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## ‘Biologising’ Putnam: saving the realism in internal realism

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Putnam’s internal realism attempts to overcome both radical subjectivism and metaphysical realism. While he agrees with subjectivists that we understand the world through conceptual schemes, Putnam rejects their ‘anything goes’ relativist conclusions, arguing that states and properties of the external world co-determine our understanding of the world, and that some theories are more rational to accept than others. Theories, in other words, while they can’t be expected to correspond ‘absolutely’ to the external world, can nevertheless be objective-for-us. When theorising about rationality, however, Putnam runs into problems, claiming that the criteria of rational acceptability, determining the choice of conceptual schemes, are a set of historically evolving cultural norms. This causes a slide into subjectivism and relativism. In this paper, I argue that the main tenet of internal realism – the possibility of an objectivity-for-us – can be maintained. Taking a naturalistic approach, I defend the view that both the conceptual tools and the epistemic values making up our conceptual schemes are ultimately grounded in our genetically determined cognitive apparatus. The conceptual schemes mediating our understanding of the world, therefore, are not merely contingent cultural products but, to an important extent, necessary biological products. In this regard, although Putnam explicitly rejects any attempts to naturalise reason, I argue that it is precisely such a naturalistic approach that provides his internal realism with the necessary backing.

### Introduction

Putnam’s internal realism states that our understanding of the world is co-determined by the conceptual schemes through which we must understand the world (internalist view) and the external world itself (realist view). It thus rejects and overcomes the dichotomy between metaphysical realism – only the external world determines our understanding of it – and radical subjectivism – only the subject (its set of beliefs, cultural frameworks, etc.) determines its representation of the world. Indeed, while metaphysical realism postulates that our representations (could ideally) copy the world, and subjectivism – as Putnam (1981) puts it – states that our representations do not (and could never) connect with the world at all, internal realism takes the middle road pointing at the possibility of an ‘objectivity-for-us’ (Putnam 1981: p. 55; Putnam 1987: p. 77). ‘Truth’, Putnam argues, ‘is some sort of idealized rational acceptability – some sort of ideal coherence of our beliefs with each other and with our experiences as those experiences are themselves represented in our belief system’ (1981: pp. 49–50). Truth, in other words, cannot be absolute correspondence with the world – a so-called ‘God’s eye view’ (as metaphysical realism holds), nor is it exclusively dependent on the subject (as subjectivism or relativism holds), but it is imposed by the external world as it is filtered through our conceptual schemes. It is ‘ultimate goodness of fit’ (p. 64).

This position has the merit, as Decock & Douven (2012: p. 111) point out, to ‘do justice both to the arguably most central realist intuition – that the world is robust in the sense that our believing things to be thus and so is in general not enough to make it true that they are thus and so – as well as to the antirealist idea that there is no uniquely correct way to conceptualize the world, and that the way the world is depends to at least some extent on the conceptual scheme that we use to speak

and think about the world'. It overcomes both a problematic metaphysical realism and an undesirable and ultimately self-undermining or even self-refuting 'anything goes' relativism.<sup>1</sup>

Internal realism, in this regard, demarcates itself from relativism in claiming that the epistemic notions of right or wrong or better or worse, while not universal or 'neutral' (we do have conceptual schemes) are nevertheless both objective for us (for the kind of cognisers we are) and depend (in part) on states of the external world, not merely on subjective justification. In Putnam's (1992) words, 'the notion of a right (or at least a 'better') answer to a question is subject to two constraints: (1) Rightness is not subjective. What is better and what is worse to say about most questions of real human concern is not just a matter of opinion. Recognizing that this is so is the essential price for admission to the community of sanity. [...] (2) Rightness goes beyond justification. [...] My own view is that truth is to be identified with idealized justification, rather than with justification-on-present-evidence. 'Truth' in this sense is as context sensitive as we are. The assertibility conditions for an arbitrary sentence are not surveyable' (pp. 114–115).

Internal realism, therefore, requires some notion of an 'unrelativised fit' between representation and the world (Conee 1987: p. 90). Without such a notion, we're back to an 'anything goes' and lose the 'realism' in internal realism. Conceptualising truth as 'idealised rational acceptability', that benchmark for Putnam – it bears no doubt – is rationality. In this regard, Putnam (1981) claims that, while there is not a uniquely right way of describing the world, some ways are better or more rational than others. Rationality, in Putnam's words, cannot 'be (or evolve into) anything' (p. x). Furthermore, he argues that: 'the view that rational acceptability is itself simply subjective is a self-refuting one' (pp. 135–136) – given that total relativism is self-refuting (see footnote 1). Rationality or rational acceptability, in this regard, provides us with the epistemic orientation (a sense of right or wrong or at least better or worse) necessary to ward off an 'anything goes' relativism. It goes beyond what can be persuasively argued in a given cultural context (Putnam 1981: p. 158) – as cultural relativists as Rorty (1979) would have it – and possesses therefore, next to an 'immanent' facet – what is considered reasonable is shaped against the background of an inherited tradition – a 'transcendent' facet – traditions themselves can be criticised (Putnam 1982: p. 8).

Nevertheless, Putnam offers no reason whatsoever as to what enables us to take this '(culture) transcendent' stance. Indeed, when theorising about the source of rationality, he situates it exclusively in a historically evolving set of cultural norms.<sup>2</sup> This sacrifices the necessary 'unrelativised fit' required by internal realism and causes a slide back into relativism. While there might be a benchmark to demarcate better or worse theories within a given cultural context, by situating the source of rationality in a contingent historical process, we lose this ability outside such spatio-temporal context. Objectivity-for-us becomes objectivity-for-us-here-and-now. Exactly the point that Rorty (1979) endorses.

Consider Putnam's (1981: p. x) following claims: 'I do not believe (...) that rationality is defined by a set of unchanging "canons" or "principles": methodological principles are connected with our view of the world, including our view of ourselves as part of the world, and change with time'. There is, he continues, no 'ahistorical organon' that defines what is rational. In later writings, Putnam even takes on a pragmatic view on what determines conceptual schemes. He agrees with Dewey that 'humanity is constantly redesigning itself, and that we create needs' (Putnam 1987: p. 79). There is no such thing, he claims, as a description 'that reflects no particular interest at all' (Putnam 1994: p. 447). Conceptual schemes, therefore, as Moran (2000: p. 94) points out, are – according to Putnam – accepted or rejected on the basis of needs or interests. In this regard, Putnam came to replace the initial term 'internal realism' by 'pragmatic realism'.<sup>3</sup>

1 Self-undermining, since claiming that every understanding is relative to some contingent, cultural framework, undermines the validity of this very claim as well. Putnam (1981) also argues that total relativism cannot distinguish between being right and thinking one is right. This means, according to Putnam, that there is no difference in 'asserting or thinking on the one hand and merely making noises (or producing mental images) on the other' (p. 122).

2 To be fair, Putnam (1981: p. 55) does mention at one point that 'our concepts of coherence and acceptability[...] depend upon our biology and our culture'. This mention of biology, however, is the only reference to something extra-cultural as to what grounds rational acceptability and it is left unelaborated.

3 The term pragmatic realism, which Putnam also referred to as 'natural' or 'commonsense' realism, came to replace his internal realism

Therefore, unable to discern and pinpoint a non-historical, non-contingent normative component of rationality, which therefore remains an empty notion in Putnam's talk about rationality (cf. rationality's transcendent facet), his internal realism is, if not incoherent, at least painfully weakened, failing to rebut the relativist implications he wants to avoid at all costs. Rationality or rational acceptability is once again at the mercy of history, epistemic right or wrong, better or worse pointing no further than a given culture's horizon. We're back to an 'anything goes'.

In this sense, Putnam's account of rationality is at odds with the role it must play in his internal realism. Indeed, his conception of rationality violates one of the two key ideas of internal realism, namely that truth – as idealised rational acceptability – is stable or 'convergent' (the other key idea being that it goes beyond present justification) (Baghramian 2008: p. 24). What is rational to accept, in other words, cannot (merely) depend on volatile spatio-temporal frameworks. It must stand on its own. On this claim hinges the realism part of internal realism. This stability, as pointed out, is lost when rationality does not possess a culture-transcendent foundation. Therefore, failing to provide rationality with such a foundation by reducing it to a set of historically evolving norms and principles, Putnam's account of internal realism becomes untenable.

This slide into relativism has been noted by critics such as Steinhoff (1986), claiming that 'although internal realism has been developed in order to avoid both metaphysical realism and relativism, I believe that by abandoning the correspondence theory of truth Putnam has thrown away the very doctrine which can save his theory from relativistic consequences'. This leads him to conclude that 'Putnam has not successfully distinguished internal realism from relativism' (Steinhoff 1986: pp. 355–360).

In this paper I will argue that a rejection of metaphysical realism need not entail relativistic consequences. Internal realism, in other words, can be maintained. What is at stake here, is securing a stable notion of rational acceptability all the while admitting to a conceptual scheme view of knowledge. In order to do so, I will identify and defend a culture-transcendent foundation of rationality, a 'stable' source of what makes a theory or a representation rationally acceptable. This source, in other words, determines the conceptual scheme(s) mediating our understanding of the world. Before attending to the source of rational acceptability, I must first engage with Putnam's (1982) explicit rejection of any attempt to naturalise reason, since it is precisely such a naturalised approach that my argument will take.

### Why reason can be naturalised

In 'Why Reason Can't be Naturalized', Putnam (1982) examines different attempts to naturalise epistemological notions, i.e. to bring empirical or scientific theories to bear on philosophical questions pertaining to the theory of knowledge (e.g. can beliefs be justified, are claims rationally acceptable, etc.). Broadly sketched, Putnam discerns three kinds of naturalised approaches to epistemology. The first attempts to provide a naturalistic basis for justification. The second offers naturalistic reasons to deny the possibility of such a justification. And the third – the Quinean approach – eliminates epistemology altogether, according to Putnam, by simply abandoning the notion of justification.

The first approach, providing justification with a naturalistic basis, typically draws on Darwinian evolution. In its crudest form, its argument goes as follows: reason is a capacity for discovering truths, discovering truths has reproductive and survival value, therefore evolution by means of natural selection must have selected for a reliable capacity for reasoning, i.e. a capacity leading – to an important extent – to true beliefs. This, according to Putnam (1982: p. 5) is an empty statement. Since – in Putnam's view – truth is what is rationally acceptable (under idealised epistemic conditions), arguing that 'reason is a capacity for discovering truths' is actually saying that 'reason is a capacity to discover what is rationally acceptable'. Reason yields reasonable beliefs, in other words, a mere truism. To make such a claim interesting, Putnam argues, one has to presuppose metaphysical realism, defining truth in terms of (absolute) correspondence between beliefs and the external world. A problematic position, as pointed out above, largely abandoned

after the late 1980s. However, the main tenet of internal realism – i.e. a rejection of both metaphysical realism and relativism – was maintained (Baghramian 2008: p. 17). To avoid confusion, I will stick to the term 'internal realism' throughout this paper.

by contemporary philosophers, and definitely – according to Putnam – by thinkers of a more ‘reductionist’ ilk, such as evolutionary epistemologists, typically disparaging traditional foundationalist enterprises of epistemology (p. 3).

The second kind of naturalised epistemology, according to Putnam (1982), is – quite surprisingly – the view defended by cultural relativists. These skeptics of science – it being merely a contingent cultural framework in their opinion – nevertheless, naturalise epistemology – Putnam argues – since their views rely on the worldview inherent to some of the ‘softer’ social sciences, such as anthropology, linguistics, psychology and history (p. 8). These sciences – Putnam claims – propagate the view that contingent cultural entities determine the way we come to view the world. This, as pointed out above, leads to an ultimately self-refuting relativism, Putnam’s internal realism is meant to reject.

The final kind of naturalised epistemology, deals with Quine’s (1969) influential piece ‘Epistemology naturalized’. Quine notoriously claims that since the Cartesian quest for certainty and therefore ultimate justification of knowledge has failed, we should give up traditional epistemology and settle for psychology (pp. 76–77). This, according to Putnam (1982), is a form of epistemological eliminationism. It eliminates the normative. If all justification goes, Putnam argues, statements are but noise-making and thoughts but mere subvocalisations. It is ‘attempted mental suicide’, an unwarranted, destructive and self-refuting enterprise (p. 20).

According to Putnam (1982) all three kinds of naturalised epistemology are incoherent and self-refuting. There is, he argues, no eliminating the normative, nor reducing it to ‘our favorite science’ (p. 21). Reason, therefore, Putnam concludes, cannot be naturalised. I disagree. The way Putnam links science to epistemology is caricatural to say the least. Either it is seen as providing epistemology with ultimate foundations, or it is seen as denying any possible foundation or giving up on epistemology altogether. There is, however, a middle way. Naturalism need not entail the complete replacement of normative epistemology by natural sciences, nor need the question of justification be settled by means of empirical claims alone. Naturalised epistemology, the way I want to defend it, is of an *informative* kind. It does not replace epistemology, nor does it settle its evaluative questions once and for all, but informs it. It is what is often referred to as a ‘cooperative’ naturalism.

In this regard, siding with Putnam, I do not believe empirical theories about the mind yield conclusive answers to normative questions. Tracing the origin of our cognitive capacities in an evolutionary process by natural selection does not entitle us to assume that its products correspond to the external world. Nor does it warrant the opposite conclusion. What those theories can, however, point at is a better understanding of the source of normative claims. Why do we perceive one explanation as a better account of the world than another? Is this merely a question of a personal taste or cultural background, or are there other determining factors in play? These are empirical questions, and an answer to those questions – as I hope to show below – does have profound implications on the question of epistemological realism.

### The source of conceptual schemes

The conceptual scheme(s) through which we (must) view or understand the world can either be necessary for all possible cognisers, necessary for the particular cognisers we are or contingent. The first possibility I call the Kantian view of conceptual schemes, since Kant (1781) conjectured that all thinking (rational) creatures would have to understand the world through the same universal set of categories. The second possibility I will refer to as the human species-specific view of conceptual schemes. The third possibility, finally, is the cultural view of conceptual schemes.<sup>4</sup>

Any non-subjectivist or non-relativist view – to use Putnam’s (1981) terminology – on our relation between our representations and the world must adhere to either a Kantian or a human species-specific view of conceptual schemes or a combination of both. If those schemes are thought to be the product of contingent cultural elements (as natural languages, sets of belief,

<sup>4</sup> A view of contingent conceptual schemes could also take these schemes to be determined by the individual. Every individual cognizer, in this view, would be endowed with a particular set of conceptual schemes. This claim, however, is less common among relativists. I will therefore restrict my discussion to the cultural view.

‘*zeitgeist*’ or paradigms) – as conjectured by the cultural view – there can be no objectivity-for-us. All we’re left with is a radically contingent, culturally determined outlook on a world we can only assume lurks behind our opaque cultural veils. When having to choose between two incompatible and competing views of the world therefore with respect to their epistemic desirability we can only capitulate, forced to admit to an ‘anything goes’.

Putnam’s claim that rational acceptability is ultimately determined by a set of changing cultural norms (and changing needs creating particular norms) subscribes to this cultural view of conceptual schemes. Doing so, the realist component (implying both that the world is robust and co-determines what is true and what is not; and that some representations of the world are better than others, given the kind of cognisers we are) of his internal realism is lost and all that’s left is subjectivism or (cultural) relativism. In order to maintain internal realism, a case has to be made for either the Kantian view of conceptual schemes or the human species-specific view.

I do not want to defend the stronger Kantian view. There is, indeed, no reason to suppose human reasoning is the only possible kind of cognising and partakes in some universal rationality. An interesting hypothesis, in this regard, is the possibility of alien scientists. Reasoning from an evolutionary informed take on human epistemic abilities, Clark (1986) points out that we must accept the possibility of alien epistemologists, working successfully with a different model of our ‘common reality’. Indeed, he argues, ‘the ideal limit of human scientific enquiry is still not the only possible ‘correct’ representation of reality even if relative to our cognitive constraints and observational access there are no visible alternatives’ (p. 158).

Nevertheless, while a Kantian take on rationality is no longer warranted, I argue that the main tenet of internal realism – the possibility of an objectivity-for-us – is still a viable option. There is, indeed, the possibility of a human species-specific determination of conceptual schemes. This is the case I want to defend in this paper against the cultural view. In order to do so, we first have to elucidate what exactly makes up a conceptual scheme.

### **What does a conceptual scheme consist of?**

As Decock & Douven (2012) point out, critics have often complained about the vagueness surrounding Putnam’s notion of conceptual schemes. Putnam (1981) relies on metaphors in talking about conceptual schemes, describing them as ‘a way of speaking, a language’ (p. 36). This hardly helps our aim of trying to uncover the source of these conceptual schemes. Luckily, however, the notion of conceptual schemes is widely used in contemporary philosophy. All forms of cultural relativism refer in some way or another to particular schemes, frameworks or paradigms which determine our thinking.

Typically, talk of conceptual schemes either takes the scheme to consist of particular subject-dependent conceptual tools with which we analyse the world or particular subject-dependent epistemic values with which we analyse the epistemic desirability or the alleged correspondence between our representations and the world, or – often – a combination of both. Whorfian linguistic relativism, for instance, takes the former stance on conceptual schemes, arguing that what we project into reality is determined by the linguistically shaped conceptual tools at our disposal. Feyerabend’s (1975) scientific relativism, on the other hand, leans more towards the latter approach, arguing that scientific methodology and goals – i.e. the rules or values underlying ‘good’ science – are utterly contingent. Similarly, but somewhat less radically, Kuhn (1962) argues that the rules and agenda of science are determined by a particular paradigm. Conceptual schemes, in this regard, are both said to comprise a set of tools – the building blocks of our representations – and a set of values – the criteria which make representations epistemically desirable.

In the following sections, I will argue that both the tools and values making up our conceptual schemes are ultimately grounded in our genetic makeup rather than being exclusively determined by cultural contingencies (as natural languages, scientific frameworks or sets of inherited beliefs). Taking the human species-specific stance on conceptual schemes, the core claim of internal realism – i.e. that there is an objectivity-for-us – can be maintained. In defense of this case, I will adopt a naturalistic approach – as signposted earlier – pointing at empirical evidence for such a ‘biological backing’ of human knowledge.

### The source of conceptual tools

Minds, it often was and in some respects still is assumed, are ‘blank slates’ on which culture prints frameworks of thought in the form of linguistically determined concepts, culture-specific cognitive virtues, moral values, belief systems and the like. We see the world through the eyes of the culture we are born into and we behave according to the norms laid out by that same culture. In this view, the human mind, to use another metaphor, is seen as a sponge rather than a computer running different programs. This is what Pinker (2002) refers to as the ‘standard social science model’.

This model of the human mind underlies a series of cultural forms of relativism. The famous anthropologist, Franz Boas (1887: p. 589), claimed that ‘our ideas and conceptions are true only so far as our civilization goes’. Since our view of the world is exclusively determined by our cultural background, he argued, there is no way of asserting that one view is inherently better (more accurate, more true, morally superior) than another. The linguists Sapir and Whorf, on the other hand, argued that ‘we dissect nature along lines laid down by our native language’ (Whorf 1956: pp. 212–214). This influential position, as pointed out, came to be known as linguistic relativism.

Today, however, the ‘blank slate’ model of mind is largely discarded. It is now commonly accepted, at least in the sciences preoccupied with understanding the working of the human mind, that the mind is not an empty container but contains a number of special-purpose programs. This radical turn, known as the cognitive revolution, owes a great deal to Chomsky’s (1959) work in linguistics and his ground-breaking review of Skinner’s (1957) *Verbal Behavior*. Language, it appears, is not – and cannot be – learnt through mere general-purpose learning mechanisms, but presupposes the existence of a ‘language module’, an innate set of grammatical rules and constraints or – as Chomsky (1959: p. 42) calls it – a ‘generative grammar’, enabling the child to make inferences about the construction of new sentences it has never encountered before.

This new paradigm of human cognition was soon confirmed by empirical evidence from areas such as developmental psychology and cognitive anthropology. In this regard, developmental psychologists Spelke (1991) and Baillargeon (1991) tested 3- to 8-month-old infants with regard to their conception of objects and the physical laws governing them and concluded that infants expect objects to be impenetrable by each other, to move along continuous trajectories and to be cohesive. Infant minds, in other words, come equipped with a set of core intuitions about the physical world they couldn’t have gathered from mere induction. Anthropological research, on the other hand, shows that the human mind is predisposed to think about fauna and flora in a highly structured way. All cultures appear to divide the natural world into a complex taxonomy that incorporates different groups, each further defined in different levels of subgroups (Atran 1998). Other probable candidates for domains of innately constrained representations are: a sense of numeracy and natural geometry (Spelke 2003), a domain for psychology or theory of mind (Pinker 2007), a domain for facial recognition, and a cheater-detection module (Tooby and Cosmides 1992).<sup>5</sup>

It has, therefore, been established beyond any reasonable doubt that human thought is constrained to an important extent by the genetic makeup of the human brain. The way we think about the world, in other words, is not merely the result of experience and learning but also of innate cognitive predispositions. Science is no exception. Ruse (1986), in this context, argues that while the products of science (i.e. the representations or theories it produces) transcend their organic origin, the methods science employs and the principles it adheres to are still firmly rooted in our biology. Our scientific endeavours, in other words, as far as they can take us beyond our commonsense understanding and intuitions about the world, still flow through ‘biologically channeled modes of thinking’ imposed on us by evolution (p. 149). Similarly, Pinker (2007) argues that all human thought is grounded in a basic set of reasoning patterns evolved to deal with space, time, substance and causality. These cognitive patterns are, in other words, the substrate of our thinking, from simple commonsense reflection to our most counter-intuitive and abstract theories.

<sup>5</sup> Whether all of these proposed domains constitute separate and autonomous modules, however, is not my concern. My only aim is to illustrate the generally accepted claim in cognitive and evolutionary psychology that the human mind is endowed with domain-specific knowledge systems, predisposing it to view the world in a particular way.

This, I must emphasise, does not mean that scientific representations of the world are in any way an extension of our innately based commonsense representations of the world. Quite to the contrary in fact. The way science came to represent the world is often very counter-intuitive (think of superposition in quantum mechanics or even population thinking in biology, which clashes with our natural disposition to attribute essences to species). Science, as I have argued in another paper (Vlerick 2012), radically transcends our commonsense view of the world. It radically overrides our intuitive representations in domains such as physics and biology, and it conceptualises areas to which our intuitive understanding of the world is not attuned (e.g. molecular biology or quantum physics). It is also a safe-guard against an array of cognitive biases to which our minds are predisposed (see Tversky & Kahneman 1974, 1983; Nisbett & Ross 1980; Fine 2006; Kahneman 2011). Nevertheless, while its products radically depart from our intuition and its methods guard against deeply ingrained cognitive biases, the reasoning patterns it uses are to an important extent determined by our cognitive make-up.

This is not mere conjecture, empirical research supports this claim. Indeed, developmental and cognitive psychologists Carey and Spelke (1994) have brought to light a cognitive process called ‘mapping across domains’, which reconciles our ability to (radically) transcend our innately based commonsense theories about the world – as exemplified by modern sciences – and our reliance on innate systems of knowledge. According to these psychologists, the human mind is endowed with innate systems of knowledge, each pertaining to a particular domain, such as – for example – other minds, physical objects or number. Each knowledge system comprises a distinct set of entities and phenomena (e.g. the innate knowledge system of physics applies to material bodies and their behaviour) and a series of core principles (in the case of physical objects: cohesion, continuity and contact). Mapping across domains occurs when the core principles of one system are applied to the set of entities of another system. For example, by devising and using systems of measurement in physics, scientists create a mapping between the core knowledge system of numbers and that of physics. The principles governing the behaviour of physical bodies are therefore no longer those of cohesion, continuity and contact but the core principles of the system of number – such as one-to-one correspondence and succession. This results in theories about the physical world that radically transcend our ‘folk’ understanding (consider Einstein’s relativity theory), all the while building with innate cognitive building blocks.

In this sense, it is misguided to argue that contingent cultural elements provide us with the reasoning tools we employ, since these elements are themselves produced and constrained by our particular mental wiring. Take natural languages and mathematics, two very powerful thinking ‘tools’ (see Dennett [2000] on the role of natural languages in forming metarepresentations and Wigner [1960] on the ‘unreasonable effectiveness of mathematics in the natural sciences’). Natural languages, as Chomsky’s (1959) ground-breaking research shows, are constrained to an important extent by our cognitive make-up (more precisely our possession of a generative grammar). Similarly, research on the cognitive foundations of mathematics – particularly arithmetic and geometry – points at an innate basis (e.g. Dehaene & Brannon 2011). The ultimate source of the conceptual tools we employ in representing the world, in this regard, is not some contingent cultural ‘imprinting’ but a genetically fixed cognitive apparatus. For, as Wilson (1978: p. 167) puts it: ‘genes hold culture on a leash’.

### **The source of epistemic values**

Science, much as any epistemic enterprise, is not value-free. According to Putnam (1981) the values inherent to modern sciences are that theories should be instrumentally efficacious, coherent, comprehensive and functionally simple. These are the criteria in virtue of which a theory becomes rationally acceptable. Similarly, Kuhn (1977: pp. 321–322) discerns the following values: accuracy (predicting all or most data and explaining away the rest), consistency (both internal and with other relevant and accepted theories), scope (the consequences of a theory should extend as much as possible beyond the data it is required to explain), simplicity (explaining the data as economically as possible) and fruitfulness (the degree to which a theory permits one to make new predictions).



Those scientific values, it is often assumed, are culturally determined. They are thought to be the product of our western scientific *zeitgeist*, born with the development of modern science during the European scientific revolution. Putnam (1981: p. x), as pointed out, subscribes to such a cultural view of epistemic values or criteria, describing those criteria as a historically evolving set of norms determining what is rational and what is not. Feyerabend (1975) takes the argument a step further, claiming that there isn't even a consensus in a particular cultural context on what determines good science. Since value is inherent to science and value must be cultural or – even worse – personal, science in particular and any epistemic endeavour in general can be – at best – ‘true only so far as our civilization goes’, to dig up Boas’ (1887: p. 589) famous quote.

Values, however, cannot be lumped together. Not all values are a matter of personal and/or cultural taste. Longino (1990), in this context, distinguishes between contextual and constitutive values underlying science. While contextual values are personal, social and cultural values, belonging to a particular cultural and social context, constitutive values are ‘generated from an understanding of the goals of science’ (p. 4). They comprise the aforementioned criteria of predictive accuracy, coherence, scope and simplicity. These constitutive values enable us to judge competing explanations and derive norms and constraints governing scientific practice in particular fields. As Longino (1990) points out, independence from these kind of values is not what is at stake when debating whether science is value laden (p. 4). They do not bias the scientific enterprise, but – to the contrary – make out its essence.

The question, however, remains: what is the source of these constitutive values? Are they the product of the particular cultural context that saw the birth of modern science or are they – as is the case for the cognitive ‘building blocks’ science employs – ultimately grounded in our cognitive architecture? An increasing amount of empirical research points at the latter, uncovering an innate basis of those ‘constitutive’ epistemic values. This – in addition to the biological basis of conceptual tools defended above – would support the species-specific view of conceptual schemes, providing the necessary biological (read culture transcendent) backing for internal realism.

Carruthers (2006: p. 347), argues that the core epistemic values governing our reasoning are ‘most probably innate’, for they seem universal to human cultures, from hunter-gatherer societies to western scientific communities. Those values underlie, in other words, not just modern scientific reasoning, but all of human kind’s belief forming about the world. Furthermore, Carruthers points out, they are not – at least among hunter-gatherers – explicitly taught. Therefore, these epistemic values must be part of our cognitive endowment, not merely cultural acquisitions.

More specifically, Carruthers (2002) takes from Liebenberg (1990), it is the reasoning in which hunter-gatherers engage when tracking an animal which displays the clearest parallels with reasoning in science. Successful hunters will typically develop hypotheses concerning the (unobserved) causes of the (observed) signs (e.g. the way in which pebbles have been scattered, grass has been bent). These hypotheses are then examined and empirically tested for their accuracy (new data supporting or falsifying the hypothesis), coherence with background knowledge (e.g. known behavioural patterns of the hunted animal, and geography of the area), and explanatory and predictive power, very much like hypotheses in modern science.

Furthermore, the claim that epistemic values have an innate basis is supported by empirical research on simplicity. Lombrozo’s (2007: pp. 233–235) experiments point to a preference for simpler explanations (i.e. explanations invoking less causes) and the role of simplicity in probabilistic reasoning. More precisely, her experiments suggest that ‘simplicity is used as a basis for evaluating explanations and for assigning prior probabilities when unambiguous probability information is absent’ (p. 233). In this regard, participants to her experiments showed such a strong bias towards simple explanations that ‘disproportionate probabilistic evidence’ is required before preferring a complex explanation over a simple alternative (p. 233). Furthermore, Bonawitz & Lombrozo (2012) found that when simplicity competes with probability, young children show an even stronger bias for simplicity than adults – although they too are not entirely blind to the rate of probability. This points at a strong innate disposition to accept explanations invoking one or few different causes over explanations invoking more causes.

Finally, as Papineau (2000) points out, human beings are endowed with a strong cognitive predisposition to put their beliefs to the test and provide them with epistemic justification. The search for truth,<sup>6</sup> Papineau claims, is an innate human drive, much like hunger and the desire for sex. It is, in other words, part of our innate endowment: a product of natural selection that increases our chances of success in our practical projects and thereby boosts our biological fitness (p. 202). This drive underlies the remarkable curiosity we exhibit as a species, our hunger for knowledge, and our need for justification before adopting a belief. Truth – or the concept of justified beliefs – however, remains vacuous without criteria in terms of which it can be realised or in terms of which these beliefs can be justified.

Those criteria are epistemic values. In this regard, much as our cognitive goal (truth) is carved in our cognitive apparatus, the criteria for realising this goal must also find their origin in our mental makeup. Indeed, how could we be endowed with an innate drive to provide our beliefs with justification, without the necessary tools to respond to this drive? Natural selection, in this regard, provided us with a particular epistemic orientation – an epistemic goal and criteria in terms of which any hypothesis can be evaluated in the light of this goal. This orientation<sup>7</sup> underlies both the reasoning of illiterate, hunter-gatherer tribes as well as that of our most sophisticated scientists and it is present in young children with no or very little training in how to think rationally. It is, in every sense, our birthright.<sup>8</sup>

Indeed, since the epistemic values determining whether a theory or hypothesis is rational to accept are common to both human beings in radically different cultural contexts and children who develop these values without any explicit training – cf. Carruthers (2006) on the fact that hunter-gatherer tribes do not explicitly teach these values and Bonawitz & Lombrozo (2012) on simplicity in young children – these values must ultimately be grounded in our biology rather than in a contingent cultural context. The source of these values cannot be some spatio-temporal paradigm or *zeitgeist*, but must be an innate epistemic orientation the human mind is equipped with.

### Linking biological constraints to internal realism

Internal realism, as pointed out, claims that, while we must represent the world through conceptual schemes and an externalist position – construing the truth of a representation as direct or immediate correspondence with the external world – can therefore not be maintained, we ought not to succumb to radical subjectivism or relativism. An internalist position – construing truth as idealised rational acceptability – can indeed hold that true (i.e. rationally acceptable) representations are stable (i.e. do not change over time) and go beyond present justification (hence the definition of truth as idealised rational acceptability). This implies that what is rational for us to accept does not merely depend on contingent spatio-temporal factors. The mediating conceptual schemes through which we represent the world, therefore, cannot be (exclusively) determined by cultural factors, but must to some extent be constrained by necessary factors, i.e. factors underlying all human reasoning.

Adopting a naturalised perspective, I locate these necessary, stable factors, constraining the conceptual schemes mediating our representations of the world, in our genetic endowment. Indeed, as argued above, human cognition in general and what is rationally acceptable in particular is

6 Truth, in this context, refers to being epistemically justified. Our disposition to search for truth, as Papineau (2000) intends it, is a disposition to put beliefs to the test and abandon them in the face of falsifying evidence. It should not be understood as correspondence with the external world.

7 It bears explicit mention that the fact that this epistemic orientation evolved by means of natural selection offers no guarantee that it provides us with representations that correspond to the external world. Such an evolutionary argument for epistemic justification, originally developed by Lorenz (1941, 1977) and recently revived by Wilkins and Griffiths (2012), should not be confused with the argument at the basis of this paper. For my argument to work, I merely need to point out a biological basis of the cognitive tools and values making up our conceptual schemes, thereby providing Putnam's internal realism with the necessary culture transcendent basis for rational acceptability (see Introduction). In other words, the biological basis of our conceptual scheme does not warrant and is not intended to support any externalist kind of realism or correspondence theory of truth, a position Putnam's internal realism precisely wants to replace.

8 This, however, does not imply that our reasoning is always rational. As evident from the literature on heuristics and biases, our thinking is often and predictably biased, relying on 'fast and frugal' heuristics (for an overview see Kahneman 2011). The only point I want to make is that rationality – the operations of system 2 in Kahneman's terminology – is rooted in our cognitive make-up.

determined to an important extent by our cognitive nature. In this regard, both the conceptual tools we bring to our representations and the epistemic values by which we judge the epistemic desirability of our representations – i.e. their rational acceptability – are ultimately grounded in our cognitive makeup. They are not a matter of cultural consensus or ‘*zeitgeist*’, let alone one of personal taste.<sup>9</sup>

These findings point at what I called ‘the human species-specific view of conceptual schemes’. While the conceptual schemes (comprising both species-specific conceptual tools and species-specific epistemic values) through which we must view the world divorce our representations from any direct or immediate correspondence with the external world, they can nevertheless be expected to provide us with a stable foundation from which to determine which representations are right or at least better and which are wrong. Truth – although internal (in the sense of rational acceptability) – becomes stable again. There is a spatio-temporal transcendent stance from which we can appeal to an objectivity-for-us. The realist tenet of internal realism can be maintained.

This, however, does not imply that given our input from the world and the conceptual schemes through which we must represent the world, we can or should expect that our best theories will ultimately converge into a single set of theories, let alone a single ‘grand unified theory of the world’, which would be an ultimate fit. As Quine (1975: p. 327) points out, our best theories – even a postulated global theory of the world – might be underdetermined by the available evidence, having to tolerate incompatible but empirically equivalent alternatives. Furthermore, although there are necessary, biological constraints on human thinking in general and rationality in particular, they can hardly be said to be the sole determinants of what is rationally acceptable. Culture might be held on a leash by nature, as Wilson (1978) exclaimed, but it still wanders freely within those boundaries. In this regard, it remains the question how long exactly Wilson’s famous leash is.

Nevertheless, biology does play a role in how we come to conceptualise the world, and rationality is rooted beyond the contingent realm of any given culture. This enables us – as Putnam (1982: p. 8) phrases it – to take a culture transcendent stance, warding off the destructive implications of relativism and saving the ‘realism’ in internal realism.

## Conclusion

Given that our representations of the world are constrained by a set of cognitive reasoning patterns and epistemic values that are ultimately determined by our cognitive architecture, the conceptual schemes through which our understanding of the external world is mediated are not contingent cultural frameworks but – to an important extent – necessary human species-specific ones. Our epistemic relation to the world is a particular (remember the possibility of alien scientists) but non-contingent fit, guided by our innately grounded epistemic orientation, with a set of particular but non-contingent tools (the biologically based cognitive building blocks at our disposal).

This ‘biological turn’ enables us to reinstate Putnam’s internal realism, which collapsed when Putnam claimed that the criteria of rational acceptability or rational choice between conceptual schemes were a loose set of historically evolving norms. Providing these schemes with a biological backing, the realist tenet of internal realism, the view that there is an objectivity-for-us – where fitting theories are the product both of external states and properties of the world *and* the conceptual schemes we *must* apply in virtue of our cognitive nature – can be adhered to. This provides us with a sturdy foundation for human knowledge, leaving behind an unwarranted ‘copy theory’ – where the mind is thought to produce exact copies of the world – and an undesirable and ultimately self-undermining subjectivism – where the mind is thought to make up the world.

9 At this point, one might object that the analysis of what makes up our conceptual schemes is itself ‘tainted’ or undermined by the necessity to reason from within such a scheme. This, however, need not affect my argument, since my aim is not to show how our cognitive nature ‘deforms’ the world – which would require the impossible perspective from outside our conceptual scheme – but merely that in forming our representations of the world, biological factors do play a role. Pointing out the source of our conceptual schemes, in this regard, is not problematic. It is an empirical matter. (Do different cultures have radically different representational tools and epistemic values? Are there universal constraints in the reasoning of young children?) Pointing out the scope of those schemes, on the other hand, would require us to contrast our representations with the external world, necessitating an impossible external perspective.

Rescher (1990), in this context, argues that we are endowed with a particular ‘cognitive project’ that is ‘the intellectual product characteristic of one particular sort of cognitive life-form’ (p. 95). Our representation of the world is indeed intricately linked with our genetically determined cognitive architecture. The features of our mind, shaped throughout our evolutionary past, constrain the representations that are intelligible to us, on the one hand, and that are epistemically desirable for us, on the other hand. Radically different cognitive beings (alien scientists) could, as pointed out, produce radically different representations of the same world that could very well be utterly unintelligible to us. But within the representations that are humanly accessible, not every representation could fulfill us with a similar sense of truthfulness. We are indeed endowed with an innate epistemic orientation, providing us with a set of criteria determining which representations are rational to accept. Objective-for-us, in this regard, are representations that, given the data we gather (or could ideally gather) from the external world, are in line with our epistemic orientation.

This, however, is not arguing that all human beings have and always had the same outlook on the world. That is obviously mistaken. Different cultures have radically different beliefs about the world and different areas of interest they pass on to the next generation. We do not come into a world that is laid out in front of us as a virgin terrain ready to be explored without any inherited preconceptions and analyses. In this regard, it is trivially true that a Pygmy living in the central African jungle in the nineteenth century looks at the world differently, and explains the same phenomena in a radically different way than a European scholar at the beginning of the twenty-first century.

However, while we are not born into a virgin world, neither are we born as virgins into the world. All human beings share the same perceptual and cognitive apparatus. We are endowed with a fixed set of reasoning patterns and a given epistemic orientation carved into our genetic makeup. There is, in this sense, a common and necessary foundation of human reasoning. What ultimately makes a representation true for us – therefore – is not some contingent cultural framework (although contextual values might have a considerable influence – cf. Longino 1990) but a necessary biologically determined one. Human knowledge is not a random, nor a conventional, perspective on the world but a necessary one in virtue of the kind of cognisers we are. It is the product both of the way the world is and the way we must represent it. Putnam’s internal realism was right on the mark.

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