

Why Does *This* Humpback Whale Sing?

Animal Rationality and the Study of Animal Behavior

Emily Dupree

The Song of the Humpback Whale

In the late 1970's, the humpback whale transformed, in our popular imagination, from a massive but largely mysterious ocean-dwelling mammal to a beloved, complex creature whose life was a source of tremendous beauty on this earth.¹ The American scientist Roger Payne made this change possible in part with his underwater recordings of the song of the humpback whale, released to the public by CRM Records and later Capital Records to widespread acclaim.² Listening to these records, one is immersed in a stunning array of complex vocalizations – haunting and otherworldly moans, wails like the American Midwestern tornado sirens, growls as if the sea floor were being torn in half, and staccato bursts of whistling whose reverberations convey the vastness of the environment in which

¹ Hal Whitehead and Luke Rendell, *The Cultural Lives of Whales and Dolphins*, Chicago: The University of Chicago Press, p. 76.

² Cary O'Dell, "Songs of the Humpback Whale," National Recording Preservation Board. Accessible at <https://www.loc.gov/programs/static/national-recording-preservation-board/documents/humpback%20whales.pdf>

these whales live.³ The sounds themselves are stunning, and metaphor hardly approaches what it is like to hear them.

But Payne made an additional discovery while analyzing these vocalizations: the most accurate characterization is that they make up different *songs*. That is, the vocalizations comprised a “series of notes, generally of more than one type, uttered in succession and so related as to form a recognizable sequence or pattern in time.”⁴ Like a bird song, the songs of whales conformed to a series of types that carry both intra- and inter-species recognition. This remarkable discovery can be summarized as follows: each whale, while singing, conforms to one of at least two known song types consisting of three main sections – “rapidly repeated pulses that often alternate with sustained tones;” “short, high-frequency units, most of which abruptly rise in frequency;” and “lower, more sustained notes that are monotonously repetitious in rhythm and frequency and contain many units that fall in frequency.”⁵ The themes within each song always occur in the same order, both for the same whale and for other whales singing that song type. But the precise repetition, pitch, and duration of the phrases and notes within each theme can vary from whale to whale, generating a stunning array of different songs that we hear. One can’t help but make a comparison to classical symphonies, which bear a precise structure and order at any given time, but within which all of the musical variation of Mozart, Beethoven, and Dvorak is made possible.

The comparison to symphonies is apt for another important reason, which is that humpback whale song evolves over time, and we can trace the movement of any given

³ Roger Payne, “Songs of the Humpback Whale” (1970). The album in its entirety can be listened to at <https://www.youtube.com/watch?v=p-7QrQ0cbpg> as of June 14, 2018.

⁴ Roger S. Payne and Scott McVay, “Songs of Humpback Whales,” *Science*, Vol. 173 No. 3997 (August 13, 1971), p. 590.

⁵ *Id.* p. 591.

song throughout migratory patterns from year to year in much the same way that we can trace the evolution of the symphony throughout recent human history, both in its gradual and abrupt manifestations. That is, there is strong evidence that the humpback songs exist within what biologists Hal Whitehead and Luke Rendell have referred to as a whale *culture*.⁶ They cite data collected by the scientist Katherine Payne, which is worth reproducing here as well:

Basic units change in frequency, contour, duration, and the ways they are organized to make phrases. Phrases change in the numbers and types of units they contain and in their rhythmic patterning. Themes gradually occupy a larger or smaller percentage of the song on average...After some five or ten years, every theme is either much changed as a result of many little changes, or it has become obsolete and dropped out of the song, or both. At the same time, new phrase types have been introduced, imitated, and developed into new themes.⁷

What's more, songs recorded in different ocean basins “have different content and distinct trajectories of change.”⁸ And, in at least one known instance, there has been a “revolution” in whale song so widespread that a single novel song sung by one whale off the east coast of Australia in 1996 had travelled the globe by 1997. That is, one whale's song had proved so “irresistible” to other whales that all who heard it adopted it as their own. In today's parlance, the song went viral. What is so important from a scientific, and later we will see philosophical, perspective, is that as Whitehead and Rendell put it, “there is only one way

⁶ See Whitehead and Rendell.

⁷ Katherine Payne, as cited in Whitehead and Rendell, p. 79.

⁸ Id.

large numbers of animals can sing the same song that evolves over periods of time that are much less than an individual's lifetime: culture. Genes cannot do this, nor can individual learning.”

What is the significance of this research for my philosophical purposes in this paper? For one, this research (when considered in combination with other research on whale capacities, family networks, and social structures) shows us that humpback whales are cognitively complex animals. It also shows us that humpback whales are capable of the expression of a certain sort of individuality – that is, all humpback whales introduce novel variations into songs that otherwise conform to the formal structures governing the songs of their species. In some cases, this novelty is so remarkable that it sweeps the globe and alters the trajectory of whale song forever. And in this, the research shows us that humpback whales are capable of learning and transmitting knowledge in ways that require the (at least minimal) use of representation in combination with a sensitivity to certain adaptive pressures that bear on singing.

But the scientific research that has taught us this is also framed by certain guiding questions when it comes to analyzing *why* humpback whales sing as they do, and it is these framing questions that I wish to look into more carefully. Of course, asking *why* certain behavior exists in a species is a valuable question, and it is part of a more general (and not exclusively scientific) attempt to understand what it is to be that species. That is, inquiring into the origins and function of some behavior can help us produce a model of the characteristic functioning of that species, and by extension what it is for that species to live well. So this critical inquiry has not only scientific but philosophical and political significance. But what I will try to show in this paper is that the way these questions have been framed in the biological study of behavior has been limited in such a way as to

undermine the very aims of the inquiry. That is, for certain cognitively complex species like the humpback whale, the different axes along which this question of *why* has been understood misses out on a crucial dimension of what life is like for that species. This unacknowledged feature of life for animals like the humpback whale is an individuality and reason-sensitivity that has been largely denied to all animals despite persuasive evidence of its existence. As a result, contemporary accounts of cognitively complex species, even at the species level, are incomplete. Therefore we must complete the inquiry if we are to have the resources needed to both describe what a complete life would be for cognitively complex species and defend the environmental conditions that would make this flourishing life possible.

The Scientific “Why”

Once complex behavior like the song of the humpback whale has been described in sufficient detail, scientists like Payne and Whitehead turn, understandably, to the critical project of understanding why it is that whales sing as they do. Discussing Payne’s research, Whitehead and Rendell write: “They asked: why, who, and when? Why do humpbacks sing such extraordinary songs? Why do the songs evolve?”⁹ After considering the possibility that mating might answer this question, Whitehead and Rendell ask their own more specific version: “Why do the males sing when alone, then, if the song is about stimulating females to mate?”¹⁰ And then they link this inquiry to their discipline as a whole, writing:

⁹ Whitehead and Rendell, p. 82.

¹⁰ Id., p. 83.

As behavioral ecologists we then ask the question: Why? Why do female humpbacks – or male humpbacks, if Darling’s hypothesis is correct – like the complex, ever-changing, yet stereotypical song?¹¹

Like all good behavioral ecologists, Whitehead and Rendell focus their critical investigation on theories that answer these questions by appeal to the hypothesized *function* of the humpback whale song. They look to the effects that singing might have on prospective mates; the ways it might facilitate coordination among males; the evolutionary advantage that a “beautiful” song might have in gaining a mate.¹² Though this last potential function references the internal state of the female (insofar as she *prefers* one song over another), in general the inquiry does not make reference at all to the subjective preferences and aims of the singing whale as relevant to *why* that whale might be singing.

This inattention to the individuality of the animal whose behavior is being studied is not unique. In the seminal 1963 paper by Niko Tinbergen, “On Aims and Methods of Ethology,”¹³ he argues that the question “Why do these animals behave as they do?” is the foundation on which all ethology (which he characterizes as the biological study of behavior) rests. One of his first orders of business, though, is to disparage theories that look to animals’ interior lives when attempting to understand the causes of some form of behavior. Naming these theories “subjectivist,” he writes:

...Ethology has not yet completely succeeded in freeing itself from subjectivism in this sense. It is true that one rarely meets with it in its crudest form (“the animal

¹¹ Id., p. 84.

¹² Id., p. 83.

¹³ Niko Tinbergen, “On Aims and Methods of Ethology,” *Zeitschrift für Tierpsychologie*, 20 (1963), pp. 410-433.

attacks because it feels angry”), but in its subtler forms it is still very much with us. Concepts such as “play” and “learning” have not yet been purged completely from their subjectivist, anthropomorphic undertones.¹⁴

A lot is going on in this short passage. First, Tinbergen claims that the subjectivist appeal to the interior mental states of animals is something that behavioral scientists must be “freed” from. And even appeal to an emotion such as anger (in explaining, for example, a zoo animal lashing out at a handler) is described as “crude.” Importantly, Tinbergen regards subjectivist explanations of complex behavior like play and learning as anthropomorphic, the death knell for biological accounts of animal behavior. This suggests that he believes any discussion of mental states in order to explain animal behavior will be a misguided imposition of human norms onto animals. Whether he believes animals are incapable of such mental states is not clear; but what is clear is that he believes scientific theories should avoid mention of the interior mental states of animals if they are going to succeed in giving a truly scientific account of the species based on observed behavior.

Instead, he argues that there are four main explanations that are proper to the science of ethology: causation, survival value, ontogeny, and evolution. Exploring these four types of explanations will give us an insight into how animal behavior is generally understood in the biological sciences and the ways that these explanations fail to fully capture the behavior of cognitively complex species. First, understanding animal behavior from a *causal* perspective is facilitated by thinking of behavior patterns as “organs,” a

¹⁴ Id., p. 413.

founding insight from Konrad Lorenz, the renowned biologist whom Tinbergen credits as “the father of modern ethology.”¹⁵ Tinbergen writes:

The treatment of behavior patterns as organs has not merely removed obstacles to analysis, it has also positively facilitated causal analysis, for it led to the realization that each animal is endowed with a strictly limited, albeit hugely complex, behavior machinery which...is surprisingly constant throughout a species or population.¹⁶

Like Aristotle’s efficient cause, behavior understood in this manner is seen as deriving from an almost mechanical process aimed at achieving some end to which that process was specially adapted. Causal analysis allows biologists to understand the *how* of behavior in two respects: both how behavior in a single individual is generated, and how that behavior can be constant across all species-members if environmental differences during development and at the time of the observed behavior is held constant. It focuses on the short-term mechanisms, shared by all members in a species, that give rise to the observable behavior that we see.

If causation answers the question “How does it work?”, *survival value* answers the question “What is this good for?”¹⁷ Behavior patterns, on this axis of analysis, are “organs” that a species evolves “as one of its means for survival.”¹⁸ Tinbergen notes that one of the innovations of ethology was to insist upon looking at survival value and not merely mechanistic causation when attempting to understand some behavior – survival value allows the biologist to develop a holistic understanding of the individual animal, as not only

¹⁵ Id., p. 410.

¹⁶ Id., p. 414.

¹⁷ Id., p. 417.

¹⁸ Ibid.

the product of mechanical chain reactions but also as a member of an ongoing species that faces “hostile, or at least unco-operative environment[s].”¹⁹ Applied to the humpback whale, for example, it allows us to see how the behavior of singing increases the chances of successful mating in the vast ocean environment, where a whale might be hundreds of miles from the nearest potential mate. Certainly many of the questions posed by Whitehead and Rendell look to the survival value of humpback whale song.

Of note, though, is that looking to survival value often runs the risk of effacing the individuality of the animal in question by rendering outlier and counter-survival-value behavior mysterious. Take the example offered by Tinbergen:

...there are even many behavior patterns of which we do not even know the basic answer: has it any function at all? As an illustration let me mention the example of the “rocking” of certain cryptic animals. There are a number of animals which...perform a series of curious rocking movements....Now these animals are all camouflaged; many of their behavior characters...are obviously adapted to the function of avoiding detection by visually hunting predators. In view of this the habit of rocking *seems very strange indeed*, for movement in general is a stimulus to which visually hunting predators react, and which these cryptic animals are for the rest at such pains to avoid giving.²⁰

What I want to point out here is that any behavior that goes against what would be expected of an animal from the perspective of survival is rendered “curious” and “strange”. Survival value runs the risk of “going imperial”, so to speak – a degree of normativity is

¹⁹ Ibid.

²⁰ Id., p. 420. Italics added for emphasis.

inserted into the observation of animal behavior. It is not inherently bad to find some behavior curious and others self-evident; but often the behaviors observed in cognitively complex animals and deemed “strange” could only be deemed so if the observer willfully ignored the possibility that the behavior was evidence of the internal mental life of an animal that makes individuality possible. Of course, this individuality, and the subjective preferences and reasons that it entails, are rejected by Tinbergen as properly scientific explanations. But it must be noted that rejecting them renders all sorts of behavior mysterious, and pushes biologists to ever-more speculative functional explanations when the simplest would be an appeal to internal mental states of animals.

Animals at the behavioral margins of their species are the most obvious examples of this oversight – “strange” behavior that seems to go against self-interest is, I believe, best understood as easily explicable through appeal to that animal’s own preferences and reasons for acting (if, of course, they have the cognitive capacities that would constitute such an interior life). But even core species behavior that bears no obvious relationship to survival fits into this, too – one can think of the widespread practice of breaching and repetitive fin slapping that we observe in humpback whales, and for which biologists give tenuous functional explanations, at best.²¹ One only needs to watch some Youtube videos of breaching whales to note that it looks extremely fun *for the whale*. Of course, it may very well be that breaching serves a communicative function, as is the prevailing explanation today; but to think that this fact could possibly answer the question “Why do whales breach?” is to deny that each whale might breach because it is joyful, or invigorating, or any other number of desirable states. Because biologists have conflated the attribution of mental states to animals and “anthropomorphism” (understood to be universally

²¹ Ailbhe S. Kavanagh, “Evidence for the functions of surface-active behaviors in humpback whales (*Megaptera novaeangliae*), *Marine Mammal Science*, Vol.33, Issue 1 (January 2017), pp. 313-334.

unscientific), they are at pains to avoid any discussion of the interior lives of animals at all. As a result, a certain denial of the phenomenology of animal behavior attends most functional explanations.

So much for survival value. The third axis of analysis Tinbergen notes is *ontogeny*, or the “change of behavior machinery during development.”²² Like causal analyses, ontogenetic explanations answer the “how” of observed behavior, but with reference to its emergence in the particular life history of the animal in question. For example, in observing the behavior of a Herring gull pecking at red objects, an ethologist offering an ontogenetic explanation can reference the fact that even “a newly-hatched Herring Gull pecks selectively at red objects” without requiring instruction from its parents.²³ In this way, ontogenetic explanations get a bit closer to recognizing the relevance of the individual animal in question for fully understanding its behavior (another point of similarity between ontogenetic and causal explanations). Behavior patterns change, and therefore understanding it fully will require understanding the animal *over time*.

Nonetheless, ontogenetic explanations treat life histories as relevant only insofar as the animal exemplifies the typical behavioral learning of the species. It is at this point that we see the reemergence of questions of survival value in ontogenetic explanations – only the species-typical timeline of behavioral emergence will be included in ontogenetic explanations, because only these fit into the story about the advantage of that *type* of emergence for the survival of the animal and therefore the species. Tinbergen writes:

[We] need to ask what the survival value is of the many different types of ontogenetic control that our analysis brings out. ...[It] is in some cases easy to see

²² Tinbergen, p. 424.

²³ Id., p. 423.

why the control in certain behavior patterns is largely internal, and why in other interaction with the environment is advantageous. Thus a young Gannet, which has to jump off a high cliff, would be poorly off if he had to acquire the basic pattern of flight the way we acquire a skill such as writing.²⁴

Of course what Tinbergen says is true – a species whose babies can't fly after taking their first jump would not last long (nor would it even exist in the first place, to be more precise). But a survival value analysis of ontogenetic development of behavior introduces the question “Why?”, and I have already argued that this method of analysis is particularly ill-suited to accurately answering that question for animals that have rich mental and emotional lives.

Curiously, Tinbergen does recognize individuality and the cognitive capacities that underlie it when he discusses a case of human behavior. He writes:

[There] is sufficient justification to distinguish between [causal and ontogenetic] processes; as is obvious from the fact that one can say that a man is afraid of a flying plane “because he sees it” but also “because he has been bombed out as a child”. The main point is to recognize that both statements may be true, that each covers part of the total causal chain involved, and that the question “What made him behave the way he did?” requires a complete answer in which both partial answers are contained.²⁵

²⁴ Id., p. 426.

²⁵ Id., p. 427.

We can see here that for a species Tinbergen recognizes as having complex mental and emotional lives (which give each member a recognizable individuality), he is more than willing to support at least two ideas: first, that behavior might indicate “anger” or some other internal state; and second, that behavior can be explained by reference to subjective facts about that individual’s life history, even where it is not species-typical. This willingness to discuss mental states and individual-specific reasons in the case of humans suggests to me that he does not think these exist for any (other) animals, even ones as complex as the humpback whale. Recall, he claimed that discussing “anger” as a potential cause of animal behavior was absurd and “crude,” rejecting what he termed the “subjectivism” and “anthropomorphism” in these accounts.

It is worth pausing to ask what exactly the scientific error of anthropomorphism is – why is its presence a mark of scientific absurdity? Anthropomorphism is the inappropriate projection of distinctly human experiences, motives, and capacities onto animals who do not in fact have those experiences, motives, or capacities. It is a way of *not seeing* the animal at precisely the moment a theory claims to see it and understand its behavior. Certainly when a theory is genuinely anthropomorphic, a grave scientific error has been committed. But that is not because there is anything unique about *human* capacities that make their observation in others suspect; rather it is because the theory is false, and it is false in a way that human scientists are especially prone to be. Nevertheless, there is no logical impossibility in imagining that humans and non-human animals share certain capacities that we have long thought were our exclusive domain. Some theories of animals (which I will discuss shortly) explore just this possibility, and use insights about *human* experiences of reason and emotion to understand non-human animal experiences of these same types. Why not make use of, for example, the entire history of philosophy of

action in order to understand the motives of certain animals? If there is a genuine shared capacity, then *who* bears that capacity should not matter for the underlying philosophical account of it. Scientists like Tinbergen of course classify these theories as anthropomorphic and therefore unscientific. But there is a crucial distinction between the error of genuine anthropomorphism and the virtue of using our long history of reasoning about reason and emotion to understand animals. This latter type of theory is not properly understood as anthropomorphic because there is no error in seeing. Any being that is capable of having subjective ends will display certain behavior, and it is the task of ethologists to understand that behavior in its fullest sense. Tinbergen recognizes this is true for humans; the point I am making here is that it is at least logically possible that this will be true for any other animals with sufficient mental capacities and experiences.

Before I discuss those theories, I will just briefly note Tinbergen’s final axis on which animal behavior can be understood: *evolution*. Tinbergen writes, “Evolutionary study has, of course, two major aims: the elucidation of the course evolution must be assumed to have taken, and the unraveling of its dynamics.”²⁶ Like ontogeny, the first aim of evolutionary study is to understand progressive changes over time, but for the species rather than for a single individual. And like causation, the second aim of evolutionary study is to understand how, exactly, these changes come about, either through genetic change or through “the influence of selection on behavior evolution.”²⁷ Of note is that the evolutionary study of animal behavior has revealed that there is as much intra-species variety in behavior patterns as there is in genetics – this is the variety upon which natural selection acts to stabilize and shape the behavioral “blueprint” of the species. Much of this can be attributed, conservatively, to variations in genes that determine various behaviors.

²⁶ Id., p. 428.

²⁷ Ibid.

But it can also be attributed, where appropriate, to the exercise of cognitive and emotional capacities in the behavioral spaces that genetics leaves indeterminate. It should come as no surprise that many scientists following Tinbergen reject this possibility; but the behavioral variation upon which natural selection acts has to come from somewhere, and denying its partial origins in the preferences and choices of individual animals is to fail to provide a complete picture of the animal, even from an evolutionary perspective.

This concludes, then, our discussion of the four axes of understanding that have guided biological study of animal behavior since the field emerged. Biologists using this framework, or some subset of it, inquire into the causes and functions of animal behavior because, ultimately, they are trying to understand essential elements of existence for that species – they are investigating what it is to be that type of animal, what role its behavior plays in the essential functioning and flourishing of the species. No doubt these are important questions to ask in order to develop such a picture. I have so far described some of the shortcomings of each of these axes of understanding when it comes to cognitively and emotionally complex animals; but now I wish to turn to the stronger claim that there must be another axis of understanding if we are to fully understand such animals. That is, biologists' *own* aim of understanding the species will not be met if they fail to see that individual species members' behavior might be best explained by reference to that individual's interior mental life and the subjective ends which it generates.

Acting for Reasons

The study of intentional action and what constitutes acting *for reasons* has long existed parallel to the study of animals and animal behavior. Most often, this philosophical discipline confines its investigations to the intentional action of humans – indeed, one of

the foundational assumptions of philosophy of action is that intentional action is a unique capacity of humans that separates us from “the animals.” Nevertheless, remarkable cross-pollination between animal studies and philosophy of action has gained traction in recent years in the field of cognitive ethology, upending this widespread assumption. It is beyond the scope of this paper to go into all of the developments that this field has provided, though as José Luis Bermúdez puts it, “[h]igh-level cognitive abilities are being identified and studied in an ever-increasing number of species.”²⁸ For this reason, I will focus on one such philosopher of mind and action, Hans-Johann Glock, who has argued that some animals display behavior that is best understood as *intentional*, and that these animals therefore can act in the light of reasons (and hence their behavior is not subject simply to mechanistic causal explanations).²⁹ His arguments do not represent the entire field, nor do they answer the extreme skeptic about animal minds (who views animals as no different than plants). Nonetheless I believe they persuasively show that, even on a conservative reading of both theories of rationality and animal capacities, there is good reason to think that some animals are *rational* in the robust sense that is at issue in these debates. As a result, I will argue that scientists must reckon with this essential fact about the behavior of cognitively complex animals if they are to give adequate accounts of the distinct form of life that marks a given species.

To begin, Glock and Tinbergian ethologists share at least one methodological commitment: to focus only on observable behavior. Glock writes, “I shall approach the question of animal rationality from a *third-person perspective*. That is to say, there will be no appeal to phenomena...that cannot be manifested in observable behavior even in

²⁸ José Luis Bermúdez, *Thinking Without Words*, Oxford University Press (2003), p. 3.

²⁹ Hans-Johann Glock, “Can Animals Act for Reasons?”, *Inquiry*, Vol. 52, No. 3, 232-254 (June 2009).

principle.”³⁰ But he emphatically rejects the extreme skepticism that can be found in cognitive ethology with respect to the conclusions that can be drawn from observable behavior. Mental terms, for Glock, exist because of our need to understand and predict the behavior of other human and non-human animals; though the terms themselves (like “intentional action”) reference some interior mental state, ultimately they address the need to understand how these states reveal themselves in observable behavior.³¹ Thus the behavior of an animal is a starting point from which we can work backwards to understand whether complex mental states exist and, if so, what their contours are. In holding this to be possible, Glock rejects the scientific tendency to “only attribute higher mental capacities to a creature if this is the *only* explanation of its behavioral capacities.”³² Instead, he offers us a different methodological starting point: “We should only attribute higher mental capacities to a creature if this is the *best* explanation of its behavioral capacities.”³³ From this perspective, the failure of ethologists (who e.g. exclude subjective desires for “fun” as possible explanations of whale breaching behavior) is made more coherent – these cases show us not only the tenuous lengths to which scientists will go to avoid attributing higher mental faculties to animals, but also the way that this insistent avoidance of subjective explanations undermines the quality of the explanations they offer.

Glock’s arguments rely on two different distinctions in the philosophy of action: external versus internal conceptions of rationality; and objective versus subjective conceptions of reasons. External conceptions of rationality are often employed by biologists – an animal’s behavior is rational insofar as it maximizes that animal’s well-being

³⁰ Id., p. 234.

³¹ Ibid.

³² Id., p. 236.

³³ Ibid.

or interests *qua* species-member.³⁴ This is the form that survival value explanations take (e.g. a gull pecking at red objects is rational insofar as it maximizes the chances of acquiring nutritious food). We can note, though, that external conceptions of rationality can be found in Aristotle, too – an action is rational insofar as it maximizes well-being, or flourishing, conceived of independently of that individual’s *own* goals or preferences. And yet Glock notes that externalist conceptions of rationality are overinclusive for the usage of “rationality” that is actually at issue in the debate about animal rationality. On this view, even the migration of worms out of the soil after a rainstorm will be “rational,” though nobody realistically believes that they are *acting* at all.³⁵

For this reason, Glock argues that we must look to internal conceptions of rationality to capture the more robust sense of “rationality” at issue in these debates. On this conception, the rationality of an individual’s behavior (let’s call him *A*) is judged “by reference to *A*’s *own perspective*, by reference to *A*’s beliefs, desires, intentions and preferences.”³⁶ So the worms coming out of the soil will not be rational in this more robust sense, as they do not have the capacity to adopt ends of their own (though it is still coherent to say that the worms have interests *qua* worms). Thus the internal conception of rationality presupposes a certain level of cognitive capacity for the animals that are rational by the theory’s standards. Glock writes:

An agent is rational in [an internal] sense if she can perform an action in order to attain a good, subjectively conceived, something *she herself wants*. In other words, the agent needs to be capable of acting *purposively* or *intentionally*, in pursuit of her own

³⁴ Id., p. 238.

³⁵ See Bermúdez, p. 116, for a similar point.

³⁶ Glock, p. 238.

goals. The connection with *rationality* is easily retained, moreover, since intentional actions are standardly equated with actions which the agent performs *for a reason*.³⁷

This is the hallmark of intentional action – pursuing an end that is an end for the individual *qua* individual. Whether these ends will overlap with the ends of the species is a matter of coincidence, as anybody familiar with eating an entire box of Cheez-Its can confirm.

What does it mean, though, to perform an action *for a reason*? At this point Glock introduces the second distinction between subjectivist and objectivist accounts of reasons. A subjectivist account of reason holds that an agent acts for reasons where their actions can be explained by reference to their mental states such as beliefs, desires, and intentions.³⁸ Intentional action, on this account, is psychologistic, as it requires positing that the action was caused by complex mental states such as representation, propositional attitudes, and the self-conscious formulation of preferences. As Glock puts it, “For subjectivism the reasons in the light of which *A* acts are subjective states antecedent to *A*’s action.”³⁹ This implies that intentional action requires the capacity to entertain second-order thoughts *about* one’s own mental states, a high bar indeed for imputing rationality onto animals. Notably, such a capacity is not something that can be directly observed, and it is therefore no wonder that biologists prefer thinking of behavior as an *event* rather than an intentional *action* if this is how intentional action is to be conceived.

However there is an alternative, objectivist conception of reasons which does not require regarding these mental states as the *reason* for action (and therefore it does not presuppose them), nor does it imply the ability to entertain second-order thoughts about

³⁷ Id., p. 239.

³⁸ Id., p. 240.

³⁹ Id., p. 244.

one’s own mental states. On this view, “*A* is capable of acting for a reason if *A* can act in the light of reasons, that is, in the light of facts (as *A* sees them).”⁴⁰ That is, we find the possibility for intentional action wherever there are individuals who perceive their environment at a sufficiently high level and who have desires or preferences that will ultimately be expressed within that environment. As one familiar example among many, I bring my umbrella with me to class because it is raining (as I see it), and I want to stay dry.⁴¹ My belief that it is raining is not the reason I bring the umbrella; rather, the *fact* that it is raining (coupled with my desire to stay dry) is the reason. This shifts the focus of intentional action away from beliefs as *causing* actions and towards looking to the environments in which these actions take place. Facts about the world are the relevant data points for intentional action – these are the things that serve as reasons in light of which individuals act. So the awareness that intentional action implies only requires an awareness of one’s environment at a certain propositional level (rather than a second-order awareness of mental states). And there is good reason to think that many animals have *this* capacity.

Consider the following distinction (discussed at length by Glock): a dog perceives a bone in a bowl and eats it; and a dog perceives *that* a bone is in a bowl, and eats it (because whatever is in the bowl can be eaten). What is the difference? Glock notes that these are two different ways of describing the same observed behavior – the former attributes a minimum level of *object*-perception to the dog, the latter attributes the more complex capacity of *fact*-perception. Glock argues any “creature that is capable of perception is ipso facto capable of belief. To be more precise, perceiving that *p* implies either knowing that *p*...or it implies merely believing that *p*.”⁴² When the dog refrains from eating the bone

⁴⁰ Ibid.

⁴¹ Id., p. 241.

⁴² Id., p. 243.

until it has been placed in the bowl, his behavior can only be explained by attributing to him the perception *that* something is the case; if it were mere object perception (bone-in-the-bowl), the behavior becomes inexplicable, as being in the bowl could only explain which bone the dog perceives, and not whether it can be eaten. “The explanatory power of the ascription can be purchased only by imputing fact-perception, whether explicitly or implicitly.”⁴³

If this is right, then many animals are capable of having knowledge and beliefs about their environment. Whether they can entertain second order thoughts *about* these mental states is a difficult question. But it is crucial to see that this is only a requirement of intentional action and rationality on *one* theory of reasons – namely the subjectivist account. If, on the other hand, we adopt an objectivist account of reasons (where rationality involves acting in the light of *facts*), then animals are capable of intentional action and rationality. Moreover, if we adopt an internalist conception of rationality (as we should, given the shortcomings of externalist conceptions), then animals are capable of acting in the light of reasons which are good for them *qua* individuals, even if not *qua* species members. The counter-survival behaviors that puzzles scientists end up being paradigm examples of rationality on this view – it is an expression of an animal’s capacity for intentional action that he sometimes behaves in ways that are not characteristic of his species, or in ways that are not directly related to survival. I will not go through the reasons for and against objectivist versus subjectivist accounts of reasons – I will just point out that this is a debate about rationality in which many scientists do not engage, and there is at minimum a coherent theory of intentional action on which animals are capable of performing it. Far from being an anthropomorphic analysis of animal behavior, the

⁴³ Ibid.

attribution of rationality and intentionality to the behavior of complex animals can be well-defended from both a philosophical and empirical perspective.

Completing our Scientific Theories

What I want to spend the remainder of this paper discussing is what this means for the scientific account of animal behavior that I have been discussing so far. If many animals are capable of acting *for reasons*, and for reasons that are particular *to them*, what does it mean that scientists ignore this when trying to understanding why they exhibit certain behavior? Think back to the humpback whales discussed at the start of this paper. As a species, humpback whales display an incredible variety of songs that adhere to complicated formal structures, and they display this behavior at moments when it seems that it will improve their chances of mating to do so. It is no wonder, then, that scientists have answered the question “Why do humpback whales sing?” by referencing the survival value of the behavior. But as we saw earlier, almost all whales introduce a bit of originality into their song – they sing it a bit differently, extending one phrase longer, or at a higher pitch, or with a different “melody.” This phenomenon can’t be plausibly explained without invoking the concept of individuality. And yet, scientists have explained even this intra-species variety with reference to survival value.

Notably, scientists haven’t yet asked the question, “Why does *this* humpback whale sing?” To use the language of philosophy of action, they have confined their inquiry to discovering the reasons that might fit into an external conception of rationality, but have not yet considered that there might also be internal reasons unique to each animal. And humpback whales are perfect candidates for inquiring into their subjective ends. They are capable of the sort of fact-perception discussed by Glock above, among other cognitively

complex behavior (like the transmission of skills and songs), and they have displayed a range of behavior that suggests a sophisticated emotional and conative life. There is good reason to think, then, that they are capable of acting for reasons.

If this is the case, then the aims of ethology, i.e. to understand the species, are severely undermined by ignoring that part of what life is like for the members of that species is to act on reasons which bear no necessary connection to the survival of the species. Few would argue that one could develop a complete picture of humans without noting that one of the central capacities of humans is to form and pursue one's own conception of the good (indeed this is a fundamental starting point of much of political philosophy). And that is because as soon as a species possesses certain perceptual and cognitive capacities, then what we mean when we ask about the *reasons* for their behavior will come to have a special significance – we can adopt both an external and an internal view of *why* an individual exhibits certain behavior. Current explanations of whale behavior, and indeed many other species, displays this gap. Scientists have come a long way in understanding the survival value of behavior, but their aversion to charges of anthropomorphism has led them to disregard one of the key insights to understanding that behavior.

To remedy this oversight, it is imperative that scientists begin to accept that understanding any given species will also require acknowledging that the species members' behavior is often motivated by individual-specific reasons. Understanding the species, even at a species level, requires understanding that the individuals who make up that species can act for reasons, and in particular can act for reasons that have nothing to do with that individual *qua* species member. What this means is that Tinbergen's "Four Why's" will need to become the "Five Why's" – scientists must have the resources to say the

humpback whale sings, for example, *because* it wants to, and not simply because singing increases its chances of successful mating. This is an essential feature of what life is like for the members of that species.

As a final note, I will add that amending Tinbergen’s “Four Why’s” has political philosophical consequences. If we grant that many species of animals on earth are being harmed by humans, and that this harm constitutes an injustice, then we will need to have an accurate and comprehensive account of what a flourishing life would look like for that species in order to know what changes need to be made. Just as denying highly social animals of intra-species companionship is a serious wrong, so too is denying cognitively complex animals the ability to act on their own preferences. In this sense, our scientific theories of species have direct ties to what we believe they are owed from humans. It is imperative, then, that we get our descriptive theories of animals right – and for cognitively complex species like the humpback whale, the possibility of individual-specific reasons for acting is an essential part of a scientific account of their distinct form of life.