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TELEOFUNCTIONALISM AND THE NORMATIVITY OF PRACTICAL RATIONALITY

by

DAVID A. DIDOMENICO

Under the Direction of Dr. Eddy Nahmias and Dr. Dan Weiskopf

ABSTRACT

In this thesis, I apply teleofunctionalism to a current debate concerning the normativity of practical rationality. Assuming teleofunctionalism is the correct theory of mental phenomena, I argue that it can provide a promising account of the normativity of practical rationality. This claim is motivated by the idea that a capacity to represent internal states, external states, and relations between these states as reasons for action has a teleofunction, and is thus a source of normativity. This teleofunction is marked by a distinctive causal role that reason-representation plays in action. Although I argue that this capacity developed out of processes of biological natural selection, the content of representations of reasons for action produced by the mechanisms underlying this capacity need not be determined solely by biological selection. In an effort to naturalize normativity in this way, I discuss the relation between biological-functional normativity and the normativity of rationality itself.

INDEX WORDS: Teleofunctionalism, Practical rationality, Normativity, Action, Mental representation, Content, Evolution, Selection process

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DAVID A. DIDOMENICO

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DEDICATION

For Dr. Steve Brule—for I too will soon be a doctor.

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1. INTRODUCTION

'Practical rationality' is typically described in one of two ways: 1) recognizing what I have reason to do, or 2) internal coherence of psychological states or attitudes relative to the practical reasons I already have. Recognizing that I have most reason to avoid harmful predators or to eat nutritious apples over dirt are both instances of rationality in the first sense.[1] Rationality in the second sense prescribes a certain way in which we ought to think about the reasons we have such that our other mental states are consistent with those reasons. If I believe that I have most reason to apply for this car loan over that car loan, then rationality requires that I decide to apply for this one. It's easy to see how these two senses of rationality can be conceptually separated. I may recognize what I have most reason to do, but fail to form appropriate decisions and intentions following the recognition of what reasons there are for me. Alternatively, there may be times when I do not recognize what I actually have most reason to do. In fact it's probably true of most of us that we very rarely recognize what we have most reason to do. Nevertheless, once we have formed beliefs about what we have most reason to do, rationality makes certain demands on us—it requires that our psychological attitudes cohere with those beliefs. If I believe that I have most reason to donate to Oxfam, then rationality requires that I form an intention to donate to Oxfam.

We would not want to reduce rationality to coherence of psychological states alone, however, because such a reduction would entail that acting on the basis of false beliefs regarding what one has reason to do would be correctly described as rational. Murdering one's neighbor isn't the rational thing to do merely because one believes he has most reason to rid himself of his

[1] From here onward, 'rationality' and 'practical rationality' will be used interchangeably. In this paper I avoid any direct discussion of theoretical or epistemic rationality.

neighbor (perhaps his neighbor's cats regularly meander into his garden and consume his basil leaves). Hence, the normative[2] standard of practical rationality includes not only internal coherence of psychological states, but also an ability to recognize actual reasons as opposed to merely apparent ones. Simply put, practical rationality is *a capacity to respond correctly to actual reasons*.

The normative standard of practical rationality is pervasive throughout our day-to-day interactions with others and our introspection on our own behavior. We *feel* normative pressure to be rational, and our reasons take priority when we deliberate about possible courses of action that we might take. Moreover, acting rationally often renders one the object of praise, acting irrationally the object of criticism. There are distinct phenomenologies to serving as the object in either case. Generally speaking, we feel good when others approve of our actions and bad when they do not. When we fail to act in accordance with the dictates of reason we often feel guilty, ashamed, or even blameworthy.[3]

It should be clear that we at least think and act as if rationality were normative, but is it really? What licenses or entitles us to apply the normative standards of rationality to our own behavior and the behavior of others? Nicholas Southwood claims that any account of the normativity of rationality "would have to show that, for any agent and rational requirement, the agent has an independent reason to obey the requirement" (13). In other words, any successful account of the normativity of rationality must provide universal justification for complying with rational requirements. Rationality must be normative for everyone, everywhere, all of the time.

[2] There are a variety of ways in which one might use the term 'normative'. In this paper, I will use the term to refer to a feature of rules or requirements that renders those rules or requirements ones that we *ought* to follow or *have reason* to follow. Practical rationality is normative in the sense that we ought to follow the rules of rationality.

[3] This claim is consistent with our sometimes regretting having done what we thought was the most rational thing to do. There is probably quite a bit of individual difference on this point. I mention these points only to highlight the concrete nature of rationality in our everyday lives.

The supposed categorical nature of the normativity of rationality has led some philosophers to doubt that rationality is in fact normative. For example, John Broome argues that "it is only a contingent fact, if it is a fact at all, that the rational faculty is part of the best means of achieving much of what you ought to achieve" (10). Although rationality is instrumentally successful, we can imagine possible worlds in which rationality is not the best means we have of achieving the things that we ought to. It follows naturally from these possible worlds that the following proposition is false: necessarily, if rationality requires N to F, then N ought to F because rationality requires N to F.[4] Hence, Broome says that no argument can be given to show that rationality is in fact normative, although he takes it for granted that rationality is in fact normative. One might worry that if Broome is right, then the normative claims we make about human rationality are illegitimate. When we charge people with irrationality, our charge is groundless. In order for rationality to be normative, the rules of rationality must necessarily apply to all rational agents.

In this paper, I also take it for granted that rationality is in fact normative. In other words, my goal is not to persuade the skeptic who asks "Why ought I be rational?" that she is wrong. On the contrary, my goal is to offer a convincing answer to the question "What makes it the case that rationality is normative for creatures like us?" To help the reader see the problem I am trying to address, consider the following analogy. Suppose I am doing evolutionary biology and a skeptical student approaches me and asks "Do hearts really pump blood?" I may respond to the student that I merely take it for granted that hearts pump blood—that I don't need to provide any arguments to answer this or that skeptical challenge about brute biological facts. However,

[4] Broome refers to this proposition as strong normativity. In his 2008, he distinguishes between strong, weak, and medium normativity. Strong normativity entails both weak and medium normativity. Hence, if I can show that rationality is normative in the strong sense, that is all that is required to show that rationality is normative in any sense on his reading of normativity.

suppose another student approaches me and asks "I know that hearts pump blood, but *why* do they do this?" To respond to this question, I may provide an argument for why the heart does what it does by reference to the heart's evolutionary history. Analogously, an interested philosophy student might ask "I know that I ought to do the rational thing, but what makes this true? *Why* is rationality normative?"

To answer these questions, I draw from the philosophies of mind and biology, both following the lead of, and responding to a challenge from, Timothy Schroeder. In "Practical Rationality is a Problem in the Philosophy of Mind," Schroeder argues that philosophers of mind have at their disposal various tools for explaining the normativity of rationality. In short, his argument runs as follows: insofar as actions are caused by some combination of mental states, e.g. beliefs, desires, and intentions, it's likely that an essential feature, or combination of features, of these states might lead us in the right direction to explaining the normativity of rationality. Philosophers of mind are well-equipped to answer questions about these mental states and their interactions. Thus, philosophers of mind ought to be working on giving a satisfactory account of the normativity of rationality.

Following this initial methodological suggestion Schroeder considers the extent to which teleofunctionalism, a substantive thesis in the philosophy of mind, can explain this kind of normativity. Teleofunctionalism is an attractive tool for bridging the gap between *is* and *ought* because the notion of a teleofunction provides a direct source of normativity. Consider the teleofunction of a sunflower's phototropic mechanisms. Those phototropic mechanisms that succeed in turning the sunflower toward the sun are doing what they were naturally designed to do. Defective mechanisms that fail to turn the sunflower toward the sun fail to do what they

ought to do. Thus, the teleofunction of these mechanisms in sunflowers serves as a kind of prescriptive norm for what the mechanisms are supposed to do.

After a brief examination of teleofunctionalism's virtues, Schroeder concludes that the theory fails to explain the normativity of practical rationality for two primary reasons. First, Davidson's Swampman[5] demonstrates that histories of natural selection fail to explain the normativity of rationality because "[e]ven if we were, like Donald Davidson, the children of an earthly swamp and a heavenly lightning bolt, we would be capable of acting rationally or irrationally: as we ought or as we ought not" (402). Thus, reference to histories of natural selection fails to explain the rationality of action. However, one might respond that histories of natural selection are required to have a mind at all. Schroeder's second objection is that teleofunctionalism still fails because "biological imperatives are not enough to make a course of action truly reasonable" (402). To support this claim, Schroeder invokes the idea that we could have "been naturally selected to sometimes have sex with biologically fit and fertile partners regardless of the social, emotional, and moral consequences of such sex" (402). The point is that having such sex would not be made rational simply by virtue of its having been genetically selected for.

Perhaps Schroeder is too quick to dismiss teleofunctionalism as a philosophical tool with which to explain rational normativity. In what follows, I'll address Schroeder's initial worries about the extent to which teleofunctionalism succeeds at this task.[6] After dismissing these

[5] The Swampman argument is a thought experiment first put forth by Davidson in "Knowing One's Own Mind" (1987). Suppose Davidson is standing near a swamp when lightning strikes a tree beside him and destroys him. Also suppose that, by some cosmic coincidence, the lightning results in the formation and emergence from the swamp of another creature that is particle-for-particle identical to Davidson. The apparent problem for teleofunctionalism is that there is no history of natural selection present in Davidson's example, yet it seems that Davidson's doppelganger would still be minded. If this intuition is correct, histories of natural selection are not required for either an adequate account of mental content or the normativity of practical rationality.

[6] However, I'll leave aside a detailed response to the Swampman objection. Swampman is a problem for teleofunctionalism only if histories of natural selection are required to instantiate normative functions. Processes of

worries, I'll offer reasons to support the idea that teleofunctionalism can explain the normativity of practical rationality. Specifically, a cognitive *capacity* to represent internal states (e.g. beliefs, desires, preferences, goals), external states, and relations between these states, as *reasons for action* is a capacity that arose out of biological selection processes during the course of human evolutionary history. Over time, this capacity developed into a system designed to organize competing reasons for action and be motivated by them. For example, suppose I recognize that the delicious flavor of the chocolate cake in front of me is a reason for me to eat the cake, but I also recognize that my desire to lose weight is a reason to avoid eating the cake. Without a system designed to deliberate about these reasons and organize them hierarchically it's unlikely that I would be able to reliably act on the best reasons that there are for me. Hence, the rational capacity is in the business of not only recognizing reasons, but also ordering them appropriately such that my actions reflect what I have most reason to do.

If our capacity for rationality was naturally designed in this way, then the rational capacity is normative by virtue of its serving a teleofunction—the capacity was designed to perform a certain function, so an *ought* is created by natural selection. That is not to say that the *content* of reason-representations is best explained solely by genetically-driven processes of natural selection. The content of reason-representations can be derived from a variety of selection processes whether they be biological, social, developmental, or processes of social or ontogenetic learning. Thus, the teleofunction of the cognitive capacity for reason-representation explains why rationality is normative, but the actual content of representations produced by the mechanisms underlying this capacity can be filled in by whatever reasons for action there happen

natural design are sufficient to create teleofunctions, but why think that they are also necessary? Schroeder (2004) himself offers a convincing teleofunctionalist response to the Swampman argument by invoking the notion that normative functions can be instantiated atemporally through processes of regulation. I don't have space to appropriately engage with this idea here, so I'll merely direct the reader to Schroeder's argument in "Functions From Regulation" (2004).

to be for a particular agent in her particular situations, reasons which are dependent on her environment, history, and mental and bodily states. I don't deny that some content-specific internal states might also have been directly selected for on the basis of serving a teleofunction in the systems of which they are a part, but I won't argue for such a view here.

Hence, I argue that the *capacity* for rationality—our ability to represent reasons and to be motivated to act on them—is normative because it has a teleofunction. The *content* of our reasons is appropriately flexible and may vary depending on the agent in question. On my reading of the normativity of rationality, perhaps there is a sense, albeit a thin one, in which this normativity can be known a priori. It may be true that, for any agent in any possible world, one always *ought to respond correctly to reasons*. However, responding correctly to reasons might be instantiated in a variety of different ways across possible worlds. Spelling out what the rules of rationality actually entail in a given world is an activity that requires importing at least some empirical content about that world. To be clear, my goal in this paper is to explain why *the rational capacity that we actually possess* is one that we ought to use when we deliberate about possible courses of action. Indeed, it is a contingent feature of our world that natural selection has shaped a rational capacity that serves as the best means we have of responding correctly to reasons. The mere fact that there are other possible ways in which rationality could be realized does not entail that natural selection can't explain why the human rational capacity is normative for creatures like us, which is the object of focus in this paper.

2. TELEOFUNCTIONALISM, REASON-REPRESENTATION, & RATIONAL NORMS

The capacity to consider reasons for action and deliberate about what to do in order to determine a rational course of action can be explained by processes of natural selection. Given

the assumption that the ultimate purpose behind biological change and selection is maximizing genetic replication, it is plausible that a capacity to recognize what sorts of considerations are relevant to acting in certain ways rather than others, which may include but may not be limited to what ultimately best serves one's own self-interest, would enhance differential fitness and tend to be selected.[7] It isn't hard to see why acting irrationally would pose a direct cost to fitness. Once a cognitive system that represents the world is combined with a motivational system that guides action, i.e. something akin to a belief-desire psychology, a capacity for rationality follows naturally. A creature that either counter-rationally represents one act as better for it than another but reliably chooses the worse of the pair or fails to represent the best act as the best one probably won't survive long enough to reproduce and pass on its genes. Thus, departures from a certain minimum threshold of rationality would tend to be rapidly lethal.

Although it seems plausible that rationality serves an adaptive function in human behavior, merely stipulating the benefits of a trait (or the costs associated with its absence) is clearly insufficient to show that the trait in question is an adaptation. Even if it is a matter of fact that rationality is an adaptation, figuring out what rationality was *selected for* presents its own problem. The evolutionary psychology literature is thoroughly saturated with just-so stories that fail to provide the requisite evidence to support claims about some cognitive phenomenon or other being an adaptation. Although I take it for granted that the rational capacity is in fact an adaptation with an identifiable teleofunction, getting clear on the kind of empirical evidence that would be required to support this point is important.

In *Evolutionary Psychology as Maladapted Psychology*, Robert C. Richardson offers a skeptical, and to my mind successful, examination of evolutionary psychology's actual

[7] Psychological egoism, or the idea that humans either act or are motivated to act only out of self-interest, is compatible with, but surely not entailed by, the view I'm advocating here.

methodology. What Richardson criticizes is the extent to which that methodology represents strong *evolutionary* reasoning. In "reverse engineering" an inference is made from current function or structure to historical cause. It is a method used to determine the particular function for which a trait was selected. The problem, says Richardson, is that evolutionary psychologists, such as Cosmides and Tooby, fail to provide enough evolutionary evidence to support their claims. With respect to social reasoning, for instance, Richardson claims that Cosmides and Tooby "move seamlessly from the idea that we have some specialized cognitive mechanisms for social reasoning to the conclusion that the acquisition of these mechanisms depends on the prior existence of foundational social schemata," although they do not provide any argument for why this inference is a strong one (2007, 25-26). The relevance of this point for the present discussion is that identifying the apparent function of practical rationality isn't sufficient evidence for the idea that the rational capacity was selected for that particular function. We need to know more about the historical environmental conditions in which the rational capacity emerged in order to justify the claim that the rational capacity is an adaptation. Because I don't argue directly for this claim, the reader may wish to read my ultimate conclusion as a conditional—if the rational capacity is an adaptation that was selected for because it has the teleofunction that I stipulate, then practical rationality is normative.

It wouldn't be surprising if it turned out that future evidence supported the claim that a rational capacity that motivates actions that satisfy an agent's own goals, preferences, and desires was directly selected for. For ease of use, call the kind of representation formed by such a capacity a 'PR-representation': a mental representation of a reason for action that expresses normative force regarding performance of that action (i.e. an "ought" thought), the content of which is dependent on the agent's internal states and the relations those states have to her

external environment. Does the PR-representational system have a teleofunction? If so, what is this teleofunction, and what is the relation between a fully functioning PR-representational system and the normativity of rationality?

To answer these questions, consider the teleofunction of the human heart—namely, pumping blood. It seems that to say the heart has the specific teleofunction 'pumping blood' is to do no more than to give a causal explanation for what the heart was designed to do by reference to a selective history wherein past hearts contributed to higher overall levels of fitness in the organisms that possessed them (Millikan 1984, 27-8). In other words, the human heart has the teleofunction of pumping blood because that's what the heart was selected to do. The heart was selected to perform this function because it enhances fitness for the organism possessing the heart. This type of function is commonly referred to in the literature as "function as selected effect" (Wouters 2003, 649). A phenotypic trait that performs an adaptive function gets selected for by virtue of its fitness-enhancing effect.

An analogous case can be made for the claim that the PR-representational system has a teleofunction that developed out of processes of natural selection. This claim hinges on the plausibility of the idea that past PR-representational systems contributed to higher overall levels of fitness in those organisms that possessed them. To motivate this line of thought, consider a unique way in which poisonous snakes can be cognitively represented. As with other mammals, many humans are hard-wired to fear snakes, an adaptation that comes with clear evolutionary advantages. Those organisms that lacked a fear of poisonous snakes were more likely to be harmed or even killed by being bitten. Quickly and automatically avoiding snakes is an action that isn't best explained by action-motivating PR-representations, because reflex-like emotional actions aren't driven by rational calculation, deliberation, or consideration of reasons for action.

Interestingly, however, it's sometimes the case that we *desire* to approach poisonous snakes. Suppose I want to display the physiology of a pit viper to a class of middle school students. As a rational agent, I recognize that my desire to reach into the tank to grab the viper overrides the more basic desire I have to avoid snakes in virtue of my wearing protective gear. Insofar as I am rational, I recognize that acting out of an immediate fear response when I know that I'm out of harm's way constitutes a kind of irrational action.[8] In this example, the PR-representational system motivates action such that my basic desire to avoid snakes is overridden by a stronger desire to be an effective instructor. Thus, the PR-representational system allows rational agents to *organize* their reasons for action in light of an overall set of goals, preferences, and desires (i.e. conflicting desires to avoid snakes and not avoid snakes) by recognizing the relations between internal states and the external states that make certain courses of action rational (i.e. *that* the snake is poisonous but I'm also wearing protective gear).

Alternatively, consider another agent, call her Morgan, who strongly desires to finish writing her dissertation by the end of the fall semester. Morgan believes that going out drinking with friends on Friday nights will prevent her from finishing her dissertation on time, and she desires more to finish the dissertation than to party with her friends. It seems plausible that having a capacity to cognitively represent 'working on her dissertation' *as the thing she ought to do* would result in a greater probability that Morgan performs actions aimed at finishing her dissertation on time than if she lacked the capacity to appropriately organize her PR-representations. Thus, the actual teleofunction of the PR-representational system is best expressed in the following way: picking out the action for which the agent has most reason and

[8] For further elaboration on this idea, see Michael Brady's (2009) "The irrationality of recalcitrant emotions," *Philosophical Studies* 145 (3): 413-30.

motivating the agent to perform that action. In this case, the PR-representations guiding Morgan to write her dissertation are selected by the PR-representational system to motivate action.

Although overriding basic desires to avoid snakes and representing some actions (e.g. writing a dissertation) as more rational than other alternatives are both exercises of the rational capacity that also have content, my central focus here is on the bare capacity to engage in such cognitive processes. This capacity arose out of a selective pressure to organize the reasons for action that we were antecedently able to recognize. Offering examples that already have content is merely a useful feature of giving a plausible account of why such a capacity would have been selected for in the first place.

It is important to note that the kind of normativity captured by the teleofunctional strategy is prima facie different from the kind of normativity typically implicated in discussions about rationality. Contemporary ethicists usually describe the normativity of rationality in non-functional, non-biological terms. For example, Nicholas Southwood argues that rationality is normative because of distinctive kinds of standpoint-relative demands that rationality imposes on us. On Southwood's view, behaving rationally is "a matter of honoring our first-personal authority" (28). Moreover, some philosophers reject entirely the idea that the normativity of rationality can be explained by facts about our biology or the functional role played by some subset of our cognitive systems. Niko Kolodny argues, for instance, that the normativity of rationality can't be explained at all by functional or biological facts created by natural selection because we would be subject to the standards of rationality whether or not there are any fitness consequences attached to acting rationally or irrationally. Kolodny claims that "[i]t is an a priori truth, if you like, that we are, as believers and intenders, subject to standards of rationality. It is not something that evolutionary biology could confirm or disconfirm" (2005, 552).

On the teleofunctional account, this way of approaching normativity is mistaken. The mere fact that the normativity of rationality seems to represent an "a priori truth" does not entail that evolutionary biology has nothing important to say about it. It might still be the case that these different ways of talking about the normativity of rationality, through either a naturalistic lens or a rationalist one, are related in interesting ways. As a matter of fact, any attempt to naturalize either reasons or rationality will have to come to terms with the relation between the kind of normativity discussed by ethicists and the more primitive kinds issued by the natural sciences. Most of the motivation behind this project is a desire to explain how it could be the case that the kind of normativity involved in discussions of rationality is derivative on the kind of normativity inferred from more basic facts about the biological functions of our bodily systems. On my view, it may be an a priori truth that all agents ought to respond correctly to reasons. We don't need evolutionary biology to tell us that. However, evolutionary biology *does* tell us what "responding correctly to reasons" actually amounts to for creatures like us in a world like ours.

To explain how these two kinds of normativity are related, it seems reasonable to begin with the idea that the normativity of the PR-representational system is best cashed out in terms of the conditions for success and those for failure of this system's teleofunction. The PR-representational system succeeds in performing its teleofunction when the process by which it selects PR-representations with which to motivate action tracks, or lines up with, the norms of rationality. In other words, the teleofunction of the PR-representation system is to produce intentions and decisions that align with what is practically rational for the agent in question. For example, an agent may sometimes have PR-representations that fail to capture the salient features of her environment that afford genuine reasons for action, and thereby guide action toward ends that go against what is rational for her to do. When the PR-representational system

selects these representations as reasons on which to base action, the system fails to perform its teleofunction. Thus, the conditions for success and failure regarding the proper functioning of the PR-representational system captures a sense of normativity in that it *prescribes* what one *ought* to do. At a most basic level, the sense in which *I ought to be rational* is the same as the sense in which *anything ought to comply with its teleofunction*. I ought to be rational in the same sense that my heart ought to continue pumping blood. This is the sense in which biological-functional normativity and the normativity of rationality shake hands. Hence, the way to respond correctly to reasons is to comply with the output of one's own PR-representational system. In Sections 3 and 4 I will describe how these kinds of normativity are different, but not so different that the latter can't be derived from the former.

2.1 Non-Genetically Driven Teleofunctions & PR-Representational Content

It should be clear that I am not claiming that the normativity of rationality is completely explained by genetically-driven processes of natural selection. Teleofunctionalism, including Millikan's elaborate proper functionalism (1984), is not intrinsically linked with biological natural selection, and selection processes can apply to many different types of systems (e.g. social, cultural, developmental, learning). Schroeder's point that "biological imperatives are not enough to make a course of action truly reasonable" (402) hardly discounts all attempts to ground the normativity of practical rationality in teleofunctions. Although it's true that some practically irrational behaviors could have been selected for—for example, Schroeder's example about having sex regardless of the social, emotional, or moral consequences[9]—nothing I have

[9] Although I might add that it is hard to see how there wouldn't be fitness consequences stemming from indiscriminate sex. Ignoring real features of the world doesn't change the fact that those features will have consequences, many of which may decrease overall fitness. For example, suppose I decide to have sex with Mike Tyson's wife, all the while ignoring the social consequences of doing so, and then he finds out about it.

said above is incompatible with the notion that the *content* of PR-representations can be and oftentimes is determined by non-biological selection processes because teleofunctionalism makes no *essential* reference to biological natural selection.[10] Teleofunctions can arise out of processes of natural selection (e.g. the teleofunction of the rational capacity), but it's not necessary that they do. Although a *capacity* to consider reasons for action and deliberate about what to do arose out of biological selection processes, there is no reason to believe that the *content* of the PR-representations produced by such a capacity is wholly determined by immediate facts about our biology, with complete disregard for say, social or moral facts.

In fact, the content of many PR-representations is derived from non-genetically driven selection processes and non-selectional processes like social learning. First, selection processes can occur at an ontogenetic level, from "the differential reproduction of cognitive or behavioural items themselves during the development of a given individual" (Macdonald & Papineau 2006, 15). Such ontogenetic selection sometimes results in content derived "not from the evolution of the species, but from the development of the individual" (Dretske 1988, 64). For an example of PR-representational content derived from this kind of selection process, consider the actions performed by skilled poker players. After reading countless guides and playing in a bunch of tournaments, Gabe learns that raising his opponent's ante while holding a pair of aces is in his best interest. He raises the ante because he recognizes that raising is the rational thing to do, which he learned through past experience. There is no good reason to believe that the content-specific PR-representation guiding the decision to raise an opponent in poker would have been genetically selected for, yet the content is still appropriate for filling in a PR-representation. Thus, processes of learning and the development of skills or talents can provide content for PR-representations.

[10] Abrams (2005) presents a nice discussion of the relation between natural selection and teleofunctionalism.

Second, selection processes to perform actions that conform to social norms are also a source from which the content of PR-representations is derived. Fidelity to one's spouse, for instance, is required by the extant social norms in the U.S. and many other countries. The selective processes responsible for these norms are probably social in kind.[11] It isn't uncommon for an individual to cheat on her spouse even when she knows this is something she should not do. Cheating on one's spouse, therefore, is oftentimes appropriately described as a form of akratic behavior, or an irrational action. A description of the reasons why one shouldn't cheat on her spouse will include reference to the obligations and commitments one has agreed to endorse, which are best explained by social selection processes. Thus, we evolved the cognitive capacity to take social conventions as normative, and the actual content of any particular social convention is determined most immediately by social selection processes themselves.

Finally, PR-representations can be filled in by moral content. Recognition that another human being is a fully autonomous agent, for instance, might provide a reason in favor of taking her interests seriously. Another creature's capacity for sentience might also provide a reason for acting towards it in certain ways rather than others, e.g. acting so as to avoid harming it. Teleofunctionalism might not give us a satisfactory account of the salient features of states of affairs that represent *moral* properties. What it can do, however, is give an account of why one ought to comply with the output of her systems of rationality, when that output consists of PR-representations whose content was determined by actual moral properties, whatever those properties happen to be. As I stated earlier, it might turn out that there are content-specific internal states, in this case ones that track actual moral properties that were directly selected for because they serve a particular teleofunction. However, I don't argue for such a view here.

[11] Such a view is compatible with the idea that monogamy might also have fitness advantages. I should also mention that I don't deny that this example probably represents a moral norm as well as a social one.

2.2 PR-Representations & Rational Action

Having briefly discussed the content of PR-representational states, I'll now relate what has been said above about PR-representations back to the role these representational states play in rational action. Generally speaking, it seems that any adequate explanation of the normativity of rationality will require essential reference to something in the nature of action itself. If the source of the normativity of practical rationality is a motivational force designed to get us *to do something*, then PR-representations must play a significant role in action (at least if the system that produces them is going to have any *normative* force). Thus, a psychological marker of rational actions is that they are caused in the normal way by a fully-functioning PR-representational system (i.e. a system which picks out the appropriate PR-representations with which to motivate action). The causal relation implicated here is both necessary and sufficient. We don't say of organisms that lack a capacity for recognizing reasons that they ought to be rational; reason-representation is required for rationality. Hence, PR-representations are a necessary condition for the mere possibility of instantiating rationality through the performance of rational actions. Moreover, PR-representations are sufficient causes of rational action when they are produced by fully-functioning systems of rationality. On this view, we can understand akrasia in terms of cognitive systems of rationality that are defective, broken, or not performing their teleofunction. Thus, the regulation or design of action is part of the essential nature of the PR-representational system.

Furthermore, the notion of a PR-representation offers an interesting way to think about the relation between judgments about rationality and action itself. There have been a few attempts in the philosophical literature to apply teleofunctionalism to explanations of judgments about action. For example, Neil Sinclair argues that the teleofunction of moral judgments in

action is "steering patterns of cooperation away from the action condemned... towards the action praised" (2012, 652).[12] Whereas Sinclair uses teleofunctionalism to explain the function of *moral* judgments in action, I argue for the teleofunctional role of judgments about *rationality* in action. On the teleofunctional account, judgments about the rationality of action are just sets of PR-representations (i.e. these judgments are just aggregates of the motivating beliefs and desires that we have with respect to action). For example, when an agent's PR-representational system selects certain PR-representations in favor of performing or refraining from a certain action, that set of PR-representations constitutes the judgment the agent makes about the rationality or irrationality of the action in question. Thus, making the judgment 'this action is the rational thing to do' is nothing over and above the PR-representational system's activity of identifying which PR-representations win out.

Upon making a judgment that a particular action is the rational thing to do, one typically forms an intention or decision to perform that action. However, agents don't always do what they believe they have most reason to do. When the agent in question fails to execute the action she believes is represented by the best reasons, we often say of her that she performs an irrational action. Hence, the PR-representational system can fail to serve its teleofunction at the level of judgment or at the level of action. At the level of judgment, the system might fail to pick out the right PR-representations with which to motivate action. Furthermore, even when the right PR-representations are picked out, the system may fail to actualize the right intentions and decisions. If an agent is caused to act on the basis of her fully-functioning PR-representational system, then she acts rationally. Furthermore, if an agent acts rationally, then she must have represented actual reasons at the level of judging possible courses of action and formed intentions and decisions that are responsive to those reasons. This line of thought provides support for the idea that a fully

[12] Also, see Harms (2000) for a teleofunctionalist account of moral statements and utterances in action.

functioning PR-representational system is both causally necessary and sufficient for rational action, assuming there are no external circumstances that inhibit an intentional action from being realized.

3. REASONS OBJECTIVITY

In Section 2, I argued that the PR-representational system can fail to serve its teleofunction at two levels: 1) at the level of judgment, and 2) at the level of action. Up to this point I have emphasized the role of PR-representations in rational action and the sense in which the teleofunction of the PR-representational system can explain how rationality is normative. Using PR-representations to explain these phenomena perhaps gives the impression that I am advancing a view of reasons for action that is completely subjective. Such an impression is misleading. I will now argue that the teleofunctional account of practical rationality does not necessarily rule out the objectivity of rational action.

At the level of judgment, I'll assume there is an independent normative order that determines the successful representation of a reason for action. Such a normative order is required in order to keep the present account from sliding into complete subjectivity regarding what counts as rational action. Without an objective standard, what is rational for me to do is simply whatever my systems of rationality would have me do. Completely subjective theories of rationality like this fail to take into account the normativity involved not only in responding correctly to reasons, but in correctly representing actual reasons for action as such. An alcoholic who represents his desire for booze as an overriding reason in every case where drinking is one of his possible courses of action is behaving irrationally if drinking is causing him all sorts of

problems in his health or personal life such that he would be better off without it.[13] Although he represents drinking as 'that which I have most reason to do', acting in accord with that representation isn't sufficient for rational action because he gets things wrong at the level of rational judgment. Avoiding the drink entirely would be more conducive to his flourishing. Examples like this suggest that there are better and worse ways to organize one's internal states as reasons, given one's specific situation. On the teleofunctional account of practical rationality, one ought to go about organizing her internal states such that there is output of intentions and decisions that actually satisfy or help to satisfy the agent's goals, preferences, and desires.

Just as some people are better than others at organizing their own internal states such that they succeed in performing rational actions, it's also true that some people are better than others at recognizing what the external reasons are in favor of doing this rather than that. The fact that the cheeseburger sitting in front of you contains E. coli is certainly a reason for you to avoid eating the cheeseburger, yet it would seem too stringent to require that creatures like us have the ability to detect such a reason in order to be rational. It also seems true that hypothetical creatures that were better at detecting this reason, as well as all the ones we appropriately detect, would possess better systems of rationality, i.e. they would be more rational than us. Thus, veridical ascriptions of rationality fall somewhere on a continuum. There are greater and lesser degrees of it present in any particular agent, depending on the kinds of things the agent represents as reasons as well as the level of internal psychological coherence that follows from those representations. That isn't to say that we should fault the rational capacity of humans for not being able to detect microorganisms in food or failing to always recognize *all of the actual reasons* (although rationality would still minimally require the representation of *at least some actual reasons*). It seems reasonable to apply to any theory of the normativity of rationality what

[13] Indeed, not all (perhaps even not many) alcoholics represent drinking in this way.

Owen Flanagan calls the Principle of Minimal Psychological Realism: "[m]ake sure when constructing a moral theory or projecting a moral ideal that the character, decision processing and behavior prescribed are possible, or perceived to be possible, for creatures like us" (32). Although Flanagan's principle applies to moral theory, it is easily adapted to theories about rationality. An application of this principle to the teleofunctional account of rationality allows us to talk about what sorts of things humans ought to be able to recognize as reasons without making unreasonable demands on human behavior.

This notion of *actual* as opposed to merely *apparent* reasons makes the teleofunctional account of rationality an objectively reasonable approach. In addition to certain objective facts *about me* that in part determine the rationality of my actions (e.g. it is a fact about me that I have certain goals, preferences, and desires), there are also objective facts outside of me that determine the rationality of my actions. PR-representations are causally related to the organism's environment through interactions with input stimuli afforded by the environment. For example, the fact that the pit viper in the tank is poisonous explains why a PR-representation was formed to guide action toward grabbing this snake rather than one of the other non-poisonous snakes in the tank (again, because I want to show the middle-schoolers what the *poisonous* snake looks like). Thus, there is something *about the world* that makes it the case that some features of external states of affairs get represented normatively as reasons for action and others do not. In order for the PR-representational system to succeed in actualizing its teleofunction, it must reliably indicate the salient features of a particular external state of affairs that make a course of action rational, representing those features as reasons for action. Although the actual content of any particular PR-representation is relative to the goals, preferences, and desires of the agent in

question, there is no reason to think that this fact alone entails an entirely subjective account of reasons for action.

At the level of action, there are also objective standards that determine what counts as rational action. It is an objective fact about me whether or not I decide to act on the basis of what I have reason to do. Deciding to act in accordance with, or forming intentions that are responsive to, one's own PR-representations is required for rational action. Although there are things outside of my control that may inhibit my ability to actualize the action that I have most reason to perform (perhaps working on my dissertation is the rational thing for me to do today, but I get into a car accident on the way to the library), such external factors do not by themselves constrain my ability to behave rationally. Suppose that the agent in question who has successfully represented actual reasons for action decides to act on the basis of what she has most reason to do. The mere fact that something about the world makes it the case that she can no longer perform that action does not thereby make her irrational because it prevents her from executing the action that she has most reason to perform. Systems of rationality that output intentions and decisions that are responsive to actual reasons for action are fully-functioning, full stop.

These points about the objectivity of rationality, both at the level of judgment and at the level of action, are instructive. Perhaps most important is that the normativity of rationality requires that certain features of the world actually obtain. In order for rationality to be genuinely normative, facts about rationality must be intimately tied to facts about the causal texture of the world in which the agent is acting. As Broome notes, we can imagine worlds in which our rational requirements are not the best means of achieving the things one ought to achieve due to a fundamental disconnect between our rational requirements and the causal order:

> I assume it is only a contingent fact, if it is a fact at all, that the rational faculty is part of the best means of achieving much of what you ought to achieve. I assume there could be quirky worlds where that is not so. In a quirky world, people with the rational faculty generally satisfy the same requirements of rationality as people do in our world. They generally intend to do the things they believe they ought to do; they generally do not have contradictory beliefs; they generally believe what follows by modus ponens from things they believe; and so on. But because of the way causal processes work in their world, satisfying the requirements of rationality tends to be unsuccessful. These people tend not to end up having the beliefs they ought to have, doing the things they ought to do, and so on. They do not achieve much of what they ought to achieve.
>
> In a quirky world there are also people who do not have the rational faculty. Those people do just what they feel like doing, believe whatever comes into their heads, and so on. The causal processes in their world bring it about that these people achieve much of what they ought to achieve.
>
> Plausibly, it is not the case that people in a quirky world ought to have the rational faculty, since it is not a means of achieving much of what they ought to achieve. This suggests that, if the rational faculty were not instrumentally successful, it would not be the case that we ought to have it. So it supports the claim that, if we ought to have the rational faculty, that is because it is instrumentally successful (10-11).

Although I think Broome's ultimate conclusion that no argument can be given to show that rationality is in fact normative is mistaken, there is something instructive to be learned from his thought experiment. Before discussing its virtue, however, I want to highlight two of its problems. The first problem is that it isn't clear how Broome's quirky worlds are supposed to defeat the idea that rationality is normative *for creatures like us*. Indeed, if the causal processes in Sarah's world bring it about that her immediate feelings and beliefs always guide action such that she does what she ought to do, then she has no need for a practically rational faculty at all, at least not in the sense that she needs to rationally calculate reasons in her world. That counterfactual point doesn't show that creatures in our world have no need for a practically rational faculty and in fact ought to use it if they have it. The second problem is that it also isn't clear that the people who do not have the capacity to calculate reasons in a quirky world aren't still responding correctly to the actual reasons in their world and are thereby behaving rationally, as they ought. In Sarah's world, when she feels like doing something, that fact is a reason for her

to do it. When some practical belief pops into her head, that is a reason for her to believe it. So, although Sarah might not rationally calculate the actual reasons in her world, it doesn't follow that she is not responding correctly to actual reasons. In this sense, it may still be correct to say that Sarah is behaving rationally, and she ought to be doing so.[14] Hence, Broome's thought experiment does not undermine the following claims: 1) the rational capacity that we actually possess is something we ought to use, and 2) rationality as such is not normative.

What Broome's thought experiment does successfully show is that the causal processes in one's world will determine what correctly responding to reasons amounts to. Different properties might have different powers in different possible worlds, depending on the kinds of causal relations in the world under investigation. In our world, causal processes must make it the case that aligning one's behavior with rational requirements, e.g. intending to do the things one ought to do, normally results in success, in our actually doing the things we ought to do. Otherwise, it is hard to see how what we typically see as rational requirements are the right requirements at all.

Simply put, the most general conception of the normativity of practical rationality that seems to hold necessarily across all possible worlds is that an agent ought to respond correctly to her actual reasons. If that is all that rationality requires of any agent in any possible world, then it is an a priori truth. The term 'rational requirements' specifies the correct way to respond to reasons, which may be distinct across possible worlds. The rational requirements in the actual world specify, for instance, that we must form intentions and decisions that align with the actual reasons that we cognitively represent. Although the rational requirements for Sarah are different, rationality is still normative. Rationality merely requires that she respond correctly to the actual reasons that she represents. As far as I know (perhaps my knowledge is too limited) no

[14] Assuming, that is, that Sarah and her quirky world comrades have reason-representations. If they don't, then it's not clear how they would even be candidates for being constrained by the normativity of rationality.

philosopher has stressed this intimate relation between the normativity of rational requirements and the causal order present in one's world. In our world, the normativity of rational requirements presupposes a particular theory of action explanation whereby rational actions are normally caused by things like intentions and decisions to do what one represents as rational.[15] Without this specific kind of action theory we would be mistaken about our rational requirements.

The selection processes responsible for determining the normativity of rationality play specific causal roles in the world too. If the rational capacity is an adaptation, which I assume it is, then it must be true that this capacity was shaped and molded by natural selection because it played a key causal role in enhancing fitness. The teleofunctional account of rationality presupposes that certain causal relations between the effects of natural selection and the world actually obtain. For example, one effect of natural selection is that we have digestive systems responsible for breaking down and absorbing nutrients. If the behavior of our digestive systems didn't play a key causal role in the reproduction of our genetic material, then it's hard to see how our digestive systems have a teleofunction, and thus a normative standard for their behavior at all. Analogously, systems of rationality must play a key causal role in genetic reproduction for there to be a selection-derived normative standard that constrains their behavior. In quirky worlds with different causal powers, it's likely that always acting on the basis of one's immediate beliefs and inclinations would have clear selective advantages. The effects of selection would be different in this world, yet there would still be a teleofunction attached to the capacity for responding correctly to reasons.

[15] If these theories of action explanation turn out to be false, which they may, then the teleofunctional account of rationality is surely doomed.

Selection processes that determine PR-representational content must also have particular causal relations to us and the world. For example, one effect of social selection processes is that I have a reason to cooperate with others. If it weren't also true of the world that cooperating with others tended to cause the satisfaction of my own goals, preferences, and desires, then it is hard to see how cooperation could ever be a reason for me to do one thing rather than another.[16] We realize at a very young age that failing to cooperate with others typically has negative effects on our well-being: our parents punish us, others resent us, we lose our friends.

Steve Sloman's work on causal models as mediators of human reasoning systems (mediators between information in the world and our own decision-making processes) gives strong empirical support for the kind of view I'm advocating here. If systems of rationality have the teleofunction of signaling those features of the environment that are relevant to the pursuit of our goals, preferences, and desires and causing certain decisions and intentions to act, then empirical confirmation that this is the way human reasoning systems *actually* operate provides initial support for my teleofunctional claim about rationality. Sloman (2005)[17] writes, "we search for the aspects or variables in the world that reliably signal information useful for achieving our goals...[t]he most valuable information you can have to achieve your goals is knowledge about the mechanisms that produce change. This is what causal models represent" (177). I find Sloman's claims here instructive because they highlight the relation between the information we search for (external states) to help us achieve our goals (internal states) and the causal features of the world that make this information apparent to us. An interesting feature of this sort of view is that the means by which our systems of rationality function mirrors the relation between what we

[16] The reader might be wondering whether content-creating processes like social selection are ultimately based on natural selection, in which case the only content that could ever serve as a reason for anyone must be ultimately directed at genetic reproduction. Perhaps this is true, although it is a very strong claim.
[17] This book includes a rich assortment of studies that suggest causal modeling is the primary means by which our rational capacities function.

represent as reasons and the world itself. This isomorphism between the causal structure of reason-representation and events in the world makes the rational capacity possible in the first place. If there were no reliable regularities between things we take to be reasons and the effects of our behavior, then it would be difficult to see how the rational capacity would have any opportunity whatsoever to evolve. For example, if foul-smelling substances didn't reliably cause illness after being ingested, then it's unreasonable to think a nasty smell could have ever become a reason to avoid eating something. This example could be multiplied indefinitely to cover anything that we typically take to be a reason for doing or not doing something. The rational capacity would be completely devoid of content, in which case it would be utterly useless.

3.1 Teleofunctions as Reasons

Following a discussion of the objectivity of reasons, I want now to examine closely the idea that teleofunctions themselves *are reasons* for behaving one way over another. Recall Southwood's rational requirement-requirement from earlier on in this paper: any account of the normativity of rationality "would have to show that, for any agent and rational requirement, the agent has an independent reason to obey the requirement" (13). The teleofunctional account of practical rationality responds to this requirement by supplying the teleofunction of practical rationality itself as an independent reason to obey rational requirements. This claim hinges on the plausibility of the earlier claim that systems of rationality were selected for because they serve the function of getting us do those things that help to satisfy our goals, preferences, and desires. If it turns out that research in evolutionary psychology bolsters the idea that this is the actual teleofunction of our rational faculties, then that teleofunctional fact provides an independent reason to behave rationally.

Suppose it turned out that the rational faculty was selected for because it served some function other than the one I stipulate. Assume that this other function is one that we wouldn't say is good—perhaps it turns out that the rational faculty is a completely selfish calculator for the blind satisfaction of desires. We might then say that the teleofunction of the rational faculty is something we ought to reject as an independent reason to behave rationally. We don't value the blind satisfaction of desires, so we also wouldn't value a system whose function was to blindly satisfy desires. If we were to discover that the rational faculty was selected for this purpose, then we wouldn't be so inclined to say that the normativity of rationality is explained by the teleofunction of rational systems, because rationality often requires us to do things that go against self-interest (e.g. when PR-representations get their content from social or moral norms) and we usually think that is a good thing. It is hard for us to imagine how rationality would be normative if this were the rational capacity's actual function because we are implicitly assuming that the causal powers in both the actual world and this imaginary world are the same. If what I've argued for in Section 3 is true, then it is hard to see how this counterfactually-described rational capacity would have ever evolved in the actual world in the first place, given the actual causal processes at work in our world. It's unlikely that a rational faculty that functioned to blindly satisfy desires would be without fitness consequences. Historical environmental conditions in the actual world created selective pressures for such phenomena as social cohesion and cooperation, which were selected for because they enhanced fitness. However, if the causal order in one's world make it the case that always acting for the sake of the blind satisfaction of desires causes one to do only those things that she ought to do (presumably, those things that contribute to human flourishing), then it's totally plausible that a capacity facilitating such action would have a teleofunction and thus provide an independent reason for behaving rationally.

It isn't at all obvious that a teleofunction can provide a reason for doing one thing rather than another. It sounds strange to say that the heart has a *reason* to pump blood, unless of course what we mean by 'reason' is something akin to 'causal-historical explanation'. The relevant difference between humans and hearts or sunflowers in terms of the normative standards that constrain their separate behaviors is that humans have a capacity to become aware of the functional capacities served by their individual parts, and we can recognize that allowing those capacities to serve their teleofunctions is always in our best interest. *Given such a capacity to recognize functions as normative standards*, it makes sense to talk about a teleofunction providing a *reason* to do this over that, where 'reason for X' now means 'a consideration in favor of doing X'. Thus, the idea that a teleofunction can serve as an independent reason to obey rational requirements is made possible by our capacities to become aware of, and reflect on, reasons and normativity. The fact that we are conscious of things like reasons, functions, and normativity (more importantly, *that* we can recognize the function of our rational capacity) imposes a stronger normative constraint on our behavior than the mere success-failure conditions that attach a level of normativity to the notion of a biological teleofunction. That is not to say that the normative constraints afforded by rationality aren't still derived from the teleofunction of practical rationality itself.

Admittedly, there is quite a bit of work that needs to be done to explain this important sense in which normativity for creatures like us is different from normativity for non-humans. Perhaps there is something more basic than a conscious capacity to recognize reasons that makes it the case that the normativity of rationality is different from other kinds of functional normativity. One plausible candidate here is the notion of a persons-level mechanism: a mechanism in whose functioning and operation I am in some meaningful sense present

throughout. It's likely that the rational capacity falls under the scope of things that represent persons-level mechanisms. When I consider reasons for action, I am present throughout the process, throughout the operation of calculating reasons for doing this over that and coming to some conclusion regarding what I have reason to do. The contrast class to a persons-level mechanism is a system-levels mechanism: a mechanism in whose functions and operations I am never present. My visual system, for instance, carries out a number of complex operations to assess and represent objects in my visual field. I enter the scene only when the finished product of my visual system outputs some visual representation. I am neither in control of nor aware of the functions and operations of the many subsystems that give rise to my visual representations. The same can't be said for the rational faculty. The distinction between persons-level mechanisms and systems-level mechanisms is significant for getting clear on how the kind of normativity involved in rationality is distinct, yet still derived, from more basic forms of normativity. I suspect that a more fully developed philosophical analysis of this distinction will require a more complete understanding of both consciousness and personal identity.

Regardless of whatever it is that gives rise to differences in kinds of normativity, normative facts about many kinds of animal or plant behavior (which, of course, includes human behavior) often stem from functions shaped by evolutionary biology. In the cases of the flower that doesn't turn toward the sun vs. the man who acts irrationally, the higher-level kind of normativity (e.g. the normativity of rationality) is grounded in the same kind of fact, a fact about an adaptive function shaped by natural selection, that grounds the lower-level kind of normativity (e.g. the normativity of phototropism). In this section, I have made a case for the idea that teleofunctions are themselves reasons that provide objective standards for behaving in

certain ways rather than others. Might a similar case be made for other kinds of normativity like epistemic, logical, or moral normativity? That remains to be seen.

4. POTENTIAL OBJECTIONS & RESPONSES

In this thesis, I have argued that rationality is normative in virtue of the teleofunction that the rational capacity serves in human behavior. I will now consider two objections to my argument and respond to them.

Objection 1: Patterns of differential responses (some sunflowers turn toward the sun, others turn away, some don't move at all) that are conducive to fitness get selected for, but it seems more appropriate to describe deviations from statistically normal patterns as *anomalous* rather than *mistaken* or *incorrect*. The sunflower that doesn't turn toward the sun is behaving oddly, but is it doing something incorrectly? Indeed, phototropic mechanisms in sunflowers were probably selected for because they enhance the fitness of sunflowers, but does a limp sunflower really represent an instance of normative failure? To consider the objection from another angle: let's say the "design" of sunflowers can be formulated as a set of rules or directions that sunflowers follow when they are functioning properly. If enough sunflowers deviate from this set of rules, we'll reconsider the rule we think sunflowers are following. We'll suspect that we got the rules wrong. Is this how we would respond to a significant number of infractions of or deviations from rules about how to behave rationally?[18]

Response to Objection 1: If enough sunflowers fail to perform what we think is the naturally designed or adaptive function of some subset of their internal mechanisms, then of course we'll

[18] Many thanks to Eric Wilson for raising this objection.

reconsider what we thought was the teleofunction of these mechanisms. If this situation were to arise, it would pose an epistemic problem regarding our knowledge of what the particular teleofunction happens to be (we wouldn't respond similarly to deviations from rules about how to behave rationally because we're more confident about our knowledge of what the rules are). However, if it's genuinely true that the sunflower's phototropic mechanisms have the teleofunction of turning the flower toward the sun, then even if a bunch of sunflowers fail in this regard, the normative standard for these mechanisms is the same. Many of them are just doing a bad job.

Suppose, however, that the force behind this objection isn't really epistemological at all. That is, a rule of rationality isn't a genuine norm of rationality if the rule should be changed in light of failures to comply with the rule, irrespective of any epistemic awareness of these rules. To this reading of the objection, I am largely in agreement. However, I do not think that it poses a strong objection to any of my central claims in this thesis. Teleofunctions may change depending on how the force of natural selection shapes the biological structure and function of organic systems over time. However, natural selection alone can change the rules that it designs. Failures to comply with a rule would only have an effect on what the rule actually is if it is also the case that failing to comply with the rule represents a behavior that enhances fitness and gets selected for. Mere failure to comply with the rule, in this case a teleofunction, is not sufficient to change what the rule requires.

Perhaps what is really driving the intuition that these divergent cases involve distinct kinds of behavioral assessment is that there is a relevant difference in the objects to which the rules or normative standards apply rather than some feature of the normative standards themselves. If we just focus on humans, for instance, one difference between the normativity

involved in the behavior of humans vs. plants is that we tend to think that we are accountable for our actions, and deserve praise or blame for obeying or breaching rational requirements, while plants and other inanimate objects are not so accountable or deserving in this way. I have already argued earlier for what I think is the central distinguishing feature that marks these distinct kinds of normativity. In any case, ascribing functions to non-human objects (both living things and artifacts) happens all the time and always carries with it a degree of normativity. When my fan quits working properly, I'm entitled to say that it's not doing what it was designed to do, what it *ought* to do. The same can be said for cars, guitars, sunflowers, and humans.[19]

Objection 2: The kind of normativity involved in discussions about the rationality of action is evaluative rather than prescriptive. Although the notion of a teleofunction provides a sense in which a thing ought to behave in certain ways rather than others, teleofunctionalism alone can't help distinguish between those teleofunctions that we value as good (e.g. rationality) and those that we do not (e.g. morning sickness in expectant mothers). For example, some evolutionary biologists argue that morning sickness is an adaptation that probably served the function of protecting a mother and her developing embryo from potentially harmful or lethal microorganisms in food (see Profet 1992 and Alcock 2001). Their intuition is that it is likely that morning sickness was selected for because those mothers in our ancestral history that experienced morning sickness were more fit for their environments than those mothers that did not. Hence, morning sickness was selected for because it performed an adaptive function in our ancestral history, yet we don't recognize that teleofunction as good, as something that we value.

[19] The objector might be worrying that in order for function ascriptions to be licensed ones, intentional design is required. Natural selection is a non-intentional process, so living things and their parts, unlike artifacts, don't really have functions at all. I refer the reader to Hannah Ginsborg's discussion of non-intentionally designed functions and primitive normativity in "Oughts without intentions: a Kantian approach to biological functions" (forthcoming).

On the contrary, the kind of normativity involved in practical rationality *does* include our stamp of approval. We typically say that acting rationally is what we ought to do, and doing so is a good thing. On the teleofunctional approach to the normativity of rationality, how does one get from a trait's being selected for, to a teleofunction that represents something we value?

Response to Objection 2: Nothing that has been said thus far precludes the notion that there are particular teleofunctions that we normally judge as good and others that we do not judge in this way. There are an indefinitely large number of biological systems in the world that perform teleofunctions that most of us wouldn't say represent goodness in any sense (e.g. the marvelously precise sting of parasitoid wasps on their innocent cockroach victims). Discussing this distinction is important for discerning between the kinds of normative assessment involved in discussions about rationality and discussions about function-oughts more generally, and explaining the relation between the two. Whether or not we value any particular teleofunction hinges on the kind of teleofunction in question. Those teleofunctions that serve the interests, desires, preferences, and goals of the moral patients and agents in whatever moral theory one adopts will be seen as good. We judge the rational capacity as good in virtue of its instrumental success in facilitating our ability to realize those things that we value (e.g. pleasure, virtue, friendship). Hence, the capacities PR-representations provide us are good (in every sense of the word), while the goodness or badness of the content that fills in the exercises of our rational capacities is variable. In any case, distinguishing between teleofunctions that we see as good and those that we do not does not entail that there are some teleofunctions that fail to provide a normative standard for the behavior of the systems in which they were selected (which would cause all sorts of problems for the account I've sketched above). The parasitoid wasp's sting serves an adaptive

function in the life of the wasp and thus prescribes what the wasp ought to do when it approaches its cockroach victim. The mere fact that we don't say the sting is a good thing is irrelevant.

These considerations notwithstanding, it's not entirely clear that morning sickness is an adaptation anyway, in which case it no longer serves the teleofunction for which it was selected. It's likely that morning sickness was selected for in our ancestral history and use to serve a specific teleofunction in human behavior. However, to be considered an adaptation, a trait must continue to serve the function for which it was shaped by natural selection such that the trait is still beneficial today (Sober 1984). It's plausible that the value of morning sickness has been eclipsed by pharmaceutical advances and more sophisticated technologies in the food industry. If this much is true, not only should we abstain from positively evaluating morning sickness as good for expectant mothers, but we shouldn't ascribe any level of normativity to morning sickness *at all* (e.g. we shouldn't say that expectant mothers *ought* to get morning sickness). In light of these considerations, morning sickness might no longer serve the teleofunction for which it was selected in our ancestral history, which isn't at all surprising. Teleofunctions come and go. We should expect that the level of change in what counts as a teleofunction covaries with the level of change in an organism's environmental conditions. Rapidly accelerating changes in current environmental conditions will probably continue to render many teleofunctions obsolete.

But maybe morning sickness really does still serve some adaptive function in human behavior. If it does, then morning sickness does indeed represent something that expectant mothers ought to undergo. If it really is an adaptation, then it is indeed a positive thing for expectant mothers—just not a pleasant one. In either case, whether it represents an actual adaptation or not, morning sickness does not present a viable objection to the teleofunctional account of rationality.

Perhaps a more apparently problematic counterexample is the reproductive system of anyone who fails to use it solely for the sake of reproduction. It might seem like the teleofunctional account of rationality is committed to the idea that homosexuals ought to have heterosexual sex aimed at reproduction and heterosexual couples using contraceptives ought to ditch their birth control because any deviation from reproduction-driven intercourse is a kind of teleofunctional failure of our reproductive systems. Surely we wouldn't want to say that anyone is entitled to make such individuals the objects of criticism simply for their having failed to comply with the teleofunctions of their reproductive organs.

Fortunately the teleofunctional account of rationality is not committed to such a problematic view. On the teleofunctional account, we might say that there is normative failure at the level of Jay's reproductive system when it doesn't produce any viable offspring. However, that failure is a fact, not about Jay, but about merely part of Jay's body. However, when Jay knows that he has most reason to avoid drinking the entire bottle of bourbon but decides to anyway (to keep things simple, assume Jay is not an alcoholic), that failure of Jay's rational capacities is a fact about *Jay the person* and thus makes him a candidate for normative criticism.[20] Hence, it may be true of Jay's reproductive system that it is normatively failing. The same cannot be said of Jay.

Admittedly there are some complex issues at work here. Although it seems clear that Jay's reproductive system is one in whose functions, activities, and operations, Jay is not present, it isn't clear that the same can be said about systems of rationality. In other words, when Jay fails to act rationally, is that a fact about Jay the person or merely a fact about one of Jay's bodily

[20] To sharpen this distinction further, there is a difference between system-level assessment and person-level assessment regarding the teleofunctions of one's own systems. We might say that failure to recognize the right reasons in any particular case is a fact about me (i.e. I failed to direct my attention in the right sort of way; hence, person-level assessment) but we also might say that it is a fact about merely part of my cognitive systems (i.e. my rational systems didn't represent the right reasons; hence, system-level assessment). In any case, determining whatever it is that warrants ascriptions of praise and blame will be a complex issue.

systems? In my own case, when I reflect on how my own rational capacity functions, I am present throughout the activity of recognizing and responding to the reasons that I represent. Recognizing reasons and deliberating about them seems like something that *I* am doing, something over which it at least feels like *I* have some control. If such introspection gives us any indication of what's actually going on when we employ our rational faculties (perhaps it doesn't) then it's plausible that failing to act rationally is a fact about me.

5. CONCLUSION

The teleofunctional account of practical rationality attempts to explain the normativity of rationality in a naturalistic framework. Perhaps one upshot to this view is that it dovetails nicely with contemporary work being done in ethics on the nature of rationality. Grounding the normativity of rationality in a teleofunction corresponds well with what ethicists call the "proper functioning account" of rationality (Southwood 2008, 29).[21] According to the proper functioning account, rational requirements indicate what is necessary for our cognitive systems, and the beliefs, desires, and intentions that those systems produce, to function properly. On my view, our cognitive systems function properly when they guide us to execute only those actions that are governed by the teleofunction of practical rationality itself. Thus, in addition to offering a naturalistic account of the normativity of rationality, a further theoretical advantage of this view is its compatibility with current research being done by ethicists.

I hope to have shown how teleofunctionalism can provide an interesting framework from which to develop a satisfactory explanation of the normativity of practical rationality. The following is a brief summary of what I have set out to do in this thesis: I began my inquiry in

[21] Proponents of the proper functioning view include Michael Bratman (2009) and David Velleman (1996), among others.

Section 2 by gesturing at some reasons to think that the rational capacity is conducive to fitness, although I admitted that it is ultimately an assumption of mine that rationality is an adaptation that has a teleofunction. Next, I introduced the notion of a PR-representation and offered what I take to be the teleofunction of the PR-representational system. Additionally, I argued that although the rational capacity was genetically selected for, the content that fills in this capacity is appropriately flexible and oftentimes depends on non-genetic processes. I finished this section by explaining how rational normativity and the normativity of a biological function are related. In Sections 2.1 and 2.2, I argued that the content of the rational capacity does not derive entirely from genetic selection, and I explained how the PR-representational system is related to rational action and judgments about rationality—specifically how it might fail normatively at the level of judgment and at the level of action itself. Following these moves, I investigated the role of objectivity in the teleofunctional account of rational normativity in Section 3. Additionally in this section, I argued that rational normativity is intimately tied to the causal order. In Section 3.1, I completed the project by arguing that the teleofunction of the rational capacity provides an independent reason to obey rational requirements. In conclusion, the attractiveness of the teleofunctionalist approach is rooted in the notion that a teleofunction provides a normative standard by which the rationality of action is determined. If what makes it the case that an action is rational is the fact that the action is caused in the normal way by a PR-representational system carrying out its teleofunction, then failure to act in accord with one's fully-functioning PR-representational system is the hallmark of irrationality.

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