

WHO ARE YOU CALLING NORMAL! – THE RELATIONSHIP  
BETWEEN SPECIES FUNCTION AND HEALTH CARE JUSTICE

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## ABSTRACT

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### WHO ARE YOU CALLING NORMAL! – THE RELATIONSHIP BETWEEN SPECIES FUNCTION AND HEALTH CARE JUSTICE

For the past 2,000 years, the medical and philosophical communities have been unable to formulate a clear conception of function. Yet, I argue that this debate has become of central importance to Western bioethics due to the role the concept of function plays within emerging health care justice models, and more broadly, within the debate surrounding universal health care in the United States. My thesis focuses on the relationship between species function and health care justice. Specifically, my position is that any workable formulation of just health care that is justified from a Rawlsian or politically liberal perspective must utilize conceptions of normal species function that are as neutral and stable as possible. I conclude by showing that Larry Wright's evolutionarily-based teleological account of function is the most neutral and stable account of function within the philosophical canon, and utilize two case studies – idiopathic short stature and obesity – to help illustrate the applicability of Wright's account to liberal health care justice formulations.

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## Introduction

One of the most interesting areas of bioethical research in the United States over the past 25 years has been the emergence of projects intended to apply basic moral and ethical theory towards specific models of health care justice. Norman Daniels has provided probably the most well known application of a theory of political justice to conceptions of health care with his Normal Functions Model, otherwise referred to as the fair equality of opportunity model.<sup>1</sup> The fair equality of opportunity model is based on the assumption that society has a fundamental duty to ensure normal species functioning to individuals because, “impairments of normal species functioning reduce the range of opportunity open to the individual in which he may construct his ‘plan of life’ or ‘conception of the good.’”<sup>1</sup> Health care gains the moral weight to command a “special claim” for societal resources and support, then, by virtue of the role it plays in ensuring normal species functioning.

Daniels’s notion that fundamental health care needs should be guaranteed by modern liberal societies – while not universally agreed upon by the general public in the United States – has at least gained traction to the point where it is seriously discussed within national policy debates. However, the much more difficult issue, at least from an *applied* ethics standpoint, is what *level* of health care is actually required. Daniels takes as his “baseline” for what society should guarantee through health care as ensuring “the normal range” of skills and talents. Yet, the notion of “a normal range” is exceedingly vague. While I may believe that being 5-foot-4 is *seriously* precluding me from functioning as a normal human being, others may view my desire to undergo medical

intervention to manipulate my height as representing a personal desire (“expensive taste”) to be tall, and nothing more.

In order to protect against this type of “social hijacking”<sup>2</sup> of the normal range of species functioning by “persons with expensive tastes,”<sup>1</sup> Daniels turns to the biomedical sciences to provide a clear notion of disease and dysfunction.<sup>1</sup> By referring to biomedical models – and their subsumed concepts of functional ascription and evolutionary theory – Daniels hopes to narrow the definition of dysfunction in a way that could be agreed upon by an overlapping consensus, irrespective of comprehensive doctrines:

Our best hope of sustaining a point around which we can achieve principled, uncoerced social agreement is one that most assiduously avoids incorporating valuations into its definition of disease and impairment...<sup>3</sup>

Indeed, Daniels seems to assume that the key difference between biomedical models of function/dysfunction<sup>a</sup> and other, more normative concepts of function/dysfunction, lies in the belief that biologically defined terms are able to invoke, “a measure of importance *independent* of an individual’s own assessment.”<sup>1</sup> Everyone has certain “needs” and “desires;” however, if we are to claim that health care is a fundamental human *need* (or *primary social good* in Rawlsian parlance) that is worthy of significant and guaranteed public support, only a strongly non-normative account of disease will have the moral weight to suffice.

Despite the importance that a clear and strongly non-normative account of health and disease play in his theory, Daniels has always been quite adamant that the Normal Functions Model,

...does not turn on...[the] strong claim about non-normativeness advanced by some advocates of the

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<sup>a</sup> The most important examples include Christopher Boorse,<sup>4</sup> Larry Wright,<sup>5</sup> and Robert Cummins.<sup>6</sup>

biomedical model. It is enough...that the line between disease and the absence of disease is, for the general run of cases, uncontroversial and ascertainable through publicly acceptable methods, such as those of the biomedical sciences.<sup>1</sup>

However, my thesis will argue that even for “the general run of cases,” the utilization of differing concepts of “normal function” will have dramatic implications for the Normal Functions Model. The Normal Functions Model, I think, is unable to rationally and consistently distinguish between “true health care needs” and “simple personal preference disguised as health care needs” without an account of function that is strongly *stable* and *neutral*. It is not my intention to captiously weigh the pros and cons of different conceptions of function and disease. Rather, this paper will attempt to show that a teleological account of function is simply much more *applicable* to liberal health care justice models than other accounts of function.

The order of exposition in my thesis will be as follows: 1) I will explain the crucial role that the *concept* of function plays within the fair equality of opportunity model of just health care, and argue that; 2) a *strongly stable* and *neutral* definition of function is ultimately required within that Model if it is ever going to successfully protect against a completely *unreasonable* (in Rawlsian argot) expansion of health care rights; 3) I will then critically examine two different naturalistic reductionist accounts of function, which is the philosophical backbone to any non-normative definition of disease, and argue that a teleological approach to function provides a more stable, neutral, and more conceptually sound depiction of function than Boorse’s latently normative goal-contribution definition; 4) Finally, I will apply those two definitions of function to specific cases regarding height and obesity to elucidate the consequences of applying



different accounts of function to Daniels's project. The diverging effects that the two definitions will have on each of the case studies will hopefully show how important it is for the Normal Functions Model to have a clear definition of function that has as strong a claim as possible to stability and neutrality.

## Chapter I – The Role of Function within Fair Equality of Opportunity

### Rawls's Account of Justice

Before delving into the role that function plays within the fair equality of opportunity model of just health care, I wish to briefly outline the basic aspects of Rawls's theory of justice and explain why Daniels extends that theory to health care.

Rawls develops two basic principles that guide his conception of justice:

- (a) Each person has an equal claim to a fully adequate scheme of equal basic rights and liberties, which scheme is compatible with the same scheme for all; and in this scheme the equal political liberties, and only those liberties, are to be guaranteed their fair value.
- (b) Social and economic inequalities are to satisfy two conditions: first, they are to be attached to offices and positions open to all under conditions of fair equality of opportunity; and second, they are to be to the greatest benefit of the least-advantaged members of society.<sup>7</sup>

Principle (a), which I will call equal rights and liberties, has priority over principle (b), and the first part of principle (b) – fair equality of opportunity – has priority over the second part of (b), the difference principle. As Rawls explains, “priority means that in applying a principle (or checking it against test cases) we assume that the prior principles are fully satisfied.”<sup>8</sup> In other words, citizens within this conception of justice have the strongest claim to equal rights and liberties, followed by fair equality of opportunity, then finally to the difference principle.

The equal rights and liberties principle (principle a) is a natural extension of the political liberal tradition that can be found in Locke and Kant.<sup>9</sup> It maximally values the idea of equal personal liberty. Despite its insistence on *strict* equality of liberty, the equal

rights and liberties principle is relatively uncontroversial within the broad tradition of liberalism. On the other hand, the fair equality of opportunity and the difference principles (principle b) are both related to social and economic structures, and pull the tradition of political liberalism in a pointedly egalitarian direction. The unique aspect of Rawls's formulation is that he "interprets both the protection of pluralism and individual rights and the promotion of socioeconomic equality as expressions of a single value – that of equality in the relations between people through their common political and social institutions."<sup>9</sup> Indeed, Rawls understands his principles to have culminated from a conceptual process that ideally balances liberty and equality as well as political (personal rights) and democratic (political rights) liberalism within a broader, *socioeconomic perspective*.<sup>9; 10; 11</sup>

Rawls *justifies* his theory of justice by utilizing a complex theoretical model that derives the two basic principles in the tradition of the "social contract as represented by Locke, Rousseau, and Kant."<sup>12</sup> As Samuel Freeman states, that tradition's "main idea is that the political constitution and the laws are just when they *could* be agreed to by free and rational persons from a position of equal right and equal political jurisdiction."<sup>13</sup> In order to achieve that type of hypothetical social agreement, Rawls relies on three ideas of justification: reflective equilibrium, the original position, and the idea of Public Reason.<sup>14</sup> While it is beyond the scope of this thesis to expatiate upon the complex manner that those three ideas interact and ultimately *justify* Rawls's two principles,<sup>14</sup> the main idea is that Rawls asks what type of social contract would be designed by people who are negotiating and designing a constitution in a completely just manner.

Rawls answers this question by first delineating what he thinks to be the essence of a *concept of justice*: adjudicating in a completely unbiased manner. He achieves this by having us imagine what type of constitution people would make if they were blinded by a “veil of ignorance,” that did not allow them to know their future “social positions or [their] particular comprehensive doctrines...[or their] race and ethnic group, sex, or various native endowments such as strength and intelligence.”<sup>8</sup> Rawls describes such an arrangement as the “original position.”<sup>b</sup> He then argues that the people in the original position would design a constitution that would uphold and align with his abovementioned two basic principles.

### The Egalitarian Challenge to Rawls

A significant challenge to Rawls’s second principle is that it inappropriately uses property, or wealth, as the main proxy for measuring inequality.<sup>c</sup> Rawls assesses who the “most well-off” individuals are in society by referring to a hypothetical individual’s possession of an *index of primary social goods*:

1. A set of basic liberties
2. Freedom of movement and choice of occupations against a back-ground of diverse opportunities
3. Powers and prerogatives of office

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<sup>b</sup> The original position is not *solely* characterized by the fact that people in it are under a “veil of ignorance.” As T.M. Scanlon writes, “the structure of the original position is itself justified by employing the method of reflective equilibrium.” Additionally, the idea of public reason – a method of justification fleshed out in Rawls’s most recent formulation of his theory of justice, *Political Liberalism* – also serves to further refine the principles by arguing: 1) that the principles are *political* not *metaphysical* or absolute principles; and 2) that overlapping consensus can be achieved in a well-ordered society irrespective of comprehensive doctrines if the principles are indeed viewed as *political* and not *metaphysical* principles. In the end, all three ideas – reflective equilibrium, the original position, and public reason – are interwoven and rely on each other in a way that ultimately provides justification for Rawls’s two basic principles of justice. However, for purposes of this thesis I will only refer to the original position when I discuss Rawls’s justification for his two basic principles, even though the original position would really be derived from culmination of conceptual restraint brought about by reflective equilibrium and public reason.<sup>14</sup>

<sup>c</sup> Arrow,<sup>15</sup> Sen,<sup>16</sup> Cohen,<sup>17</sup> and Arneson<sup>18</sup> all base their respective arguments on the interpretation of *opportunity* to mean something *more* than normal species function.

4. Income and wealth
5. The social bases of self-respect<sup>8</sup>

The key point is that Rawls uses “income and wealth...as approximations to the whole index.”<sup>1</sup> Thus, individuals who are poor are assumed to be not well-off, whereas individuals who are wealthy are thought to possess the most important goods of society. Soon after the publication of *A Theory of Justice*, economist Kenneth Arrow elucidated the problem of “interpersonal comparisons of utility”<sup>1</sup> in Rawls’s work by arguing for satisfaction-based measurement of wellness.<sup>15</sup> The problem with Rawls’s index, Arrow claims, is that it fails to adequately capture different conceptions of wellness. Some individuals may forgo all the riches of the world in exchange for good health while others may prefer to sacrifice salubrity in the name of fame and fortune. Professional boxers come to mind.

Likewise, Amartya Sen has argued that the index of primary social goods should be categorized into “capability sets,” or measured by what individuals can accomplish or become, as opposed to how much property they possess.<sup>16</sup> The chief concern of equality, according to Sen, is not about the distribution of resources to individual people, but rather how those resources play into individual capabilities. Central to each of these egalitarian challenges to Rawls is the idea that the demands of equality extend much further *beyond* the just allocation of only *resources*. Rawls seeks to define the most fundamental aspects of his theory in purely neutral terms by not utilizing subjectively derived concepts such as “personal utility” or “capability.” Yet, the strongest challenges to Rawls from the egalitarian standpoint have to do with the perceived limits that such neutral terms (quantifiable wealth, for instance) place on achieving true equality.

Daniels's Response to the Egalitarian Pull  
(aka: *His Extension of Rawls to Health Care*)

Daniels defines the challenge that Arrow and Sen raise as the “wrong space” problem: by focusing on “the resources rather than the capabilities (or positive freedom) to do or be what one chooses, the index fails to capture inequalities important to justice.”<sup>19</sup> In order to accommodate this egalitarian challenge, Daniels argues that the equality of opportunity principle ought to satisfy health care needs. In other words, he attempts to mitigate the gap between Rawls's index of social goods and individuals' capabilities to do what they wish by including “health-care institutions and practices among the basic institutions involved in providing for fair equality of opportunity.”<sup>1</sup> Health-care institutions and practices are singled out as “special” to providing positive equality of opportunity (or in quasi-Sen terms, “capability sets”) because of the unique role that health care plays within normal species functioning, which in turn plays a fundamental role within a broader, more “capability” centered, interpretation of fair equality of opportunity.<sup>1</sup>

In Rawls's original conception of his theory, he simplified the variables in his model by assuming that individuals in society were all, “normal, active, and fully cooperating members of society over the course of a complete life.”<sup>2</sup> Daniels avoids this assumption for three reasons: 1) he is trying to derive a model for *applied* ethics where sick people do indeed exist; 2) by securing a right that ensures the satisfaction of health care needs, in some ways he accommodates the egalitarian challenges posed by Arrow<sup>15</sup> and Sen;<sup>16</sup> and 3) protecting normal species function (via ensuring certain basic health care rights) is something that rational and reasonable Rawlsian contractors would assume to be essential to protecting fair equality of opportunity. In summary, the underlying

moral impetus behind Daniels's extension of Rawls's theory to health care is that satisfying health care *needs* has a *fundamental* effect on the distribution of opportunity.<sup>1</sup> The task for Daniels, however, is how to guarantee health care rights that can satisfy normal species function without falling into the trap of subsidizing "expensive tastes" in health care, such as breast enhancement surgery or penis enlargement.

### Limiting the Egalitarian Pull: The Concept of *Public Reason*

We have on one side of the political spectrum Sen's "capability sets" and Arrow's "equal opportunity for welfare," both of which interpret *equality of opportunity* to include a full-range scale of satisfaction. They base their respective arguments on the interpretation of *opportunity* to mean something *more* than normal species function. On the other end of the spectrum is Rawls's original conception of a theory of justice that does not even include normal species function as being a primary social good. Daniels's Normal Functions Model is situated somewhere in between these two ends of the political spectrum. Above I have outlined why Daniels extends Rawls to health care: the index of primary social goods *inadequately* accounts for *true* inequality (the "wrong space" problem). Here I explain why Daniels does not extend Rawls all the way to Sen's "capability sets" or Arrow's "equal opportunity for welfare" models.

Daniels does not extend equality of opportunity to include a full-range scale of satisfaction (such as Sen's "capability sets") because such a scale would fall outside of the political jurisdiction outlined by Public Reason.<sup>d</sup> Public Reason<sup>e</sup> is the idea that

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<sup>d</sup> Even though Rawls did not formally articulate his concept of Public Reason until the publication of *Political Liberalism*, (which was published after *Just Health Care*), the concepts behind Public Reason were a fundamental part of Rawls's original conception in *A Theory of Justice*. In particular, the idea of *publicity* in *A Theory of Justice* forms the backbone for later articulations of the Public Reason. Daniels

“questions of constitutional essentials and basic justice are to be settled by appeal to political values that everyone in the society, regardless of their comprehensive view, has reason to care about.”<sup>14</sup> *Political* conceptions of justice are justified if they fall within the realm of Public Reason. The idea of Public Reason (a public, *political* sphere) is contrasted with the idea of *comprehensive doctrines*. Comprehensive doctrines are defined as moral doctrines that govern, “or can be extended to govern all aspects of life – background culture and so forth...”<sup>23</sup> At its most basic level, the difference between what ideas fall within Public Reason and what ideas are informed by comprehensive doctrines is based on *scope*.

The reason Daniels’s formulation must block expensive tastes such as breast enhancement and penis enlargement from being supported is that they represent desires that informed by beliefs whose *scope* extends beyond the Public Reason. They are a part of a *full-range* of satisfaction. Satisfying a full-range of desires could never be included within a politically liberal conception of justice because a full-range of desires are informed by religious, philosophical, and moral beliefs and would thus fall outside of the public political sphere. Daniels explicitly states in *Just Health Care* that: “Just arrangements are supposed to guarantee individuals a reasonable share of certain basic or primary social goods – and these primary goods constitute for Rawls the relevant, *truncated* scale of well-being *for purposes of justice*.”<sup>1</sup> Daniels extends Rawls to normal species functioning (and not all the way to a full-range scale of satisfaction) because he interprets normal species functioning as being a primary good *from a political standpoint*.

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utilizes the concepts surrounding *publicity* throughout *Just Health Care*. For further discussion, please see <sup>20</sup>

<sup>c</sup> My understanding of Rawls’s concept of Public Reason is greatly informed by Scanlon,<sup>14</sup> Freeman,<sup>21</sup> Dreben,<sup>22</sup> and Larmore.<sup>20</sup>



On the other hand, full-range scales of satisfaction like Sen's "capability sets" are, by definition, informed by comprehensive doctrines and thus are outside of the confines of Public Reason.

The demarcation between the sphere of Public Reason and the sphere of comprehensive doctrines is based on the fact that, "Citizens have conflicting religious, philosophical, and moral views...[which] implies that there is no such doctrine, whether fully or partially comprehensive, on which all citizens do or can agree to settle the fundamental questions of political justice."<sup>8</sup> Thus, in order to derive a universal political system that *everyone* cares about, comprehensive doctrines must play no role in any of the political principles. The important assumption that Daniels makes is that normal species function is something that would be universally agreed upon within the public political sphere (or something that *everyone* would care about). That is, he assumes that ensuring normal species function would be valued by all individuals, regardless of his or her comprehensive doctrine just as Rawls's two principles would be agreed upon by all reasonable individuals.

Public Reason is the tool that Rawls uses to determine what things would be agreed upon by wide consensus to formulate a primary political structure, and what things are actually informed by comprehensive doctrines. The question then becomes, how do we distinguish between claims of *function* that are rooted in comprehensive doctrines, and claims of *function* that fall within the confines of Public Reason and thus should be satisfied under the equality of opportunity principle?

## Chapter II – Constraints on Concepts of Function within Daniels’s Model

### Why Daniels’s Account of Function Needs Neutrality and Stability

The argument that I am working from is that *Daniels’s concept of normal species functioning is a politically justified notion and can only be included within a political conception of Just Health Care if its definition can be agreed upon within the constraints of Public Reason*. Daniels attempts to block against expensive tastes by limiting his definition of *opportunity* to mean *only* normal species function (and nothing beyond). In other words, Daniels derives his division of responsibility (ie. what types of function constitute normal species function and what types of function represent expensive tastes) by appealing to *Public Reason*. Therefore, an account of function that is able to satisfy the demands imposed by Public Reason would be usable within a larger health care justice framework. On the other hand, any account of function that is not able to satisfy the demands imposed by Public Reason is not particularly usable within Daniels’s account of Just Health Care.

To Daniels, preventing and treating disease is the primary aim of including health care under the equality of opportunity clause, while health care that satisfies “other social goals” would not be considered as falling under the equality of opportunity clause. Part of the reason Daniels turns to the biomedical sciences for a definition of function, then, is that the biomedical sciences allow “us to draw a fairly sharp line between uses of health-care services to prevent and treat diseases and uses which meet other social goals,”<sup>1</sup> because the biological sciences are ostensibly strongly non-normative and could be included under Public Reason. The problem is that the biological sciences have been

unable to provide a fundamental, and overwhelmingly accepted, definition of function. Thus, the task is to find an account of function that aligns most closely with the constraints imposed by Public Reason. Any account of function that is going to fall within the demands of Public Reason must conform to the three most important ideas that constitute Public Reason: 1) *neutrality* (reasonable pluralism); 2) *Stability*; and 3) *reciprocity* (which demands neutrality and Stability).

### Neutrality (aka: Reasonable Pluralism)

Perhaps the most important principle undergirding Public Reason is the idea of reasonable pluralism. Rawls's focus on the *reasonable* as opposed to the *rational* is a key difference between his and Kant's formulation of justice.<sup>f</sup> While Kant promotes a notion of the good that is rooted in secular notions of rationality, Rawls explicitly values tolerance and respecting all comprehensive doctrines, stating that, "reasonable persons will think it unreasonable to use political power, would they possess it, to repress comprehensive views that are not unreasonable, though different from their own."<sup>7</sup> The fundamental idea behind this statement is that any conception of justice as fairness must be completely *neutral* towards sundry comprehensive doctrines. In effect, Rawls does not subscribe to any comprehensive doctrine by virtue of respecting *all* comprehensive doctrines. He is able to do this by providing a political framework that is sedulously neutral.

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<sup>f</sup> Rawls's focus on the reasonable over the rational is *explicitly* outlined in *Political Liberalism* and in his subsequent writings after 1992. However, the idea of *publicity*, which was discussed in the original *Theory of Justice*, tacitly recognizes the importance of reason over rationality. Please see reference <sup>20</sup>.

The idea of neutrality is somewhat related to the formally articulated Rawlsian concept of *congruence*.<sup>21</sup> An infinite number of individuals who hold an infinite amount of personal doctrines can agree to a single public conception of justice as long as the public conception of justice allows each of those individual doctrines to flourish. This is where individual doctrines and public conception of justice *converge*. The key to this convergence is neutrality. As T.M. Scanlon states,

Justifications of a society's basic institutions that depend crucially on particular comprehensive views will be reasonably resented by citizens who do not share these views. They will therefore not only be destabilizing but also fail to show proper respect for these citizens, who are owed reasons that they could reasonably accept.<sup>14</sup>

The basic point is that political conceptions within Public Reason must be “freestanding”<sup>22</sup> with regards to comprehensive doctrines. Individuals within a functioning society do not have rational motivation to support political conceptions that are informed by comprehensive doctrines since there is such a large possibility – given the myriad of comprehensive doctrines that humans subscribe towards – that they will not share the comprehensive doctrines of the majority. Rawls's original position and veil of ignorance highlight this fact. Reasonable pluralism acknowledges that certain belief systems cannot all be negotiated with one another. Therefore, sustainable political systems must in some ways circumvent those comprehensive doctrines.

It is very important to understand, however, that neutrality is not tantamount to secular rationality. As Burton Dreben states, “Scientism...is a comprehensive doctrine. It might be a secular comprehensive doctrine, but it is still a comprehensive doctrine.”<sup>22</sup> Likewise, the secular utilitarianism of Mill and Bentham, or the rational liberalism of Kant, are also examples of comprehensive doctrines. Thus, just because an account of

function is based on the biological sciences does not inoculate it against being informed by a comprehensive doctrine and falling outside of the boundaries of Public Reason. An account of function, if it is to be successfully applied to Daniels's Normal Functions Model, must be neutral to a degree that reasonable pluralism would accept. Put another way, an account of function cannot be informed by a comprehensive doctrine in the sense that Rawls uses the term.

### Stability

Any account of function that would be accepted within the constraints of Public Reason must also be stable. There are two senses of the term "stable," that I wish to discuss. The first is Stability (with a capital "S") for the "right reasons." As Rawls states in *A Theory of Justice*, "when institutions are just (as defined by this conception), those taking part in these arrangements acquire the corresponding sense of justice and desire to do their part in maintaining them."<sup>12</sup> By this Rawls means that any formulation of justice can only be successful if citizens in that society are moved to accept those principles free of coercion. The term Stability is used because such a system would be maintainable from generation to generation. In a sense, Rawls is searching for a free-standing conception that he feels people would be motivated to actually *believe* in. The reason Rawls rejects Bentham and Mill utilitarianism is that,

The maximization of average utility is...unlikely to generate its own support since it accords poorly with the facts of moral psychology. Its overriding devotion to efficiency will not inspire the allegiance of those whom it asks to give up their life prospects for the greater good of the whole. Only by calling upon improbably reservoirs of sympathetic identification can utilitarians hope that such a system of justice will endure.<sup>20</sup>

That is to say, Rawls feels that systems that are based on concepts where individuals work for the benefit of others (and not necessarily for the benefit of themselves) are utopian, and thus not Stable. Individuals born into this type of system would not rationally accept it as a justifiable political framework. On the other hand, deontologically based theories such as Rawls's, which incorporate liberty principles, ensure that "everyone benefits from social cooperation"<sup>20</sup> in some regard. In this way, Rawls views his own theory as Stable because people would come to accept the principles of their own accord, from generation to generation.

The other sense of stability – the idea that something is permanent and unchanging – also directly informs Rawls's concept of Stability. In order for political concepts to be stable (with a lower case "s"), the terms of agreement that comprise those theories must be stable over time. Concepts and definitions that fluctuate over time have no place within Public Reason because they undermine Stability: people are not *motivated* to agree on contracts or rules if those rules and contracts change over time. Stable contracts and rules, on the other hand, are promulgated within a publicly viewable realm and are thus anchored within space and time. This anchoring fosters reciprocal social cooperation. The key point is that definitions and terms of agreement that are not anchored in space and time are subject to influence by comprehensive doctrines in a way that stable terms are not. It is inconceivable how any society would ever be able to adjudicate or make social decisions without having some method to arbitrate that was non-arbitrary (at least from the standpoint of the denizens comprising the society). Stability lends a degree of non-arbitrariness to terms that protects them against corruption from comprehensive doctrines.

In this way, I think, we can see why any notion of function that is to satisfy the demands imposed by Public Reason must be both Stable with a capital “S” and stable in the sense of “not fluctuating.” Individuals have no reason to agree to terms and contracts that are mutable and thus subject to vagaries. Likewise, concepts that are applicable to Daniels’s Normal Function Model and work within the realm of Public Reason need to be stable over space and time if they are to foster Stability in the sense that Rawls presents to us.

### Reciprocity

Rawls argues that in order for constitutional liberal democracies to succeed, a criterion for reciprocity must be satisfied:

The criterion of reciprocity requires that when those terms are proposed as the most reasonable terms of fair cooperation, those proposing them must also think it at least reasonable for others to accept them, as free and equal citizens, and not as dominated or manipulated, or under the pressure of an inferior political or social position. Citizens will, of course, differ as to which conceptions of political justice they think the most reasonable, but they will all agree that all are reasonable, even if barely so.<sup>23</sup>

The fundamental point behind the criterion of reciprocity is not that there exists an ultimate political conception that all citizens will agree is the most reasonable, but rather that workable political conceptions must be *sufficiently* reasonable “to be accepted as a justification.”<sup>22</sup> It is Rawls’s assumption that the ideas of neutrality and Stability are thus required within a political conception if it is to be *sufficiently* reasonable. Reasonable and rational individuals will justifiably accept political systems that are both neutral and

Stable because those two ideas maximally ensure that terms of social cooperation are just and *mutually* beneficial.

If reciprocity is satisfied, individuals sense “of justice will be constantly reinforced”<sup>22</sup> to a degree that provides justification for the political framework being considered. This is why the issue of situating normal species function in the most stable and neutral terms possible cuts to the heart of Rawlsian theories of justice. To Rawls, and political liberalism in general, pluralism and tolerance are centrally valued as the core of conceptions of justice in that as ideals they formally outline mutual respect between citizens. The problem with not *firmly* situating normal species function in neutral and stable terms is that it allows the second principle to dissolve into respecting *comprehensive values*, as opposed to the much narrower *political* values Rawls’s theory is meant to apply to, as best articulated in the reformulation manifested in *Political Liberalism*.<sup>7</sup> Indeed, what I am suggesting is that if Daniels’s extension of Rawls to health care is to be a *truly* modern politically liberal conception, it must utilize a definition of normal species function that conforms to the demands of Public Reason.



### Chapter III – What is a Function?

I have presented in chapters I and II of this thesis the requirements that an account of function must satisfy if it is to be utilized within a truly politically liberal conception of health care. The remainder of this thesis will focus on what accounts of function actually satisfy those liberal demands.

#### Why Analytically Defined Definitions of Functions Will Not Suffice

A very obvious question that arises before analyzing different accounts of function is: If the goal of the function debate were simply to try and derive a completely neutral and stable account of function, why not arbitrarily and analytically define whatever endpoints are to be classified as normal function, and then the rest of the world would then have to agree? The length measurement of a meter is not based on anything more than arbitrarily defined endpoints, and one could argue that function could be fashioned in a similar manner. The purpose of the functions debate has traditionally been *conceptual analysis*, thus it seems ill-suited to providing politically applicable terms that are neutral and stable.

Yet, what conceptual analysis of function and disease *does* provide is a way for analytically derived philosophical ideas to gain traction within *applied* ethical theories such as Daniels's Normal Functions Model. What arbitrary designations lack is the ability to corral any sort of consensus within a general group of individuals. Any type of definition of function that is proposed, if it is to ever gain an overlapping consensus to be applied to such projects as the Normal Functions Model, must have at least *some*

*relevance* to common and intuitive lexicon. Arbitrary designations will not do with well entrenched concepts like function, even if there is no consensus entrenchment.

Rawls, and especially Daniels, are chiefly concerned with *applied* political philosophy. The “reflective equilibrium” that Rawls utilizes provides *content* to fundamental principles. Public Reason is not an idea in a box, or a form of armchair philosophizing. As Burton Deben argues, “You cannot do substantial political or moral philosophy in any Cartesian-framed manner or shape of mind whatsoever. That is what Rawls has always seen.”<sup>22</sup> In a similar vein, the introduction of terms such as function within Public Reason cannot, “change the nature and content of justification in public reason itself.”<sup>23</sup> So while arbitrarily derived definitions of function may be stable and neutral, they do not carry sufficient content to be utilized within Public Reason.

#### Categories and Examples of “*Content-Full*” Theories of Function

Mark Perlman has recently developed a taxonomy of philosophical theories of functions that organizes different accounts into three broad categories: Non-Naturalistic, Quasi-Naturalistic, and Naturalistic.<sup>24</sup> Non-Naturalistic accounts of function include metaphysical (such as Plato) and religiously derived definitions of function, while Quasi-Naturalistic accounts (such as Aristotle) gesture towards reductionist terms.<sup>24</sup> It should be clear from chapters I and II of this paper that Non-Naturalistic and Quasi-Naturalistic accounts of function would not conform to the demands imposed by Public Reason. While it is beyond the scope of this paper to enter into a serious discussion about why Platonic and religious accounts of function cannot guide *political* policy making, I think

it is sufficient to state that at their core, Non-Naturalistic and Quasi-Naturalistic accounts of function are obviously informed by comprehensive doctrines.

What is left are Naturalist accounts of function. Naturalistic theories are focused on biological functions, mainly due to biology's perceived degree of neutrality and stability. Certainly biology does not possess completely reducible concepts (which are purely neutral and stable) to the degree of other disciplines, as "modern science seems to have purged physics and chemistry of any teleology."<sup>24</sup> Mathematics, physics, and chemistry have no role for an account of function. Those disciplines are reduced to a degree that does not need accounts of function to help provide meaning or explication. Theories of entropy or thermodynamics can exist in a function-less vacuum. Despite the fact that biology has been unable (or perhaps, *is* unable) to "eliminate functions and purposes"<sup>24</sup> from its realm, Naturalistic accounts of function at least tend towards neutrality and stability to a greater degree than Non-Naturalistic and Quasi-Naturalistic accounts of function. While there are many different Naturalistic accounts of function currently in the literature that gesture towards neutrality and stability,<sup>24</sup> most of those accounts of function are directly related to, and based on, either Larry Wright's teleological account of function or Christopher Boorse's goal-contributing account of function. Thus, I will limit my discussion here to those two seminal accounts of function through which most other Naturalistic accounts of function flow.

## Teleological<sup>g</sup> Accounts of Function

Despite its large presence in classical and theological schools of thought, the debate on teleological functions experienced a sustained lull from the Enlightenment until around the middle of the 20<sup>th</sup> century. The emergence of secular skepticism along with modern science (and its reducible disciplines of physics and chemistry) seemed to have quenched any need for an ancient metaphysical notion such as functions. However, the inability for the emerging field of biology to derive any reducible concepts left a void that was naturally filled by conceptions of teleological functions.<sup>24</sup> In 1973, Larry Wright put forth a teleological definition of function that was intended to be an account that science could accept and utilize.

Wright's account of function is teleological in nature and implies that a function can be determined by a causal explanation:

- The function of X is Z *means*
- (a) X is there because it does Z,
  - (b) Z is a consequence (or result) of X's being there.

The translation to biological terms is roughly:

- The function of the heart is pumping blood *means*
- (a) the heart is there because it pumps blood,
  - (b) pumping blood is a consequence (or result) of the heart's being there.

Ostensibly, this definition is illogical. It is difficult to understand how an effect (the function – in this case pumping blood) can explain the cause (the object – in this case the

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<sup>g</sup> The term “teleological function” was coined by Wright himself, however this is distinct from Aristotle's notion of teleology. Both Aristotle and Wright's accounts of teleological function have a causal, or explanatory “what is it there for...” component. However, Aristotle's account assumes some value within his definition in that he distinguishes function from dysfunction based on whether something is acting for an end that achieves an overall *good*.<sup>24</sup> Wright, on the other hand, limits his distinction between function and dysfunction as whether or not the function satisfies its original intent, irrespective of any overall valuation. He is focused on blind causal histories as opposed to Aristotle's guided or *focused* causal histories.

heart). However, from a logical standpoint it is possible to derive this account if one can see that: 1) effects can play a role in their creation even if the object has yet to be created (Thomas Edison most likely envisioned in his mind that his creation of the light bulb was going to provide light prior to his actually creating it); and 2) it is logically possible for an X to be created without ever doing Z (Thomas Edison could have created a light bulb that no one ever turned on).

The biological application of Wright's account of function relies on the concept of *natural selection*. Natural selection is based on the idea that certain biological processes either *contribute to* or *inhibit* an organism's ability to reproduce. If the mechanisms that certain ancestor organisms possessed increased their reproductive efficacy, then those mechanisms would be "naturally selected" and would hence exist in their distant progeny, even if those mechanisms were not manifested in today's organisms. On the other hand, mechanisms in ancestor organisms that inhibited their ability to reproduce would never be transferred to their progeny, and would thus cease to exist. In this sense, then, it is possible for Wright's formulation to not succumb to the logical fallacy that an effect precedes a cause. Wright relies heavily on prior work done by Hempel which focused on functional analysis in explanatory terms: "Empirical science, in all its major branches, seeks not only to *describe* the phenomena in the world of our experience, but also to *explain* or *understand* them."<sup>25</sup> The key point is that Wright's account of function is derived by asking the question: "why is the function there?"

However, it is important to note that the linguistic sense of "explanatory nature" that Wright uses is similar to our understanding of the term "causal," and not in the sense

of understanding a concept. It is *blind* causal relations that contribute to something's existence (as opposed to understood causal relations). Wright is very explicit that

...the kind of explanatory role suggested...is not the anemic "What's it good for?" sort of thing often imputed to functional explanations. It is rather something more substantial than that. If to specify the function of quills is to explain why porcupines *have* them, then the function must be the reason they *have* them.<sup>5</sup>

The elegance of this designation is that it forces the account of function to be a natural property, free from any interpretive corruption. *It does not matter if a function benefits or impairs the object that performs the function.* Likewise, this account of function is not related to or influenced by the reasons why humans talk about functions in the first place. Rather, it is simply a stable and objective reference point that can be used to highlight if there is a difference between what an object does and why it got there. Temperature is a measure of how much kinetic energy an object is exuding in proportion to the amount of kinetic energy contained in the molecules of an ideal gas. In the same way, a function is a measure of how well aligned a mechanism is in proportion to its original design.

#### Teleology Contrasted with Goal-Directedness

Yet, it is exactly the explanatory component of Wright's formulation that has drawn the most criticism. Christopher Boorse, whose classic Biostatistical Account<sup>26; 27;</sup><sup>28</sup> of disease, which relies on a *goal-contributing* account of function, argues that one of the most fundamental problems with a teleological approach is that it has nothing to do with an object's *actual function*. Indeed, integral to the teleological account of function is an understanding of why something is there; however, it fails to account for how

something *works*. Wright is very explicit in that the workings of an object are irrelevant to its function:

...if an earthquake shifted the rollers of a transistor production-line conveyor belt, causing the belt to ripple in just such a way that defective transistors would not pass over the ripple, while good transistors would, we could say that the ripple was *functioning as* a quality control sorter. But it would be incorrect to say that the ripple *had* the function of quality control sorting.<sup>5</sup>

The reason why Wright resists designating the quality control aspect of the altered conveyor belt “its function” is that the quality control aspect of the belt is not the reason that the belt exists. In the restricted sense, the belt with the function of sorting did not *get there* because of its sorting capabilities. Essentially, the problem that Boorse highlights is that a teleological account of function does not have an “operational explanation,” with “which physiology has traditionally been concerned.”<sup>4</sup>

Boorse’s alternative to the teleological account of functions is that a function is a contribution to a goal:

*X performs the function Z* in the *G*-ing of *S* at *t* if and only if at *t*, the *Z*-ing of *X* is a causal contribution to *G*

A trait *X*’s contribution to a goal, then, if made sufficiently often, becomes the function of *X*, or *X*’s function, if it is *X*’s only regular contribution; and is a function of *X*, among *X*’s functions, otherwise.<sup>29</sup>

The translation to biological terms is roughly:

The heart *performs the function* of pumping blood in the overall survival of a human in the year 2008 if and only if in the year 2008, the pumping of blood of the heart is a causal contribution to the human’s overall survival and reproduction.

The heart’s contribution to survival, then, if made sufficiently often, becomes the function of the heart, or

heart's function, if it is the heart's only regular contribution; and is a function of the heart, among the heart's functions, otherwise.

The biological application of Boorse's concept relies on the assumption that humans tend to be goal-directed towards Darwinian-style survival and reproduction. Thus, a process is deemed a "function" of that organism if that process contributes to the organism's overall survival and reproductive capabilities. So, a heart's function is pumping blood because that is what directly contributes to a human's survival and reproduction at this present moment. In the same way, if a Bible tucked away in a soldier's pocket deflects a bullet 13 times over the course of a war,<sup>4</sup> the Bible's function would have changed to being a bullet deflector because that is its current *contribution* towards a specific goal. The Bible was most likely created to convey a certain message; however, if we are focused on its present goals (behavior – in this case deflecting bullets) as Boorse is, we then must focus on something else: how the object works.

The key feature of Boorse's account is that it allows for a function to be traced back only to the establishment of *the* goal for the object, not to the causal origins that established the object. Put differently, "a trait can causally promote its bearer's survival in the absence of any selection process favoring the trait or its bearer."<sup>29</sup> Perhaps the most striking example of how the teleological account of functions differs from a goal contribution description that Boorse provides can be seen by examining Boorse's lion that sprang into existence through "unparalleled saltation."<sup>4</sup> Science fiction aside, a lion that miraculously came into existence through a divine or random natural act of molecular arrangement poses serious problems for a teleological account of function. Wright's analysis would not be able to account for any of such a lion's physiological



mechanisms because none of its mechanisms were ever naturally selected to do anything. The lion, according to a teleological account of functions, would simply not have any functions. To Boorse, this seems patently incorrect.

Boorse claims that the problem is that a function for a physiologist is “simply describing the organization of a species as they found it.”<sup>4</sup> If a scientist were to travel to Pluto and discover a type of fish, they would deduce functions in that fish’s body in the same manner that one would deduce functions in the unparalleled molecular collision conceived lion: “by determining what contribution, if any, each part makes to the operation of the whole.”<sup>4</sup> The point of Boorse’s account of the lion is to show that “in at least one case an intricate functional organization was created by chance,”<sup>4</sup> and that this example arguably highlights the fundamental misrepresentation that Wright’s account has of functions.

For Boorse, intentions (in the sense of why an object exists) are neither necessary nor sufficient to explain a function. Rather, it is the contextual milieu of an entire system that a function operates within that situates an object’s function. Oftentimes an object will have an unknown function, even in the case of consciously designed artifacts. The makers of phosphodiesterase-5 inhibitors (an example being Viagra) originally designed the medication to be used for angina.<sup>30</sup> However, it would seem silly to say that the function of Viagra in most instances would be to treat angina when a doctor prescribes the medicine specifically to treat erectile dysfunction.

The same is true for natural mechanisms. Unintended consequences can be the biggest contributor to a goal, such as survival and reproduction, irrespective of any knowledge about teleology. Boorse’s example of the male urethra is a case in point. If

the urethra was originally selected to be a conduit for sperm, and it just so happened that along the evolutionary timeline it also became a conduit for urine, it is difficult for one say that the function of the urethra is not to carry urine simply because carrying urine is not the original reason the urethra exists. The goal contribution account of function can accommodate both functions of the urethra because both are “standard causal contributions to the organism’s over-all goals.”<sup>4</sup>

Wright and Boorse Juxtaposed  
(*aka: Which Account Satisfies the Demands of Public Reason?*)

On one end of the debate is Wright, whose account of function is *explanatory* in nature. It derives what an object’s function is by asking, “why is the object there?” On the other end of the debate is Boorse, whose account of function is *descriptive* in nature. It derives functions by asking, “how does the object work?” At the core of both accounts of function is a difference between their respective *reference points*. A teleological account of function is always described in reference to “why it is there.” An object is *dysfunctional* if it is unable to or is not working in a similar manner to how it was originally designed – the teleologically-derived reference point. On the other hand, a goal contribution account of function is always described in reference to its causal contributions to a temporally defined system. Thus, an object is *dysfunctional* if it ceases to, or never has, contributed to a system’s overall operations at a specific time – the goal-contribution reference point. To Wright, an air-purifier that was designed to suck out “pollutant A” from the atmosphere is still functioning (assuming it still works) even 50 years later when there is not a trace of pollutant A in the atmosphere because it is still operating within the confines of its reference point.<sup>4</sup> It would be an example of

something that is innocuously desuetude. Boorse, however, would say that the filter is non-functional simply because it does not causally contribute to anything.

The debate on reference point is salient because it makes clear how Boorse's account *imposes* function onto objects: even if the biological goals of survival and reproduction are completely scientific – that is, completely value-free from a biological standpoint – *they are still observer relative* in a way that referencing an analytically (“why is it there?”) defined reference point is not. Determining whether or not something contributes to survival and reproduction entails at least some degree of interpretation, and thus theoretically allows for the imposition of vaguely-defined notions of function. This is where Boorse's account loses the neutrality and stability that are required if an account of function is to satisfy the demands imposed by Public Reason. Additionally, even the *act* of interpreting survival and reproduction as being what the human species tends towards *itself* relies on normative judgments to a much greater degree than Wright's account ever would. Boorse argues that he did not choose survival and reproduction as universal biological goals, rather that he is capturing “what disease *is*” and by extension, what our biological goals *are* as “best reconstructed from medical classifications.”<sup>27</sup> But this is precisely how bias and instability can enter into his account of function. Medical classifications are not based on intrinsic values, but rather on what the medical community *interprets* from a biological *viewpoint*.

In *The Construction of Social Reality*, John Searle argues that “As far as nature is concerned intrinsically, there are no functional facts *beyond causal facts*. The *further* assignment of function is observer relative.” (emphasis added)<sup>31</sup> It is true that in nature, the heart intrinsically pumps blood, causing blood to course through our circulatory

system. All of these processes ultimately contribute to human survival and reproduction. However, by saying that the heart *functions* to pump blood, we are “situating these facts relative to a system of values that we hold...the *discovery* of a natural function can take place only within a set of prior *assignments* of value (including purposes, teleology, and other functions).”<sup>31</sup> Indeed, it is a biological *interpretation* of natural phenomena – that humans tend to be goal-directed towards survival and reproduction – that informs Boorse’s account of function.

Searle continues by using the heart pumping blood example: “If we thought the most important value in the world was to glorify God by making thumping noises, then the function of the heart would be to make a thumping noise, and the noisier heart would be the better heart.”<sup>31</sup> Boorse certainly does not think that the heart making thumping noises is an important value; however, our modern secular world *does* view the universe through a scientific and biological lens that biases all interpretations, at least to some degree. The most important value within the biological community is survival and reproduction, and that is the background valuation undergirding all of its observations. And it is here where tendentiousness and instability enter into Boorse’s account of function.

Conversely, Wright’s account eliminates the “observer relativity of function,” I think, because there is no background valuation present – a function is simply referenced to a temporally static and causally defined “why was it made?” An explanatory derived reference point is both neutral and stable in that it will never change over time, cultural, social, or even scientific situations. By definition, teleological accounts of function can

never change or be mutable because the reason something exists cannot change.

Teleological accounts of function are anchored in time and space.

Searle is familiar with Wright's account, and argues that since Wright's definition attempts to capture "certain essential features of the ordinary notion of function" that it is ultimately fraught with explanatory components that render function as we understand it to be value-laden:

...the normative component of functions is left unexplained.... Why do we talk of malfunctioning hearts of heart disease, of better and worse hearts...either we are talking about brute, blind causal relations in which case hearts pumping blood and colds spreading germs are in the same basket...<sup>31</sup>

Yet, Searle's criticism is exactly why Wright's account succeeds within Public Reason – it limits itself to "blind causal relations," while at the same time aligning well enough with common parlance to inoculate it against the "content-less" charge. Wright's account of function is far enough removed from the "observer" (in this case, biology and their values of survival and reproduction) interference that plagues Boorse, yet its meaning is close enough to common and intuitive lexicon to provide enough content for people to accept.

It is precisely because the "normative component" of functions is not addressed by a teleological account of functions that the teleological account becomes so applicable to something like Daniels's Normal Functions Model. A teleological account of function is either/neither agnostic or/nor theological in that it situates functional origins in a way that both camps can accept. Wright's account of function, by its nature, completely avoids comprehensive doctrines by relying on a quasi fact/value distinction.  $2 + 2 = 4$  is a fact without any influence from normative components. Its definition can be accepted

within an overlapping consensus, regardless of differing comprehensive doctrines influencing its interpretation. Yet, its use in deciding how much change I get back from McDonald's or how much our government is going to spend beyond its budget is very normative. In the same way, a function – by using Wright's account – is not intrinsically normative, but rather the *applications* of that property can be very normative indeed.

To conclude, it should be clear that while both Wright and Boorse's accounts of function succeed to some degree in *conceptually analyzing* the term "function," Wright's account is *more* neutral and stable and is thus more usable within a broader politically liberal framework.<sup>h</sup> Boorse even writes that, "What converts a function X performs into "the function of X" is our background interests in the context in which the function statement is made."<sup>4</sup> It is clear that our "background interests in the context" are value-laden, regardless of whether or not science has derived the background interests. As Searle points out, science itself is based on assumptions that are often value-laden. Goal contributing accounts of function disregard intention, but the problem is that intention is the only *stable* and *neutral* reference point on which to base a definition. The physiologically defined endpoints of survival and reproduction are certainly as close to any objective natural goal that one might consider, however as I will try to show in chapter IV, *any goal* – including survival and reproduction – is simply too observer dependent to every be stable and neutral enough of an account to serve within the framework of the Normal Functions Model.

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<sup>h</sup> Indeed, I am not arguing that the differences between Boorse and Wright's accounts are differences in *kind*. Rather, I am arguing that they are differences in *degree*. However, my goal in chapter IV is to demonstrate that the differences between the two are nonetheless very significant when applied to the Normal Functions Model.

## Chapter IV – Why Functions Matter to Health Care Justice

### Who Cares?

While the abstruse exercises above demonstrate that there are subtle yet fundamental differences between the teleological and goal-contributing accounts of function, the question remains: Are the differences relevant from an applied standpoint? I argue that the differences *are* important, especially when applied to ethical formulations of Just Health Care. Even if the *conceptual* capturing of functions by Boorse and Wright degenerates into a “dull thud of conflicting intuitions,” the fact that Wright’s analysis does not rely upon comprehensive doctrines and is thus more neutral and stable lends profound consequences to any sort of application towards a Rawlsian account of health care.

In its most basic terms, this thesis has attempted to align and utilize basic philosophical concepts within larger ethical frameworks. From a conceptual standpoint, both Wright and Boorse’s definitions of function seem to be correct in certain instances. Yet, when applied to a larger ethical framework, the demands imposed by Public Reason and political liberalism more broadly make Wright’s definition more suitable. It is not that Wright’s account of function is special. Rather, *terms and concepts that tend towards neutrality and stability simply lend themselves more readily to political liberal frameworks in general.* That is the nature of modern political liberalism.

In addition, the fact that Wright’s account of function is so neutral and stable affords it many other practical advantages over other accounts of function. Most saliently, it could be used as a rational and consistent method for determining what

should and should not count as a disease from an economic, legal, and even cultural standpoint. As Winston Chiong states,

Identifying a disease can confer social legitimacy on a patient's symptoms, relieving patients of the suspicion that they are malingering or exaggerating their woes; conversely, it may...imply that the patient...requires intervention. Having a disease might mark the patient as a member of a community of sufferers.<sup>32</sup>

Indeed, the “sick role” appellation is extremely important within Western societal mores, chiefly because “being sick” often exculpates individuals from otherwise strictly delimited standards as to whom we owe sympathy towards. For instance, should fibromyalgia patients be lent sympathy for their disease? Is fibromyalgia a disease? Should insurance companies be obligated to reimburse “treatments” for fibromyalgia? Having a more stable definition of normal function may help with some of those questions.

The ramifications of what constitutes a disease are also very important from an economic and legal perspective. The preamble to the 1990 Americans with Disabilities Act stated that 43 million Americans were disabled – which was nearly 20% of the United States population at the time!<sup>33</sup> Yet, as Heather MacDonald reports, “the National Institute on Disability and Rehabilitation Research estimated in 1991 that 3.1 million Americans need assistance with basic activities like bathing and dressing, while 3.9 million need help with things like shopping and cleaning”<sup>34</sup> Clearly, there was a disconnect between what exactly “normal function” and “disability” meant.

The consequences of the overwhelming vagueness in what is and is not normal functioning even extend to our national pastime. During the 2008 Mitchell Report Congressional Hearings on steroid use in Major League Baseball, it was reported that the



number of major league baseball players who were prescribed amphetamines such as Ritalin and Adderall as a therapeutic agent for adult attention deficit disorder (adult ADHD) was “almost eight times the adult use in our population.”<sup>35</sup> Are those players who are unable to pay attention during a grueling 162 game season normal and just overworked, or do they really deserve treatment for ADHD? There were obviously medical doctors who felt that those baseball players fulfilled the diagnostic criteria for ADHD, but how firmly should we rely upon that definition of “normal” and “hyperactive?”

Finally, if the current political climate in the United States effectuates a more nationalized health care system in the future, what types of things should be covered? Ostensibly, any “disease” (aberrant function) should be covered, as on the surface the treatment of disease provides a conceptually clean demarcation of what we owe to one another in modern society. Yet, as my case examples hopefully elucidate, this is not always the case. Even the moral status of future technologies, such as genetic enhancements,<sup>3</sup> are greatly affected by accounts of function. Is mitigating baldness an example of an enhancement or a treatment? Indeed, the future of health care justice is fraught with the imponderables of the genetic age.

By critically examining two case studies of very common “disease states,” I think we will be able to see that the latent bias and instability within Boorse’s account of function has – contrary to Daniels’s relatively superficial analysis of the situation – a dramatic impact on the Normal Functions Model. In short, *Boorse’s account is heavily dependent upon comprehensive doctrines in deriving functional ascriptions*. If this is

true, then the ramifications for ever being able to garner moral support for the principles behind the Normal Functions Model are quite troubled.

## Case 1 – Short People

### Molecular Basis of Idiopathic Short Stature

In this case study, I will argue that Wright’s account of function would classify idiopathic short stature as *not* representing a dysfunctional state, whereas Boorse’s account of function *would* classify idiopathic short stature as a dysfunctional state. As mentioned above, the consequences of such a divergence are significant for the Normal Functions Model, and health care in general. However, before delving into any discussion that attempts to navigate between competing philosophical versions of the word “function,” we must first situate ourselves within the vernacular of rudimentary biological terms and facts. Despite the ubiquitous use of the term “genetic causation” within a popular culture that seems to consider genes the sole source of all human function and behavior,<sup>i</sup> the fact remains that biological development within human beings has always been due to a very complex interaction between *both* environmental and genetic influences.<sup>37</sup> Specifically with regards to skeletal maturation and stature, a *veritable gallimaufry* of factors such as growth hormone, physical activity, sex steroids, psychological well-being, cytokines, nutrition, thyroid hormone, and even the climate of the area in which a child is reared all influence overall height.<sup>38; 39; 37; 40</sup>

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<sup>i</sup> *New York Times* columnist David Brooks has recently labeled (slightly sardonically) our generation the *Age of Darwin* due to the emergence of fields such as evolutionary psychiatry.<sup>36</sup>

Human stature follows a normal Gaussian distribution, and anyone whose height is below -2.25 standard deviations<sup>j</sup> for age and sex is considered as having short stature.<sup>41; 42</sup> Within the medical community, short stature is often etiologically classified as being either a primary growth disorder, a secondary growth disorder, or idiopathic short stature.<sup>43</sup> Primary growth disorders are related to intrinsic defects within musculoskeletal structures, and are primarily the result of genetic abnormalities or prenatal damage.<sup>43</sup> Examples of primary growth disorders include skeletal dysplasias or diseases that cause defects in bone metabolism. Secondary growth disorders result from factors that are extrinsic to the musculoskeletal systems such as endocrine disturbances, systemic metabolic derangements, nutritional deficiencies, or psychogenically induced pathologies.<sup>43</sup>

The third category of short stature – idiopathic short stature – is diagnosed when a child’s height is less than -2.25 standard deviations for age and gender and when all identifiable disease processes that were included under primary and secondary growth disorders have been excluded.<sup>44; 43; 41; 42</sup> There is still a great deal of controversy regarding the definition of idiopathic short stature, most certainly due to the diagnostic, conceptual, and philosophic difficulties of demarcating the concepts of medical disorder from normal variation. Indeed, by its very nature the diagnosis of idiopathic short stature is given to individuals whose height falls on the low end of a statistical distribution, but who also lack any identifiable abnormal etiology or any link to significant health risks.

Central to understanding the tension underlying delimiting medical disorder from normal variation with regards to height is understanding that the molecular basis of

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<sup>j</sup> The American Academy of Pediatrics’ definition of short stature includes children whose stature is less than -2 standard deviations, however, the United States Food and Drug Administration’s definition is less than -2.25 standard deviations.<sup>41</sup>

idiopathic short stature is based on a continuum of functional efficiency<sup>k</sup> rather than a clean function/dysfunction conceptual model. Variations in growth hormone receptor functioning or insulin-like growth factor gene expression rates explain variations in height; not whether or not the growth hormone receptor is functioning at all, or if the insulin-like growth factor gene is being expressed at all. The antithesis to this model that is often cited is pregnancy. A woman is either pregnant or not pregnant. There is no in-between. However, it is virtually impossible – by definition – to identify a molecular dysfunction for idiopathic short stature that can be applied in a conceptually clean manner. It should be pointed out that with further research, many of the patients who currently have the diagnosis of idiopathic short stature will eventually be found to have some identifiable cause that is putatively expressed,<sup>46</sup> however the fact remains that ultimately, by the very nature of biological variability, there ends up being “line-drawing problems”<sup>47</sup> with determining what constitutes normal variation and abnormal function.

For the purposes of this thesis, I will only focus on whether or not the “dysfunction” designation should be applied to idiopathic short stature and not on whether or not it should apply to primary or secondary growth disorders. From a medical and even philosophical standpoint, the conceptual designation of primary and secondary growth disorders as being disease- or dysfunctional-states is rather uncontroversial. To my knowledge, there are no definitions of dysfunction – normative, completely objective, or anything in between – that would have necessary and sufficient conditions that would exclude any primary or secondary growth disorders (such as Turner’s syndrome, a sex

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<sup>k</sup> While anthropologists and evolutionary biologists often understand function in terms of whole *species* phenotypes, biologists tend to assign functions to parts of animals and their physiology. Indeed, from a biological perspective it is difficult to assign a specific function to height.<sup>45</sup> However, our basic understanding of many of the factors that contribute to height (such as growth hormone levels) allows us to assign functions to those more specific parts and processes.

chromosome disorder) from being classified as a diseased state. That being said, the applicability of the idiopathic short stature discussion to everyday clinical practice should not be underestimated. Short stature is the most common cause of referral to pediatric endocrinologists.<sup>41</sup> Yet, primary and secondary growth disorders such as growth hormone deficiency (incidence of 1:4,000 – 1:10,000)<sup>48</sup> or Turner’s syndrome (incidence of about 5.7:100,000 live births)<sup>49</sup> represent a relatively small subset of the entire 3% of children who are diagnosed with clinical short stature in whom recombinant human growth hormone might be utilized to enhance idiopathic short stature.

#### Short Stature and the Goal-Contribution Definition of Function (*aka: Idiopathic Short Stature is Dysfunctional*)

As discussed in chapter III, Boorse’s goal-contribution definition of function is centered around contextually orienting a function and asking whether or not it then contributes to the overall goals of the object. In the case of biological functions, the salient question is whether or not a specific trait or part of a process contributes to overall survival and reproduction. If a function does not contribute to those goals, then it is classified as dysfunctioning. Over the course of the past 10-15 years, there has been an *abundance* of research that has shown that short stature in males in the modern day world dramatically impacts their reproductive potential.<sup>50; 51; 52; 53; 54; 55; 56; 57; 58; 59; 60; 61</sup> Thus, it seems reasonable to argue that from a Boorsian perspective on function, idiopathic short stature (or in the case of the biologist, the factors that contribute to idiopathic short stature) represents a dysfunctional state.

In 2000, a comprehensive study was released in the *Oxford Bulletin of Economics and Statistics* that showed “physical appearance has a *substantial* effect on

earnings and employment patterns...those who are...short...experience a *significant* earnings penalty. Tall men receive a pay premium...among men, lower marriage rates are found for those who are short” (emphasis added).<sup>52</sup> After controlling for confounding variables such as social class, education, health, race, and region of residence, the researchers found that the probability of being married was 7 percentage points lower for short men (bottom 10<sup>th</sup> percentile) than for men whose height fell within the 20<sup>th</sup> to 79<sup>th</sup> percentiles.<sup>52</sup> In another study examining the mate-selection patterns of 720 heterosexual couples, probability models predicted that the chance expectation for the frequency of couples with the female being taller than the male was 2/100.<sup>51</sup> However, the actual value found was 1/720, which the authors concluded was evidence supporting the idea that short stature militates heterosexual mating-rates.<sup>51</sup> In a very recent study that tracked the patterns of 20,000 online daters, it was calculated that men who were 5-foot-8 needed to earn \$146,000 a year more money than men who were 6 feet tall to be just as successful at getting dates, and men who were 5-foot-2 needed to earn \$277,000 more than the 6-footer!<sup>54; 60</sup>

The data also extends beyond simply mating rates to actual reproductive fitness. In an original research article on the topic of modern-day evolutionary fitness, the journal *Nature* published an article that examined height differences in men with and without children.<sup>59</sup> Their sample of 3,201 men showed that childless men are significantly shorter than those men who have at least one child, and that this trend applies to almost all variations in age and educational achievement.<sup>59</sup> Another study that found correlations between tallness and reproductive fitness concluded that taller stature had an indirect effect on overall male lifetime fitness independent of socio-economic status.<sup>57</sup>

Additionally, they found that selection favored very tall men, and did not simply select against short men.<sup>57</sup> This data was further quantified by another study that found the men with the highest reproductive success rates were 2.2 inches taller than the cohort mean.<sup>58</sup>

Indeed, while most of the studies did not control for different etiologies of short stature, it seems reasonable to conclude that the vast majority of subjects would have fallen under the designation of either idiopathic short stature or were simply short normal (ie. below the 10<sup>th</sup> percentile). Thus, all of the presented data seems very germane to any discussion attempting to determine whether or not idiopathic short stature is the result of dysfunctional processes under the Boorsian designation of function. The necessary, and thus fundamental criteria for Boorse's definition of part-function, is understanding whether or not that certain part of a system makes a contribution to the system's overall goals. If that part does not make an overall contribution to the system's overall goals, it is dysfunctional. From a strictly biological perspective, the overall goal of any living organism is survival and reproduction. It seems patently correct, then, to view idiopathic short stature as being the end result of certain dysfunctional processes (decreased gene expression, non-ideal hormone levels, sub-optimal nutrition, etc.). While none of those specific processes have been deemed independently dysfunctional in cases of idiopathic short stature, the consequence of utilizing a Boorsian framework for function would seem to force us to consider those lower normal functioning processes to actually be dysfunction in nature.

Idiopathic Short Stature and the Teleological Definition of Function  
(*aka: Idiopathic Short Stature is Not Dysfunctional*)

Wright's teleological account of function is based on understanding the causal nature behind certain part-functions of overall processes. When applied to secular biological processes, the causal nature behind all functions is based upon Darwinian evolutionary causal principles. Natural biological processes are evaluated based on whether or not they function in a manner that they were originally selected. For example, stature in human beings is the end result of a complex interplay of physiological functions, all of which have been selected over an evolutionary time scale.<sup>40</sup> When one of those naturally selected processes, such as the secretion of growth hormone by the pituitary gland, is impaired, the pituitary gland would be considered dysfunctional under the teleological account of function (as well as Boorse's goal-contribution account). The reason for this is that evolution has selected the pituitary gland to secrete (among other things) growth hormone, thus if it is not doing that, it is not satisfying the original intent of its existence.

Prior to determining whether or not idiopathic short stature is the result of dysfunctional processes, it must be categorically established that short stature and small body size are not genetic adaptations. In 1980, the economist David Seckler first claimed that the small size of individuals living in poverty might reflect a genetic adaptation.<sup>62; 63</sup> Smaller bodies have decreased metabolic and caloric demands, and thus might represent an adaptation to a relatively barren environment. He concludes by asking if some groups of people, such as the Guatemala Maya, could be "small but healthy?"<sup>63</sup> However, recent evidence has shown this hypothesis not to be true. In a recent study, it was demonstrated that the children of Mayan immigrants who were raised in the United States were on



average 11.54 cm taller than Guatemalan Mayan children of the same age.<sup>64</sup> As Professor Barry Bogin states, “if Mayan short stature were a genetic adaptation, fashioned over centuries, such a biologically and statistically significant difference in height could not occur in less than one generation.”<sup>65</sup> Indeed, while short stature in some population cohorts may be “a beneficial accommodation to undernutrition,” they certainly do not represent a “genetic adaptation.”<sup>66</sup>

However, the fact that height is so environmentally dependent lends evidence to the idea that idiopathic short stature may be an example of a state that is neither evolutionarily advantageous nor disadvantageous. In other words, I think, *from the perspective of natural selection, idiopathic short stature might be selectively neutral.* While it is difficult to ascertain exactly how stature and reproductive fitness are related from a purely physiological standpoint,<sup>67</sup> recent research has attempted to test the hypothesis of whether small body size is an adaptation to undernutrition by measuring fertility rates under states of nutritional deprivation or stress. Those studies have shown that the relationship between maternal stature and fertility in populations living in malnourished settings is highly *variable*.<sup>40; 68</sup> What this suggests is that while small stature does not increase reproductive fitness in times of stress, it also may not represent a state that decreases reproductive fitness.

Furthermore, the fact that variations in height from our hominid ancestors who lived over 1,000,000 years ago to modern day homo-sapiens has remained dramatically static lends additional evidence to the idea that short stature is selectively neutral.<sup>38; 69; 70</sup> While there have been periods (such as the short stature seen from 4,000 BC until

contemporary times) of relative shorter stature in humans,<sup>1</sup> it is well accepted within the anthropological community that, “the range of normal body size found in contemporary populations reflects the human, and pre-human, condition of the past 1.8 million years.”<sup>38</sup>

Traits that increase reproductive fitness are increasingly expressed. Thus, from an evolutionary standpoint, *it is difficult to argue that taller stature increases reproductive fitness if for the past 1.8 million years (which is sufficient time on the evolutionary time scale for traits such as stature to be modified) human stature has remained very constant.*

The point is that short stature does not seem to play a very large role in reproductive fitness, but rather is more of a manifestation of environmental conditions in which populations live. Thus, while idiopathic short stature may not represent an evolutionary advantage, by understanding certain basic biological and anthropological principles, it also seems to not represent an evolutionary disadvantage. *The implications for Wright’s teleological account of function are then, I think, that idiopathic short stature is not the result of dysfunctional physiological processes.* If stature is a natural-selection-neutral trait, then the factors that influence stature cannot be said to be dysfunctional.

The case of idiopathic short stature is interesting on a second level in that it provides another example of how the teleological account of function is more neutral than the goal-contributing account. As we have seen, the goal-contributing account must take into consideration *secular trends* – processes that influence populations from one generation to the next – such as shifting sociological values with regards to height. Yet,

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<sup>1</sup> These oft-observed transient variations in stature throughout natural history are now thought to be secondary to “the way of life of ancient and modern humans, and...not due to any genetic change[s].”<sup>71</sup> In other words, variations in stature have mostly been accounted for by environmental differences, not genetic shifts and drifts.

that type of contextualization is fraught with valuations that are extremely difficult to capture. *In other words, secular trends introduce comprehensive doctrines into the interpretations.* If another society did not have prejudices against short males, and the reproductive rates of smaller men were similar to taller men in that population, then the Normal Functions Model in that society would not view idiopathic short stature as dysfunctional (using a Boorsian account of function). Under Boorse's account, shifting social values influence the Normal Functions Model. On the other hand, the teleological account is conceptually much cleaner in that once it is understood why a function is present, a process can be evaluated as functional or dysfunctional. There is no need for fancy sociological and scientific exegesis or biological haggling over what increases survival and reproduction and what does not.

What I have attempted to highlight in this chapter is a divergence between the teleological and goal-contributing accounts of function. Idiopathic short stature is a relatively common clinical issue, and there are certainly disputes as to whether or not it really constitutes a disease.<sup>72; 73; 74; 75; 76; 77</sup> However, the point of this case study was not so much to enter the debate about whether or not idiopathic short stature is a disease (and if it merits all of the benefits and baggage that accompany a disease appellation), but rather to use it as an example of what types of implications there are to using diverging accounts of function. Boorse's goal-contributing account of function must take into consideration secular trends, such as modern Western society's prejudice against short male stature. This fact highlights how the goal-contributing account of function is reliant upon comprehensive doctrines, whereas Wright's account of function completely circumvents secular trends.

The key point is that Wright’s account of function seems to be more neutral and stable, which is what concepts within Public Reason need to strive towards. Under Wright’s account of function, idiopathic short stature is *not* the result of dysfunctional processes. Thus, in larger political frameworks such as Daniels’s Normal Functions Model, individuals with idiopathic short stature would not be entitled to compensated treatment, as idiopathic short stature does not represent a fundamental obstacle to equality of opportunity as Daniels frames it. Rather, treating idiopathic short stature would represent an unreasonable expansion of health care rights that provides for “expensive tastes.”

Boorse’s account of function, on the other hand, would not block against providing treatment for idiopathic short stature because his account of function would interpret idiopathic short stature as a true dysfunctional state. Idiopathic short stature, in modern Western society, does inhibit reproductive rates in a clear and definable manner. Thus, treatment for idiopathic short stature is not a moral hazard, “expensive taste,” but rather represents an attempt to ameliorate a true insult to equality of opportunity.

## Case 2 – Obesity in America

In this case study, I will argue that Wright’s account of function would classify the factors that contribute to common obesity<sup>m</sup> as *not* representing dysfunctional states, whereas Boorse’s account of function *would* classify mechanisms that contribute to common obesity as dysfunctional states. Despite my debate here as to whether common obesity represents a dysfunction state or not, it is clear that almost all individuals –

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<sup>m</sup> Common obesity is contrasted with obesity that is specifically associated with other syndromes, such as Prader-Willi syndrome or Bardet-Biedl syndrome. The most common “syndromic” forms of obesity have been genetically mapped, and represent a very small proportion of individuals who are obese.<sup>78</sup>

medical doctors or otherwise – would think it unconscionable not to treat the morbidity and mortality *associated with* obesity. There is no debate about civilized actions. However, the more interesting question is whether or not the factors that lead to obesity *themselves* are worthy of the moral, and thus social support, provided within the fair equality of opportunity model. And central to that debate, I think, is the distinction between theories of function. That is, the difference between Boorse’s goal-contribution account of function and Wright’s teleological account cuts to the heart of whether or not we can consider common obesity to be a *legitimate* dysfunctional state within a politically liberal conception of health care justice. Before delving into how different accounts of function apply to obesity, the basic biological processes that contribute to obesity must be described.

### Why Are Americans So Fat?

The World Health Organization (WHO) defines obesity as an accumulation of excess body fat, to the extent that overall health may be impaired.<sup>79</sup> Obesity in America is becoming a public health problem of epidemic (indeed, epic) proportions. According to WHO classifications,<sup>79</sup> 54% of U.S. adults are overweight (body mass index (BMI)  $\geq$  25 kg/m<sup>2</sup>) and 22% are obese (BMI  $\geq$  30 kg/m<sup>2</sup>).<sup>80</sup> In the rudimentary sense, obesity results when caloric intake exceeds energy expenditure, and the excess energy is stored as fat.<sup>81</sup> However, there are a multitude<sup>n</sup> of genetic, environmental, and psychosocial factors that contribute to that overall energy distortion.<sup>81; 84; 90; 91; 92</sup>

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<sup>n</sup> Despite the fact that there are very strong genetic factors that contribute to obesity,<sup>82; 83; 84; 85</sup> it is clear that the most conspicuous factors that contribute to obesity in America today are environmental in nature.<sup>86</sup> While the prevalence of obesity in America increased by 8% from 1976 to 1991,<sup>87</sup> as mentioned above it is clear that the human genome did not substantially change within that time frame. An abundance of

Those multi-factorial elements are manifested through specific physiological processes. Within the human body, organs such as the pancreas, stomach, and adipose tissue (fat) generate humoral signals<sup>o</sup> that are interpreted by the hypothalamus in the brain. Depending on the type of signal that those organ systems send, the brain will interpret whether or not the body should be in an anabolic (energy storage) state, or a catabolic (energy expending) state. Once the brain has interpreted what net energy state the body should be in, it sends its own signals out to the rest of the body. Those signals influence feeding behavior, satiety, and energy expenditure. Many scientists now believe that the reason why so many Americans are obese is that the abovementioned system is in some ways set up towards favoring an anabolic state.<sup>92</sup> The hypothesis that humans have a natural propensity to store fat is called the “thrifty gene” theory.<sup>93; 94; 95</sup> I argue that the abundance of data that supports the “thrifty gene” theory provides the most profound evidence that the factors that contribute to common obesity are not dysfunctional in nature, despite the fact that obesity is now so common worldwide that it is “beginning to replace undernutrition and infectious diseases as the most significant contributor to ill health.”<sup>91</sup>

#### Common Obesity and the Teleological Definition of Dysfunction (aka: *The Factors that Contribute to Common Obesity are Not Dysfunctional*)

The landmark thrifty genotype theory was first proposed by James Neel in 1962.<sup>95</sup>

He hypothesized that the basic defect in diabetes mellitus is the human body’s “quick

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inexpensive, highly caloric, readily available foods that are gustatorily delightful has combined with a culture that is increasingly sedentary. This has provided the U.S. with a proverbial cauldron for producing obese individuals. Shockingly, Pima Indians living in Arizona have an average BMI that is 10 points higher than Mexican Pima Indians (BMI of  $34.2 \pm 8.2$  for Arizona Pimas vs.  $24.9 \pm 3.9$  for Mexican Pima Indians)<sup>88; 89</sup>

<sup>o</sup> The three most important signals that regulate energy balance are leptin, insulin, and ghrelin. For a more detailed explanation, please see Kumar et. al.<sup>81</sup>

insulin trigger,” which would be an asset to ancient hunter-gatherers, however would be detrimental to survival in a modern day world that fosters gormandization. While the *specific* genetic and physiological mechanisms originally proposed by Neel have not been supported by recent scientific evidence, the thrifty genotype hypothesis as a broad theoretical concept has unequivocally been accepted within the mainstream anthropological and medical establishment.<sup>96</sup> At its most basic level, the thrifty genotype theory is an attempt to explain how a genotype that contributes to obesity has persisted through thousands of years of selective pressure and evolution.

It is clear that our Paleolithic ancestors lived in a time when significant physical exertion was obligatory<sup>97</sup> and food was scarce (and much different from our modern-day surfeit of high fat, low fiber, high carbohydrate goodies).<sup>98</sup> These Paleolithic selective pressures contributed to what are called susceptibility genes. Susceptibility genes are genes that predispose individuals to certain physical states (in this case, genes that get us to eat lots of food and store it efficiently).<sup>83; 84</sup> The problem for modern day America is that while significant changes to our diet and exercise habits have occurred over the past century, our genome has remain pretty much the same<sup>p</sup> for the past 40,000 years.<sup>99</sup> Indeed, the selective pressures that have contributed most to our current human genome pre-date even the beginning of agriculture. In a hunter-gatherer world, physiological factors that contributed to the storage of fat and low level of satiety would have been heavily selected for, because they would have provided a significant survival advantage. Likewise, factors that contribute to salt and water retention would have provided a survival advantage in areas where water was scare. This is why some scientists now

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<sup>p</sup> Artemis Simopoulos reports that “The spontaneous mutation rate for nuclear DNA is estimated at 0.05% per million years. Therefore, over the past 10,000 years there has been time for very little change in our genes, perhaps 0.005%.”<sup>99</sup>

argue that the factors that contribute to essential hypertension were naturally selected.<sup>100</sup> So, while physiological processes that are geared towards the promotion of eating large quantities of food and storing it as fat would have provided for a survival advantage in our ancestors, they could also represent a survival disadvantage in our current environment of plenty.

The ramifications for the Normal Functions Model based on Wright's account of function should be clear: the factors that contribute to humans wanting to eat all of the time are not dysfunctional. Atavistic impulses, a propensity to store fat relatively easily, and an arrant desire for fatty foods are all *normal* aspects of human nature, despite how bad they are for us in this day and age. However, I want to re-emphasize the point that just because Wright's account of function does not consider the factors that contribute to common obesity as being dysfunctional does not mean that the medical community does not have a strong interest in combating obesity. Treatment of obesity via gastric bypass surgery,<sup>101; 102</sup> new medical therapies,<sup>103</sup> or even genetic medicine<sup>82</sup> might be *justified* from an economic standpoint based on epidemiological and public health cost-benefit models.<sup>79; 104; 105</sup> Treatment could also be completely *justified* from an empathetic and compassionate perspective. The distinction between treatment and "disease" has never been very firm within the medical community, as doctors have always had a tendency to provide treatment for things that are not always clearly a disease (ie. cosmetic surgery, vaccines in healthy children).<sup>9</sup>

However, treatment of the factors that contribute to obesity, as viewed through the lens of a Wrightian account of function, *cannot be justified from the standpoint of justice*. The fair equality of opportunity model helps determine what individuals owe to one

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<sup>9</sup> See further Engelhardt's chapter on the "Languages of Medicalization."<sup>106</sup>



another and to society in general. By using a Wrightian account of function within the Normal Functions Model, it should be clear that interventions<sup>f</sup> aimed at the factors that contribute to obesity would represent an unreasonable expansion of health-care rights. Factors that contribute to obesity do not represent an insult to equality of opportunity because those factors are part of *normal functioning* for the human species. Thus, individuals who are predisposed to getting fat do not have a justifiable claim on society for resources to combat those predilections, at least from a political and justice standpoint.

Common Obesity and the Goal-Contribution Definition of Function  
(*aka: The Factors that Contribute to Obesity are Dysfunctional*)

From a Boorsian perspective, the factors that contribute to obesity clearly represent a dysfunctional state in that obesity is associated with decreased survival and reproduction, the ultimately biological goals that humans tend towards. Over the past 40 years, there has been an *abundance* of literature detailing the central role obesity plays in diabetes,<sup>107; 108; 109; 110</sup> hypertension,<sup>111; 108; 109</sup> heart disease,<sup>112; 111; 113; 108; 109</sup> liver failure,<sup>108; 109</sup> cancer,<sup>114; 108; 109</sup> osteoarthritis,<sup>109</sup> pancreatitis,<sup>109</sup> and overall mortality,<sup>108; 109</sup> among other things. Without question, obesity negatively impacts overall human health.

Yet, even if we take a broader Boorsian perspective on function outside of the realm of biology – that a function is a contribution to an overall goal – we can see how the factors that contribute to obesity have become so dysfunctional in the 21<sup>st</sup> century.

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<sup>f</sup> The interventions that I am referring to include gastric bypass surgery, medicines that could decrease satiety, or anything else that combats our innate desire to eat food in quantities that exceed our nutritional demands.

Boorse views survival and reproduction as the overall goals of the human species because that is what humans *tend* towards. This is a very reasonable scientific justification for his account of function. However, even if we exclude the biological goal of survival and reproduction as Boorse's ultimate goal, obesity seems to impede almost all other goals that humans *tend* towards. In 1993, the *New England Journal of Medicine* published a study that examined the social and economic consequences of obesity of over 10,000 individuals. The data, which was collected over 7 years, showed that women who were overweight had completed fewer years of school (0.3 year less,  $p \leq 0.009$ ), were less likely to be married (20% less likely,  $p \leq 0.001$ ), had lower household incomes (\$6,710 less per year,  $p \leq 0.001$ ), and had higher rates of household poverty (10% higher,  $p \leq 0.001$ ) than women who were not overweight, "independent of their base-line socioeconomic status and aptitude-test."<sup>115</sup> Additionally, overweight men in the study were less likely to be married (11% less likely,  $p = 0.005$ ).<sup>115</sup>

In the Nurses' Health Study, a prospective cohort study of over 40,000 women published in *JAMA* in 1999, it was shown that women who gained 5 – 20 lbs were associated with "decreased physical function and vitality, and increased bodily pain regardless of baseline weight."<sup>116</sup> The authors concluded that weight gain was associated with a subjective decrease in quality of life.<sup>116</sup> Regardless of how one wishes to designate human "goals," data measuring the impact of obesity on people's lives in the 21<sup>st</sup> century suggests that obesity does not contribute to much more than ill-health, worse education, worse employment, and worse overall quality of life.

Obesity in America is an apposite case study to highlight the diverging effects that Wright and Boorse have on the Normal Functions Model because it pins down *so*

*precisely* what the difference is between the two accounts of function. An analogy might be helpful. Polar bears have very thick fur and a propensity to store large amounts of fat to insulate their bodies from cold air and water. These physical characteristics have come about mainly because they offer a survival advantage in cold climates. However, if one were to transport a polar bear to the Sahara desert, its very thick fur and propensity to store large amounts of fat to insulate its body would not be very beneficial to the polar bear's overall health. In fact, those physical characteristics would most likely lead to significant morbidity (massive heat exhaustion) and early mortality. Wright's account of function would not view the fact that the polar bear's thick fur and fat storage propensities are dysfunctional in nature, even if it were living in a desert. Rather, the polar bear's fur and fat are functioning correctly, and it is the cataclysmal environmental shift that is contributing to the polar bear's problems. While this is very sad for the polar bear, it is clear that its fur and fat are not dysfunctional. Boorse would most certainly disagree, given that the fur and excess fat are not contributing to the deracinated polar bear's overall goals.

Boorse's account of function is unable to discount such things as a change in setting: while a certain genotype might provide positive selective value in one setting, that genotype may also be detrimental in another setting, and the goal-contributing account of function must take this into account. The data above should provide clear evidence that the factors contributing to obesity in America are *not* dysfunctional according to a Wrightian account of function, whereas the factors contributing to obesity *are* dysfunctional according to a Boorsian account of function, and this highlights the

importance of utilizing a teleological account of function within the Normal Functions Model.

In the same way that Boorse's goal-contributing account of function must take into account the secular trends against short people, it must also take into account shifting environments when trying to determine if certain physiological processes are dysfunctional or not. The impact that different environments – both in space and time – have on the goal-contribution account of function are further evidence of how Boorse's account of function is too unstable to be utilized within a politically derived conception of just health care such as the Normal Functions Model. Obesity results because humans have been predisposed to having a low degree of satiety. While this certainly leads to public health problems, it does not represent a *fundamental insult to equality of opportunity because it is an aspect of human nature that all humans share*.

Having to determine if the environment contributes to overall survival and reproduction adds one more interpretative layer to understanding if a process is dysfunctional or not. This leads to more and more opportunities for comprehensive doctrines to enter into the overall process of deriving a just health care system. Boorse's account of function must take into account many different things: secular trends, the social, temporal, and environmental setting in which we live in, shifting values towards health and disease, even generational changes in where we live. In determining how all of those different things impact one's life, individuals will almost always rely on their own comprehensive doctrines in informing their political judgment whether they try to utilize them or not. This is unacceptable from a Rawlsian standpoint.

Wright's account of function is much more neutral and stable in that it demands an absolute minimal amount human interpretation. His account of function is based on causal explanations, nothing more. While at times it is certainly difficult to determine those causal origins (in the case of biology, understanding what selective pressures contributed to what functions), when they are determined, they can be utilized with full confidence that they are politically neutral and stable.

## Conclusion

The fundamental difference, I think, between goal-contributing definitions and teleological definitions that can be teased out from these case-analysis's is that Boorse's contextually oriented approach to function (when juxtaposed with Wright's) is open-ended. It is analogous to the ethical concept of consequentialism. One evaluates a function in terms of whether or not it contributes to an end-state *goal*. In the case of biology, that end-state goal is survival and reproduction, just as in ethics the end goal is oftentimes thought to be overall utility. While this view of function can lead to some puzzling paradoxes, such as the fact that the factors that contribute to common obesity are normal, it avoids difficulties with deriving explanations on why certain functions occur.

Wright's account of function, in contrast, is in some ways analogous to the ethical concept of deontology. End consequences, such as survival or reproduction, are irrelevant in evaluating the functional efficacy of a biological process. The only determinate of functional success is whether or not the biological process satisfies its intended – as dictated from natural selection – functions. While there are certainly disadvantages to view function in this manner, it is certainly the most neutral and stable way to evaluate processes in that there is no room for interpretation, *assuming that the machinery that undergirds natural selection can be determined*.<sup>s</sup> At the very least, this approach leaves the ball in the court of biology and out of political and philosophical quibbling.

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<sup>s</sup> Indeed, one drawback of Wright's account of function when applied to biology is determining what traits have been naturally selected for. The scientific and anthropological data that is required to make such determinations is never conspicuous, and demands much research.

It should be clear that after applying the two accounts of function to the concepts of idiopathic short stature and obesity, one can see that there are very real and very divergent accounts that can stem from applying these two different concepts to the same cases. The goal-contribution definition of function would seem to argue that short stature and the factors that contribute to obesity are indeed the result of dysfunctional processes, and should thus carry the appellation of dysfunctional along with all other associated moral, legal, and medical baggage, good or otherwise. Alternatively, the teleological account of function would seem to argue that idiopathic short stature, obesity, and perhaps even essential hypertension are normal. All are evolutionarily neutral processes, just as different blood types or ear-lobe shape. Thus, under the Normal Functions Model, subsidized treatment for those states would represent an unreasonable expansion of health care rights. Social support for treatment of those states would be tantamount to providing for an expensive taste, such as not wanting to look old.

While using the teleological account of function within the Normal Functions Model may make the model seem heartless (“hey buster, you’re callin’ *me* normal!”), it does provide for a tremendous expansion of health care rights compared with the current U.S. system. Currently, there are around 45 million Americans without health insurance.<sup>117</sup> The Normal Functions Model, even when using Wright’s account of function, would mandate some level of health insurance coverage for all Americans. This is because lack of any health care for *dysfunctional* processes represents a fundamental insult to equality of opportunity. However, that model – while certainly providing a significant expansion of health care rights compared with what we currently

have – would not cover such things as idiopathic short stature or gastric bypass surgery for obesity.

Of course, if there were no economic scarcity all of us would choose a comprehensive health care system that provided the best of everything for everyone. No one is irrationally callous. However, that is unrealistic, even in the wealthiest of nations such as the U.S. The U.S. already spends nearly 16% of its gross domestic product (GDP) on health care<sup>118</sup> (that is over \$6,700 per person), and that number is expected to reach 20% by 2015!<sup>119</sup> Daniels's Normal Functions Model is justified from a political standpoint, and does not take into account economic scarcity. The model blocks paying for breast augmentation because it represents a treatment decision based on a comprehensive doctrine; not because breast augmentation would put an unnecessary drain on our overall economy. However, given the significant economic challenges that the U.S. faces with regard to health care, a Normal Functions Model that utilizes Wright's account of function would provide a more frugal (but justifiably so) approach to universal health care.

Conceptual analysis has traditionally sought to derive, and at times force, internal consistency within terms and definitions. However, what this thesis has attempted to do is highlight the demands that Rawlsian liberalism place on concepts and terms that are utilized within broad ethical frameworks. While accounts of biological function are but one specific example of conceptual analysis, I have tried to use the function debate as an example of how vital a role any analytical concept can play within broad ethical theory.

On a more specific level, it should be clear that concepts within political liberalism should strive to be as neutral and stable as possible. I am not claiming that



Wright's account of function is devoid of *all* interpretive corruption, and is thus a purely analytical concept. Rather, I have used the case studies as a tool to show how much more Wright's account of function tends towards neutrality and stability than Boorse's account of function. *My position is that Wright's account is sufficiently neutral and stable to be workable within Public Reason, whereas Boorse's account of function is not.* When applied to Daniels's Normal Function Model for just health care, I think we can see where teleological approaches to function succeed in conforming to the demands imposed by Public Reason. While other accounts of biological function may satisfy conceptual scrutiny, they fail to align with the demands of political liberalism when forced to be applied to practical models of justice.

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119. Borger, C, and et al. "Health Spending Projections through 2015: Changes on the Horizon." Health Affairs Web Exclusive W61 (2006).

## Curriculum Vitae

Eric Douglas Morrell

### Education

- 2008            Doctor of Medicine (M.D.)  
Indiana University School of Medicine  
Indianapolis, IN
- 2008            Master of Arts (M.A.) in Philosophy  
Concentration in Bioethics  
Thesis: “Who Are You Calling Normal! – The Relationship Between  
Species Function and Health Care Justice” (Thesis Director: Peter  
Schwartz, M.D.,Ph.D.)  
Indiana University  
Indianapolis, IN
- 2003            Bachelor of Arts (B.A.) with Highest Distinction, Phi Beta Kappa  
Concentration in English Literature and Biochemistry  
Indiana University  
Bloomington, IN

### Clinical Training

- 2008-current    Internship in Internal Medicine  
Department of Internal Medicine  
National Naval Medical Center  
Bethesda, MD

### Research Experience

- 2006-2007      Student Researcher  
Principal Investigator – Paul R. Helft, M.D., Indiana University School  
of Medicine, Section of Hematology/Oncology, Director of Fairbanks  
Center for Medical Ethics. Investigated DNR ordering patterns and  
end of life care via retrospective cohort study.
- 2005-2006      Student Researcher  
Principal Investigator – Daniel R. Meldrum, M.D., Indiana University  
School of Medicine, Section of Cardiothoracic Surgery, Director of  
Surgical Research. Investigated vascular reactivity in pulmonary  
artery and aorta following hypoxia and endotoxemia.



2004

Student Researcher

Principal Investigator – Leonard F. Peruski, Ph.D./W. Marshall Anderson, Ph.D., Indiana University School of Medicine, Department of Microbiology and Immunology. Investigated and identified the molecular components involved in the  $\gamma$  diagnostic phase that infects a majority of the strains of *Bacillus anthracis*.

## Publications

### *Peer-Reviewed Papers*

1. Morrell ED, Brown BP, Qi R, Drabiak K, Helft PR. The Do-Not-Resuscitate Order: Associations with Advance Directives, Physician Specialty, and Documentation of Discussion 15 Years after the Patient Self-Determination Act. *Journal of Medical Ethics*. in press.
2. Wairiuko GM, Crisostomo PR, Wang M, Morrell ED, Meldrum KK, Lillemoe KD, Meldrum DR. Stem Cells Improve Right Ventricular Functional Recovery After Acute Pressure Overload and Ischemia Reperfusion Injury. *Journal of Surgical Research*. 2007 Aug; 141(2):241-246.
3. Tsai BM, Lahm T, Morrell ED, Crisostomo PR, Markel T, Wang M, Meldrum DR. Ethyl Pyruvate Inhibits Hypoxic Pulmonary Vasoconstriction and Attenuates Pulmonary Artery Cytokine Expression. *Journal of Surgical Research*. 2007 Jun 13; [Epub ahead of print]
4. Tsai BM, Patel K, Wang M, Morrell ED, Crisostomo PR, Meldrum DR. Selective Protein Kinase C Inhibition Attenuates Pulmonary Artery Cytokine Expression without Affecting Hypoxic Pulmonary Vasoconstriction. *Shock*. 2007 Jan;27(1):36-39.
5. Crisostomo PR, Wang M, Wairiuko GM, Morrell ED, Terrell AM, Seshadri P, Nam UH, Meldrum DR. High Passage Number of Stem Cells Adversely Affects Stem Cell Activation and Myocardial Protection. *Shock*. 2006 Dec;26(6):575-580.
6. Crisostomo PR, Wang M, Herring CM, Morrell ED, Seshadri P, Meldrum KK, Meldrum DR. Sex Dimorphisms in Activated Mesenchymal Stem Cell Function. *Shock*. 2006 Dec;26(6):571-574.
7. Terrell AM, Crisostomo PR, Wairiuko GM, Wang M, Morrell ED, Meldrum DR. JAK/STAT/SOCS Signalling Circuits and Associated Cytokine-Mediated Inflammation and Hypertrophy in the Heart. *Shock*. 2006 Sep;26(3):226-34.
8. Morrell ED, Tsai BM, Crisostomo PR, Wang M, Meldrum DR. p38 Mitogen Activated Protein Kinase Mediates the Sustained Phase of Hypoxic Pulmonary Vasoconstriction and Plays a Role in Phase I Vasodilation. *Journal of Surgical Research*. 2006 Aug;134(2):335-341.
9. Morrell ED, Tsai BM, Crisostomo PR, Markel TA, Wang M, Meldrum DR. Therapeutic Concepts for Hypoxic Pulmonary Vasoconstriction Involving Ion Regulation and the Smooth Muscle Contractile Apparatus. *Journal of Molecular and Cellular Cardiology*. 2006 Jun;40(6):751-760.
10. Crisostomo PR, Wang M, Wairiuko GM, Morrell ED, Meldrum DR. Brief Exposure to Exogenous Testosterone Increases Death Signaling and Adversely

- Affects Myocardial Function After Ischemia. *Am J. Physiol Regul Integr Comp Physiol.* 2006 May;290(5):R1168-74.
11. Crisostomo PR, Wairiuko GM, Wang M, Tsai BM, Morrell ED, Meldrum DR. Preconditioning Versus Postconditioning: Mechanisms and Therapeutic Potentials. *J Am Coll Surg.* 2006 May;202(5):797-812.
  12. Morrell ED, Tsai BM, Crisostomo PR, Hammoud ZT, Meldrum DR. Experimental Therapies for Hypoxia-Induced Pulmonary Hypertension During Acute Lung Injury. *Shock.* 2006 Mar;25(3):214-226.

#### Presentations

1. Do-Not-Resuscitate Ordering Patterns Among Physician Specialties. 2007 Joint Ethics Conference of the 18<sup>th</sup> Canadian Bioethics Society Conference and the 3<sup>rd</sup> International Conference on Clinical Ethics and Consultation, Toronto, Canada, May 30-June 3, 2007. (poster presentation)
2. Viagra Restores Pulmonary Artery Vasorelaxation in Endotoxin-Induced Acute Lung Injury. 26<sup>th</sup> Annual Meeting of the Surgical Infection Society, La Jolla, CA, April 27-29, 2006. (poster presentation)
3. p38 Mitogen Activated Protein Kinase Mediates Acute Hypoxic Pulmonary Vasoconstriction. Academic Surgical Conference 1<sup>st</sup> Annual Meeting, San Diego, CA, Feb 7-11, 2006. (oral presentation)

#### Honors and Achievements

2006-2008	Health Professions Scholarship Program Recipient, U.S. Navy
2007	Fourth Place National Medical Student Research Competition, Association of Academic Surgery National Student Research Contest
2007	Fifth Place Indiana Statewide ACP Abstract Competition in the Medical Student Research Division, Indianapolis, IN
2006	Commissioned Officer U.S. Navy
2006	First Place (co-winner) Medical Humanities Graduate Student Essay Contest, IU School of Medicine/IUPUI Graduate School/IU Law School, Indianapolis, IN
2006	Third Place Resident Research Poster Award, 26 <sup>th</sup> Annual Meeting of the Surgical Infection Society, La Jolla, CA
2006	Second Place Indiana Statewide ACP Abstract Competition in the Medical Student Research Division, Indianapolis, IN
2006	Qualified for Boston Marathon – finished with time of 2:54:13 (588/19688 finishers)
2004-2006	Vernie and Murley Plummer Scholarship Award Recipient, IU School of Medicine
2004-2006	Theodore Abercrombie Scholarship Award Recipient, IU School of Medicine
2005	First Place Indiana Statewide ACP Abstract Competition in the Medical Student Research Division, Indianapolis, IN
2004	AHEC Student Research Grant, IU School of Medicine

- 2003 Indiana County Fee Remission Scholarship, Indiana University  
Bloomington
- 2003 Margaret Banks James Teaching Award, Indiana University English  
Department
- 2003 General Honors Notation from Honor's College, Indiana University  
Bloomington
- 2003 Honors in English (Undergraduate Thesis – “Jonson’s “Steele-Pen”:  
Carving Out a New Mode of Literature” – Thesis Director: Ellen  
MacKay, Ph.D.)
- 1999-2003 Dean's Honor List, Indiana University Bloomington
- 2002 Phi Beta Kappa, Indiana University Bloomington

#### Professional Memberships

American College of Physicians, student member