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On Epistemic Conditions Differentiated for Situations in Varying Degrees of Uncertainty, the Distinction Between Hierarchical and Flat Ontology, and the Necessary Merger With the Axiological Domain of Values

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Abstract: This paper adds axiology to ontology and epistemology. These three together address the ultimate questions of *what* (is being observed), *how* (to know and respond) and *who* (adds meaning). This is not about producing knowledge about one true reality. Instead, these three aspects will differentiate their questions about the what, how and who, depending on the circumstances. As these circumstances differ in varying degrees of uncertainty, it is the uncertainty of a situation that determines which ontological, epistemological and axiological questions are asked. This paper proposes three categories into which these questions can fall, for simple, complex and highly complex issues. For each of these categories of 'uncertainty', the ontological, epistemological and axiological questions must be in balance. With the addition of axiology and the differentiation of reality into various uncertainties, a much more powerful method of knowing and understanding the world in which we live arises.

1 Introduction

Absolute certainty is an illusion, while uncertainty is fundamental, cannot be denied and is perceived by us to varying degrees. This position is at odds with the belief that knowledge sets aside uncertainty and offers certainty. Knowledge is then no longer synonymous with certainty. Full and absolute knowledge is not within reach, so that knowledge mainly concerns information that is useful, meaningful and persistent, at least for some time. It is primarily a means of acting in uncertainty. And uncertainty occurs to varying degrees. And this 'knowing in degrees of uncertainty' has consequences.

For an eternity, scientific knowledge has been subject to epistemological and ontological conditions. *Epistemology and ontology* are part of the academic language, and are often used, but as often used in moments that makes one wonder about the use of these notions and what it adds to the story of knowing and understanding. It touches on long and profound discussions in philosophy of science, which are not so accessible and easy to understand. As a result, these words are somewhat mysterious to many.

Epistemology and ontology, why always these two, and these only? As if only the 'how' and the 'what' matter, and there is nothing else that is relevant enough to consider as a reference to academic reasoning and the creation of knowledge. What may explain their 'inviolability' is that epistemology and ontology are almost sacred connotations. This is partially due to a firmly entrenched philosophical state of mind from which it is almost impossible to escape. This philosophical framework has its origins in classical antiquity, has been deeply internalised over centuries and became unprecedentedly dominant in the 19th and 20th centuries. This has blinded us to alternative realities, with answers to all kinds of questions that live in today's complex times, in which uncertainty and dynamism require attention.

This observation is an important motive to review the current debate on ontology and epistemology, and the questions that are central to them: 'what can we know about what exists independent from the human observer', and 'how do we know what we claim to know'. This paper takes a critical look at the philosophical and scientific developments that have taken place under the conditions imposed by ontology and epistemology. The question is asked as to what these conditions mean when knowledge is seen as a means to act in uncertainty. This paper thus explores the debate about knowledge and understanding in a reality that is intrinsically dynamic and uncertain.

Among other things, this paper refers to the 'flat ontology' debate to reconsider common ontological and epistemological conditions. These conditions are undeniably relevant to the object-oriented focus of academics on their environment. But these conditions are one-sided, lack self-reflection and are barely prone to ongoing and evolving debate, shifts in paradigms and the emergence of alternative views. 'Flat ontology' is somewhat peculiar in

that regard. It clearly represents a search for an even-more-grounded object-oriented knowledge base. However, it is also the product of a reasoning of those who are not only central to the 'flat ontology' debate, but who are also critical of – and even opposed to – current philosophical dogmas. And they – Bhaskar, Deleuze and Delanda – seem to want nothing more than a realistic alternative to knowledge and understanding. Still, and relevant to the argument here, they remain within the ontological domain of knowledge.

This paper is not primarily about 'flat ontology', but it uses the two opposite meanings given to 'flat ontology' as a stepping stone to an alternative and comprehensive framework of knowing and understanding. This epistemic framework integrates an object-oriented view with an intersubjective view, and values uncertainty and dynamism rather than certainty and stability. In constructing this alternative frame, this paper builds as well on other – but closely related and more concrete – debates of knowing and understanding. These debates are held by movements of realism, relativism and relationalism. In contrast to the rigid views on ontology and epistemology, these movements are relevant for their active and fruitful debates that evolve with new visions, conditions and paradigms.

Realism is object-oriented, builds on a subject-object relationship, with the subject being the 'observer' (whose subjectivity is, by and large, denied) oriented towards 'nature' (which is more or less everything that comes in through our senses), and the idea of an external world that exists independently of our mind and perception and which can nevertheless be known by us. The realism movement's debate spans from absolute realism to critical realism. It is this debate that centres around and questions the conditions set by ontology.

Relativism builds on a subject-subject relationship, which manifests itself in a series of meaningful domains of discourse, ranging from formal and closed to open discourses. Discourses aim to arrive at a kind of collective agreement on how reality can be understood. These collective agreements make clear what relativism is all about: intersubjective interaction and the sharing of values. Sharing each other's thoughts and values breaks the isolation in which the 'value-free' subject is positioned, as a passive, dehumanised observer of the world around us. With 'intersubjects', the philosophical question arises about 'who' with whom shares their valuation of observations made to arrive at a common understanding. The thesis defended here is that observation and its ontological conditions cannot exist without the intersubjective valuation of that observation. This valuation is at the heart of *axiology*. Axiology adds the 'who' to the 'how' (epistemology) and 'what' (ontology) questions and questions 'who is connected' to do 'value-based judgement' (Gunder, Winkler 2021) and 'how collectively value is formed about what is perceived in order to give it meaning and to be able to know'.

Finally, there is *relationalism*, which is only mentioned to a limited extent in the debate. But it is definitely not the least among the 'isms' considered relevant here. Relationalism sees one in relation to the other, and one gets meaning thanks to the other. Relationalism is what Hillier (2021) calls a 'bi-directional point of view', a world of multiple realities that exists in between a duality of complementary opposites (De Roo 2018; De Roo, Perrone 2020). Relationalism distinguishes between generic and specific, between 'site' and 'situation', between quantitative and qualitative, between certain and uncertain, and so on. Consequently, it recognises situations that differ in 'degrees of'.

Also, realism and relativism are seen here as a dual relationship of extremes, of complementary opposites. Thanks to relationalism, these can be brought together in such a way that they naturally give rise to alternative conceptions of knowledge and understanding. To be more precise, the principles of relationalism double-bind and intertwine an 'ontological' object orientation on the world with 'axiological' reasoning by intersubjects sharing their values. The result is an epistemic frame of reference (Figures 1 and 5).

This is the background against which this paper works towards a synergy of four propositions. The first proposition (① in Figure 1) deals with epistemological conditions for acquiring knowledge and understanding reality, which should not depend solely on *ontological criteria*, object-orientation, observation and representation, and the debate about *realism*. This paper states that *axiological criteria*, intersubjectivity, perspectives and discourses, and developments within *relativism* are equally important. The second proposition (② in Figure 1) points to the *complementary* and *contingent* relationship between ontological and axiological criteria, therefore stating that one cannot do without the other: *a relational duality*. The third proposition (③ in Figure 1) concerns the acceptance of uncertainty

as fundamentally given. In addition to uncertainty being fundamental, humans perceive uncertainty to varying degrees depending on the circumstances, meaning there is a *relational perspective on uncertainty*. This brings us to the fourth proposition (④ in Figure 1) of this paper. It concerns *a differentiated view* on reality, distinguishing situations based on their degree of uncertainty as simple, complex or highly complex. This differentiated view is directly related to behaviour in reality, and to "different contexts and political situations [which] necessitate different conceptualisations/engagements and methodological approaches …" (Gunder, Winkler 2021). In other words, the moment a situation is defined in terms of uncertainty, we 'know' how to behave. This perspective allows epistemological, ontological and axiological conditions to be differentiated accordingly. And these differentiated conditions do coincide depending on the situation. This makes it acceptable to define, know and understand this situation not only in general, but also in specific terms. The synergy of these four propositions is reflected in one overarching Figure 5, which is, in abstraction, introduced with Figure 1.

These differentiations do not represent a random, fragmented or disconnected variety of situations. Instead, the differentiated situations relate to each other in a range from one extreme to the other, a range that varies in degrees of uncertainty. Once this is recognised, it becomes clear that such a differentiated view of reality can be a general epistemic framework for understanding the environment we are in. While absolute certainty was sought in the distant past, the essence of this differentiated reality is fundamental uncertainty. And bringing light into the darkness in order to deal with fundamental uncertainty and to be able to understand this differentiated reality cannot be done by observation alone. The collective process of valuing and giving meaning also matters.

Any situation that is observed and requires attention can be qualified in terms of uncertainty, which gives it a position within the epistemic framework. This fundamental uncertainty results from the limited degree to which the situation can be defined *ontologically on the basis of observations and facts* (factual reality). Agreements are the result of intersubjective interaction about the situation and how they collectively want to see this. This concerns *the axiology of shared values* (agreed reality). As situations become increasingly uncertain, the importance of this agreed reality increases at the expense of a factual reality. This means that situations can not only be distinguished in different realities. It also becomes clear that a factual and an agreed reality are structurally connected on the basis of a distinction in different degrees of uncertainty. This differentiation is presented here as the key to 'knowing in uncertainty'.

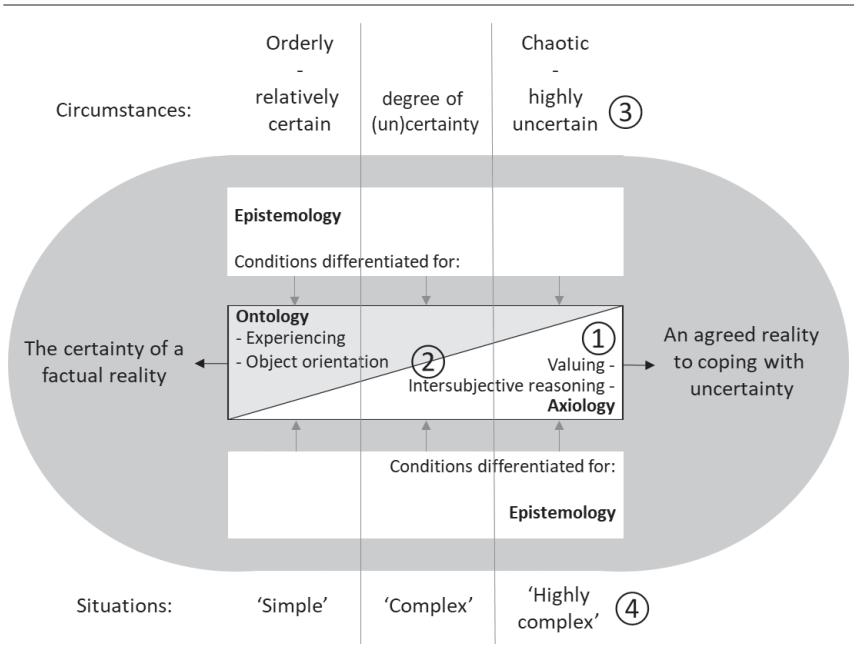

Fig. 1: The four propositions (1 to 4) central to this paper captured in one figure of relational space, which leads to differentiated epistemological, and interwoven ontological and axiological conditions to understand reality given the circumstances. For a complete elaboration: See text and Figure 5.

2 Flat ontology – part 1: Motive

Historically, ontology has been central to the search for knowledge. Ontology is hardly questioned, but rather, seen as the rules within which the game of knowledge acquisition can be played. Therefore, the theme is a little unexciting. Nevertheless, there is some movement in the ontological debate, with proposals under the heading of 'flat ontology'. At the time (1975) Bhaskar wrote down the word 'flat ontology', he had something completely different in mind than the discussion that DeLanda (2004) made of it. Bhaskar argued that "… classical philosophy led to the dissolution of the concept of the ontological realm. […] the world, which ought to be viewed as a multi-dimensional structure independent of man, came to be squashed into a flat surface whose characteristics, such as being constituted by atomistic facts, were determined by the needs of a particular concept of knowledge" (2008: 35). Bhaskar continued arguing that "… the limitations of this approach to science – with its flat ontology of undifferentiated experience – become most apparent" (2008: 57) when seen from an open-systems perspective. This classical philosophy with an ontology considered by Bhaskar to be flat and therefore undifferentiated, is far from the differentiated view presented in this paper.

Bhaskar points to the serious shortcomings of traditional epistemological and ontological questions and criteria. These questions and criteria only apply under the conditions of a closed-system world. In this closed-system world, the research object is considered discrete, isolated from any context and with the assumption to exist only without any stratification, therefore 'flat'. Bhaskar's 'flat ontology' is a reference to this traditional ontology that strives for certainty and objectivity. And it is this ontology that he rejects because the world around us is an open system, in which he considers differentiation, stratification and emergent patterns to be undeniable.

Bhaskar (1975 [2008]) referred to 'flat ontology' as a rejection of positivist and reductionist reasoning. But if a 'flat ontology' of the isolated, single object is rejected, what then is the alternative way to knowledge? For Bhaskar (and many others, DeLanda included) this route is no longer the object, entity, unit or whole to which properties can be assigned, but *differentiation* in connectivity and behaviour (Proposition ④). This is about the differentiation between an object, entity or system as a unit to be understood in relation to its environment which contributes to its identity.

Bhaskar's differentiated reality is made up of successive levels and a hierarchy of high and low. DeLanda also considers a differentiated reality as the much-needed alternative. However, to transcend the singular, isolated and self-contained object, DeLanda (2004) proposes finding a way out within the 'flat ontology' domain. Instead of disqualifying 'flat ontology' as Bhaskar does, DeLanda and others disqualify Bhaskar's alternative to differentiate reality on the basis of levels and hierarchy. This differentiated reality is considered by them to be metaphysical and is, therefore, not really there, and it is the subject who presupposes this differentiated reality (Harman 2005). In other words, hierarchy of high and low is due to value judgements that are added 'a priori' to that reality by the observer. Hierarchy and levels are metaphysical and seen as expressions of value judgement, which do not exist in that reality itself, and would lead to a 'vertical ontology' (Gunder, Winkler 2021). This, according to DeLanda (2004: 47), is undesirable: "… an ontology based on relations between general types and particular instances is hierarchical, each level representing a different ontological category". Instead, he propagates "… a flat ontology, one made exclusively of unique, singular individuals, differing in spatio-temporal scale but not in ontological status" (DeLanda 2004: 47).

How, then, do these 'flat ontologists' view a differentiated reality? Since Kant's 'Critique of Pure Reason' (1998 [1781]), it is generally understood that everything that comes through the senses is structured by the brain. The brain allows us to perceive a representation of reality. It allows us to capture reality in all sorts of modalities, through which the world can be understood 'a priori', at least to some extent. These modalities are the answer Kant gave to the question of how the mind comes to understanding at all: transcendental logic.

Kant's conclusion was that the brain is first and foremost connecting. This brain is therefore meant to differentiate and leads to a relational understanding, which allows us to see not only 'unique, singular individuals', but also to categorise them and divide them into different orders of existence. From Kant's viewpoint, even the reductionist view of the isolated, singular and self-contained object is based on a reality that is connected and differentiated, in this case, the causalities between parts and wholes. Clearly there are several ways to arrive at a differentiated understanding of reality (Proposition ④).

The concept of 'flat ontology' is adopted by DeLanda and others as it would assume a 'level playing field', an assumption that Thalos (2013) describes as 'scale-free metaphysics'. Against this background, an object is no longer studied in isolation (a 'solitary' ontology, if you like, an undifferentiated epistemology) and separately from, but in relation to other objects (say a 'network' ontology and a 'relational' epistemology). The question that arises is how, then, differentiation of reality takes shape, if not based on levels and hierarchies. Instead of Bhaskar's 'vertical' differentiation of reality, DeLanda and others propose a 'horizontal' relationship between objects, which they refer to as ensemble, assemblage, arrangement or network ('assembly theory', DeLanda 2004). The mutual relationship between these objects is not only 'flat' but also emancipated, as all objects (these are factors and actors) are seen as equal, or considered to 'equally exist' (Harman 2005), and this is taken as a starting point when studying their mutual relationships.

In the popular Actor-Network Theory (Callon 1999; Latour 2005; Law 1992, 2009; Mol 2010), all objects to be studied are seen as discrete and equal 'actants' (human and non-human agents) who can enter into relationships with each other by sharing or by passing on information through which these agents can change their nature and position, without this change requiring levels or hierarchy. Contrary to Bhaskar's proposal to see a new level of existence emerging as aggregated outcomes of interacting parts, Actor-Network Theory speaks of a 'process of translation' (Latour 1987: 108; Callon 1986a). In such a 'process of translation', an agent assumes a different role or position, in response to and in interaction with other agents who might change their role or position as well, and through which a new configuration gets shape, or a new situation can arise.

This new configuration also means a new identity. This is then called the 'process of individuation' (DeLanda 2004). This 'process of individuation' is the result of a constitutive role of interacting agents who, through their new relationship, become so connected that a whole new situation arises that can establish itself in a meaningful and persistent way (Boelens 2010). DeLanda (2016) refers to this as an ongoing 'nestedness' of assemblages-within-assemblages. When this connection is strong enough to remain together as a configuration and has sufficient persuasive power to exist as a social-spatial whole (Callon 1986b), a new order arises that can be read as a 'flat' differentiation of reality (Proposition ④).

This emancipated relationship between agents or actants sharing information has proven valuable to the academic debate. It has overcome barriers between factors and actors, and between human and non-human agents, and contributed to an awareness of the interaction game to which social phenomena are exposed.

But even then, under the conditions of a 'flat' differentiation of reality, the observer cannot judge without value 'a-priori', to assume that out there, *in* reality under investigation, a new arrangement or ensemble is really there and continues to exist. This new arrangement or ensemble is also a metaphysical assumption. And value judgments are made as well, for example, in the selection of agents, in what should be seen as part of the configuration, and in what should be excluded, when assessing their relationships and interactions, and to weigh the success of configurations based on persistence and persuasion. In other words, while reality is perceived as differentiated, it comes with preferential relationships as well, for example, between those considered relevant and those that matter less.

Bhaksar and DeLanda both want an alternative to the traditional object of study, which is seen in itself, isolated and separated from its environment. Their alternative is to be able to recognise differentiation in an open-system environment as a means to understand what 'is' in that environment (Proposition ④). Both frame this open-system environment differently, leading to two different routes to knowledge and understanding. Bhaskar takes the view that reality must have a multi-dimensional structure of levels and hierarchy, a structure that leads to knowledge and understanding. DeLanda will not go along with this realism, as it leads to various ontological categories. There's a metaphysical understanding and value judgment 'a priori', which makes the idea of seeing levels and hierarchy subjective, and positions it within the domain of relativism, which, according to DeLanda, shouldn't be.

Delanda wants to be able to look at reality without metaphysical preconditions. His alternative, therefore, to seeking differentiation in an open-system environment is to start from a 'flat' reality (Proposition ④). He then concludes 'a posteriori' that there is 'nestedness' in this 'flat' reality, which is however framed 'a priori' as an assemblage. Here, too, there is no escaping value judging, 'a priori' and 'a posteriori'. The conclusion can only be that obser-

vation and value judgement cannot be separated from each other (Proposition ①②③④). Bhaskar and DeLanda thus both show that different ways of arriving at a value judgment not only lead to different value judgments, but also show that these have different conditioning effects on our perception and thus influence our understanding of reality.

3 Flat ontology – part 2: A phrase that represents opposite meanings

It may be more relevant to be aware of how we apply value judgments rather than deny them (Proposition ①). Why does science want the observer to refrain from making value judgments about what reality is? Observations, including scientific ones, cannot do without value judgements. What matters is to know what value judgement has been chosen to perceive reality. Bhaskar's perspective of a hierarchical world is different from DeLanda's 'flat' framing of reality. And Bhaskar's 'flat ontology' focuses on a different reality than the reality that DeLanda's 'flat ontology' is intended for.

It is not necessarily strange that there are two different definitions for the same term, 'flat ontology', while expressing completely different intentions. Language is full of terms with multiple understandings. For example, a forest can refer to a collection of one and the same object, the tree, while it can also refer to the habitat of different interconnected ecosystems. In French, 'cuisine' can relate to the individual components that make up a kitchen, but it can also represent the gastronomic properties of an entire culture. What matters though is what is meant by both definitions. How can we see 'flat ontology' in this respect?

When concentrating on what is meant by both definitions for 'flat ontology', a difference between the two comes into play that proves extremely valuable in providing a springboard to understanding a reality that is relationally differentiated. On the one hand, Bhaskar's 'flat ontology' is about the object to be studied in *isolation*, framed by a 'positivist' perspective, which he criticised as an extreme position, intended to gain knowledge and understanding of that object under circumstances that presuppose *certainty*. Opposite this position is the agent whose interactions are the subject of study, not in isolation, but rather, with other agents present in its wider environment. This position, therefore, involves situations embedded in and influenced by a specific *context*. Interacting agents should not be seen as predetermined entities, but rather, contextual, specific and, almost by definition, *uncertain*. And their situations will have to be studied in the uncertainty that such a specific context entails (Proposition ③). In contrast to the position where knowledge can be derived from the parts in order to understand the whole, agents and situations in an open-system environment – flat or hierarchical – are interconnected with and under the (dynamic) influence of their specific context. The specificity of this context comes with uncertainty, vagueness and instability. There is *uncertainty* about 'it' as it is (which parts make the whole, and which parts are contextual), its behaving (how do the parts and the whole interrelate) and its behaving in relation to its environment (how does the whole relate to its context). There would be even more to be done about uncertainty if the factor of time and the intertwined nonlinear transformative processes of evolution and revolution were taken into account. This, however, is beyond the scope of this paper. But even if we leave this out, the result is a relational way of differentiating, knowing and understanding reality (Proposition ④). We will show that such a relational reality differs in *degrees of uncertainty* (Proposition ③)

This alternative and uncertainty-based value judgement will prove effective, if not essential, in understanding a (relationally) differentiated reality. It concerns a differentiation based on varying degrees of uncertainty (Propositions ③ & ④; De Roo 2003, 2018). This differentiation depends on the combination between an object-orientation that is intended to find as much certainty as possible, and intersubjective interaction that is aimed at arriving at a value judgement in an uncertain environment. This paper stresses that, in addition to object-oriented observation as a source of knowledge, value judgements by means of intersubjective interaction should be taken seriously and considered an intrinsic part of the process of knowledge development and understanding (Proposition ①).

Value-free observation is not given to humans and there is no point in clinging to it. Nor can we freely arrive at value judgements. This, in turn, could lead to mystical, obscure and biased arguments. We will see that value judgments have to meet 'axiological' conditions. Like observations which have to meet 'ontological' conditions. These will be discussed in the next paragraph. And both ontological and axiological conditions come together, depending on the degree of uncertainty. This relationalism will be clarified with an epistemic scheme (Figure 5).

4 Ontology and the shifts within the debate on realism

Although not a given, ontology is meant to provide conditions for the debate on 'realism'. The opposite is going on. Instead of a development in ontological conditions, the conversation about what is to be known mainly develops within the domain of realism. Here, the discussion broadly shows a shift from empirical and rational realism to critical realism and beyond. Once the focus was on absolute realism and the idea that absolute knowledge can be obtained about a world outside of our brain, but as a vision, it has become obsolete and has since disappeared from the debate.

The concept that humans were unable to comprehend reality in absolute terms was, for some time, attributed to their limited cognitive and intellectual abilities. There is an anecdote about Laplace (1749–1827), who imagined that, if this limitation could be removed, the world outside of us could unfold before us and be fully known, in the past, present and future (Kwa 2011: 205). And not even that long ago, Simon (1957: 198) was praised for formulating 'the principle of bounded rationality', arguing that "The capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behaviour in the real world – or even for a reasonable approximation to such objective rationality." Still today, there are numerous scientists who consider the human factor as the bottleneck for obtaining knowledge.

This thinking has since been transformed into the idea that humans may be limited, however, this 'limited' person should not be seen separately from the world outside us and, instead, is to be seen as the centre of knowledge production. The collective of human brains and their cognitive, mental capabilities is where knowledge production takes place. This shared mental sensitivity for sensed information suggests an interdependent relation with an existing environment, a sensing world of which humans construct an image collectively and which allows them to understand and to act together. These amazing collective capabilities are still not fully understood and recognised.

Assumptions made in the past should be viewed critically. About the awareness of a 'thing', or the observation of an 'event', Aquino (1225–1274) argued: "A judgment is said to be true when it conforms to the external reality" (1911 [1485]; SEP 2015), which makes the judgement meaningful. Centuries later, Russell did not see this much different: "Thus a belief is true when there is a corresponding fact" (1971 [1912]: 129). Facts were considered 'true', if they correspond to 'things' and to perceived events (*correspondence theory*, David 2018). The neo-classical era within which realism evolved, however, has distanced itself from the idea that, if the fact described is identical to that observed, this fact is true in an absolute sense. And if the fact is considered 'true', it is true within a predefined set of agreements that are subject to a continuous process of critical assessment. And thus, Wittgenstein stressed that for us "the world is the whole of facts, not of things" (1922: 25; proposition 1.1).

While the world of things is meaningless, a fact is meant to add a meaningful story to the observation of an event. Facts come with stories, thanks to properties that are added to our observations. These facts, therefore, tell something about the world, because humans add information to observations which make these facts meaningful and understandable. And it is the job of science to critically (logically) assess this information under strict conditions, often defined as 'properties' and 'rationalities'. These properties and rationalities are the motivated result deducted from a storyline, while these recognised properties and rationalities can inductively add a narrative to observations, giving them meaning and (better) understanding. It is because of these informed properties and rationalities that facts become scientifically meaningful. This cycle of knowledge production, from which facts and meaning arise in an interaction between observation and valuation, shows that obtaining an absolute sense of the world we are in has been replaced by humans making logically constructed agreements about how to perceive reality.

This suggests that acknowledged facts are a structural part of a narrative to which facts nicely relate as confirmations of a world that exists outside the perceiving brain. This narrative is essentially a conceptual understanding of this world, and includes predetermined criteria, expressed in propositions and rationalities, to which facts must correspond. This shows that facts are explanations by appeal to propositions and rationalities. An observation of an event to be considered a fact is, therefore, not a value-free enterprise, as it has to relate to a logical and systemic narrative, which conditions and provides structure to knowledge development, adds meaning to it and deepens its insight (*coherence theory*, Walker 2018; Young 2001;

Proposition ①). The narrative is supportive of knowledge development, not offering absolute knowledge. Narrative, rationality, proposition and fact are, therefore, always conceptual. And the knowledge development that is generated by narrative, rationality, proposition and fact is nothing more than a commonly agreed mental construct. This brings us to 'realism'.

Empirical realism assumes that this anthropocentric perspective leads to knowledge through experience. Thanks to the experiment, there can be an intensive exchange between the observing subject and the object to be observed. The experiment will boost the experience and is then an excellent means of acquiring knowledge. Traditionally, the experiment aims to know the object or situation 'in itself', by expressing the object or situation as a set of generic properties. The knowledge gained from such a unique observation serves one explicit purpose, to arrive at a general statement about (the behaviour of) objects, situations and a world that 'is'. That world that 'is' has, thus, been captured under conditions that are the result of the generic properties used and agreed upon. Empirical realism, therefore, is a rather narrow belief in the way of acquiring knowledge. However, the knowledge that comes with the observation cannot be separated from agreed generic properties (Proposition ①).

Empirical realism aims to make general statements about the world around us, with an emphasis on objects 'as they are', that is, in themselves, solitary and without contextual influence. Additionally, the observation that contributes to this generic knowledge is made from a perspective that assumes a fixed, frozen and unchanging reality. This obtained knowledge is, therefore, also free from the influence of time. And the observation is made without the subject being considered relevant, despite being the one who experiences, analyses and tries to understand the object. Knowledge that arises is, therefore, generic, atemporal and considered to be 'objective'.

Bhaskar evaluates this perspective as epistemological individualism and ontological atomism (2008: 178), through which "changes of things are explained in terms of unchangeable things" (2008: 173). Objects are seen as passive things, which, nevertheless, exhibit behaviour. The object and its effects are seen in themselves, without an internal structure and separate from an external environment. The research into the object's behaviour, then, focuses on the immediacy of effects. Subsequently, a causality is attributed to the object, whereby the "events which are produced as a homogeneous series of determinations: 'whenever x then y'" (Bhaskar 2008: 52) leads to predictable behaviour. With this 'direct' causality, a regularity in behaviour is identified and presented as knowledge, packaged in a general, linear cause-and-effect relationship. The fact that a context is essential to be able to observe and assess cause-and-effect behaviour of an object is considered irrelevant.

While empirical realism focuses on the experiment to arrive at general statements (inductive), *rational realism* takes the position that accepting general statements as true means that our reality is inherently deterministic (deductive). In a sense, rational realism is the other side of the same coin: the 'universal' validity of the general statement. The consequence of this 'rationally realistic' assumption is immense and hard to comprehend, that is, if it is assumed that reality would be completely deterministic. Then everything is predetermined, knowledge would lead to full certainty and the future would become an open book, which would lead to a world that would be impossible for humans to live by.

Fortunately, 'complete' determinism is as much an illusion as 'absolute' certainty. The world is not completely deterministic. There is chance, coincidence and chaos contributing to uncertainty. Moreover, this uncertainty is fundamental, as it cannot be reduced to zero by measuring endlessly, using multiple judgment criteria, and conditioning the world by generic rules (Proposition ③). With uncertainty being fundamentally present, theories are not an end in themselves and do not proclaim truths. Instead, they remain conceptual and, as such, are tools for understanding, making predictions (up to a point) and are a frame of reference for developing models. And those models, methods and techniques are, in turn, highly regulated, straightforward and logical instruments in supporting the experiment and thus contribute to the framing of the observation and the (conceptual) knowledge that comes from this.

If repeatedly observed behaviour produces exceptional and unambiguous results, a higher order is suspected. If the regularities remain strong and indisputable, generally valid statements can be made. Although these statements are sometimes referred to as 'law', they ultimately remain a presumption. As the deviations from averages increase, more and more assumptions will have to be made to arrive at a statement. In that case, correlations may indicate the possible connection, although it will

not be possible to establish this with (plausible) certainty, the cause cannot be identified or deduced, and no direct relationship with an effect can be demonstrated. If these deviations increase further, there is not much more possible than to speak of categories. In the end, it is the 'situational', as opposed to generic, that remains.

As a result of this shift, direct causality continues to decline and there is, at most, still a 'remote' causality. The solitary object can no longer be unambiguously understood, but has degenerated into a fuzzy, fluid and vague observation, making it difficult to define and, as such, is no longer easy to study and capture in terms of a 'closed system'.

It was Hume (1711–1776) who assumed that in order to know something about reality, it is best to consider it a closed system, in which the necessity of cause and effect is self-evident (Ayer 2005). The positivists took this assumption as a basis for understanding 'events'. This 'concept of closure', however, is heavily criticised since, as it is not tenable under all circumstances and, according to some, it is not tenable anyway. On the contrary, closed systems also lead to knowledge that is sensitive to bias, and the object or situation will increasingly have to be seen and understood in relation to the specific, local context which, at some point, will lead to an *integral* study of a situation that is embedded in its unique contextual environment.

The consequences of all this are ever-increasing epistemological, ontological and methodological variations (Smyth, Morris 2007; Table 1). The many variations are a logical consequence of and a response to uncertainty and relate to 'the degree of' uncertainty that an object or situation has to do with (Proposition ③). The variations in the degree of uncertainty show the 'relational' side of reality, which is recognised in various 'realisms'.

Structural realism, for example, no longer starts from 'facts', but focuses on underlying structures. Although these structures are still expected to represent generic values, they are less clear-cut. The perspective also shifts from events from which structures arise, to structures as the source from which possible events emerge (Bhaskar 2008: 92). With this shift, the influence of contextual interference gains acceptance. The structures involved are no longer always linear and straightforward and are believed to give rise to unexpected developments every so often.

Another step further from 'certainty' is the realism of probabilities and possibilities. In the *realism of probabilities*, there is variation between observations and within the data available. Instead of a clear outcome, it can be estimated, on the basis of probability, whether something is going to happen or not (a 'stochastic' reality). The *realism of possibilities* addresses a further increase in uncertainty. Data is no longer available to make sensible estimations. An option is to consider possible futures that can be worked out in scenarios. *Pragmatic realism* takes the view that, while reality remains unknown to us, we might appreciate an understanding of what works best when dealing with this reality. Instead of expanding knowledge, the focus shifts to coping strategies. Each of these realisms proposes a way of understanding reality in accordance with the degree of uncertainty of the situation under consideration. The realisms and the knowledge, insight and strategies these offer relate to a differentiated reality determined by uncertainty (Propositions ③ & ④).

When this line is continued, realities come into focus that reveal even greater uncertainties. An almost elusive world comes into view that is anything but stable, partly due to influences of external forces. This reality is, therefore, impossible to know explicitly, cannot be defined unambiguously and shows little or no direct-causal relationships anymore. The unshakable reality that 'is' was already under discussion, but in an unstable environment, certainty is definitely hard to find. Such situations are no exception. Nor are these situations immediately tragedies, crises or calamities. These situations are, first of all, complex. People are remarkably able to recognise these complex situations directly and intuitively, based on a sense of composition and seeing an interwoven, integral and interdependent coherence, which is also full of tensions, breaks and mismatches (De Roo 2018). However, such situations can no longer be clearly defined. These situations are often discussed in terms of ensembles, assemblages and arrangements, in which relationships of cause and effect can barely be substantiated. Rather, there are *tendencies* developing within webs of relationships. As a result, these situations are not only fluid, fuzzy and vague. There is also randomness in behaviour that cannot be properly understood without involving the location-specific context.

These situations are full of interdependent but fuzzy interactions between the external context and internal parts that make up the whole. These situations, therefore, display uncertain and dynamic behaviour. The examples are numerous, and only a few are about major disas-

ters. Think of the residential area in decline, the emergence of a traffic jam, or an economic crisis that hits the city. These examples are hard to define clearly and are the outcome of numerous causes. And the uncertainty in these situations is largely due to the different perspectives that exist because of the sometimes widely divergent interests, insights, responsibilities and resources between the stakeholders involved. Each stakeholder will define the situation in their own way, depending on the interests that are at stake. This implies the existence of multiple realities.

Bhaskar proposes viewing such complex situations from a *'critical realism'* that is based on a transcendental reality, with different levels of interaction. This reality of a "… higher-order level is open with respect to, in the special sense of irreducible to, the principles and descriptions of the lower-order level" (2008: 102). His example is: "the state of the market that determines the use of machines, the use of machines that determines the conditions under which certain physical laws apply. The use of machines is thus subject to dual control: by the laws of mechanics and those of economics. But it is the latter that determine the boundary conditions of the former" (2008: 102). Bhaskar then assumes that the system of the higher order imposes its conditions to intervene in the system of the lower order. Whether it is just this one-sided relationship remains to be seen. But, more importantly, the regularities seen in such an interdependent world represent the *tendencies* of events within relationships of intertwined patterns, instead of the course of events leading to a straightforward outcome, or a definite 'end' based on direct causal relations. "Tendencies are roughly powers which may be exercised unfulfilled", according to Bhaskar (2008: 88). This 'critical realism' requires its very own ontology (see 'highly complex' situations in Figure 5), one that provides preconditions for the knowledge that can be derived from situations that exist in layered, interdependent and dynamic structures.

With this reasoning, it gradually becomes clear that the criterion of epistemology should not be 'certainty', but 'uncertainty' (Proposition ③). Empirical disciplines will have to acknowledge that the aspect of reality they focus on is intrinsically uncertain. Depending on the position of the observer in relation to the circumstances and their complexity in terms of stability, entity and causality, a perspective for research must be chosen (Figure 2). If the *choice* is made to regard a situation as 'certain', simple and straightforward, 'empirical realism' is the world view that can be embraced. If there is a preference to see a situation as 'highly uncertain' and complex, with remote causalities, fuzzy entities and a context that interferes, then 'critical realism' might give a more fertile worldview (see De Roo 2003 for a discussion about differentiating reality in terms of complexity). And each preference leads to a position with different kinds of assumptions about what kind of knowledge, behaviour, strategy and agreements are needed or desired (Table 1).

- Content: from clearly defined (factual) to fuzzy (agreed) entities;
- Process: from direct causal (necessity) to remote causal (tendency) relations;
- Context: from stable, closed and passive systems to unstable, open and dynamic interdependencies.

Fig. 2: Experiencing seen as a contingent relationship of three observations: entities (content), their interactions (process) and their interdependencies with the environment (context), which vary depending on the degree of uncertainty.

This differentiated perspective (Proposition ④) exposes a series of ontological dichotomies within which reality can be observed. These are not only the oppositions of 'direct' versus 'remote' causality, 'clear' versus 'fuzzy' entity and a 'stable' versus 'unstable' context. These ontological dichotomies go further, including universal versus particular; generic versus specific; necessarily determined versus integrally related tendencies; substance versus process; abstract objects versus concrete situations; and more. The importance of these dichotomies is not their contradictions. Instead, these represent two opposing extremes that delineate 'the area in between', for it is precisely there where reality can be found (Proposition ②).

What 'is' can be 'fully' known to the observer	1	Entity and causality	Contingent structures	Contextual interference	What 'is' is situational and receptive to multiple perspectives
	2	Necessity	Chance	Tendency	
	3	Predetermined	Probable	Integrally defined	

Tab. 1: Ontological conditions differentiated in a range from 'knowing' relatively certain to uncertain situations, distinguished by the 'observation focuses on […1…]' and 'behaviour subject to […2…]', with 'the product being […3…]' as a result.

In debates that do not start from a static perspective on the world that 'is', but reason from a dynamic perspective on the world that is in flux (for example, the complexity sciences), these extremes are understood as opposites between which development takes place (for example, between order and chaos), in movements that tend to one side, then the other. Based on this, a course can be visualised that indicates the direction of development within the realm of realism. The course that is taken will show varying uncertainties (for example, a shift from order to chaos; Proposition ③) which, in turn, relates to different realisms. Therefore, a distinction can be made between (representations of) reality in different degrees of uncertainty in order to position the different types of realism, the objects and situations that are observed (Proposition ④), and related behaviour.

5 Flat ontology – part 3: Hierarchy, flat or in flow?

Critical realism is Bhaskar's answer to what he rejects as 'flat ontology'. This 'flat ontology' is his unflattering critique of 'empirical realism', with its static and positivist principles, and a reasoning based on closed systems and the uniform, unambiguous reality that should reveal itself. For Bhaskar, this leads to a poor understanding of reality, which cannot explain why the whole is sometimes more than the sum of its parts. He sees more in an explanation of a world in which there are layers, levels and hierarchies. In such a layered world, parts of a lower level can merge into phenomena of a higher level. This higher level is understood, not only from the distinct parts of which it consists, but transcends these parts, and has its own identity, with new and unique qualities that do not necessarily refer to or cannot be traced back to the individual parts (Bhaskar 2008).

This aggregation as a representation of things has consequences because it points to the existence of emergent processes. And emergent processes cannot be understood under circumstances that assume a world that 'is', and is static, fixed and frozen. Emergent processes exist in a world of 'becoming'. Archer argues that these "emergent properties are therefore relational: they are not contained in the elements themselves but could not exist apart from them" (1982: 475; see also Anderson 1972). Emergent properties fit into a reality in which the presence of temporarily stable and persistently unstable patterns is acknowledged (De Roo 2018).

Emergence (becoming) and realism (being) are meant to come together in Deleuze's process ontology (1968). His *process ontology* "… is about the world as assemblages, as nested spaces and times, as mutational transformations across timespace. Through a process ontology, Deleuze replaces the essences of entities with dynamical processes, some of which are material and energetic, but all of which remain immanent to the world of matter and energy" (DeLanda 2004: 5). Such a world is in constant flow, in which every situation, every system seeks stability and looks for balance, also tends towards this world of 'being', but will never reach such a position 'in equilibrium'. So, this is a world that is 'becoming', with emerging and transformative processes leading the way.

Deleuze's 'process ontology' is more 'in flow' than 'flat'. Deleuze's 'process ontology' sets the world of Bhaskar's 'critical realism' in motion. 'Critical realism' points to openness, context and hierarchy, and 'process ontology' adds time and sees the world in 'flow', within which tendencies can be observed. The 'process ontology' assumes that, instead of solitary direct-causal action-reaction relationships that the object enters into, movements arise in situations that can best be understood as *'tendencies'*. As the openness of the system increases, it responds less to one particular causal relation and instead, it tends more and more towards emergent, temporary persistent patterns in which events can arise and be recognised. In these situations, causal laws get out of phase with patterns and the related events (Bhaskar 2008: 25), a reality full of tendencies which Hartwig (2008: xviii) calls *'dispositional realism'*. The world is intrinsically dynamic when objects and situations under the constant influence of internal and external forces and powers tend in a certain direction, however, not reaching a steady and permanent endpoint, until some point after which new and different influences assert themselves and gain the upper hand and another direction will be taken.

DeLanda sees Deleuze's 'process ontology' as a rejection of Bhaskar's proposal to consider hierarchical structures and the evolution of reality explained by transcendent organisational principles (DeLanda 2004). Instead, DeLanda argues about "an approach in terms of interacting parts and emergent wholes [that] leads to a flat ontology, one made exclusively of unique, singular individuals, differing in spatio-temporal scale but not in ontological status" (2004: 58). He argues that no hierarchical distinction can be made between a system and its parts.

There can only be relationships between individual agents, and those relationships exist in a scale-free space. Within this space, the individual agent has some freedom to 'transform' into a good fit-performance relationship with other agents. This is DeLanda's proposal for a 'flat ontology', which has received a lot of attention, not least thanks to Actor-Network Theory.

However, this 'fit-performance relationship' can also be seen as a contingent relationship and a pattern (De Roo 2018). And this pattern can be the (aggregated) consequence of emergence which, as such, distinguishes itself from its environment, and can be observed as a differentiation, whereby the observer recognises both hierarchy and tendency (Proposition ④). In that respect, Bhaskar's 'critical realism' and Deleuze's 'process ontology' are well understood by the rapidly developing debate within the complexity sciences. Central to the complexity sciences is the emergent process of complex, adaptive and transformative systems which are in a constant state of evolution. This emergent development exists by the grace of ('strange') attractors to which the system is tending, 'on the edge of order and chaos' (Waldrop 1992).

The complexity sciences underpin hierarchy, regimes and lock-ins and make these attributes visible. These are explained as fractal behaviours that show how one level of existence continues into another level, which is the result of long-lasting tendencies, organised spontaneity and the spontaneous order of the system, its subsystems and its environment (De Roo 2018). The complexity sciences indicate stratification, which is, therefore, not questioned here. The complexity sciences indicate these processes are all time-dependent, which is beyond the scope of this paper. The story of this paper is not so much about whether or not processes in an open-system world can lead to stratification, multi-levelness, and a hierarchy of patterns of existence. Therefore, we leave Deleuze's 'process ontology' for what it is. The point is that, aside from time, flow, stratification and multi-levelness there is the possibility of differentiation (Proposition ④) of what is observed 'here and now' (atemporal), between open, semi-open and closed systems, and between independent, self-contained objects and situations embedded within networks and interfering contexts.

The different realisms presented here successively provide opportunities to understand any situation in this differentiated reality (Proposition ④). The argument is built around the idea that uncertainty is the cause of this differentiated reality (Proposition ③). In highly uncertain situations, Bhaskar's critical realism proposes distinguishing hierarchy, and Delanda assumes nested spaces. For a system environment, this would mean that, instead of being 'closed', they are open and susceptible to dynamic influences from the context. The predictability of the system behaviour decreases. And actions aimed at this open system will be different from those aimed at a closed system, with its stable environment and predictable behaviour. It is the degree to which uncertainty is around that causes differentiation of system behaviour (Proposition ③). However, and this is crucial, it is up to the observer to evaluate the situation on the basis of uncertainty, to decide their actions towards it. In other words, human values matter.

That uncertainty-based differentiation leads to an understanding of a situation from the different perspectives of realism is only half the story. *Realism* wants to know reality as much as possible apart from subjective values. This is a position that cannot be maintained, even in situations where there are 'only' certainties. With uncertainty as a criterion for knowing reality, it is impossible to exclude human values from arriving at an understanding. This necessitates a reappraisal of *relativism* (proposition ①). Rather than Weber's rejection that relativism with the subject would lead to misconceptions and mysticism (1978 [1909]), the valuing of the subject is needed to place reality, and to deal with uncertainty in that reality.

In addition to *object observation* as the basis of realism, intersubjective relativism will have to be accepted. *Intersubjectivity* does not permit value-free perception, if at all (Proposition ①). How reality can be differentiated and how situations can be judged by their degree of uncertainty is, therefore, also a matter of interpretation and choice. And choice is never based on observation alone. Even the rational actor determines its choices only in part by what has been observed and makes a valuation of the consequences these choices could have. What follows logically from this reasoning is that intersubjectivity and valuation should be part of knowledge and understanding (Proposition ②).

The ontological question 'how do we know what we claim to know' will have to be complemented with the question 'whose valuations of observations are shared to arrive at a common understanding' (proposition ②). And with valuation, interpretation and choice, *ethics* will inevitably come into play. If the knowledge question is answered on the basis of what we can do

with this knowledge, then the consequences as to what this knowledge can lead are also relevant. This means that ontology alone is unable to answer knowledge questions. The epistemic scope needs to be broadened with intersubjective reasoning.

It is, then, no longer a question of whether ontology is flat, hierarchical or in flow, but about the *re-humanisation of the question of knowledge*, which requires *a level playing field between observation and valuation*, between perception and interpretation, and between realism and relativism. Re-humanising the knowledge question means accepting that those seeking knowledge (humans) unmistakably and necessarily complement observation and valuation. Habermas already proposed that "we should shift perspective from an individualised, subject-object conception of reason, to reasoning formed within inter-subjective communication" (Healey 1992: 237). Proposition ② that relativism should be taken seriously, intersubjective reasoning matters, and valuation and interpretation are an unmistakable part of the knowledge process, demands that attention be shifted to *axiology*.

6 Axiology, the complementary part of knowledge and understanding

As uncertainty grows, the importance of valuing subjects increases (Propositions ③ & ①). That is the basic hypothesis of this paper. And the consequence of this epistemic uncertainty is an undeniable tension with object-oriented ontology. Moreover, as a result of the (growing) uncertainty, defining the situation becomes political, since several actors are involved in making choices collectively about how to reach a common understanding. This also stresses the ethical side of the situation (value-based judgements, see Gunder, Winkler, 2021; Flyvbjerg, 2001). Ethics does not affect the situation in an ontological way, as ethics refers to a different question than 'what can be known'.

With increasing uncertainty, intersubjective valuing and the relevance of ethics, ontology falls back, and axiology emerges (Figure 4; Proposition ①). Axiology centres around the intersubjective valuing of the actors involved. An exchange between actors of their values, perspectives and interests leads to a process of collective sense-making and making choices together. By making joint choices in uncertain times, the intrinsic uncertainty is parried with a kind of definition of the situation that is not primarily based on facts (because these are not there, or do not provide the clear picture that is necessary), but is mainly based on agreements between the parties involved. This creates an *agreed reality* upon which people will base their actions and behaviour.

"Axiology, value theory, and the role values play in research, are rarely explicitly addressed" conclude Biedenbach and Jacobsson (2016: 139). Just as ontology conditions the question of 'what can we know', axiology refers to the question of 'how to make sense together'. Axiology encompasses the domain of values, including ethics and aesthetics. In the rare case that axiology is mentioned, it is almost always about 'ethics' as 'collateral damage' of actions taken in the name of realism. Or it confirms – as is the case with so-called *'meaning realism'* (Fay 1996) – the denial of the intersubjective valuing with a reasoning that 'meanings are fixed entities existing independently of interpreters' (Fay 1996: 154). It is hardly, if at all, about the importance of 'giving meaning', valuing and the epistemological inclusion of intersubjective interaction.

Science has a big blind spot here and, against its better judgment, clings to a mythical past that was focused on 'objective' knowledge, even though it has been debunked on all sides for some time. The desire for a science that should be 'value-free' is still great. And still, many agree with the notion that science should keep its hands away from 'subjective' values, because – as Weber (1864–1920) argued in 1909 (1978) – relativism would only lead to mysticism, preoccupations and bias. This position casts a huge shadow over all deviating initiatives and proposals for alternative routes to knowledge and understanding that, therefore, hardly have a chance to grow and flourish.

Through the ages, object orientation and intersubjective valuing changed sides, over and over again. In his poem 'In Nature', Parmenides proposed taking both into consideration (Popper 2012). In modern times it was Nietzsche (1974 [1885–1887]) who warned against the one-sided focus on a factual reality (Proposition ①): "all that exists consists of interpretations. We cannot establish any fact 'in itself': it may even be nonsense to desire to do such a thing" (323). It would also ignore the human responsibility to weigh one's actions, to appreciate the consequences of these actions, and to listen to one another and be willing to accept that there is some validity in the other's argument. Nietzsche wasn't the only one who urged for this shift in focus.

Lotze (1817–1881) spoke of the 'Reich der Werte' (1857); Buber presented his philosophy of dialogue (1937 [1923]); the Frankfurt School put critical reflection on the agenda (Horkheimer 1972), as well as recognition (Honneth 1995) and communication (Habermas 1971), which is further explored in various ways by French language and discourse philosophers. Their message is to shift from the one-sided orientation to observing the object, to the reciprocal interaction between the observation of material reality and the intersubjects who value collectively what is observed, in order to jointly develop conceptual understandings (Proposition ①). We may be aware of the things around us, but the way we relate to those things is mainly interpretation and determined by our collective judgment.

Time and again, it will have to be stated "that men in their social activity produce knowledge, which is a social product much like any other, which is no more independent of its production and the men who produce it than motor cars, armchairs or books" (Bhaskar 2008: 11). And like any other human being, the scientist cannot observe in a way that is value-free: "Scientists don't just discover things. They write about them in agreed-upon formats, construct experiments and collect data in convincingly logical ways, and use a vast distribution network to share what they know" (Rogers 2020). Knowledge about the reality around us is obtained under conditions set by humans. These are, therefore, human conditions and cannot exist outside of us and have, therefore, undeniably, a side that is relative (Proposition ①).

Realism and its orientation to the object have long been favoured at the expense of relativism and the intersubjective interaction about the valuation of what jointly has been observed. 'Knowledge about' was separated from 'valuing about'. Realism builds on a subject-object relationship, while relativism revolves around a subject-subject relationship. From a relative perspective, knowledge is a social product and a social construct, and it takes on meaning from a constructivist epistemology.

Relativism is about the creation of meaning through an exchange among subjects of their values, opinions and ideas. Relativism is about the joint process of sense-making in which subjects share their values and perceptions. "While things are what they are by themselves […] values are what they are due to the significance human beings assign to them" (Grünberg 2000: 18). Values are mentally produced and unless these are shared with others, they're not part of the observable world outside the human brain. "Value is regarded as a relationship between an object that is worth valuing and a subject that is able to evaluate it. […It…] does not rely on the intrinsic characteristics of the object, but on the significance these characteristics present to the subject who is more or less attracted by them, according to their utilitarian, moral, political, aesthetic needs" (Grünberg 2000: 17). The intersubjective sharing of values 'about what is observed' is what contributes to knowledge and understanding in an essential and complementary way (Proposition ②). Language plays a crucial role in this process. This becomes manifest within a range of meaningful domains of discourse, from closed to open ones.

7 Discourse, an axiological pattern of meaning

Such a constructivist epistemology is, therefore, by nature 'discursive', which is expressed in meaningful discourses. These discourses arise within a prevailing culture, and are products of social processes and their subcultures, which can be formal, including institutional, scientific, work-related and bureaucratic environments, as well as informal, with environments in which personal, routine and often self-evident interactions take place (Asher, Lascarides 2003; Van Benthem, Ter Meulen 1997). Language is the dominant carrier of these intersubjective interactions leading to *discourses* (about developments). Which compliments (Proposition ②) the orientation on objects that leads to the awareness of *courses* (of development). The *expectations* that the 'course of events' evoke as 'experience' recur in the domain of discourse as 'desires' (Figure 4), from which, in turn, ideals, suggestions and goals emerge, which then prompt action. And this action is, then, to a great extent predetermined by discursive rules.

Discourses are axiological patterns of meaning. For Foucault (1979 [1975]), these discourses are not "simply isolated patterns of speech but organising principles embedded in wider patterns of social organization and practice" (Martin 2005: 558). The mechanisms for connecting people lie in these organisational principles. These principles work into the mental fibres of everyone subject to them, be they good or bad. These organisational principles are the result of interaction, choice and agreements, and are understood as rules of conduct, which give structure to behaviour, conventions and insti-

tutions. In this way, discourses are immaterial structures for intersubjects to see their values in *conformance* with the *performance* of the material reality.

Discourses are, therefore, the mental and meaningful counterparts of observable patterns in the world around us (Proposition ②). "For the term 'discourse' typically implies that the source of meaning lies not exclusively in the object being represented or the person or group doing the representation but in the social act of language use itself" (Martin 2005: 554). Composed in the language of symbols and words (Wittgenstein 1953), discourse thus represents proposals, ideas and interpretations, on the basis of which shared value judgments arise. In discourses, these ideas and points of view tend towards a jointly supported perspective or narrative and towards rules, norms and shared values. Discourses refer to informal and formal rules of conduct that have been produced culturally and socially, and which are expressed in language, and which condition our actions and behaviour. Discourses are, therefore, systems of social meaning that people feel connected and attracted to. Through discourses, we shape our thoughts and give meaning to our life and the environment in which we live.

Closed discourses concern domains of language, information and interpretation that convey a specific, unambiguous meaning. This specific, unambiguous meaning can be a single word that can only be understood in one particular and clear way. But it can also be about 'established' values, such as laws, rules and conventions. A closed discourse assumes and expresses certainty, symmetry and stability in the observable material world. Form and content come together 'beautifully'. Structure and function connect seamlessly. There is some beauty in this harmony, balance and stability, which makes it conceivable to link closed discourse to *symmetrical aesthetics*. For example, a perceived quality that is nicely captured in an indisputable number, the beauty of a world record, the inspiration that comes from scientific proof, the admiration for a mathematical formula.

Although there is debate about whether the formal language of mathematics can be seen as a discourse, Hartman (1967) speaks of a *'formal axiology'*. The formal language of mathematics stands alone, refers back to itself and has no meaning outside of itself. A number or an amount does not exist outside human reasoning, but humans have evolved in such a way that they have great advantage in being able to recognise numbers in the world around them and appreciate that world in quantitative terms. The mathematical game with numbers and figures consists of structure and logic, sees symmetry and harmony in everything, and enables us to achieve powerful abstractions. An *'axiom'* is exemplary as a fundamental principle for mathematically pinning down values but does not provide knowledge or meaning without representation in material reality.

Discourses are not always closed, on the contrary. They can be distinguished by varying degrees of openness, comparable to systems in the material reality. "When a definite description is incomplete, the domain of discourse is a mini-world", argues Recanati (1987: 62). Instead of universal values, these values are only shared to a limited extent. The description is, then, only understood within the 'mini-world', as an assumption (…I believe that…), a probability (…it is possible that…) or a unique situation (…the actual case is…). In such a 'mini world', it is not the generic but the specific that reigns.

What if descriptions are not just incomplete, indefinite, fuzzy or vague, but worse, if nothing makes sense anymore? What if the world around us suddenly appears to be 'absurd'? 'Absurd' is what Camus (1951) calls a situation that is so far from the ordinary that it lacks words to give meaning to what is happening. Consequently, people feel detached, there's no confidence, identity is lost, and a sense of belonging is nowhere to be found. It means that there is chaos all over, with no order established or recognised. Certainties have evaporated and, within the material world, the uncertainties that appear have no reference points anymore (Proposition ③). In such an extreme situation, control is lacking about what is taking place, interventions lead to nothing and seem to be meaningless, traditional structures are no longer reliable and the various functionalities are no longer to be trusted. It is in these moments that it becomes crystal clear that people need each other to make sense together, while desperately seeking common ground in constructing a story that is collectively embraced. In situations of high uncertainty, an *open domain of discourse* of exploration is likely to be maintained.

Such an *explorative discourse* is described by Laclau and Mouffe (2001). Laclau and Mouffe consider all social relations to be discursive, and they suggest that "All meaningful activity – linguistic or non-linguistic – is performed through patterns of symbolic differences that 'articulate' (or link together and differenti-

Generic values: What 'is' is implicitly shared and/or logically deduced	1	Predefined values	Discursive practices	Constructing stories	Shared values: What 'is' is explicitly agreed upon among peers
	2	Aesthetics of a symmetrical and coherent world	Incomplete descriptions and meaning-associations	Ethics of a world with symmetry breaks	
	3	Axiomatic	Trial and error	Speculative	

Tab. 2: The axiology issue differentiated in a range from closed to open systems of meaning, distinguished by 'interactions that build on […1…]' and a value system 'referring to […2…]', which 'result in […3…] value statements'.

ate) social agents, belief systems, vocabularies and institutions" (2001: 560). These patterns or structures of differences are to be seen "as complex, open-ended formations permeated by contingency and conflict" (2001: 560).

Laclau and Mouffe, however, accept that 'meaning and identity must have some degree of stability'. Or, as Fay puts it, 'difference requires a background of deep similarity' (1996: 82). With reference to this degree of stability or the existence of deep similarity, the chaotic or complex issues addressed by open discourses are mostly 'floating', multiple interpretive and context-related. And the consequence is that people want to deal with 'patterns or structures of differences' by constructing a common understanding which makes sense to all of them. The action that follows is the joint production of a narrative or storyline that should make the situation comprehendible again.

In these *open discourses* with an 'open-world assumption', symmetry, harmony and certainty are hard to find. The material world shows incongruities, inconsistencies and is far out of balance. It presents itself as wicked, fuzzy, fluid and vague. There is a great shortage of facts, if any. And those facts that do exist show little or no mutual relationship, which results in large gaps between the facts. A connecting story is no longer self-evident, but has to be constructed creatively and speculatively, and has to show, despite its explorative character, a *tendency* towards coherency and consistency to be convincing. People, in general, seek the bigger story about why things go the way they do (Connelly, Clandinin 1990; Schank, Abelson 1995). If there is no such story, there is no reference to hold on to, which makes life complicated, arbitrary and uncertain. There are several techniques to reverse these uncertain situations (Friedman 1987; Sager 1994; De Roo et al. 2020). These range from communicative action, area-specific strategies to adaptive approaches, addressing not so much situations as such, but the values people share regarding these situations.

The values addressed in Table 2 show a variety of possibilities ranging from a strongly convergent and overarching generality to widely divergent and context-sensitive qualities full of gaps, breaks, mismatches and tensions. When uncertainty increases, and the coherence in what is observed diminishes, people still see connections, even if they turn out to be imaginary, and remain a source of inspiration for storytelling, although speculative, as a means of understanding. Out of this reasoning, Figure 3 is composed, addressing the subjects' view (perspective), their desire to reach a common understanding (consensus) to which they can relate (storytelling), when taking collective action. This collective behaviour depends on those involved, and their circumstances, that range on a continuum from a generic understanding with reference to implicit meanings and generally accepted and linguistically encapsulated statements to the explicit understanding agreed upon in a collective with reference to specific circumstances. Such collective understandings differ depending on whether the environment is open or closed and, thus, range from the 'beauty' of symmetry to the 'nagging pain' of ethical implications (Figure 3).

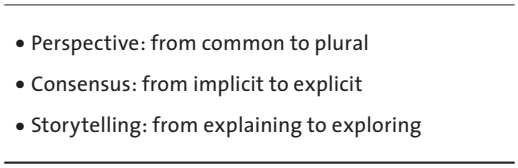

Fig. 3: Capturing intersubjective valuing as a contingent relationship of three qualities (cognitive processing, reaching out and shared messages) that varies from certainty of knowing to understanding in uncertainty.

The regularities that people perceive are reproduced and shared with each other under the conditions of cognition, language structures and experience (including empirical methods, theories and concepts). And these regularities and patterns are then understood in a way that is consistent with the beliefs and practices of the collective. People are likely to accept such meaningful representations of patterns when they correspond to their perception of the 'do-

main of the objects' (realism and ontology) and correspond to a commonly shared 'realm of values' (relativism and axiology) (Proposition ①).

Axiology and the relativist movement presume that the world acquires meaning within conceptual schemes that have arisen over time as a result of interactions between the actors involved. And these depend on and are influenced by, for example, culture, debate, argumentation and choice. Choice and argumentation are tested against the realm of realism on the basis of these conceptual schemes of meaning and understanding. Thanks to these conceptual schemes (such as Tables 1 and 2 and Figures 4 and 5), reality is conditioned, and can be read, which leads to understanding. This also means that these schemas and the associated choices and argumentation can be neither neutral nor value-free but are 'encapsulated'. Consequently, our understanding of the world is also 'encapsulated' in stories that are shared.

8 Synthesis: towards an epistemic loop of progressive understanding

This paper takes a differentiated reality perspective (Proposition ④) based on different degrees of uncertainty (Proposition ③) and has provided it with appropriate ontological and axiological conditions (Proposition ①). The next and final step is to capture this differentiated reality perspective in a coherent conceptual epistemic scheme. It is a synthesis that is *relational* and is supported by the following argumentation.

Figure 3 is an axiological reflection on valuing reality. Valuing through intersubjective interaction takes precedence over a one-sided observation of objects and situations. Figure 3 shows how intersubjective interaction comes to valuations under different circumstances, from very familiar, recognisable, closed and stable situations to very uncertain, elusive, open and unstable situations. As the situation becomes more uncertain, the facts speak less for themselves and actors will look at each other more often in order to get some understanding of the situation.

Figure 3 follows the same rhythm as Figure 2, which shows how the orientation towards the object, the situation and the circumstances can be understood in ontological terms. The axiological reflections in Figure 3 mirror the observations of objects and situations in the sense that, here, the intersubjective valuation also depends on the various degrees of uncertainty encountered (proposition ③). In Figure 2, the orientation shifts from a relatively certain and actual reality to very uncertain circumstances, partly as a result of locally increasing contextual interference, partly due to the rise of multiple actors with varying interests. And Figure 3 explains that, under these circumstances, it is wise to communicate with the others involved about each other's views, estimates and assumptions. A process of explorations ('searching' in Figure 5) within situational affairs is meant to enable a process of learning.

From an ontological perspective, the presentation of 'factual' certainties is most satisfactory. After all, it offers the most concrete answer to the question of what there is to know. As the uncertainty increases, the concretisation and 'exactness' of what can be known decreases (Figure 4). At the same time, the need to look at the situation from an axiological perspective increases in order to arrive at some kind of understanding. In uncertain situations, the understanding of reality will increasingly lie in explorative intersubjective interaction. In highly uncertain situations, intersubjective interaction is even necessary and leading, and more or less the only way to understanding (Figure 4). In-

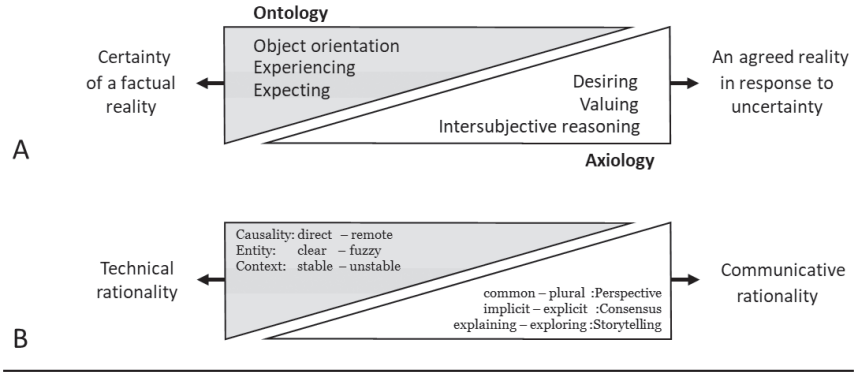

Fig. 4: The complementary input of ontological and axiological competences shifts, depending on the degree of uncertainty (De Roo 2018), resulting in factual and agreed realities (A) and provided with behavioural conditions (Figures 2 and 3) associated with technical and communicative rationalities (B; De Roo 2016).

tersubjective interaction dominates in uncertain circumstances. It does not stop there. As the *confidence* of those involved in understanding the situation increases ('Trust' in Figure 5), the importance of intersubjective interaction diminishes, the meaning of the situation becomes more and more self-evident, those involved assure each other that they 'know' the situation, and the interest in and importance of the ontological perspective increases again (Figure 4). As a result, generic statements can be produced, from which predictable futures can be derived, which can lead to routine behaviour, and on the basis of which procedurally embedded processes can be established (see Figure 5).

All in all, it can be said that, in uncertainty situations, the object orientation and the knowledge that lies within it *(factual reality)* become less decisive for understanding, and the expectations about what is to come are low. On the other hand, the importance of intersubjective interaction, the need to sharing opinions and the joint realisation of meaning *(agreed reality)* increases. By sharing needs and wishes, opinions and ideas, assumptions and reflections, however different they may be, on the basis of joint observations, an understanding of the situation arises (see Figure 4; Proposition ②).

Figure 4 explains how 'elements shape structure' and 'context shapes identity' in reciprocal relationships (Pottage 1998). Figure 4 also gives a possible answer to the question of how axiology, ontology and epistemology come together (relational; Proposition ②). The degree of certainty or uncertainty (Proposition ③) about an observation, system or situation in question, and the degree of closeness or openness of the system environment is relevant here. This has led to various proposals within realism. These proposals are linked – as we have seen in this paper – based on the degree of uncertainty perceived in the reality around us: the relative certainty of 'factual' knowledge from 'empirical' realism to 'critical' realism that offers a perspective for situations with far-reaching uncertainty. It is within the 'empirical' realism of a closed-system environment that the parts of the whole can be considered in a direct causal relation with each other, without having to take external influences into account. This is in contrast to 'critical' realism and an open-system environment, in which an unstable, dynamic context cannot be excluded, and which can possibly influence different levels of existence. In other words, uncertainty leads to a differentiated answer to the ontological question of what is known about reality (proposition ③).

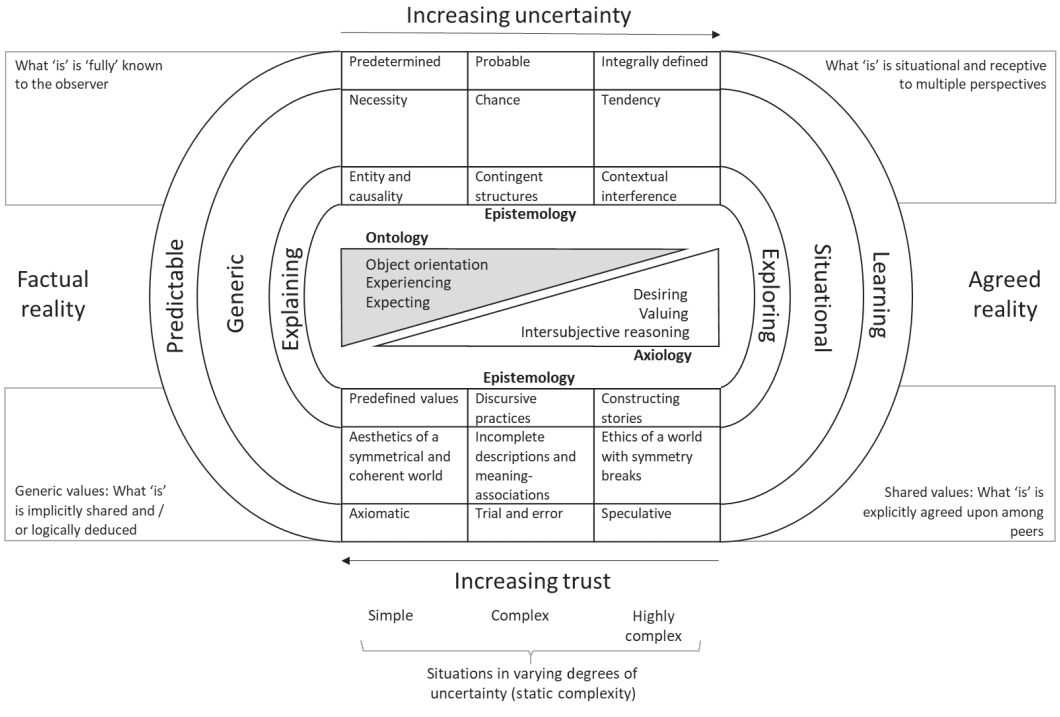

Fig. 5: Epistemic loop with reflections and their relational implications for ontological and axiological questions and criteria, to differentiate among 'realities' from factual to agreed and vice versa.

Observation and representation alone are not enough to achieve understanding of such complex situations. Also important is the exchange of values, assumptions and ideas between subjects about what is being observed (Proposition ①). And that is what relativism stands for. Relativism and the exchange and sharing of mentally constructed values are usually opposed to realism, observation and objectification. Figure 4 proposes an entirely different view, with relativism not to be seen as opposition, but as a necessary complement to realism (Proposition ②). One cannot exist without the other. In other words, the (relational) convergence of realism and relativism produces conditions that enable us to view reality as perceptible patterns of understanding.

Given this reasoning, it is not surprising that Figure 5 presents the complementary relationship between ontology and axiology (Proposition ②) as a loop. Going through this epistemic loop, new 'generic' concepts will be created each time, which become a-priori value judgements in the subsequent sequel to the loop and in the reality to which the conditions of the loop apply. This proposal has major epistemological consequences.

Epistemology has long focused on fact and certainty. Epistemology has long been based on a one-sided observation and an object-subject relationship, in which the subject is supposed to be able to view every representation of reality in a value-free way. As if representation, interpretation and perspective do not matter. Which cannot be explained with reason, because interpretation and perspective are intrinsically human qualities and essential for knowledge and understanding. The less tenable certainty is, the less relevance 'factual reality' and the closed system that comes with it have. The more the possibilities of an open-system environment increase, the more the assumptions further diverge about what 'can be', and the more uncertainty necessitates interaction and exchange of reflections between the parties involved. These actors in doubt then explore the various possibilities and each other's assumptions and opinions in order to converge towards a common perspective and point of view, resulting in consensus and an 'agreed reality'. In such a situation, a classical epistemological perspective doesn't work anymore, and a constructivist epistemological perspective becomes desirable: as the observation comes with less and less information that matters, the interpretation of this observation increases and the valuation of the observation becomes important, a valuation that presupposes, associates, speculates, simulates, creates and suggests, and will therefore largely be fictitious but, nevertheless, turns out to be highly useful for the parties involved in order to understand their environment to some extent and to be able to make choices about how to act (Propositions ①, ②, ③ & ④). This reasoning also works the other way around, when trust is gained because the expectations that prompted actions turn out to lead to the intended result, and interventions proceed as planned. An initially agreed reality then becomes increasingly factual. This can develop to a point where what we see becomes self-evident to us and, therefore, indisputable, and we exhibit what some call *'axiomatic behaviour'*. This completes the circle, and a new round can be started, after which an almost endless loop can unfold.

Ontology comes with the connotation of certainty and uncertainty. Axiology comes with a denotation of trust and doubt. Ontology focuses on observations that show performative trajectories and courses that are expressed in affirmative narratives and discourses and their axiological foundations. When ontological certainty is found, it goes hand in hand with and leads to axiological trust. On the other hand, the axiological handling of doubts should lead to an answer to the question of how to deal with ontological uncertainty. The 'degree to which' certainty, uncertainty, trust and doubt are related is shown in Figure 5, which is an epistemic frame of reference.

9 Flat ontology – part 4: There is so much more …

The reasoning in this paper is somehow inspired by 'flat ontology' and its various meanings. Now that this paper has resulted in an epistemic scheme containing complementary ontological and axiological conditions (Propositions ① & ②) to gain understanding and insight into systemic environments that vary in degrees of uncertainty (Propositions ③ & ④), the question remains: what information does this scheme provide for the discussion about 'flat ontology'? At first glance, this scheme does not say much about facilitating a flat, layered, hierarchical or process ontology. Instead, the scheme offers a level playing field for ontology and axiology. In particular, it emphasises an ontology that is relationally interwoven with an axiology (Propositions ① & ②), and in their interconnection, these can be differentiated in terms

of uncertainty (Propositions ③ & ④). This also explains how understanding is 'encapsulated' relationally by conditions and that, therefore, this understanding exists within a mental collective rather than an 'objective' environment, and how this then frames behaviour and actions, given the circumstances.

That ontology and axiology coincide forms the core of the scheme and this (relational) merger manifests itself as a spectrum language, indicating how the relationship between ontology and axiology can 'work' in between relatively certain and highly uncertain circumstances. The result is an epistemic scheme (Figure 5) in which 'flat ontology' can be placed, based on taste and preference. Bhaskar will point to a position on the far left in Figure 5, while DeLanda is expected to prefer a position on the top right of this epistemic scheme.

Even if we put aside speculation about the epistemic loop as a circular and emergent mechanism to produce continuously generic, 'encapsulated' knowledge and understanding about reality, the epistemological consequences of the spectrum language the scheme presents are immense. It means that epistemology is no longer inviolable, sublime, and firm in making demands about how and what to know. Instead, epistemology, ontology and axiology are intertwined in a *contingent relationship* (Propositions ① & ②), and, as a result, they condition each other in their questions and criteria about understanding reality. And this contingent relationship between epistemology, ontology and axiology is differentiated in terms of uncertainty (Propositions ③ & ④).

This contingent relationship presupposes a pattern, relational, observable and equivalent to a progressive understanding, which we can feel intuitively, and which is 'rationally' conditioned by and elaborated upon in epistemological, ontological and axiological questions and criteria. Whether this pattern should be seen as flat, fluid or transcendent is not the point. The pattern represents a differentiated reality of contrasts, which allows us to perceive, appreciate and understand reality in different but interrelated ways. And this pattern captures reality in a relational mix of observation and valuation, and so the understanding of this reality is logically 'encapsulated'. This understanding of reality is not absolute, complete nor imaginary, but an optimisation (pattern) of a reciprocal relationship between received signals from reality that surrounds us and what we collectively make of it. It means that what we make of reality is subject to a process of collective interpretation and choices, of making agreements and of judging together what suits us best. Thus, an epistemology that sees reality as something that can be objectively known has been replaced by a conceptual epistemic scheme that is limited to an 'encapsulated' reality, can be tested, is open to adaptation and, therefore, can evolve continuously, and that explains an understanding that is progressing.

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