

# A Science-Based Critique of Epistemological Naturalism in Ouine's Tradition

Reto Gubelmann

pəlgrəve macmillan

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Für Nathalie

### Preface

In this book, I venture a critical assessment of epistemological naturalism. Proponents of this position hold that there is no knowledge outside of science, since the empirical-scientific method (or methods) of justifying claims or theories is without alternative. Therefore, if epistemology is to deliver knowledge, it has to itself become immanent to science.

Often, critics of epistemological naturalism argue that the doctrine cannot accommodate some important aspect of human existence, say altruistic behavior. One weakness of this approach is that epistemological naturalists can always adopt an eliminativist or reductivist attitude with regard to the phenomenon in question: naturalists can argue that altruism either does not exist, or that it can be reduced to biological functions such as the reproductive success of groups.

This book is different. Rather than focusing on phenomena that are traditionally conceived to be external to empirical science, it focuses on empirical science itself. With regard to this phenomenon, epistemological naturalists cannot adopt an eliminativist position, and adopting a reductivist one comes at a considerable cost.

Furthermore, I am trying to meet my naturalistic counterpart on her own ground not only with regard to the subject matter (empirical science), but also with regard to the epistemic way in which I approach this subject matter: I try to support my central claims and arguments with detailed discussions of first-order scientific data. When arguing that it is an open question whether empirical science is able to explain how our access to empirical reality supports our scientific theorizing, I am making extensive use of first-order scientific results and experiments (such as habituation and preferential looking experiments). Even when my claim is squarely metaphilosophical, such as when I am urging that the scientific realism debate belongs to philosophy and not to science, I am making my case from within science, arguing that the debate transcends the *bona fide* epistemic practices of the sciences, and I am supporting my case with detailed analyses of actual discussions in the history of natural science.

When beginning the research for this study, one of my basic (but rather vague) working hypotheses was that the richness and diversity of actual scientific research militates against the austere and monolithic nature of epistemological naturalism. I think that my discussion of contemporary perceptual psychology in Sect. 4.2 and of Perrin's experiments to establish the reality of atoms in Chapter 9 support more specific versions of this general working hypothesis.

Hence, this book's contribution to the ongoing debate about epistemological naturalism—and about the metaphilosophy of epistemology in general—consists in arguing that there are grounds within science to question epistemological naturalism. By reviewing insights from linguistics, psychology as well as from the history of natural science, I argue that science itself points beyond itself to epistemic practices that are clearly distinct from empirical science.

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Parts of Chapters 2, 3, and 7 draw on and elaborate ideas previously published in "From Shared Stimuli to Preestablished Harmony: The Development of Quine's Thinking on Intersubjectivity and Objective Validity", *HOPOS*, 9, DOI: https://doi.org/10.1086/703253. Figure 4.2 is reproduced with permission from Yang, Jiale, So Kanazawa,

Masami K. Yamaguchi, and Ichiro Kuriki (2013). "Investigation of color constancy in 4.5-month-old infants under a strict control of luminance contrast for individual participants". In: *Journal of Experimental Child Psychology* 115.1, p. 130.

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# 1

## Introduction

Ever since the beginning of modern science and its emancipation from "natural philosophy", philosophers have marveled at the successes and the epistemic<sup>1</sup> discipline of modern science. Immanuel Kant, in his preface to the second edition of the "Critique of Pure Reason", states that, in contrast to natural science, philosophy has been unable to walk the secure path of a science. Instead, it is, and has always been, a mere groping among concepts (Kant 1998 [1987], pp. XIVf.). In response to this untenable situation, Kant intends to refashion philosophy so that it displays the desirable epistemic properties of natural science.

Kant's conviction that modern natural science poses a challenge to the self-understanding of philosophy is by no means an exception; rather, it is the rule. Given the lack of consensus, progress and discipline of philosophy,

<sup>&</sup>lt;sup>1</sup>My distinction between epistemic and epistemological matters distinguishes the actual practice of justifying claims and attaining knowledge from reflecting and theorizing about this practice. Epistemic questions are questions regarding the justification of a given claim or position; they are internal to the game of giving and asking for reasons. For example, to maintain that the epistemic standing of the claim that god exists is weak is to maintain that the claim has little warrant, or justification. In contrast, epistemological questions are questions about this game; they are answered with reflections and theories about central concepts or principles of the game. By drawing this distinction, I do by no means dispute that many epistemic debates evolve into epistemological debates.

when compared to empirical science, many philosophers have begun to worry whether the supposed insights provided by philosophical inquiry are trustworthy. Indeed, it has become a question of serious consideration whether there is anything deserving of the title of knowledge outside of empirical science.

Epistemological naturalism, the topic of this book and one of the most influential epistemological positions in contemporary western philosophy, answers this question with a clear "no". The position stands in the tradition championed by Kant: epistemological naturalists seek to refashion epistemology to set it on the secure path of a science. What clearly distinguishes epistemological naturalism from proposals such as Kant's is that naturalism requires that epistemology adopt the same epistemic methods that are in use in the natural sciences. Following W. V. O. Quine (1981, p. 72), in a first approximation, epistemological naturalism can be characterized as rejecting any dualism in epistemology. In particular, it rejects the idea that epistemology and natural science have different epistemic resources and methods.

What is the general appeal of epistemological naturalism? Mostly, epistemological naturalists share the basic perspective of scholars like Kant: when compared with the epistemic merits of empirical science, philosophy, as traditionally practiced, seems to have little to recommend itself. Additionally, epistemological naturalists are typically particularly impressed by the instrumental and predictive success of empirical science. In the past four centuries, this success has been one of the most noteworthy phenomena in human intellectual life. From Newtonian physics to computational biology, from immunology to meteorology, empirical sciences have delivered theories that have vastly increased our power over our environment as well as our bodies, and they have delivered successful predictions of phenomena such as cosmic background radiation that were long thought to be far beyond the scope of human understanding.

As a consequence, it might seem natural to expect that this conquest of empirical science has no principled limits. It seems natural to expect that the epistemic methods of science (whatever they may be precisely), can be applied with equal success to any subject matter whatsoever.

The study presented in this book critically assesses the prospects of this naturalistic expectation; it does so in a notorious philosophical way, by

focusing the attention on the subject itself: Can empirical science come to terms with its epistemic self, can it address it, using its tried and tested methods, as a phenomenon with (prospects of) the same success that it has had with so many other phenomena? With regard to these questions, that is, when the focus lies on science itself, the epistemological naturalist is committed to showing that empirical science is *epistemically self sufficient*. The goal is to show that science does not need any other epistemic means than its own scientific ones—even in epistemological matters, which include examining and justifying its own way of justifying theories and hypotheses.

Note that the target of my critical analysis is not what is traditionally conceived as empirical science itself, but rather a certain epistemological position regarding science. According to this position, reflection about topics like scientific verification, truth, or possible conflicts between scientific and common-sense insights are to be addressed using essentially the same epistemic means that are used in everyday scientific inquiry.

In the literature, epistemological naturalism (see Horwich 2014, p. 38) is generally conceived as the position that "[0]nly the scientific method can deliver genuine knowledge", which of course echoes the claim phrased above, according to which there is no knowledge outside of science. This is not to say that there is only one version of epistemological naturalism. Rather, there are at least as many versions of epistemological naturalism as there are positions on how exactly science justifies its hypotheses and theories. It will soon become clear that Quine steadfastly defends an empiricist conception of how scientific justification works, and that he thinks he can support this conception in an austerely scientific way.

Epistemological naturalism is commonly distinguished from ontological and methodological naturalism, compare Glock (2003, pp. 27–28). What unites all of the three general kinds of naturalism is the conviction that philosophy should imitate science, although they differ from each other by imitating science in an epistemological, an ontological, or a methodological dimension.

Plantinga (2002, p. 1) conceives of naturalism as an ontological thesis, namely as the rejection of the existence of any supernatural beings, such as a god. Stricter versions of ontological naturalism, such as the one endorsed by Rosenberg (2014), amount to variants of materialism, mechanism, or



Fig. 1.1 An overview on the terminology used in this book (Source Author)

physicalism. I will show that Quine endorses a sophisticated version of physicalism, and hence a version of ontological naturalism.

Methodological naturalists urge that philosophy adopt the methods of science (compare Papineau 2015). However, these methods are almost always the methods of justifying claims, which means that, for the most part, methodological naturalism is epistemological naturalism by another name.<sup>2</sup>

In the remainder of this introductory chapter, I develop my conception of epistemological naturalism (Sect. 1.1), and I provide an overview on the content and the general argument of this book (Sect. 1.2).

### 1.1 Epistemological Naturalism

Epistemological naturalism is best conceived as consisting of two elements, one of them being a central claim, defining a central structural property of the position, what I call 'justificatory monism'. The other element constitutes a positive research agenda, namely the project of pursuing epistemology as a branch of empirical psychology, what I call 'naturalized epistemology'. Figure 1.1 gives an overview on this terminology.

In the following, I introduce justificatory monism as well as naturalized epistemology, and I detail their relationship. I do so with a focus on

<sup>&</sup>lt;sup>2</sup>I take it that what Glock (2003, pp. 27–28) calls metaphilosophical naturalism largely coincides with methodological naturalism: he (ibid.) considers Quine's methodological monism as an instance of metaphilosophical naturalism.

Quine, the pioneering theoretician of the position, while also introducing the position of Penelope Maddy, whose subtle and innovative position will be discussed throughout the book.

### 1.1.1 Its Central Claim: Justificatory Monism

Naturalized epistemology is motivated by the conviction that epistemological reflection about natural science must be conducted using the same epistemic means that are used in first-order scientific inquiry. This conviction, in turn, is typically grounded in the belief that empirical-scientific justification is the only kind of justification available (this being a sufficient, but not a necessary condition for naturalized epistemology, see below, Sect. 1.1.3). I call this conviction, according to which there is only one basic way to justify any claim whatsoever, thus rejecting any kind of fundamental epistemic dualism, *justificatory monism*.

Note that the bare claim of justificatory monism does not specify what empirical-scientific justification amounts to—it does not even specify that the relevant kind of justification should be empirical. Hence, as such, the claim is almost hopelessly unspecific. What I call *versions of justificatory monism* involve a specific conception of justification. Furthermore, this book is about empiricist versions of justificatory monism, that is, versions of justificatory monism whose conception of scientific verification is recognizably empirical.

Note that, throughout the book, I am using "(empirical) verification" interchangeably with "(empirical) justification"—even though "empirical verification" is more common than "empirical justification". This is because I do not want, even on the linguistic level, to presuppose what is at issue. My naturalistic counterpart maintains that there is only one sort of justification; by systematically using, say, "justification" in the context of deductive arguments, and "verification" in the context of empirical support, I would implicate from the start that my counterpart is wrong.

Quine defines his justificatory monism in opposition to the view that there is an epistemically higher mode of inquiry, what Quine calls 'first philosophy': The fifth move, finally, brings naturalism: abandonment of the goal of a first philosophy. It sees natural science as an inquiry into reality, fallible and corrigible but not answerable to any supra-scientific tribunal, *and not in need of any justification beyond observation and the hypothetico-deductive method* [emphasis RG]. (Quine 1981, p. 72)

In this passage, Quine characterizes naturalism by means of two claims. Naturalism rejects the idea that first philosophy constitutes a tribunal to which science must answer. Considering the context, the tribunal probably does not judge the moral or legal standing of science, but rather its epistemic standing. Hence, first philosophy is in a position to decide whether the insights obtained by science are sufficiently warranted. That naturalism rejects this idea means that there is no higher court with the authority to judge the insights of science. In other words, the verdicts of science are final.

The second characteristic claim of naturalism is contained in the part of the passage that I have emphasized: naturalism rejects the idea that there is a way of justifying claims that is not reducible to observation and the hypothetico-deductive method, but still necessary for science. This means that naturalism rejects the claim that science needs a way of justifying claims that is strictly distinct from the one it, science, can provide itself.

The two claims are closely connected. If science was answerable to a supra-scientific tribunal, then it would need non-scientific means of justification to stand its ground before this tribunal. Conversely, if science would need non-scientific ways of justifying some of its claims, then it is hard to see how the discipline furnishing these ways would not thereby become a first philosophy to science—at least with regard to the relevant claims. Still, the first claim implies an epistemic hierarchy between first philosophy and science that is not directly present in the second. Hence, while the first claim clearly implies the second, it is not clear whether the second one implies the first.

The focus of this book lies on the second characteristic claim of naturalism, as Quine elaborates it in this passage. As my overall goal is to develop a critique of epistemological naturalism, it is more modest to focus on this second claim than to address the first one. To refute the second characteristic claim, it is sufficient to show that science is not epistemically self-sufficient, that is, to show that there are questions pertaining to science, including epistemological questions, that science cannot answer by itself. To refute the first characteristic claim would require showing that there is an epistemically higher mode of inquiry, which would obviously be a more ambitious goal. Hence, what I call justificatory monism (and what Quine calls naturalism<sup>3</sup>) *requires that any statement whatsoever that is necessary for science can be justified by scientific justification.* 

Of course, much depends in this definition on the precise meaning of 'necessary for science' and 'scientific justification'. I discuss these two expressions in their order of appearance. First, while, broadly speaking, many statements are necessary for science, I focus on statements that are necessary for science insofar as they specify standards for empirical justification. These standards define the game of science (this is Quine's metaphor, see below, Sect. 6.2.2) and are therefore indispensable for the practice of scientific inquiry. According to justificatory monism, these standards are justified in the same way that they themselves determine.<sup>4</sup>

Second, according to Quine, 'scientific justification' is to be understood in a strictly empiricist-holistic way. Whether a given statement is justified or not depends entirely on whether it contributes to the successful prediction of empirical data (compare Quine 1992, p. 20). Thus, Quine's version of justificatory monism, which I call his *empiricist justificatory monism*, can be specified as follows: any statement whatsoever that is necessary for science can be justified by its contribution to the successful prediction of empirical data.

The basic thrust of Maddy's naturalism agrees nicely with Quine's rejection of first philosophy, that is, with the rejection of any strict distinction between science and philosophy as well as of the idea that science is in

<sup>&</sup>lt;sup>3</sup>I use the term 'justificatory monism' instead of Quine's term 'naturalism' for two reasons. First, 'naturalism' is—mostly due to Quine's influence—currently used in so many different ways that it has lost any distinctive meaning. Second, I hope that the term 'justificatory monism' serves to highlight the aspects of Quine's naturalism that I am focusing on.

<sup>&</sup>lt;sup>4</sup>Hence, I disagree with Keil (2003, p. 277), who maintains that "it was far from clear what he [Quine, RG] did ban under the name of prior [i.e. first, RG] philosophy", and also that "[t]here are not many philosophers left at whom Quine's criticism of philosophical apriorism could be aimed." Quine's justificatory monism excludes any position according to which reflection on the correct explication of empirical-scientific justification is not itself bound by this conception. Such positions are still held by a significant part of contemporary philosophers of science.

need of, or answerable to, any non-scientific mode of reflection and justification. Hence the term that Maddy uses for her idealized naturalistic inquirer, namely the "Second Philosopher". Apart from this fundamental agreement, however, Maddy's version of justificatory monism, called "Second Philosophy", differs in interesting ways from Quine's.

In explicit terms, Maddy explains Second Philosophy merely negatively. Second Philosophy is fundamentally opposed to any epistemic two-level conceptions of the relationship between philosophy (and epistemology in particular) and science. According to Maddy (2007, pp. 56-64), the archetype of such a two-level view is Kant's transcendental philosophy: on her view, Kant's distinction between the realm of empirical science and the domain of transcendental inquiry implies that the former has nothing whatsoever to contribute to the latter. In positive terms, however, Maddy refuses to specify her justificatory monism, that is, to give a positive, explicit epistemological specification of what scientific justification consists in. Maddy refuses to do so because she thinks that it is probably an impossible task (Maddy 2007, p. 1) and because she, ultimately, holds that it is incompatible with naturalism to give a hard and fast specification of what empirical justification consists in (see esp. Maddy 2007, pp. 91f.). Hence, Maddy's justificatory monism rejects any conception of philosophy that is epistemically strictly distinct from the realm of science-without specifying positively what is epistemologically distinctive about this realm.

While Maddy does not have an explicit, clear-cut specification of what empirical justification, and hence empiricist justificatory monism, consists in, she embraces empiricist justificatory monism in the practice of her naturalism. In particular, she uses the notion of the empirical to make sense of what a two-level view amounts to (see, e.g., Maddy, 2007, p. 4). Furthermore, she emphasizes that her epistemology, in contrast to Kant's, enjoys solid empirical support (Maddy, 2007, p. 6). Finally, as I will argue in Chapter 9, Maddy uses a, perhaps problematic, distinction between empirical and non-empirical aspects of the atoms debate to position herself vis-à-vis this debate.<sup>5</sup>

<sup>&</sup>lt;sup>5</sup>Further passages where Maddy implicitly relies on empiricist justificatory monism are: Maddy (2007, p. 262), where she makes clear that it is not conceivable that any other evidence than empirical evidence could play a role in developmental psychology; Maddy (2007, p. 279), where

Leaving more specific questions aside, it is not problematic from the start to refuse to explicitly state a certain conceptual distinction while one's intellectual practice displays this same distinction at work. Furthermore, Maddy (2007, p. 1) is fully aware of this aspect of her position. She admits that she does not have a general definition, of the kind of Quine's empiricism, for the realm of science; what she does instead is introduce the Second Philosopher as a character and then "proceed by describing her thoughts and practices in a range of contexts". Hence, while her explicit characterization of her position is merely negative—consisting in a rejection of any two-level views à la Kant—it seems apt to conceive her position as an implicit and unspecific kind of empiricist justificatory monism—all the while keeping in mind that the Second Philosopher would never assume the meta-position to make this assertion.

### 1.1.2 Its Practice: Naturalized Epistemology as Empirical Psychology

Naturalized epistemology is the only remaining way to practice epistemology, once one has accepted justificatory monism. It is the attempt to pursue epistemology as a part of empirical science, namely as empirical psychology; to understand, using solely the epistemic practices of the empirical sciences, the central and basic cognitive abilities necessary for empirical science, with the ultimate goal to determine the kind of evidential support that science can enjoy.

This means that naturalized epistemology is oriented towards two main issues: (1) what is our most direct and unmediated cognitive contact with empirical reality, and what are the cognitive abilities of humans that are both of central importance for scientific inquiry and that are in most direct

she acknowledges, in striking analogy to Quine, that even the laws of logic can be revised in light of empirical evidence; Maddy (2007, p. 410), where she agrees with Mark Lange that interpretations of physical theories that allow for new empirical predictions thereby qualify as scientific theories, instead of being philosophical speculation; Finally, Maddy (2007, p. 88) distinguishes her position from Carnap's by rejecting the very idea that there is any realm of inquiry beyond the empirical one: "what she [the Second Philosopher, RG] wants, of course, is a defense based on empirical study of human language use. In contrast, Carnap explicitly distinguishes his pursuit of 'the logic of science' from the empirical study of language".

and unmediated cognitive contact with empirical reality? (2) How, and to what extent, does this contact support our scientific theorizing?

The basic idea of naturalized epistemology is by no means new: for millennia, researchers have studied the way in which we "take in information" about empirical reality, how our mind processes this information so that it can be used as evidence for our beliefs and, ultimately, for our scientific theories. What distinguishes naturalized epistemology from these traditional approaches is that it explicitly rejects most traditional modes of inquiry—typically versions of a priori reflection—for the purposes of this project.

To illustrate this very general description, I now sketch the versions of naturalized epistemology developed by W. V. O. Quine and Penelope Maddy. Additionally, I briefly introduce research by Tyler Burge, who, as I will show, occupies an interesting middle ground between Quine and Maddy—without subscribing to naturalized epistemology.

In his seminal article "Epistemology Naturalized", Quine introduces the aim of naturalized epistemology as finding out how "evidence relates to theory, and in what ways one's theory of nature transcends any available evidence" (Quine 1969, p. 83). Accordingly, naturalized epistemology examines the relationship between evidence and theory, and the principled limits that follow from this examination for the extent to which a scientific theory can be warranted by evidence.

According to Quine, the only empirical data or evidence available to us is given by patterns of sensory stimulations of our nerve endings. He considers this itself a scientific insight, and one that enjoys a particularly high degree of justification (for details and references, compare Chapter 2 below, in particular Sect. 2.2.1). Such patterns of sensory stimulations, in turn, can only be directly associated with *holophrastic* observation statements, that is, with statements taken as one-word sentences that are not ontologically committed or (proto-)logically structured. This is part of Quine's answer to the issues raised in (1) above: our most basic, unmediated contact with empirical reality is given by patterns of sensory stimulation of our nerve endings. Hence, our entire scientific edifice can stand on no more substantial empirical foundations than these patterns of sensory stimulations. Quine's answer to (2), that is, his account of how this contact with empirical reality does in fact support our scientific theorizing, proceeds by examining the ontogenesis of language: he intends to elucidate the connection between theory and evidence by studying how a typical human child develops a primitive scientific theory based on this empirical contact with the world. This presupposes two basic convictions of Quine's overall philosophy. First, Quine holds that every language constitutes a primitive scientific theory of the world. Second, he maintains that, when a scientist is testing her theories and when an infant is learning his first language, both the scientist and the infant have the same basic kind of evidence available. Epistemologically speaking, the scientist and the infant are sitting in the same boat.

This means that Quine can study the genesis of science, and hence its justification, by studying how a human infant acquires his first language.

In the following passage, Penelope Maddy describes the epistemological research of her idealized naturalistic inquirer, the Second Philosopher:

In general, the Second Philosopher's epistemological investigations take the form of asking how human beings – as described in biology, physiology, psychology, linguistics, and so on – come to have reliable beliefs about the world – as described in physics, chemistry, botany, astronomy, and so on. (Maddy 2014, p. 100)

Here, Maddy sketches the basically Quinean project of explaining scientifically how humans could have developed a scientific worldview. Hence, Maddy clearly shares the basic goal of Quine's naturalized epistemology.

Maddy also follows Quine in making developmental psychology the central discipline for naturalized epistemology. The basic idea behind this is that pre-linguistic infants have a kind of access to empirical reality that is not mediated by language, culture, or scientific preconceptions and hence much more basic and direct than the kind of access that adults have.

However, as I will detail below (Chapter 5), her answers to (1) and therefore also to (2) are about as different from Quine's as one can imagine. Maddy argues, based on experiments pioneered by developmental psychologist Elisabeth Spelke, that pre-linguistic human infants possess concepts and are able to judge the possibility or impossibility of certain simple physical events. This means that, rather than mere patterns of sensory stimulation, Maddy claims that our most basic contact with empirical reality is already conceptually structured; furthermore, she holds that infants already reason according to a simple kind of logic to judge the possibility or impossibility of such simple physical events. In answer to (2), Maddy's position implies that scientific theorizing ultimately rests on the same basic kind of contact with the world that pre-linguistic infants already possess, namely conceptually structured perceptions that are embedded in logical thought.

Tyler Burge, finally, occupies a middle position between Quine and Maddy when it comes to his answer to (1) (see below, Chapter 4). He argues that the most basic cognitive contact with the world that humans and many other animal species have is given through perceptual representations. While these representations are not conceptually structured (a claim that Maddy ventures with regard to the thoughts of pre-linguistic infants), they display an amount of structure and sophistication that qualitatively distinguishes them from Quine's patterns of sensory stimulations. It will turn out that Burge's answer to (2) also occupies a middle ground between Quine's and Maddy's positions.

Sometimes during my study of naturalized epistemology, it will be useful to have a more concrete act of cognition in mind than the slightly amorphous notion of scientific theorizing. For this purpose, I will invoke human judgments. Corresponding to established usage (compare Glock 2010, pp. 25–26), I am understanding judgments as mental acts, resulting in mental entities that are mental analogues to states of affairs on the one hand and linguistic sentences on the other. These sentences involve predication, that is, the application of a general, repeatable property to some individual, concrete particular. With regard to this, naturalized epistemology faces the task, typically based on an explanation of the ontogenesis of judgment and hence of predication, to elucidate the evidential basis of these judgments (compare (2) above).

#### 1.1.3 Some Structural Aspects

When practiced, epistemological naturalism becomes naturalized epistemology, a branch of empirical psychology and hence of empirical science. It may use findings of developmental psychology and linguistics, of cognitive and perceptual psychology and of any other empirical science to empirically elucidate the kind of evidence that human beings have available to theorize about the world. This evinces that naturalized epistemology, Quinean and other, is *inherently circular*: in its explanation of the emergence of science and of its evidential base, it employs the very scientific insights whose emergence it intends to investigate. Quine rightly argues that this circle is not vicious for him, as he does not intend to place science on a firmer foundation than science itself. Rather, his goal is to explain in a scientific way—and hence by presupposing and employing any scientific theories that he finds useful—how humans can have developed successful scientific theories, based on mere patterns of sensory stimulations as sources of information about the world.

This containment of naturalized epistemology within science results in reconceiving epistemology as a part of psychology, and it yields one direction of the much-debated "reciprocal containment" of natural science and epistemology (Quine 1969, p. 83): Epistemology is contained in science insofar as the former is a species of the latter. This containment of naturalized epistemology in science brings both rights and duties for naturalized epistemology: it can now make free use of all scientific insights, but it is bound by the epistemic standards of science (Quine 1974, p. 34).

The other direction of the reciprocal containment is given by the fact that naturalized epistemology investigates the relationship between scientific theory and evidence. As a consequence, the results of naturalized epistemology, even if it is only a part of empirical science, apply to empirical science as a whole: Should naturalized epistemology find, say, that humans have no empirical access whatsoever to empirical reality, this would have important and far-reaching consequences for empirical science as a whole.

After discussing the relationship between naturalized epistemology and empirical science, I now turn to the relationship between justificatory monism and naturalized epistemology. In any consistent naturalistic position, the two doctrines should be *mutually supportive*. Consider the architecture of Quine's epistemological naturalism. The question is: how do you scientifically defend a specific view of empirical-scientific justification? Quine's very plausible idea to accomplish this is: by showing that the respective view follows from the most solid scientific insights that are relevant to the issue. In other words, his naturalized epistemology is intended to scientifically support his empiricist version of justificatory monism. The same holds in the case of Maddy's justificatory monism: if her naturalized epistemology establishes that there are two fundamentally distinct ways to justify claims and to gain knowledge, one corresponding to traditionally philosophical, a priori reflection, the other corresponding to empirical research, then her justificatory monism would be seriously questioned.

Conversely, justificatory monism provides a sufficient—but not a necessary—condition to naturalize epistemology: If it is the case that the only basic way to justify any claim whatsoever is through empiricalscientific evidence, then the only possible way to pursue epistemology is in the form of naturalized epistemology, by relying on empirical-scientific evidence. It does not provide a necessary condition because there could be other reasons for a researcher to pursue epistemology in a naturalized manner. For instance, she could agree that metaphysics, when properly practiced, furnishes synthetic insights that are a priori warranted—but that these insights cannot apply on matters epistemological.

Note a consequence of the reciprocal support of justificatory monism and naturalized epistemology: specific versions of justificatory monism support specific versions of naturalized epistemology by determining what counts as empirically justified, and vice versa. For example, if one's version of justificatory monism is strongly focused on predictive success, this determination might exclude from the practice of naturalized epistemology these parts of evolutionary biology that are historical rather than predictive. The outcome of naturalized epistemology, in turn, by its very goal, determines the kind of evidence available to humans and thereby scientifically determines the right version of justificatory monism.

According to the schematic representation in Fig. 1.2, which elaborates on Fig. 1.1, justificatory monism and naturalized epistemology support each other, and both are located in the field demarcated by epistemological naturalism.



Fig. 1.2 The relationship of reciprocal support between justificatory monism and naturalized epistemology (*Source* Author)

To delineate the dialectical ground for a critical assessment of epistemological naturalism, in the remainder of this section, I detail the consequences of the failure of one of the two relata for the other.

First, assume that it turns out that naturalized epistemology is impossible in principle. What does this imply for epistemological naturalism and for justificatory monism? I suggest that the implications are threefold. First, it simply means that epistemological naturalism has no practice. The claim that the only way to justify any claim whatsoever is through empirical-scientific evidence together with the insight that empirical-scientific evidence is useless in matters epistemological implies that there cannot be a positive research project called epistemology. Second, it also implies that justificatory monism remains an empty claim, as it were: for an empiricist justificatory monist, the specific conception of empirical-scientific justification must be warranted by empirical science. If it turns out that empirical science cannot contribute anything in these matters, then this means that the justificatory monist cannot specify what empirical-scientific justification consists in. This ultimately means that she cannot say what distinguishes science from non-science. Third, the principled failure of naturalized epistemology would also imply that justificatory monism is not sustainable because it would mean that it cannot be justified: being a paradigm case of an epistemological claim, it would have