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A PRAGMATIC REALIST VIEW OF EMERGENCE

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Abstract: *This paper examines the notion of emergence from the perspective of pragmatism, drawing special attention to Donald Davidson's recent account of the emergence of thought and to Hilary Putnam's pragmatic realism, which, we argue, can be applied to the question of the reality of emergent properties. Our overall conclusion is that the debate over the concept of emergence actively going on in contemporary metaphysics, philosophy of mind, and philosophy of science should be focused more strongly on the realism issue, even though most emergentists (and their critics) tend to assume a rather straightforward metaphysical realism – a view that ought to be called into question on pragmatist grounds.*

Key-words: *emergence; realism; pragmatism.*

1 INTRODUCTION

In this paper, we examine a number of ideas concerning emergence, taking as a starting-point a discussion about a recent paper by Donald Davidson on the emergence of thought (Davidson [1997](2001)). Richard Rorty ([1987](1991), p. 113) regards Davidson's work as "... the culmination of a line of thought in American philosophy which aims at being naturalistic without being reductionist". He is referring to pragmatism, even though Davidson does not accept Rorty's interpretation of himself as a pragmatist (in: Borradori (1991), p. 44. See also Pereira (1998)). We do not intend here to enter any controversy concerning what would possibly be the best way to interpret Davidson's philosophy, as it suffices to our purposes to notice that, no matter whether Davidson is a pragmatist or not, his work is *at least partly* consistent with the kind of pragmatic realism we consider to be consequential to current debates about emergence.

The tradition of pragmatism has, especially since John Dewey, been characterized by a commitment to non-reductive naturalism. It is indeed proper to see it as aiming at a philosophical doctrine which is naturalistic without being reductionist. In the case of Davidson's philosophy, Rorty ([1987](1991)) claims that his non-reductive physicalism is based on the conjunction of three theses: First, the thesis that reasons can be causes; second, the thesis that there is no relation between non-sentences and sentences (or between non-beliefs and beliefs) called 'making true'; and, third, the thesis that metaphors do not have meanings. We do not aim here either at providing an exegesis of Davidson's original theses (which can be found in Davidson (1980), (1984)) or at presenting in full detail how they are interlinked by Rorty to lay the foundations for Davidson's non-reductive physicalism. Rather, our goal is to discuss the issues of emergence and realism taking as a point of departure an analysis of a paper on the emergence of thought recently published by Davidson. But why might this paper be an

interesting starting-point for us? Davidson is *not* among the emergence theorists. But consider, first, that Davidson was responsible for the long interest in the idea that physicalism might be properly couched in some form of the supervenience relation. Philosophers were allured by the prospect of discovering through supervenience a dependency relation that would not entail reducibility after Davidson's usage of this concept in his "Mental Events" (Davidson [1970](1980)). A great number of philosophers tried to formulate a non-reductive physicalist stance on the grounds of supervenience, with a very limited success (see, *e.g.*, Kim (1993), (1998)). Curiously, Davidson himself did not explore this idea further in his subsequent works. All this said, it may seem even more farfetched to use Davidson's paper to deal with the issue of emergence. But emergentists are similarly interested in dealing with the apparent paradoxes that follow from the relations between macro-micro dependence, microdetermination, and irreducibility. And, recently, Davidson wrote a paper on the emergence of thought that comes back to the issue of the mind-body relation, and the intertwined issues about reducibility and dependence. In this paper, Davidson's approach to the issue of emergence seemed to be similar, in important respects, to some proposals we have been defending in recent works (Pihlström (1996), (1999a), (2002); El-Hani (2000), (2002); El-Hani & Pihlström (2002)). Here, we want to examine these similarities, in order to see if they are indeed relevant to our own research.

Briefly, we have been arguing that emergence theorists should pay more attention to the realism issue, casting doubt over the strong metaphysical realism to which they are usually committed. Rather, we have advocated a pragmatist alternative to metaphysical realism. If one adopts some form of pragmatic realism, the purely ontological, metaphysically realist treatment of emergence typical of most contemporary approaches will have to be given up. From the perspective of pragmatic realism, the ontology of emergents, like any ontological

issue, is irreducibly epistemologized, simply because it is embedded in our ontologically relevant practices.

2 DAVIDSON ON THE EMERGENCE OF THOUGHT

In the paper we want to examine, Davidson asks: "What does it mean [...] to say some aspect of the world 'emerged'?" (Davidson [1997](2001), p. 123). He states, thus, a problem which has been receiving more and more attention in the last few years, but goes back at least to the beginning of the twentieth century. Let us see how Davidson answers the question he poses. First of all, it is important to notice that he avoids the usual way of understanding the emergence debate, firmly committed to a strong metaphysical realism, and assumes, instead, a conceptual perspective on emergence:

> Emergence makes sense only as seen from a point of view, from within a set of concepts. Given *our* set of concepts, we can appreciate the idea that different concepts were instantiated at different times. The concepts of quantum physics were instantiated very early; the concepts of the various elements were instantiated over a longer subsequent period. The concept of life was instantiated quite recently, and the concepts of thought and language were filled out only moments ago, with the coming of higher mammals. This doesn't mean the laws of physics changed, but it does mean that in order to describe and explain thought we need concepts that can't be defined in the vocabulary of physics (or any of the natural sciences). Thus, in a clear sense, emergence is relative to a set of concepts. Concepts themselves are abstractions and so timeless, of course, but it can happen that certain concepts are instantiated only as time goes on. The universe is, needless to say, indifferent to our concepts. (Davidson [1997](2001), p. 123. Emphasis in the original).

Our interest in Davidson's approach, even though he is not himself deeply involved in the emergence debate, stems exactly from this attitude towards emergence, which is compatible with our recent efforts to raise the realism issue as a metaphilosophical basis of the current debates about emergentism. The consequential move from a strong realism about levels and emergence to a more pragmatically-oriented

realism is readily apparent, notwithstanding Davidson's reluctance in accepting the 'pragmatist' label, in his treatment of the emergence of distinct levels not as a pure event in an independently perceived reality, but rather as a process involving an instantiation of concepts. Surely, this raises a number of important problems regarding the relation between knowledge and reality, some of which will be discussed later in this paper. It is quite clear, anyway, that one should not fear that a critique of strong realism necessarily ends in some sort of anti-realism. Even though Davidson assumes what we might describe as a conceptual approach to a typical ontological question such as that of emergence and the levels of reality, he still recognizes that the 'universe', that reality out there which must be assumed to underlie and in some way be responsible for experience, though remaining unknowable, is indifferent to our concepts. On the other hand, we must remember that Davidson is famous for his devastating critique of the very idea of distinguishing between our conceptual scheme(s) and the world (or the universe) as the content of those conceptual schemes.[1]

Davidson's endorsement of a concept-independent 'universe' is also a move that results in some tensions between the critical attitude towards strong metaphysical realism and the usage of some terms which seem to have a strong realist flavor. Notice, for instance, Davidson's reference to the 'laws of physics', which would remain unchanged

[1] The paper 'On the Very Idea of a Conceptual Scheme' was first published in 1974 and is included in Davidson (1984). It is not our task to determine here whether, and to what extent, Davidson's critique of conceptual relativism is compatible with the kind of 'pragmatic realism' we ascribe to him regarding emergentist ontology. We intend to use some of Davidson's ideas for our philosophical purposes, instead of claiming that a coherent overall interpretation of his position can be achieved. (We shall briefly return to Davidson's relation to Putnam's pragmatic realism below). For critical discussions of Davidson's attack on conceptual schemes, see, e.g., Rescher (1980) and Putnam (1990: chapter 6); more literature is cited in Pihlström (1996: chapter 4.5).

notwithstanding the emergence of thought. How can a term so loaded with an ontologically realist meaning such as 'law' be made compatible with an approach that conceptualizes other ontological categories such as 'levels', 'entities', 'life' etc.? We think, however, that such a tension cannot be avoided. Rather, it should be consciously embraced by any thinker who is trying to move from the kind of realism which has been for so long typical of Western thought to milder forms of realism. Only by embracing this very tension will we be able to highlight the nature of the problems we have to deal with when we put into doubt strong metaphysical realism.

After stating those initial ideas about emergence, Davidson explains why he thinks it is so difficult to say anything interesting and deep about the emergence of thought. The reason lies in the legion of concepts on which the concept of thought depends, or, briefly, in the 'holism of the mental':

> The reason is that there are so many concepts that we must have in order to talk about or describe thinking, acting on a reason, believing, or doubting, all of which depend on each other. This is the *holism of the mental*, the interdependence of various aspects of mentality. Within any one dimension of mentality, such as belief, it seems clear that it is impossible to take an atomistic approach, because it is impossible to make sense of the idea of having only one or two beliefs. Beliefs do not come one at a time: what identifies a belief and makes it the belief that it is is the relationship (among other factors) to other beliefs (Davidson [1997](2001), pp. 123-124. Emphasis in the original).

We think most philosophers would agree that such an interdependence of the concepts needed to account for thinking, mentality, rationality, normativity, etc., is deeply related to the almost intractable nature of the problems arising from any attempt to understand the mind. Davidson's case for the holism of the mental is grounded on the following arguments (for details, see the original paper, pp. 124-126): (i) There are no beliefs without many related beliefs, as beliefs are identified by their propositional content, and beliefs give each

other content, so that beliefs are individuated and identified by their relations to other beliefs, and, consequently, one must have a large number of beliefs in order to have any. (ii) There are no beliefs without desires, and no desires without beliefs, given the deep reciprocal relations between beliefs and evaluative attitudes. (iii) There are no intentions without both beliefs and desires, as beliefs and desires conspire to cause, rationalize, and explain intentional actions. Davidson then moves to the conclusion that, once the field of the mental aspects of life was enlarged as a consequence of the holism of the mental, all such aspects should emerge together. The emergence of thought is a quite complex event, involving a huge set of interrelated concepts, and all of them should emerge together, as a single whole, at least for those who accept the holism of the mental:

> Intentional action cannot emerge before belief and desire, for an intentional action is one explained by beliefs and desires that caused it; beliefs can't emerge one at a time, since the content of each belief depends on its place in the nexus of further beliefs; and so on. It is the holism of the mental that makes its emergence so difficult to describe. There cannot be a sequence of emerging features of the mental, not if those features are to be described in the usual mentalistic vocabulary (Davidson [1997](2001), p. 127).

This certainly makes it difficult to conceptualize, explain, theorize upon, and even describe the emergence of mind and thought. Not surprisingly, the major problems of the philosophy of mind have demanded the best efforts and resources of a great number of gifted philosophers and scientists, and it is quite certain, we think, that the mind-body problem will not yield to any naive and simple-minded approach, be it a physicalist or a non-physicalist one. A *pragmatic pluralism* regarding different approaches to the human mind seems to be much more fruitful in this case. Also, issues such as those of the nature of consciousness or the mind-body problem will never be solved from an exclusively scientific perspective, notwithstanding the justified excitement

about the recent advances in the neurosciences. There is a lot of philosophical work to be done that cannot be simply dispensed with. This is an important lesson to be learnt by natural scientists who are dealing with the brain and the mind. As Dennett ((1987), p. 1) states, "many things need saying that cannot be said in the restricted languages of neuroanatomy, neurophysiology, or behavioristic psychology", so that, if natural scientists intend to build a thoughtful science of the mind, they will have to pay attention to philosophers.

To say a final word about Davidson's arguments for the holism of the mental and its implications to the emergence of thought, we should say that the doors are open to counter-arguments. One might question, for instance, the very idea of such a highly interdependent system of beliefs, desires, intentions that underlies Davidson's arguments, or argue that the usual mentalistic vocabulary should be simply eliminated, as it results in a number of pseudoproblems that could be avoided if we expressed our ideas about the mind in a radically different vocabulary. Eliminativism immediately comes to mind in the latter case, with the neuroscientific vocabulary appearing as a major promise in the way to dissolve a number of traditional problems in the philosophy of mind. Although these arguments can be forcefully defended, we are not interested in discussing them here. Rather, we will simply manifest our agreement with Davidson's view about the holism of the mental.

Davidson presents an argument that bears upon an eliminativist way of escaping the consequences of the holism of the mental:

> Of course, everything in the universe and its history can in principle be described in the language of physics, and so each stage in the emergence of thought can be described in physical terms. But this will fail as an explanation of the emergence of the mental since we do not have, and cannot expect to find, a way of mapping events described in the physical vocabulary onto events described in the mental vocabulary (Davidson [1997](2001), p. 127).

It is clear, then, that Davidson is a physicalist, in the sense that he is "... someone who is prepared to say that every event can be described in micro-structural terms, a description which mentions only elementary particles, and can be explained by reference to other events so described" (Rorty [1987](1991), p. 114). But it is also clear from Davidson's statement why we should regard him as an 'anti-reductionist' or 'non-reductive' physicalist. As regards this latter issue, Rorty ([1987](1991), pp. 114-115) argues that "... he [Davidson] combines this [physicalist] claim with the doctrine that 'reduction' is a relation merely between linguistic items, not among ontological categories". When Davidson claims that a physical description of the emergence of thought, although it is certainly possible, will fail as an explanation of this process, he is close to an understanding of non-reductive physicalism which is not committed to a strong metaphysical realism, as most non-reductive physicalists who appeal to property dualism are, but rather tries to advocate irreducibility in a more epistemologized way.

It is also relevant to mention here how Rorty understands what it means to say that 'reduction' is a relation between linguistic items, not among ontological categories:

> To reduce the language of X's to the language of Y's one must show either (a) that if you can talk about Y's you do not need to talk about X's, or (b) that any given description in terms of X's applies to all and only the things to which a given description in terms of Y's applies (Rorty [1987](1991), p. 115).

We will say more about these criteria later. For the moment, we would only like to emphasize the light they cast upon Davidson's argument that we do not have, and cannot expect to find, a way of mapping events described in the physical vocabulary onto events described in the mental vocabulary.

Davidson argues, in the sequel, that the difficulty of describing the emergence of the mental is a *conceptual problem*, unveiling, in our view, an

assumption that epistemology and ontology are closely intertwined. This conceptual problem is stated by him in the following terms:

> ... it is the difficulty of describing the early stages in the maturing of reason, the stages that precede the situation in which concepts like intention, belief, and desire have clear application. In both the evolution of thought in the history of mankind, and the evolution of thought in an individual, there is a stage at which there is no thought followed by a subsequent stage at which there is thought. To describe the emergence of thought would be to describe the process which leads from the first to the second of these stages. What we lack is a satisfactory vocabulary for describing the intermediate steps. [...]. ... if you want to describe what is going on in the head of a child when it has a few words which it utters in appropriate situations, you will fail for lack of the right sort of words of your own. We have many vocabularies for describing nature when we regard it as mindless, and we have a mentalistic vocabulary for describing thought and intentional action; what we lack is a way of describing what is in between (Davidson [1997](2001), pp. 127-128).

This is quite an interesting argument, as it has bearings on such different issues as the understanding of the evolution of mind in the human lineage, the explanations of developmental psychology, educational issues related to the development of cognition, etc. It highlights, once again, the difficulties posed by the emergence of mind as a whole bunch of closely intertwined processes, as human brain development passes in a leap from a non-mental to a mental stage. There is certainly a lot to be learnt yet about what changes in the structure and function of the brain in order to allow for populations of neurons connected by a swarm of synapses in different states of activation to instantiate mental functions such as intentions, beliefs, desires, all interweaved (given the holism of the mental) in a single complex of processes. But the problem is not only of either an empirical or linguistic sort. Davidson suspects there is something deeper involved in our difficulty to describe the developmental stages between a mindless brain and a brain endowed with the mental capacities which so clearly defines, at least in our experiences, what it is to be human:

> It is not that we have a clear idea what sort of language we could use to describe half-formed minds; there may be a very deep conceptual difficulty or impossibility involved. That means there is a perhaps insuperable problem in giving a full description of the emergence of thought (Davidson [1997](2001), p. 128).

Davidson points to a specific conceptual problem in our understanding of the emergence of the mind, the lack of a satisfactory vocabulary for describing the intermediate steps between a brain with no mental functions and a brain properly functioning as a humanly-device to conceptualize the world of nature and the world of human affairs. And this is not a simply matter of needing to couch the good words to describe half-formed minds. We have to pay attention to the concepts underlying the vocabulary we might use for describing half-formed minds. This identification of what seems to be a major shortcoming in the vocabularies available to understand brain evolution and development might have a substantial heuristic power, potentially launching scientists and philosophers to the task of building such concepts and words. Nevertheless, maybe a different attitude towards this task is needed for the heuristic power of Davidson's argument to be realized. We should believe that the conceptual problem he detects is not insuperable. Otherwise, why would we take our time to try to solve it? A feeling that we can solve this problem is needed in order to research to advance towards some pragmatically-workable understanding of how the brain develops towards a mentally-functioning device. It is like our fundamental guess that the universe has an order and we can manage to understand it. We really do not know for sure, and we will never be able to really know, that there is such an order, and, moreover, that we have the tools for understanding it, but we simply take for granted that both claims are true. As concerns our minds, which are so weird but so present in our daily endeavors, we have to play the same game, to suppose that it has an order (it doesn't matter here if you are an eliminativist, since you would also have to assume that the brain has an

order) and we can understand it, as well as its development and history, no matter the conceptual problems involved.

Symptomatically, Davidson moves, "despite these pessimistic remarks", to some suggestions about how we might approach the problem of saying something intelligible about the emergence of thought. Surely, to have any hope to say something intelligible about something else, we have to believe in some underlying order that we can, even if in a clumsy way, describe and understand. Thus, one might say that, although Davidson suggests that the conceptual problem involved in understanding half-formed minds may be insuperable, he is ready to make the assumptions we discussed above.

Let us take a look at the suggestions Davidson offers us. He argues, first, that there is a prelinguistic, precognitive situation which constitutes, in his view, a necessary condition for thought and language, and, moreover, as it can exist independent of thought, it can precede it. It is also a situation that can be observed both in nonhuman animals and small children. The situation to which Davidson is calling attention, and that could provide some insight into the understanding of the developing mind, is a common situation in social animals. It involves two or more creatures simultaneously in interaction with each other and with the world they share. Davidson ([1997](2001), p. 128) calls this situation 'triangulation'. Through triangulation, each creature learns to correlate the reactions of other creatures with changes or objects in the world to which it also reacts. Davidson mentions both wired-in reactions, as those observed in schools of fishes, and learned reactions, such as the reactions to warning sounds in monkeys. He argues, however, that the mode of communication involved in these learned behaviors does not constitute, in fact, a language:

> ... on reflection we realize that the behavior of these primates, complex and purposeful as it is, cannot be due to propositional beliefs, desires, or intentions, nor does their mode of communication constitute a language (Davidson [1997](2001), p. 128).

This claim raises important issues as regards inferences about animal minds based on communication and complex behavior, such as Griffin's (2001) thesis that animal communication provides a 'window' on animal minds, as well as about the existence of language in animals. It is based on Davidson's arguments about the holism of the mental. Dogs do not have beliefs or any other propositional attitudes, in his view, because it is not possible to have a single belief (Davidson [1997](2001), p. 124). Surely, Davidson is committed to assumptions about animal 'minds' which could be disputed, as Griffin would probably do. We shall not go further into this discussion here. It is more interesting, for our purposes, to call attention to the fact that Davidson's argument is quite consistent with current views about the evolution of the mind, which typically correlates it with the evolution of sociality, involving complex communicational circumstances.[2] Davidson ([1997](2001), p. 129) himself stresses this by writing that "... thought as well as language is necessarily social". In the emergence literature, Emmeche and colleagues (1997), for instance, emphasize that the psychological level is defined by self-consciousness, regarding it as a human specific defining feature, intimately related to language acquisition, to the possibility to transcend the local situation both spatially and temporally, and also to intersubjectivity. They also claim that some primary characteristics are the same for the psychological and sociological levels, and, thus, we have to see their development as interconnected. These levels are interwoven,

[2] In the course of a discussion about whether nonhuman animals might have minds and be able to think, one might call attention to the observation that humans are not the only animals who build complex social circumstances. But this would only add one more issue to the controversy, since some might argue that there are fundamental differences between human societies and other animals' social groups. Many issues are interwoven in such a debate, and this is the main reason why we deliberately avoid it here. It would be interesting, however, to consider Davidson's arguments in current debates about animal communication and animal minds.

in their view, in such a manner that they are each part of what constitutes the other. Also, we may think of these two levels as forming different descriptions of properties in one and the same psycho-social level. All these claims are, as we understand them, consistent with Davidson's view that triangulation is a necessary condition for the emergence of thought and language.

Davidson ([1997](2001), pp. 129-130) also discusses the reasons why triangulation is essential to the emergence of thought: without the triangle he described, we cannot account for two key aspects of thought, its objectivity and its empirical content about the external world.[3] He goes on, then, to argue that triangulation is necessary but not sufficient to thought, as it is shown by the fact that it is observed in animals we do not credit with judgement. The conclusions he draws are found in other works, but, anyway, they are consequential to the issues regarding the difficulties we face in our efforts to understand the evolution of the mind:

> ... we are in a position to say something about a situation that must exist if thought does, but it is a situation that can exist independently, and so can precede thought in the order of things. [...]. Thus, we can say that a certain kind of primitive social interaction is part of the story of how thought emerged (Davidson [1997](2001), p. 130).

But what completes the story? In Davidson's view, language does. He asks, then, why language is essential to thought, and offers the following answer: unless the connection between the two agents in the triangle is strengthened to the point where the communication of propositional contents can be implemented, there is no way the agents can make use of triangular situations to form judgements about the

[3] We will not deal here with these two aspects of thought, since this would compel us to deal with a number of controversial and difficult issues which are not in the scope of this paper. We invite our readers to peruse Davidson's original paper.

world (Davidson [1997](2001), p. 130). Finally, Davidson develops, in the final part of his paper, an analogy between semantic theories and theories of fundamental measurements, which brings, he argues, a 'relative clarity' to our thinking about the emergence of thought, giving us a platform from which to distinguish stages leading up to thought and language from the initial conditions of a mindless brain (Davidson [1997](2001), pp. 130-134).

3 THE EMERGENCE DEBATE

The debate about the concept of emergence has recently re-emerged (Kim (1999); Cunningham (2001); Pihlström (2002); El-Hani (2002)). This revitalization of the emergence debate is in part related to the influence of recent emergentist hypotheses about mind and consciousness (*e.g.*, Sperry (1969), (1983), (1991); Searle (1992); Baas (1996)). Discussions about the 'emergence' of thought, mind, rationality, consciousness, qualia, etc., such as that offered by Davidson in the paper examined above, have become more and more common. But, as the concept of emergence is increasingly used, it becomes particularly important to keep the exact meaning of the central ideas involved clear.

Davidson is to be regarded, as Rorty emphasizes, as a physicalist, in a sense which does not entail a commitment to reductionism.[4]

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[4] It is important to be clear about what is meant by 'physicalist' here, since this term is often conflated with a particular sort of physicalism, namely, reductive physicalism. Physicalism can be understood as an ontological stance which does not have as a necessary consequence an epistemological or methodological commitment to physical explanation as the best way to understand or study all phenomena. Trout (1991, p. 390), for instance, remarks that "... it has [...] become commonplace among philosophers and scientists to defend a rather strong version of reductionism on the basis of the evidence for physicalism alone". Hellman and Thompson (1975:551-552) recognize that "traditionally, physicalism has taken the form of reductionism", but make it explicit that "of late there has been a growing awareness [...] that

Similarly, many emergentist thinkers (but not all of them) are ontological physicalists, i.e., they believe that there are no concrete existents in the world other than material bodies, i.e., aggregates of the basic physical particles recognized by current physics. Such a materialistic monism confers to the physical level a kind of priority, since the diversity of things should necessarily result from different arrangements of the same basic constituents. This means that many emergentists will endorse the generality of physics vis-à-vis the special sciences (Fodor [1974](1991)), although not the classical reductionist account captured in many usual references to 'the unity of science' (e.g., Oppenheim & Putnam [1958] (1991)). The generality of physics is properly expressed in the hypothesis of *the inclusivity of levels*, claiming that the relation between levels is such that a higher level (e.g., the psychological level) is built upon lower levels (say, the biological and physical levels), so that all types of higher levels are included within the physical level, and does not violate physical laws and organizational principles (Emmeche *et al.* (1997), p. 93; Emmeche *et al.* (2000), pp. 14-15).

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reductionism is an unreasonably strong claim. Along with this has come recognition that reductionism is to be distinguished from a purely ontological thesis concerning the sorts of entities of which the world is constituted". Similarly, Fodor ([1974]1991, p. 429) comments: "I think that many philosophers who accept reductionism do so primarily because they wish to endorse the generality of physics vis-à-vis the special sciences [...]. For such philosophers, saying that physics is basic science and saying that theories in the special sciences must reduce to physical theories have seemed to be two ways of saying the same thing, so that the latter doctrine has come to be a standard construal of the former". Reductionists typically aim at advocating a philosophical position which is much stronger than a mere belief in the generality of physics. It is desirable, then, to keep the distinction between 'physicalism' (or 'materialism') and 'reductionism' clear. Some philosophers (e.g., Putnam 1999) problematize this distinction, however, and we will have to return to the topic, if only briefly, below.

Nonetheless, emergentist materialists face a fundamental problem: as they recognize that all higher-level events, states, and properties are realized by physical events, states, and properties, how can they explain that genuine novelties ever arise? The suspicion that emergence violates the maxim that you can't get something from nothing seems to be justified (*cf.* O'Connor (1994)). Several emergentists claim that this problem can be adequately solved by taking downward causation (DC)[5] into account (*e.g.* O'Connor (1994); Emmeche *et al.* (1997), (2000); El-Hani (2002); El-Hani & Pereira (1999), (2000); Andersen *et al.* (2000); El-Hani & Emmeche (2000); El-Hani & Videira (2001)). But this leads to a further problem: we have to deal with the difficulties involving DC, for instance, the possibility that it entails a violation of the physical causal closure (Kim (1992), (1996), (1998), (1999), (2000)). A tempting possibility is simply to cast DC aside and try to formulate emergentism without appealing to this notion. Nonetheless, one has to argue, in this case, against the general belief among emergentists that DC is of crucial importance in understanding causation. This scenario portrays a significant part of the universe of problems current emergence theorists have to deal with.

4 DISCUSSING KIM'S CRITIQUE OF EMERGENCE

Kim (1992) claims that there is a parallelism between emergentism and non-reductive physicalism, arguably the current orthodoxy on the mind-body problem. Non-reductive physicalists typically attempt to combine a physicalist ontological monism with a dualism of physical and psychological properties. Kim ([1989](1995)) argues that non-reductive physicalism is not a stable position. It collapses into either reductionism or more radical forms of dualism. It is hard, indeed, to give a proper

[5] The problem of DC, much discussed in emergentism, is the problem of how a higher-level phenomenon can cause or determine or structure a lower-level phenomenon.

explanation to the idea that mental properties are something 'over and above' their physical/biological bases. In the absence of such an explanation, mental properties cannot be regarded as *ontologically irreducible* without breaching fundamental tenets of physicalism (Kim (1993), (1998); Bickle (1998)). It follows, then, that non-reductive physicalism isn't sufficiently strong as a philosophical position and some kind of identity theory is the most attractive option for a physicalist philosopher of mind. But couldn't non-reductive physicalism or, broadly speaking, non-reductive naturalism be defensible not in terms of the ontological doctrine of property dualism, but as a more epistemologically and methodologically-oriented stance? One might argue that the understanding of mentality, normativity, or human agency demands other perspectives than reductionism (and even physicalism). Influential philosophers like Charles Taylor (1995) and Hilary Putnam ((1994), (1999)) have resisted the reductively physicalist idea that a scientific and naturalistic perspective would be adequate to understand features peculiar to human life and practices. Our interpretation of ourselves as conscious, ethically responsible persons seems to require, according to these thinkers, an irreducibly normative account of the practices we engage in, and such an account cannot be grounded, in their view, on a physicalist world-view.[6]

Most non-reductive physicalists are committed to a positive account of how mental and other 'non-physical' properties relate to physical properties. Two approaches have been widely used to explicate the relations between higher-level and physical properties: supervenience (which has become a focus of philosophical debate after Davidson [1970](1980)) and realization (Kim (1992), (1993)).[7] Supervenience, not emergence, has been for some time the choice of many authors when

[6] We will cast this non-physicalist, non-causalist proposal aside for a moment, but we will return later to Putnam's views, in particular.

[7] Kim (1993, 1996, 1997, 1998) cogently shows that physical realizationism explains mind-body supervenience.

they engaged in characterizing interlevel relationships. Many philosophers have argued that physicalism should be properly formulated in some form of the supervenience relation, often associated with two basic ideas concerning the relations between sets of properties, dependence and determination (Hellman & Thompson (1975); Kim (1993); Chalmers (1996); Horgan (1982), (1993); Bailey (1999)).[8] Others have insisted that emergence, not supervenience, is the better alternative regarding the understanding of ontological relations between levels (*e.g.* Humphreys (1997)). Still others have argued that a combination of these notions is an attractive philosophical alternative for defining an interlevel relationship meeting the double requirement of dependence and nonreducibility (Van Cleve (1990); O'Connor (1994); El-Hani & Pereira (2000); El-Hani & Emmeche (2000)).

A major part of the philosophical attractiveness of supervenience is related to the prospect of discovering a relationship that might give us determination, or dependence, without reducibility. Supervenience seemed to be, at first, exactly what non-reductive physicalism required, a dependence relation that could do justice to both physicalism and antireductionism. Nonetheless, the concept of supervenience does not seem to support by itself a cogent formulation of non-reductive physicalism. It is an unsettled issue whether supervenience physicalism in any of its several versions is a viable form of non-reductive physicalism (Kim (1996), pp. 222-226). Kim nicely states the dilemma concerning supervenience as a relation intended to be both non-reductive and physicalist:

> ... if a [supervenience] relation is weak enough to be nonreductive, it tends to be too weak to serve as a dependence relation; conversely, when a relation is strong enough to give us dependence, it tends to be too strong – strong enough to imply reducibility (Kim (1993), p. 276).

[8] The relation between the notions of supervenience and dependence/determination, however, is not entirely clear (Kim 1993, 1997; Bailey 1999).

Instead of deriving non-reductive theses from supervenience physicalism, Kim ((1993), (1996), (1998)) claims that this doctrine resuscitates a quite different stance, token identity physicalism (see also Bailey (1999)). In view of the difficulties faced by supervenience physicalism as a non-reductive stance, we have to search for alternative paths to the middle road between substance dualism and reductionism that many philosophers find attractive. In this connection, it is worth investigating if a combination of supervenience and emergence might fulfill the double requirement of dependence and determination, on the one hand, and non-reducibility, on the other.

If emergent properties are characterized as particular kinds of strong supervenient properties, it is tempting to conclude that they can be thus regarded both as dependent on, and determined by, the micro-structure, and as irreducible higher-level properties. But supervenience naturally turns, in the context of level theories, into "the thesis that properties of a whole are determined by the properties and relations that characterize its parts" (Kim (1997), p. 278), 'determination' meaning that "what higher-level properties a given entity has are totally fixed by the lower-level properties and relations characterizing its parts" (Kim (1996), p. 222). When we characterize emergence as a species of supervenience, the very notion of 'emergence' is at risk. It is not an easy task to explain how the claim that emergents are dependent on, and determined by, the micro-structure from which they emerge can be reconciled with the idea of irreducibility. Maybe the notion of DC can help us solve this paradox, as El-Hani & Emmeche (2000) and El-Hani (2000, 2002) argue. DC might explain in what sense an emergent property can be irreducible, and yet dependent on, and determined by, the micro-structure from which it emerges.[9] Nonetheless, as Kim ((1992), p. 137, (1999), p. 25) argues, the

[9] What is at stake here is what Kim (1999, p. 26) calls 'reflexive downward causation', observed when some activity or event involving a whole is a cause of, or has a causal influence on, the events involving its own micro-constituents.

combination of upward determination and DC may threaten the coherence of emergentism, even though he himself ((1999), p. 33) conceives of a conceptual approach to DC which might avoid the issue at stake (see below). Pihlström (2002) considers, by his turn, that a non-causalist approach is a better way to understand emergentism than the habitual appeal to DC found in emergentist thinkers (see below). Anyway, if we intend to discuss what are the prospects and limitations of employing the notion of DC, we have to take into account Kim's criticism of it.

Kim's arguments against DC are basically focused on the problem of causal/explanatory exclusion (Kim (1993), (1996), (1998), (1999)). He derives a general principle, 'the principle of downward causation' (Kim (1999), p. 24), from his arguments about inter- and intra-level causation in the context of a layered model of the world: To cause any property to be instantiated, you must cause the basal conditions from which it arises.[10] When we consider that any higher-level property has, according to the supervenience concept, a supervenience base (or realizer) that is sufficient to bring about its instantiation, the problem of causal/explanatory exclusion enters the scene: considering that for any single event there can be no more than a single sufficient cause, if both a higher-level property $\mathcal{Q}$ and its physical supervenience base P are sufficient causes of another physical property P^* and, hence, of its supervenient property $\mathcal{Q}^*$, one of them must be excluded from this causal picture. It is reasonable to claim that the role of $\mathcal{Q}$ in the causation of P^* (an instance of DC) should be preempted by P, so that we end in a picture that Kim calls the model of supervenient causation: P causes P^*, and $\mathcal{Q}$ supervenes on P, and $\mathcal{Q}^*$ supervenes on P^*. This model takes causal processes at the micro-level as fundamental and considers all

[10] The only possible exception being same-level microphysical causation, assuming that the physical is thought of as the bottom level in the multilayered structure of the world.

events of macro-causation (including DC) as supervenient, or dependent, on micro-causation.[11]

This model poses a serious problem for the emergentist's interpretation of DC as a causal power that could change the mode of occurrence of lower-level events, as it is clearly incompatible with the claim that emergent properties are related to novel causal powers, irreducible to the causal powers of the micro-structure from which they emerge. But, perhaps, a major problem in understanding DC is located, rather, in the strong realism that typically underlies the emergence debate.

Given the problem of causal/explanatory exclusion, if the emergentist wishes to insist on the idea of irreducible DC, a violation of the physical causal closure will seem to follow. The basic idea is that irreducible DC would be a "causation of physical processes by nonphysical properties" (Kim (1996), p. 232). If emergentism is to be taken as an ontologically physicalist stance, we must face the problems posed by Kim: how can we make sense of DC without committing ourselves to a violation of the physical causal closure? How can the problem of causal/explanatory exclusion be avoided, so that one may claim that novel and irreducible causal powers appear in the higher-level entities? Kim ((1993), p. 356) claims that the only plausible solution is some form of reductionism, allowing us to discard, or at least moderate, the claim that mental properties are distinct from their underlying

[11] For useful discussions of Kim's argument, see Stephan (1997, 1999). Stephan points out that Kim presupposes that supervenient causation would have to be what is sometimes called 'superdupervenient' causation, i.e., not only ontologically dependent on the basic (physical) causation but also robustly, materialistically, explainable on the basis of the latter. Stephan believes that by emphasizing the distinction between superdupervenience and supervenience one may construct a sufficiently non-reductive notion of DC, but this attempt seems to us to be hopeless. For a more thoroughgoing engagement with Stephan's arguments, see Pihlström (2002).

physical properties. Kim's arguments against DC, which convey the more forceful difficulty faced by contemporary emergence theories, can be seen as a powerful *modus tollens* against the causalist picture which not only the critics of emergentism but also many recent emergentists like Stephan ((1997), (1998), (1999)) adopt (Pihlström (2002)).

One should be cautious, however, when claiming that a given process, event or property is 'non-physical', so as to avoid being committed to too a narrow notion of 'physical', that does not take due account of the idea that all levels of reality are contained in the global physical level, i.e., the thesis of the inclusivity of levels. It is not necessarily the case that an emergentist advocates, as Kim ((1999), pp. 20-21) argues, "... the idea that some of the properties of complex systems, though physically grounded, are nonphysical, and belong outside the physical domain". Rather, emergentists typically conceive that, given the inclusivity of levels, emergent properties are also, but not exclusively (as they demand higher-levels of description and explanation), physical properties. Given that a higher level, say, the psychological one, is built *on* the lower biological and physico-chemical levels, it is not adequate to call a property described at that level 'non-physical'; rather, to be coherent with the inclusivity of levels, one should regard it as something which is, *at the same time*, a psychological property and a quite complex set of biological and physico-chemical properties and relations. It is in this sense that a mind is in the same place and time a physico-chemical, biological, and psychological system. The inclusivity of levels is such that a mind *remains* physical/chemical/biological, and is *also* a psychological system, when neural structures and processes are so arranged that they show the qualities usually identified as mental ones.

This leads us to what might be labeled *pragmatic pluralism* regarding different approaches to the human mind. For some particular purposes, especially explanatory ones, it may be useful to stick to a physical or biological (or, more generally, natural-scientific) perspective in our attempt to make our mentality intelligible. Adopting such a perspective

does not make the mind any less mental or psychological, insofar as other perspectives are equally legitimate. If we are not primarily interested in scientific explanations but attempt in broader terms to understand human life in its normatively structured (individual and social) surroundings, we should, instead of any reductive scientific accounts, stay on the level of folk psychology or, perhaps, of what John McDowell ([1994](1996)) calls our 'second nature', i.e., an irreducibly normative 'space of reasons' that is not anything non-natural but cannot be reduced to nature construed as a realm of natural laws (see Pihlström (1999b), (2002)).[12] Such different pictures of the mind have their own

[12] McDowell's relation to Davidson is complicated, to say the least. On the one hand, they seem to share the (basically Kantian) idea that in some sense the one and the same world can be viewed under the aspect of causality or alternatively under the aspect of normativity, or reason. Thus, in a sense McDowell could be seen as subscribing to Davidson's conception of the anomalism of the mental; yet, on the other hand, McDowell apparently rejects the idea – which Rorty considers one of the most important points in Davidson – that "reasons can be causes", i.e., that "the ordinary notion of cause which enters into scientific or commonsense accounts of non-psychological affairs is essential also to the understanding of what it is to act with a reason, to have a certain intention in acting, to be an agent, to act counter to one's own best judgement, or to act freely" (Davidson 1980, p. xv). More precisely, however, we might say that we are not, simply by emphasizing McDowell's Sellarsian distinction between the space of reasons and the realm of natural law, committed to totally denying the "reasons as causes" idea; rather, we are committed to denying the stronger reductive idea that rational, intentional or normative notions can be fully accounted for in terms of natural (causal) laws – a denial which, again, comes close to Davidson's anomalism. Accordingly, our references to McDowell's and others' "non-causalist" alternative in the DC debate need not be strongly anti-Davidsonian. McDowell's criticisms of Davidson's views in his ([1994]1996) are focused on Davidson's physicalist notion that all relations between beliefs and the world are causal: what McDowell questions, in particular, is the view that mere causal relations could normatively justify beliefs as well as the resulting Davidsonian

criteria of adequacy. One's position is dangerously reductionist only if one claims absolute priority to some specific perspective (typically the natural-scientific one). More 'humanistic' approaches should, of course, admit the legitimacy of scientific investigation of the mind, e.g., of the neural bases of mental operations, reminding scientists that the mind remains psychological (and also intersubjective in the sense of being normatively rooted in the cultural environment in which a human *person* lives and acts) even when its capacities are neurally or physiologically explained. Thus, no one approach essentially defines the mind; for an anti-reductionist pragmatist, all these different perspectives can happily coexist. The inclusivity of levels should be interpreted in this pluralistic manner.

Such a pragmatic pluralist view about the different approaches to mind and thought is compatible with Davidson's ([1997](2001), p. 127) argument that, even though everything in the universe can in principle be described in the language of physics, a physical description of the emergence of thought would fail as an explanation as we do not have, and, in his view, cannot expect to find, a way of mapping events described in the physical vocabulary onto events described in the mental vocabulary. For different levels of complexity, different levels of description and explanation will be required for a pragmatically-useful account. After all, emergent domains such as those involved in mentality, normativity, and rationality are regarded, from an ontologically physicalist standpoint, as physical systems, but their structure and the properties they instantiate demand, from a non-reductive vantage point, higher-levels of description and explanation. An ontological physicalist must be prepared, as Rorty ([1987](1991), p. 114) writes, to say that every event can be described in micro-structural terms, but this ontological thesis about the constitution of things should not be conflated with an

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position that justification is a matter of coherence among beliefs rather than a relation to the states of affairs that beliefs are about.

epistemological thesis about how our knowledge about things should be stated. As non-reductive physicalists, we can combine the ontological claim that all entities in the world, including molecules, organisms, mind, humans, etc., are made from the very same materials, and the epistemological and methodological claims that different modes of explanation and different scientific strategies should be used to account for phenomena at different levels of complexity. And we can do so without committing ourselves to arguably feeble and certainly controversial ontological views such as property dualism.

We can also argue, on the basis of pragmatic pluralism, for the idea that we should use several different notions of causation to account for all the modes of causation we appear to need in our (scientific and commonsensical) world-view. No monistic reduction of the notion of causation to a single metaphysically privileged mode is acceptable for a pragmatist thinker. For some purposes it may be better to employ the standard physicalist notion of effective causation; for some others one may adopt an 'Aristotelian' variant; for still others one might prefer a non-causal account. This pluralism liberates us from the dilemma to which Kim has led emergence theorists and other non-reductive physicalists.

Kim understands DC as an instance of ordinary *efficient causation*, and this in part explains why he argues that, as long as we are committed to irreducible DC, we should accept a violation of the physical causal closure (El-Hani & Emmeche 2000). We believe that Kim's arguments are essentially correct, if one claims that DC occurs independently of the activity of the microproperties *and* can be understood as an instance of efficient causality. In this sense, either DC will be excluded by the efficient causal powers of a system's microstructure or it will breach the physical causal closure. Emmeche and coworkers (2000) suggest that an Aristotelian understanding of causality may help us grasp the nature of the causal influence of the whole over its parts. An emergentist framework would demand a revaluation of classical causal notions,

resulting in a sort of neo-Aristotelian approach. They identify three versions of DC, based on different interpretations of the causal modes at stake (strong, medium and weak DC). In the medium version, DC is understood as a kind of formal causality. As the set of possible relations among the components is always *constrained* when they become part of a higher-level system, the *modification* suffered by a complex system's parts can be understood as a *constraint implied by being part of a pattern* (Emmeche *et al.* 2000; El-Hani & Pereira 2000; El-Hani & Emmeche 2000; El-Hani & Videira 2001; El-Hani 2002).[13] A specific set of properties emerges in a given system *for the simple fact that it is that kind of system, constrained to that particular region of a state space.* Emergence can be explained by the fact that a given system always instantiates a particular subset of its possible states, and, thus, a number of properties which are not found in the parts themselves or in other regions of the state space, where different modes of organization are instantiated.

Another possibility to face Kim's dilemma would be to maintain the natural-scientific understanding of causation as efficient causation and argue that such a causal vocabulary is simply inappropriate for an adequate account of human mentality and agency from the point of view of what McDowell ([1994](1996)) calls our second nature – though this suggestion, while bearing some resemblance to Davidson's (1980) idea of the anomalism of the mental, also brings us quite close to a rather anti-Davidsonian strict separation between reasons and causes. Faced by the DC dilemma, one may thus challenge the basic causal picture of the mind-body relation presupposed by Kim (and others). If we take the idea of emergence seriously in the realm of human mentality and rationality, we may argue not that these 'higher levels' can be causally efficacious but that human life cannot be thoroughly conceptualized in terms of causal concepts, which are primarily appropriate to the lower level(s) – that is, without taking into account the levels that cannot be included in the

[13] For details, see the original papers cited in this paragraph.

causal system of the natural world.[14] These higher, emergent, domains would accommodate human beings' *rational* or *normative* relations to each other and to the rest of the world. Together with Davidson and Rorty, we may (even if we argue in this manner) admit, however, that it is precisely the *descriptions* of these relations – the 'vocabularies' we need in accounting for the normative aspects of our lives – that are irreducible to causal, physical descriptions or vocabularies. It might still be the case that in some sense, ontologically, the vocabularies are about one and the same world. But this is an uneasy position. At the moment we say that the world itself is ultimately physical, although it can be described by means of several different vocabularies, we make, according to the pragmatic pluralist emphasizing the 'non-causalist' alternative to DC, an unjustified leap to a view ultimately indistinguishable from metaphysical realism.

This seems to be one of the reasons why pragmatists such as Putnam and McDowell have rejected Davidson's and Rorty's approach in the philosophy of mind and language. In brief, reductive physicalists relying on metaphysical realism have not told us how it is possible to reductively 'naturalize' normativity.[15] Philosophers like Davidson and Rorty, again, have resisted metaphysical realism while relying on a sharp distinction between the (physical) world that is there anyway and our descriptions of it, or the equally legitimate vocabularies of physics and intentional, reasoned action that can both be applied to the one and the same world (which, to say it again, is ultimately just physical). According to Putnam ((1990), (1994), (1999)), for instance, this is little more than

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[14] Even if we argue in this manner, we should be careful to avoid supernaturalist assumptions in our conception of the hierarchy of levels.

[15] See the discussion of this issue, with references to relevant literature, in Pihlström (1996, 1998, 2003). It is a complicated matter how we should define the normativity that is ineliminable in our epistemic and conceptual practices: for a critical discussion of the allegedly inevitable sociality of such normativity, see Engel (2002).

metaphysical realism and reductive physicalism in disguise. To adopt the non-causalist approach would in a sense be to give up, partly, the physicalistic principles introduced above (however non-reductive they are designed to be). Yet, in an important sense, philosophers like Putnam and McDowell would go on to argue, nothing would be lost, except scientistic prejudices not needed in true naturalism.

This suggestion cannot be evaluated here in any detail (cf. Pihlström 2002). It is not put forward as a view to be accepted but as an alternative perspective partly resembling Davidson's project but partly crucially different from it. It is a thesis about the inadequacy of viewing human life from an exclusive causal-physicalist perspective, a perspective not sufficiently problematized either by emergentists or their critics. While a causal (e.g., neurobiological) vocabulary is probably necessary in accounting for the complexities of human life, it is by no means sufficient for understanding the normative aspects naturally belonging to that life. Instead of attacking any particular field of scientific research, we wish to locate a philosophical issue concerning the perspectives from which we should approach reality. This introduces an epistemic and pragmatic element into our emergence discussion.

Furthermore, if we take Kantian ideas seriously, we may wonder whether the notion of causation should not be relativized to the human mind as a category of structuring the world into an intelligible shape. Putnam (1990) has argued against reductively physicalist construals of causation, insisting that causation is an interest- or purpose-relative concept whose application depends upon the context of explanation and description in which it is used. *If* this is an option for a non-reductive naturalist or emergentist, then there will be room for doubts about the strength of Kim's dilemma as an argument against emergentism. Yet, far from denying the importance of the DC problem for *a* (physicalistically-oriented) notion of emergence, it should be argued merely that some areas of the emergence discussion, most intimately related to human ontology, need not be troubled by this problem, if we are willing to

embrace a pragmatic pluralism regarding different pragmatically-workable notions of emergence. The non-causalist alternative can be taken seriously only if weaker notions of emergence, for which DC certainly is a major issue, are allowed their own area of relevance.

5 THE REALITY OF EMERGENT PROPERTIES

Dennett's arguments in his "Real Patterns" can provide us with a starting-point to discuss the reality of emergent properties. Dennett ((1991), p. 27) challenges the dichotomy between realism and eliminativism as regards the status of beliefs by exploring the feature that beliefs are abstract objects. He argues that the reality of abstract objects can be discussed along 'metaphysical' or 'scientific' avenues. The former concerns the reality of those objects in general, while the latter considers their scientific utility. Dennett ((1991), p. 30) chooses the scientific path, considering that what is generally at stake is not the ultimate metaphysical status of beliefs, but whether beliefs and other mental items are *as real as* electrons or centers of gravity. He claims that, say, centers of gravity are real because they are *good* abstract objects, as they are scientifically useful.[16]

To make the idea of 'utility' at stake more precise, Dennett develops an argument about the reasons why patterns can be regarded to be 'real'. He takes Chaitin's (1975) definition of 'mathematical randomness' as a basis for grasping the idea of a real pattern: A series (of dots, numbers, etc.) is random iff the information required to describe it is *incompressible*, i.e., nothing shorter than a verbatim bit map will preserve it (Dennett (1991), p. 32). We can deduce, then, that a series is *not* random, showing

[16] Here, we should remember that the pragmatic realism favored by Putnam, for example, is much less scientifically-oriented than Dennett's. It would be a mistake to construe these philosophers' pragmatic realisms as simply identical.

a *real pattern*, iff there is a more efficient way of describing it than the bit map (Dennett (1991), p. 34).

Dennett's discussion of Conway's Game of Life helps us deal with the problem of discerning levels in a set of data. In that game, one finds a 'physical' level, where individual cells and their patterns of change according to some simple rules are described, and a higher level, where we find a series of distinct configurations:

> ... there are the eaters, the puffer trains, and space rakes, and a host of other aptly named denizens of the Life world that emerge in the ontology of a new level. [...]. Note that there has been a distinct ontological shift as we move between levels; whereas at the physical level there is no motion, and the only individuals, cells, are defined by their fixed spatial location, at this design level we have the motion of persisting objects [...] (Dennett (1991), p. 39).

Those two levels are *different descriptions of the same set of data*, albeit an ontological shift can be perceived when we move from one descriptive level to another. When we ascend to the higher level in the Life world, we can predict the behavior of configurations without computing the physical level. Those higher-level configurations can be regarded as *real patterns*: they are more efficient than the bit map as concerns the transmission of information in the Life world.

Here we can refer to Davidson's arguments about physical and mental descriptions. He explicitly admits that everything in the universe can in principle be described in the language of physics, but makes a statement about the lack of pragmatic efficacy of such a physical description to account for the emergence of the mental (Davidson [1997](2001), p. 127). Notwithstanding the possibility of describing the very same entity or event in physical and mental terms, he claims a mental description should be preferred, given its greater efficacy in dealing with the problems at stake when we try to understand the emergence of the mental.

It is also enlightening to consider some arguments *contra* Paul Churchland's eliminativism put forward by Dennett (1991). On the grounds of Dennett's ideas about what is a real pattern, the reality of beliefs can be established as follows: a belief is a real pattern to the extent that it is a description of a brain state which is more efficient for some purpose than the description of the locations, connections, and activation states of each neuron involved in that brain state (In Dennett's words, the neurophysiological 'bit map'). Generally speaking, an emergent property can be regarded as real to the extent that it provides a more efficient description (for some purpose) of the micro-structure by which it is synchronically determined. An eliminative materialist may claim that neuroscience will eventually discover patterns that are so clearly superior to the patterns provided by the mentalist or intentional language of folk psychology that everyone will readily abandon the latter. Dennett argues, however, that even though the intentional language were entirely translated into neurobiological terms, it could be the case that the patterns described from the intentional stance were still more useful and efficient for a number of purposes than the neurobiological patterns. As Dennett writes:

> ... it is not enough for Churchland to suppose that in principle, neuroscientific levels of description will explain more of the variance, predict more of the 'noise' that bedevils higher levels. This is of course bound to be true in the limit – if we descend all the way to the neurophysiological 'bit map'. But [...] the trade-off between ease of use and immunity from error for such a cumbersome system may make it profoundly unattractive. If the 'pattern' is scarcely an improvement over the bit map, talk of eliminative materialism will fall on deaf ears [...]. A truly general-purpose, robust system of pattern-description more valuable than the intentional stance is not an impossibility, but anyone who wants to bet on it might care to talk to me about the odds they'll take (Dennett (1991), pp. 50-51).

Davidson's claim that a physical description of the emergence of thought is possible but will fail as an explanation of this process is close

to an understanding of non-reductive physicalism not in terms of a metaphysically-realist commitment to property dualism, but, rather, in terms of a more epistemologized way of supporting irreducibility. Given that the pragmatic efficacy of mentalistic, intentional descriptions in view of explanatory, predictive, ethical purposes are well-defined, this will mean (employing one of Rorty's criteria to demonstrate that a language of X's is reduced to a language of Y's) that we should still talk of X's (say, beliefs, intentions, desires, etc.) although we can talk of Y's (say, neurons, activation states, neurotransmitters, etc.). On these grounds, one may argue for the irreducibility of a mentalistic language without having to maintain the idea that the items described in the mental vocabulary are something over and above their physical/biological bases.

Rorty also deals with the mentalistic language on the grounds of its pragmatic efficacy. He argues that it is rarely the case that we can show that if you can talk about Y's you do not need to talk about X's, or that any given description in terms of X's applies to all and only the things to which a given description in terms of Y's applies. It is not easy to show that "... a given language-game which has been played for some time is, in fact, dispensable. This is because any tool which has been used for some time is likely to continue to have a use" (Rorty [1987](1991), p. 115). He also argues that ontological simplification, a goal which most reductionists are usually looking for, is not likely to be achieved by some philosophical or scientific discovery, but, rather, by a loss of utility for some sort of language in human practices:

> ... X-talk [...] fades away, not because someone has made a philosophical or scientific discovery that there are no X's, but because nobody any longer has a use for this sort of talk. Ontological parsimony is not to be attained [...] by armchair 'linguistic analysis', but, if at all, in everyday practice (Rorty [1987](1991), p. 115).

Rorty's arguments to the effect that folk psychological talk can be maintained despite one's physicalistically-inclined premises come close to

Dennett's, notwithstanding the differences between their ideas in other respects:

> So to be a physicalist is, on this non-reductionist account, perfectly compatible with saying that we shall probably continue to talk about mental entities [...] forever. Such talk is not metaphorical, does not need to be bracketed, does not need to be made more precise or scientific, does not need philosophical clarification. Further, it would be wrong to suggest that talk about minds is necessary for convenience but is not to be taken as the 'truth about the way the world is'. To say that we shall always be talking about beliefs and desires is to say that folk psychology will probably remain the best way of predicting what our friends and acquaintances will do next. That is all that one could possibly mean by saying 'There really are mental entities'. Similarly, the best way to predict the behavior of tables will probably remain to talk about them *qua* tables rather than as collections of particles or as fuzzy replicas of the Platonic archetypal table (Rorty [1987](1991), pp. 115-116).[17]

It is on these pragmatic grounds that Rorty intends to maintain non-reductive physicalism as a stable position, without having to be committed to such ontological claims as property dualism. The same can be said, we think, of Dennett's and Davidson's positions. Although we need not be committed to all the details of these philosophers' views (especially not to Rorty's controversial interpretations of what pragmatism actually amounts to),[18] it is roughly in this sense that we argue for a pragmatist account of emergence as a significant contribution to the current emergence debate.

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[17] Here, we would like to enter some caveats regarding Rorty's claim that mentalistic talk does not need to be made more precise or scientific, and does not need philosophical clarification. Although we agree that it is not a matter of necessity that such an increase in precision or clarification be achieved, one should not neglect the possibility that scientific and philosophical efforts show that some notions held in folk psychology should be clarified, made more precise, corrected, or even eliminated.

[18] For Rorty's and Putnam's disagreements over the significance of the pragmatist tradition in philosophy, see Putnam (1990, 1994) and Pihlström (1996, 1998).

Kim ((1997), pp. 287-289) claims that mental 'properties' should be understood as second-order nonrigid property designators or descriptions that pick out first-order rigid physical properties, often disjunctively. Thus, they are second-order concepts, not properties. It is easy to see that this view assumes a strong metaphysical realism: genuine properties are to be carefully distinguished from concepts or descriptions that designate or identify them. Kim ((1999), p. 17) conceives of a kind of eliminative reduction in which an emergent property *E* is eliminated as a property and only the expression '*E*' or the concept *E* (which may play a practically indispensable role in our discourse, both ordinary and scientific) is retained. But can we easily distinguish between properties and concepts? To advocate such an easy distinction may be tantamount to assuming a pre-Kantian and pre-Wittgensteinian metaphysical stance that pragmatic realists ought to avoid (Pihlström 2002). It is hard to maintain a duality between properties and concepts in a philosophical position taking due account of the consequences of Kant's and Wittgenstein's ideas, which are among the lessons that pragmatists should have taken to heart.[19] Once we assume that the experienced, cognized world is always conceptualized, insofar as it is a world of human experience (scientific or otherwise), it becomes problematic to draw a sharp distinction between properties and concepts.

Kim presupposes a metaphysically realistic conception of reality, according to which there are absolutely independent metaphysically existing properties out there, and it is the task of our conceptualizations to pick up, or approximate, those real properties. On an alternative, more mildly realistic view, we can slice the world differently by employing

[19] *Pace* Rorty, pragmatism should not only take into account Wittgenstein's views of the practice-embeddedness of linguistic meaning but also work within the (broadly conceived) Kantian framework which views the (empirical) world as a human conceptual construction rather than anything "ready-made" (and through which, indeed, Wittgenstein's philosophy of language should also be interpreted). For more on this, see Pihlström (2003).

different conceptual schemes,[20] identifying different properties. There is no way to separate our conceptual contribution from the contribution of the world as it is in itself. This metaphysical distinction is impossible to draw, because we could never measure the adequacy of our conceptualizations against an independent, unconceptualized reality.

Dennett's mild realism suggests that a property E can be retained in our pictures of the world exactly if it plays an indispensable role in our discourse. It is not simply the case of arguing for the reality of emergent properties in *metaphysical* terms; rather, one can advocate the *scientific* (or otherwise) utility of emergence as a modeling/explanatory tool. Instead of simply worrying about "what emergent properties [...] can *do* – that is, how they are able to make their special contributions to the ongoing processes of the world" (Kim (1999), p. 22), we can ask what they can do in our theories and models about the world.

From a pragmatic realist standpoint, we are also entirely content with Kim's ((1999), p. 33) idea that we may salvage downward causation by giving it a conceptual interpretation. We can speak of DC when a cause is described in terms of higher-level concepts, in relation to the concepts in which its effect is represented. Kim argues that this conceptual approach may not save real DC, but it may be a good enough way of saving downward causal explanation, and, he adds, perhaps this is all we need or should care about. We agree that to save downward causal explanation is all we need, inasmuch as the notion of 'real' DC brings with it the very issue this paper puts into question.

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[20] Again, we must not forget that Davidson ([1974]1984) strongly opposes the very idea of a conceptual scheme, which he finds incoherent. Thus, we are, to say the least, expressing our pragmatic realism about emergence in an un-Davidsonian way, although we are at the same time employing his approach to the realism issue. We need not subscribe to Davidson's denial of conceptual schemes and conceptual relativity in order to find his discussions of the emergence of thought relevant to our concerns.

6 PRAGMATISM AND REALISM

The cognizable world (to which, if anywhere, the notion of emergence may be usefully applied) is always already conceptualized through our practices of predication and inquiry. The tradition of pragmatism has strongly emphasized the practice- and discourse-embeddedness of the real world and its properties. From this perspective, it is meaningless to speak about the reality of emergent properties absolutely independently of human theories and conceptualizations. Pragmatism may serve, thus, as a background philosophical framework supporting the kind of 'mildly realist' interpretation of the reality of emergents defended in the previous section. Emergent properties are not metaphysically real independently of our practices of inquiry but gain their ontological status from the practice-laden ontological commitments we make.

This is not to deny that emergence is, primarily, an ontological notion; rather, it is to say that ontology is not clearly separable from epistemology, because it concerns a humanly structured, conceptualized reality (cf. Pihlström 2002, 2003; El-Hani 2002). Any ontological commitments, whether to emergent or to non-emergent properties, must be assessed in terms of their pragmatic efficacy, which, in the scientific case, primarily means the need for such commitments in theory-formation and the empirical testing of theories, but can be interpreted more broadly in order to include various non-scientific pragmatic effects our commitments may conceivably have.

In seeking a pragmatic conception of ontological commitment, we might, instead of just following Davidson and Rorty, turn our attention somewhat more closely to Putnam's ((1990), (1994), (1999)) much discussed views on realism. Putnam argues that ontological commitments depend on the conceptual frameworks within which they are made, frameworks which in turn depend on the human purposes and

interests they serve. Such a defense of 'conceptual relativity' has for several years played an important role in Putnam's critique of metaphysical realism.[21] As Putnam ((1994), p. 302) puts it, no description of the world is the world's or Nature's own. All descriptions – all conceptualizations of properties – are human constructions, and insofar as the structure of the world itself is inseparable from those conceptualizations, the world and its properties are equally human constructions. We are not copying a language- and theory-independent world; factual and conventional aspects of our world-picture are inseparably interwoven (Putnam (1994), pp. 250-251). Moreover, certain ontological commitments may, for specific human purposes, be better than others (Putnam (1990), p. 103). Conceptual relativity does not imply an uncritical 'anything goes' relativism. The ontologically-committed conceptualizations of the world that we construct by means of engaging in scientific and non-scientific practices can be challenged and critically assessed from the point of view of another framework of commitments.

According to this pragmatist approach, not even basic ontological notions such as existence have one fixed metaphysically privileged meaning or use (see, e.g., Putnam (1990), pp. 96-97). Although this statement of pragmatic conceptual relativity is clearly anti-Davidsonian (given Davidson's denial of the coherence of the notion of a conceptual scheme), Putnam adopts a more Davidsonian tone of voice in arguing that our language and mind "*penetrate so deeply into what we call 'reality' that the very project of representing ourselves as being 'mappers' of something 'language independent' is fatally compromised from the very start*" (Putnam (1990), p. 28; emphasis in the original). What counts as 'objects' or as 'properties' is as much up to us as it is up to the world, partly depending on how we use these words in the language-games within which our ontological

[21] We may ignore the changes in Putnam's views that have taken place in the course of his engagement with the realism issue. For critical discussions, see Pihlström (1996: chapter 4, 1998: chapter 3).

structurings are created. It should be noted that this view is as much intended, by Putnam, as a critique of Davidson's attacks on conceptual relativity as of the kind of metaphysical realists who fail to appreciate the entanglement of the real world and human conceptuality. Putnam argues, *contra* Davidson, that there is a legitimate notion of conceptual relativity available to us, insofar as we emphasize the pragmatic use of, say, the notion of existence for different human purposes. This is, however, compatible with adopting what we have labeled Davidson's 'conceptual' approach to the ontology of emergents.[22]

Although Putnam does not discuss the reality of emergent properties in this connection, his suggestions can be applied, *mutatis mutandis*, to that problem. There is no pragmatic sense in asking whether emergent properties are real in some metaphysical sense independently of our pragmatic purposes and interests in the light of which we structure the world we investigate and live in. There is much more pragmatic sense in asking whether a particular ontological commitment to the reality (or unreality) of certain emergent properties (e.g., mental ones) serves certain particular purposes or not. Such contextualized pragmatic questions are the true core of ontological debates. Yet, for radical neo-pragmatists like Rorty, even such weak pragmatic ontological com-

[22] Neither Davidson's critique of the scheme vs. content distinction nor Putnam's reactions to his critique can be treated here. Cf., again, Pihlström (1996: chapter 4.5). We cannot here pay attention to the vast critical literature that has been produced on Putnam's critique of metaphysical realism since the late 1970s. Putnam's position does have its difficulties: as several critics have argued, his pragmatism may in the end become indistinguishable from idealism (does the human mind just create the world?) or from relativism (if there are many equally acceptable ontological frameworks, is there any rational way to exclude any particular framework?). These issues should be treated in connection with the emergence debate, but we cannot do this here. Let us just note that a number of philosophers have defended forms of realism much more robust than Putnam's: see, *e.g.*, Devitt ([1984]1991), Dreyfus & Spinosa (1999), Niiniluoto (1999), and more recently Haack (2002).

mitments are not acceptable – even though it is hard to see how Rorty's own non-reductive physicalism is in the end anything else than a (pragmatic) ontological picture of the world (cf. Pihlström (1998), chapter 7).

We may see Putnam's (as well as Rorty's) critique of metaphysical realism as a modification of the *pragmatic method* James ([1907](1975), chapter 2) inherited from his friend Charles Peirce, the founder of pragmatism. In the Jamesian formulation, this method encourages us to look and see what kind of practical consequences might result from (our believing in) the truth of some particular metaphysical view – e.g., the reality of emergent properties such as mental ones – in comparison to our rejecting that belief. In Putnamean terms, it is on the basis of pragmatic criteria that one should choose whether to slice up the world so that emergent properties turn out to be real or so that they turn out to be unreal. As there is no sense, from a pragmatic standpoint, in claiming that the world in itself contains or fails to contain emergent properties, we should keep our ontology of emergence epistemologized in the sense of being tied to human practices of inquiry. The scientific approach to emergence with which this paper has been concerned is an example of this strategy, which may be extended to non-scientific areas of pragmatic evaluation as well.

Pragmatic realism is an inherently pluralistic and anti-reductionistic position. For some purposes it might be better to adopt an ontological scheme in which there are emergent properties; for some other purposes it might be better to adopt another scheme in which emergents do not exist. Different notions of causation may be acceptable in different schemes. One may define a variety of notions of emergence. The exciting issues are pragmatic: When confronting a definition, we should pragmatically ask what kind of philosophical work can be done with it, and how it helps us in understanding, reformulating and (possibly) solving philosophical dilemmas such as the mind-body problem. It is *partly* a terminological issue what kind of properties or structures are called 'emergent'. But terminological or conceptual issues

are not unimportant in philosophy, as philosophical problems and views are constituted by the traditions within which they are spoken about.

Hence, pragmatism might help us in adopting a relaxed, pluralistic and context-sensitive attitude to the notion of emergence. Perhaps a notion of emergence based on non-reductive physicalism *à la* Stephan (1999) and others who try to encounter Kim's criticisms does some interesting, pragmatically valuable work in certain specific fields, e.g., in the philosophy of biology – possibly in accounting for the relation between biological and physico-chemical properties. But when we move on to other ontological regions, particularly the mental and cultural (normative) realms, we do not seem to have a sufficiently clear idea of how the program of non-reductive physicalism could be carried through (with or without emergence). A stronger notion of emergence might be needed, then, for an adequate account of our self-image as consciously acting, free, responsible agents – for an account of ourselves as human beings, irreducible to physics or even biology. We might have use for at least two different concepts of emergence: a relatively weak one to be employed within the factual realm in which humans are undeniably parts of physical and biological nature, and a stronger one to account for the qualitative difference between this factual level of investigation and the normative one that is our second nature (employing, once more, McDowell's apt term). The applicability of such concepts of emergence would of course have to be assessed in more detail.

It is important to notice that this contextualization of emergence is *not* a return to the epistemic, theory-relative, non-ontological definitions proposed by logical empiricists and their followers (Nagel (1961)). It is the very *ontology* of our world-picture that is epistemologized and hence contextualized in a pragmatist framework. Sharp dichotomies between ontological and epistemological matters are not appealing to pragmatists, even though it may be important, for the sake of clarity, to distinguish in some cases between ontological and epistemological arguments.

A deep problem will, however, inevitably disturb anyone tempted by the above-described pragmatist manner of thinking. *How* dependent, exactly, is the structure of the world, or the properties things have, on human conceptualization, language-use, and practices? Is it possible to say, for instance, that in some sense any 'structure' the world possesses is a human construction instead of being the world's own but that even so there is a physical world out there that we did not make in any literal sense? Can we draw such a distinction between the world itself (amounting to something like Kant's *Ding an sich*) and its structures, and claim that only the latter depend on our conceptualizing abilities and practical engagement? In order to retain even a mild realism within our pragmatism, we should claim that we do not, after all, just make up the world. Davidson ([1997](2001), p. 123), with whom we began our inquiry, thinks it is "needless to say" that the universe is "indifferent to our concerns". There is at least *something* out there we do not make. On a general metaphysical level this issue will remain undecided. What is relevant to our concerns is simply the realism issue as applied to emergent properties. In this case, it is easier to maintain the idea that emergents are parts of ontological structurings of the world based upon human interests and purposes. In this sense, emergent properties depend on human ontological classifications, although we should, in the spirit of reasonable naturalism, say that they have (diachronically) 'emerged' out of the non-human world. It is compatible with this to say that they also 'emerge' out of human practices of making ontological commitments within various areas of life, including science.

7. CONCLUSION

We took Davidson's arguments about the emergence of thought as a starting-point for discussing the general issue of realism, as a neglected background of emergentism. Nonetheless, our treatment of emergence and realism is also indebted to other thinkers often identified

as pragmatist philosophers, such as Dennett, Rorty, and Putnam. If one adopts *any form of pragmatism*, the purely ontological, metaphysically realist treatment of emergence typical of most contemporary approaches will have to be given up. Insofar as the reality of emergent properties is rooted in our pragmatic ontological commitments, it is also rooted in our epistemic circumstances. The ontology of emergents, like any ontological issue, is, then, irreducibly epistemologized, simply because it is embedded in our ontologically relevant practices. We can conclude, thus, that emergence theorists should pay more attention to the realism issue, and consider the pragmatist alternative to metaphysical realism, which might lead to a more nuanced treatment of the DC problem, as well as of other problems debated in recent literature. On the other hand, it is not entirely clear what exactly the 'pragmatist alternative' we are recommending *is*, because neopragmatists like Putnam and Rorty disagree over the correct meaning of 'pragmatism' (and, among other things, over their views on the significance of Davidson's arguments for the development of pragmatism). Further critical comparisons between pragmatism and realism (about emergents and more generally) are obviously needed.[23]

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[23] Both authors are responsible for the entire paper, although sections 2, 3, and 5 were primarily written by Charbel Niño El-Hani and section 6 primarily by Sami Pihlström; sections 1, 4, and 7 were written by both.

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