/10.1007/ s10539-019-9688-9

[63] Veit, W. 2020. Model Anarchism. *Preprint*. http://doi.org/10.13140/RG.2.2.36694.47683

[64] Veit, W. forthcoming. Review of Nancy Cartwright's Nature, the Artful Modeler: Lectures on Laws, Science, How Nature Arranges the World and How We Can Arrange It Better. Philosophy of Science.

[65] Veit, W. and H. Browning 2020. Perspectival pluralism for animal welfare. European Journal for Philosophy of Science 11(1).

[66] Chapman, R. and W. Veit 2020. Representing the Autism Spectrum. *The American Journal of Bioethics 20*(4), 46–48. https://doi.org/10.1080/ 15265161.2020.1730495

[67] Chapman, R. and W. Veit 2020. "The essence of autism: fact or artefact?" Molecular Psychiatry. https://doi.org/10.1038/s41380-020-00959-1

[68] Mitchell, P. and A. Alexandrova 2020. Well-being and Pluralism. Journal of Happiness Studies, 1–23.

[69] Veit, W. and H. Browning 2020. Two Kinds of Conceptual Engineering. Preprint. http://philsci-archive.pitt.edu/17452/

[70] Veit, W. and H. Browning forthcoming. Ethics of Mixed Martial Arts. In J. Holt and M. Ramsay (Eds.), The Philosophy of Mixed Martial Arts: Squaring the Octagon. Routledge.

[71] Browning, H. 2018. Won't Somebody Please Think of the Mammoths? Deextinction and Animal Welfare. Journal of Agricultural and Environmental Ethics 31(6), 785–803. https://doi.org/10.1007/s10806-018-9755-2

[72] Browning, H. and W. Veit 2020. Improving invertebrate welfare. Animal Sentience 29(4). https://animalstudiesrepository.org/animsent/ vol5/iss29/4/

[73] Browning, H. 2017. Anecdotes can be evidence too. *Animal Sentience: An Interdisciplinary Journal on Animal Feeling 2*(16), 13. https:// animalstudiesrepository.org/animsent/vol2/iss16/13/