A popular reading of the advancement of medical science suggests that illnesses and diseases, treatments and cures, are objective facts of the world that await human discovery. Yet all such medical “facts” are influenced by the society that discovers them. That is, concepts of health and disease are not fully independent facts of the world, but rather are—at least in part—socially constructed concepts impacted by the often taken-for-granted frameworks of political, societal, and cultural values (both moral and non-moral), religious beliefs, standards of beauty, and notions of human grace. In this paper, I argue that disease is a “value-laden” concept; more specifically, I critically assess and explore the role of moral and non-moral values as they impact concepts of health and disease.

My exploration will begin with a critical analysis of Christopher Boorse’s influential Bio-statistical Theory (hereafter, BST), which holds that the concept of disease is value-free. Boorse defines disease as an internal state of abnormal functioning, where normal functioning is itself defined in terms of what is statistically common for a group of similar beings or organisms, as well as by what promotes the reproduction or survival of such beings or organisms. So defined, health and disease are products of the natural world that humans simply uncover. Boorse claims that this definition allows the field of medicine to distinguish accurately between health and disease in a purely objective and universal manner. My analysis draws upon both the history of medicine and contemporary philosophy of medicine. As will become clear, I will argue that the
BST fails adequately to accommodate the complex and socially constructed nature of medical reality.\(^1\) Consider as heuristic, the phenomenon of hypertension. According to *Harrison’s Principles of Internal Medicine*, “there is no dividing line between normal and high blood pressure, arbitrary levels have been established to define persons who have an increased risk of developing a morbid cardiovascular event and/or who would benefit from therapy” \(^2\). This example illustrates how physicians often use arbitrary, but useful, value-laden distinctions rather than objective formulas, when deciding where and how to draw the line between health and disease. The BST, as I argue, fails to do justice to the complexity of these decisions. I will further argue that an appreciation of the particularly salient role that values play in medical reality not only supports the conclusion that concepts of health and disease are inherently value-laden, but also allows for a deeper, more nuanced understanding of medical phenomena and the more pragmatic treatment of patients.

I. The Bio-statistical Theory

The assessment of the BST will begin with the theory’s foundational principles and basic purpose. The BST is a union of Boorse’s naturalism and commitment to biology: he is a self-admitted “unrepentant naturalist” \(^3\), and he chooses to focus the BST on the principles of physiology (physiology being the sub-field of biology “on which”, he claims, “somatic medicine relies”) \(^9\). Moreover, the BST places emphasis on “species

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\(^1\) Here, the term medical reality is used broadly, and includes the interaction between doctor and patient, the process of diagnosis, the categorization of disease (nosology), and so forth.


\(^3\) To accept the BST, one must also accept certain underlying naturalist principles: for example, that nature is value-free, meaning that there are no moral values inherent to the design in products of nature.
design”, defined as “the interlocking hierarchy of functional processes, at every level from organelle to cell to tissue to organ to gross behavior, by which organisms of a given species maintain and renew their life” (7). Simply put, each species has a particular, unique manner of functioning that is common to all its members. Conformity to “species design” is health, and the failure of conformity is disease. Boorse terms this dichotomy the “normal-pathological distinction”. According to Boorse, the basic goal of the BST is “to analyze the normal-pathological distinction, which…is the basic theoretical concept of Western medicine” (7).

After stating the theory’s basic foundation and purpose, Boorse then elaborates on the BST. His argument can be outlined in the following steps:

1. There is a hierarchy of functional processes by which individual members of a species maintain and renew life.

2. The organization of this hierarchy is “species design”, and a group of species members with a consistent design structure is a “reference class”.

3. Species and their body-states function in accordance to, and in contribution of, multiple goals and will modify such functioning or behavior to secure these goals.

4. If species design and reference class are accurate descriptions of biological and physiological phenomena, then the functioning processes of species members are

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4 He chooses this phrasing over the health-disease distinction, to avoid the confusion and controversy associated with the usage of the term “disease”.

5 Boorse offers the following summary definition of the BST: 1. The reference class is a natural class of organisms of uniform functional design (specifically, an age group of a sex of a species); 2. A normal function of a part or process within members of the reference class is a statistically typical contribution by it to their individual survival and reproduction; 3. A disease is a type of internal state which is either an impairment of normal functional ability, i.e. a reduction of one or more functional abilities below typical efficiency, or a limitation on functional ability caused by environmental agents; 4. Health is the absence of disease (6-7).
measurable, in that a range of normal and abnormal functioning is statistically determinable.

5. If the goals of survival and reproduction are the goals most relevant to somatic medicine, then medical pathology can be determined by the disruption of such goals. 6. Thus, disease can be determined by functioning that falls below normal range and disrupts the goals of survival and reproduction.

Defined as such, disease is identified pathologically—it is an atypical level of species typical functioning. To provide further explication, Boorse argues that for every “reference class” there is a normal level of functioning (7). Normal (or species typical) functioning is the functioning process, or part thereof, which contributes to the survival and reproduction of a specific reference class. The success of an individual’s functioning is determined by comparing his level of functioning to the average level of functioning for his reference class. If the level of functioning digresses from the normal range, then this atypical characteristic indicates disease. So for example, a woman of age 25, who suffers from cervical cancer, would be considered diseased insofar as her functioning (or that of her reproductive body-state) is atypical for her reference class and does not contribute to reproduction or survival.6

In part, Boorse claims his concept of disease is value-free because it only looks at the facts of the world. He argues that the BST isolates the concept of disease from social and cultural influences, as well as moral and non-moral values, because the theory looks only at medical “facts”: namely, evolutionary goals of species and functioning processes.

6 A more controversial example would be homosexuality: Boorse classifies homosexuality as a disease, because he claims it is species a-typical and a hindrance to reproductive fitness. Engelhardt, however, argues that Boorse’s claim incorporates social values into the evaluative judgment; he also points out that the research done by Kinsey suggests that homosexual tendencies are more typical than Boorse admits.
or behaviors of species (6-7). For Boorse, physiological normality exists independent of value judgments, moral concepts, socially and historically determined expectations, religious beliefs, and cultural trends. Medicine, he concludes, can determine the difference between normal and abnormal functioning, without interference from such external and contingent factors.

Further, Boorse approaches the concept of disease from the perspective of a pathologist, not a clinician. According to Boorse, pathologists operate on the theoretical level (45). He argues, “To a pathologist, any process causing cellular dysfunction, no matter how local, is Pathological. But this judgment has nothing to do with how an individual patient views it, or how it affects his activities” (46). Thus, he will seek out objective facts to make a diagnosis, without reference to the patient’s genetic history, individual medical history, much less to subjective factors such as patient or social values. Boorse avers that the only factors of interest to physiology are the biological goals of reproduction and survival. Essentially, since the pathologist does not consider patient or clinician values, Boorse concludes that he can theorize a concept of disease that remains value-free.8

II. Medical Science and Medical Phenomenon

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7 So, for instance, the Pathologist who inspects the Pap smear of the aforementioned cervical cancer patient will designate her cancer as Stage I, II, III, or IV based on the standardized TNM system: the anatomic extent of the tumor will be based on the primary tumor (T), the regional lymph nodes (N), and metastases (M) (Harrison’s Principles of Internal Medicine, 1998, p. 495).

8 In a series of articles published throughout the 1970’s, Boorse initially formulated his theory of the BST. His theory was polemical, and in A Rebuttal on Health (1997), he restated the BST and responded to nearly twenty years of criticisms and critiques. The initial formulation of the BST, as well as the more recent revised version, have influenced many commentators—some have attempted to defend or partially defend the theory, while others have simply followed in Boorse’s naturalist footsteps. To be fair, further elaboration of the BST, especially in terms of Boorse’s defenses, will be offered where appropriate throughout this paper.
Boorse claims that one strength of the BST, cited by others as well, is that “it gives health concepts scientific status” (15). This claim is obscure, insofar as it is unclear what is meant by “scientific status”; however, it is tacit that “scientific status” refers to the BST’s impermeability to values. In this section, I aver that it is rather the case that values are particularly and singularly salient in medical science. This, I claim, is evident in the health-disease distinction: it is a created distinction, resulting from preexisting values and preconceived notions of normality. Moreover, I will argue, that the BST’s reductionist position also fails to capture the intricacies of the world of morbid medical phenomena.

Medical science and values

Even if the BST effectuates the “scientific status” that Boorse boasts of, this does not necessitate its status of “value-free”. Boorse acknowledges that all science, even medical science, is value-laden to an extent. Yet he accepts this caveat, claiming, “If health and disease are only as value-laden as astrophysics and inorganic chemistry, I am content” (56).

But I assert that this is not the case: there is a special relationship between values and medical science. Boorse claims that the normal-pathological distinction is the basic theoretical concept that underlies Western medicine. Yet, it has been argued, specifically by Fleck, that the categorization of diseases is an approach by physicians to simplify and

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9 It has been argued by the Polish philosopher of medicine, Ludwig Fleck and later, by Thomas Kuhn, that values imprint sciences of every discipline: specifically, the values of the investigator shape the outcome of his scientific research, and the values of the scientific community shape what research is pursued and how it is conducted. In Fleck’s terms, scientific research is governed by the thought-style and thought-collective in which it is conducted (McCullough, 257-261).

10 A contemporary example of the value-laden nature of other sciences, such as astronomy, one might consider the recent declassification of Pluto as a planet. Such a debate within the scientific community exposes the use of often arbitrary criteria by which distinctions and classifications are made. In other words, there is no universal, natural criterion that secerns a planet from a non-planet—the difference or proposed criteria is gauged by a knowledgeable community of experts.
better understand the intricate field of pathology and morbid phenomena. However helpful this organizational attempt may be, it is somewhat misleading: as Fleck argued, “in nature, there is no such thing as ‘diseases’; only individual pathological phenomena exist” (Lowry, 217). To elaborate upon this thesis, a category of disease presupposes a normative notion of health. But both these categories originate in man. According to the BST, nature functions in such a way that patterns can be detected in the biological and physiological behavior of species and reference classes. An abundance of behavior that is conducive to species’ survival and reproduction is non-pathological behavior. But as Fleck postulates, in an individual member of a species, only individual phenomenon exists. The individual behavior is thus neither diseased nor healthy in and of itself; the BST does allow one to be diacritical, but not by virtue of purely natural occurrences.

Fleck’s view is reinforced by pathologist Lester King, who argues, first, that biology does not care about health or disease, only about the relationship between internal and external environments, and second, that medical science studies the interactions within the internal component.11 Further, he argues the distinction between normal and abnormal is a man-made distinction: physiology and pathology are only patterns that are interrelated and dependent upon each other.12 As King quotes from Sir Clifford Allbutt, “disease itself contains no elements essentially different from those of health, but elements presented in a less useful order” (194); he then concludes that since useful is a value judgment, “‘Health’ or ‘Disease’ are value judgments based on

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11 External components, King specifies, refer to “factors such as light, heat, percentage of oxygen in the air”, and so forth; the internal component is an arbitrary distinction, and includes “crude factors such as anatomical structures…or secretions of glands” (1954, p. 193).
12 King also outlines the somewhat paradoxical relationship between physiology and pathology. The delegating of normal behavior to physiology and abnormal to pathology is “sheer nonsense, since physiology makes it great advance by studying highly ‘abnormal’ conditions, like animals without a liver...” and, “pathology is intelligible only by reference to the ‘normal’”. (194).
something more than the study of reactions” (194). So, pathology and physiology are not concepts in the world that can be discovered through statistics or research of species typicality—they are socially constructed and thus penetrated by values. If the concepts of health and disease are themselves value-laden via their social construction, then Boorse cannot expect to eliminate values from his distinction between the two.

Moreover, if the health-disease distinction emanates in man, then this provides a unique opportunity for values to shape evaluations of medical pathology and physiology. As Fleck argued, the training of the physician will affect how he sorts information from noise: it will dictate what he looks for, how he looks for it, and what conclusions he will draw in the end (229-257). In short, it will dictate his interpretation of pathological information. The BST endeavors to limit or qualify this subjectivity—but the BST cannot overcome the inherent value-laden nature of medical science. Thus, Boorse’s ideals of statistical normality and species design, which aim at pure objectivity, are flawed insofar as purely objective medical observations do not exist. Whatever Boorse means by his claim of “scientific status”, it is clear that the social construction and value-laden nature of medical science is not nullified by the BST.

The complex world of medical phenomenon

The BST not only fails to rise to “scientific status”, at least in terms of being value-free, it cannot even sufficiently reflect the involute world of medical phenomenon. Fleck argues that infectious disease is incredibly complex and not easily understood. A reductionist, simplistic point of view does not capture the intricate nature of disease. Rather, Fleck suggests that disease be observed from chemical, bacteriological, psychological factors, and so forth (216). The BST only looks at disease through the physiological perspective.
Moreover, Fleck claims that no single, universal point of view is capable of explaining the entire world of pathological phenomena. This is what the BST attempts to do: find a definitive method to distinguish between health and disease that is objective, universal, and value-free.

What the BST does not consider is the inherent problems posed by reducing concepts of disease to a simplified (though not simple) method. As Fleck points out, a physician who appeals to such a method runs the risk of either over diagnosing or under diagnosing patients. Consider again the heuristic example of blood pressure. The BST would define hypertension, normal blood pressure, and hypotension based on a statistically determined range of normality. But such a standard is not applicable in a universal manner: blood pressure varies significantly based on an individual’s biology, genetic make-up, external and psychological factors, and so forth. A person who may have a naturally low blood pressure does not necessarily suffer from hypotension, and such a person’s blood pressure rose significantly, then they may benefit from treatment for hypertension, even if the blood pressure remained in the “normal” range. If the physician were to only consider the BST, he would fail to make the hypertension diagnosis and the patient would suffer thereby. Thus, the example of blood pressure illustrates how “normal functioning” cannot be described by species design and reference class alone. Other factors must be taken into account; therefore, the BST cannot capture variations in disease from individual to individual, and thereby disease variations in the world of morbid phenomenon.  

Medical interactions
The BST instigates problems beyond improper diagnosing. I argue, contra Boorse, that concepts of disease are integral to the practice of medicine. The BST not only precludes a nuanced understanding of disease, it also precludes the fully pragmatic treatment of patients. This is exemplified in the medical interaction, wherein normative concepts, non-moral values, and value judgments are incorporated into concepts of health and disease.

Engelhardt states that moral strangers have “numerous competing content-full normative visions” (499); I aver that same can be said for non-moral accounts of health.

To have even a preliminary sense of disease, one must have a normative understanding of what it is to be healthy. Before abnormality may be diagnosed, a sense of the normality that one digresses from must first be established. However, the expectation for such normal ideals to be found statistically, and thus shared from person to person, is naive. Rather, individuals hold distinct, sometimes incommensurable, ideals of what it means to be healthy and what is means to be diseased.

Consider the problems one encounters with the treatment of menopause. One woman’s normative vision of health may suggest that the menopausal process is not a disease, but a natural function of her aging body, and thus will not seek treatment for it as a diseased state. Another may find the “symptoms” of menopause to be discomforting.

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13 To be fair, Boorse claims, “I have never doubted that medical practice is permeated by values” (13). Nevertheless, how Boorse can then defend his theory without recognizing its failure to capture the nuanced realm of medical practice is perplexing to say the least.

14 Engelhardt posits that medical interactions are descriptive, evaluative, and performative: the patient’s account of symptoms descriptively reflects a personal perception of health; the doctor’s interpretation of this description is an evaluation of the patient’s health based on expertise; and finally, the diagnosis offered is performative, in that it has the ability to alter the patient’s previous perception of health or even his experience of reality. As such, medical interactions incorporate values and expectations into the world of medicine, thereby affecting the distinction between health and disease in a way that is not recognized or accommodated by the BST (which appeals to statistical evidence, not clinical interactions) (189-238).

15 In other words, I do not reject Engelhardt’s view; I only mean to expand upon it.
and will thus visit her doctor for treatment in order to alleviate and remedy her ailment.\footnote{Interestingly, K. Danner Clouser, Charles M. Culver, and Bernard Gert do consider menopause to be a malady; they construct the following explanation of this term: “Individuals have a malady if and only if they have a condition, other than their rational beliefs or desires, such that they are incurring or are at a significantly increase risk of incurring, a harm or evil (death, pain, disability, loss of freedom, or loss of pleasure) in the absence of a distinct sustaining cause” (190). According to their views, menopause is a malady insofar as it causes a disability (the loss of fertility-which is a “ability that is characteristic of the human species in its prime”) (207). Yet this seems like an odd statement, because if one were to accept this definition, then all pre-pubescent girls would also be malady-stricken and disabled, because they share the same characteristic of infertility.}

In short, one woman may make a negative value judgment in her status of health, while another may pass no judgment at all. As a result of these distinct expressions of non-moral values, the two women will offer different descriptions of their health status to their doctors—this will, in turn, potentially affect the evaluative judgment of each doctor. The decision to treat or not to treat is oftentimes a reflection of the patient’s expectations, as revealed by the two menopausal women. The same biological occurrence will be treated as either an acceptable or non-acceptable body-state based on pre-existing ideas of normality. The woman who seeks treatment regards menopause as a disease, while the woman who refuses treatment regards the occurrence as a part of healthy aging.

Essentially, society is value-pluralistic, and thus it is important to consider how values play a role in medical interactions, not simply theoretical accounts of disease concepts.

The BST looks only at the theoretical concept of disease. But how accurate can the theoretical concept be, if it is isolated from practical factors? Boorse argues, “Medical treatment of a condition is neither necessary nor sufficient for it to be a disease”; he also claims, “The BST is not heartless about treatment; rather, critics are confused about disease. There is no need to ruin the concept of disease to help aging men and women, and no point in doing so” (92). The BST, I believe, is very limited by its isolation from values. In complex situations such as menopause, the normal-pathological
distinction is affected by value judgments, and the physician and patient must engage to
draw the line between what is normal and what is pathological; sometimes, the fact that a
condition is biologically and physiologically normal, is irrelevant to the patient and to
patient concerns. In these situations, Boorse’s theory cannot accurately account for how
the physician and even the patient draw the line between what is normal and what is
pathological, because values and normative expectations, as they are incorporated into
medical interactions, affect where and how such lines are drawn.

III. Conclusion

To conclude, the Bio-statistical Theory is not viable in or beyond the theoretical realm.
Values are innate to medical science and thus cannot be excised from concepts of health
and disease. Even the distinction between health and disease is not an objective,
naturally occurring distinction—it emanates in man and man’s values. In addition, the
worlds of medical phenomenon and medical interactions are complex: the world of
medical phenomenon is demarcated by countless variations of morbidity, and medical
interactions are chiseled by value judgments and normative concepts. Boorse examines
nature to “discover” normal and abnormal processes within species and species members.
Though such a reading of statistical normality may be extremely helpful to a diacritical
assessment of concepts of health and disease, it by no means encompasses the broad,
perhaps sometimes convoluted, world of physiology and pathology—either within the lab
or beyond.
Bibliography


