

Systems Models Are Not Representations

SYSTEMS MODELS ARE NEITHER REPRESENTATIONS OF SYSTEMS “OUT-THERE” IN REALITY, NOR MENTAL CONSTRUCTIONS

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ABSTRACT

The question “what is a system?” has arguably marked a division between different strands within the systems thinking movement. ¿Are systems things in the world that can, for instance, be represented by means of systemic models? ¿Or are they mental constructions, the manifestation of our incapacity to take everything into account, that nevertheless allow us to make sense of our experience and of the world? Each of these options is based on a version of the notion that ideas somehow represent reality, even if only according to a worldview or scheme. But this assumption has brought some conceptual problems in both cases, which can affect systems practice. Using arguments in the philosophy of language, it can be shown that representationalism—or the idea that language represents reality—provides a misleading picture of language. Based on this discussion, a characterisation can be constructed of what we do in language when we talk about systems or use systems ideas, that can be labelled holistic, non-representational, linguistic, and local.

Keywords: systems, representations, models, holism, language.

INTRODUCTION

The emergence of soft or interpretive systems thinking may have been marked by the questioning of a number of basic assumptions made by proponents of the various existing systems approaches—labelled *hard* at the time. One such basic assumption concerns the basic question “what is a system?”, and can be formulated as *Reality is constituted by systems*, or, in Jackson’s words (2000, p.203), “that the real-world is systemic”. Let me now reformulate that assumption, this time emphasising the nature of systems: *Systems are things which exist “out there” in reality*. Soft systems thinkers, instead, will argue that the objectivist ontology and epistemology underlying hard systems thinking is untenable, and should be replaced with a more subjectivist one. The alternative to the hard systems thinking assumption, as provided by soft systems thinkers, can be thus postulated: “Systems are [regarded] as having a subjective existence as the product of

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individual consciousness” (Jackson, 2000, p.283). Or, rephrasing it: *Systems are mental constructions that help make sense of and inquire into reality.*

A number of things might be said about this distinction. For example, Checkland has argued that in hard systems thinking models attempt to represent the world, whereas in soft systems thinking models are regarded as epistemological devices designed to help formulate relevant questions, in a creative way, about reality (see Checkland, 1995). Additionally, if models are mental constructions, then it is said that no model can be more valid or accurate than another, only more or less useful (Beer, 1992). Therefore, experts in modelling would not be able to claim any primacy of their views on grounds of a better validity, and stakeholders in a situation should then be able to input their views into the discussion or inquiry. Models here would be useful at the most to “clarify the implications of worldviews” (Jackson, 2000, p.283).

“Systems as things ‘out-there’ in reality” has proved to be problematic in various ways. Firstly, in social situations ethical issues are not part of the “out-there”, and are therefore not considered part of the study. But there are normative ethical issues in the justification of the validity of a system design (see Ulrich, 1983). If the systems analyst takes the definition of the system to be studied as provided by the person hiring her/him, then this may imply that probably only those concerns and interests represented in that system definition—those of the person hiring the study—will be addressed in the intervention, and that therefore ethical issues regarding how the functioning of the system may affect other people, will never surface. Secondly, in very complex situations it may be problematic to take a system definition as given, because the variables and elements relevant for its operation, as assumed in that system definition, may not be sufficient to explain and predict the behaviour of the important variables. That is, side effects and unexpected influences from other elements not considered may affect the outcomes of the operation of the system. Among these influences are those of stakeholders who may react to the implementation of the system activities, and hence affect its outcomes (see for instance Checkland, 1981).

Let me now point at a difficulty I see with “systems as mental constructions”. There are actually occasions in which a certain number of elements seem to exhibit some relations which bind them together and make it useful to refer to them as a whole, and which perhaps exhibit some closure. A number of theoretical concepts can actually be developed that describe those relations. Let us think, for instance, of Maturana’s and Varela’s central notion of *autopoiesis* to explain living systems (see Varela et al., 1974). Despite their attack on objectivity and of their presumed adoption of a non-objectivist epistemology (Maturana and Varela, 1980 and 1992), their own account of systems, which is advanced in the field of biology, is one which does not take them as mental constructions of an observer. For instance, their theorisation on life describes systems from an arguably objective viewpoint, and they even provide a list of six points that can help correctly identify whether a system is autopoietic or not (Varela et al., 1974). The point is, elements seem to be better grouped together in some ways as compared to

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others, and those decisions can be justified¹. The grouping, and therefore the drawing of a system boundary encircling those elements, does *not* seem to be arbitrary or subjective. How can “systems as mental constructions” account for the fact that it can be argued that in some cases systems are better defined in some ways—and therefore that those definitions are *not* arbitrary or subjective? I think it cannot.

One might argue that this is a result of the incommensurability that exists between these two instances of systems thinking, and resign to the fact that one has to learn to live with it. I think, however, that a less demanding solution is possible. In fact, even though it is beyond the scope of this paper to spell out that solution in full detail, I will present a few basic characteristics that it should have. For this purpose I will firstly argue in this paper that both kinds of approaches make the same assumption that language *represents*, in one way or another, reality. Then, following the work of Rorty and Davidson in philosophy of language, I will explain what it could be to regard language as non-representational. And lastly, I will attempt to explain the significance I think this has for a new understanding of systems.

REPRESENTATIONS

In fact, I think both kinds of criticism mentioned above are valid, and therefore both approaches have a point. However, as I will argue, the failure of each of these kinds of approaches in accounting for the cases in which the other seems to be strong is, curiously enough, due to the fact that they *both* adopt what has been called a *representationalist* position (see Rorty, 1996). The idea of representation applies to the relation between elements in language on the one hand, and reality on the other. It suggests that our words and/or our sentences represent, correspond to, refer to, name, or whatever one wants to call it, elements in reality. Normally it is said that these elements in reality may be *objects*, as what is represented by words and particularly by nouns; and *facts* or *states of affairs*, as what is represented by sentences. Although, as we shall see later, there are other possibilities.

In the case of realist forms of representationalism, truth would be defined as the accurate correspondence between a sentence and a fact, as well as between an object and a word, and there would be a unique way of establishing that relation. This is the traditional correspondence theory of truth.

In anti-realist forms of representationalism, like what I take to be interpretive systems approaches, the situation is a little more complex. To explain it, let me say first that they rely on a distinction between scheme and content (see my other paper in this volume, Mejía, 2002). That distinction would be one between reality, or experience, on the one hand, and worldviews, conceptual frameworks, or in general, schemes, with which one would interpret that reality or experience. Schemes, it is said, would be lenses through

¹ In the same way in which any other decision or assertion can be justified. In practice, they become justifiable at the very moment of there being someone trying to justify them. Let us notice that I'm not recurring to any epistemological notion of justification *in principle*, which I think cannot be had.

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which one would see the world around. In this case there would be many different alternative ways of representing reality or experience, just as there would be many different possible schemes. The choice of scheme would be, however, arbitrary, and perhaps subjective.

MODELS AND THE REALITY-WORD RELATION

If language represents reality, then the fact that language individuates—or distinguishes—different words and sentences implies that reality on its own must be as well divided into different kinds of things. Otherwise, the idea of representation would be meaningless, for a categorising language trying to represent a single unity of reality would mean that language somehow *swings free* from that reality. It is convenient here to distinguish between two different kinds of linguistic elements: words [and non-sentential expressions], and sentences.

In the case of words, the candidates for referents are objects. It seems uncontroversial that many words do actually represent *real* objects. The word “computer” represents all the computers in the world including the one in front of me, and “Arnoldo” represents a nice dog I know. But there are other words which do not represent objects in the world: e.g., “Curupira”, a mythological demon who is said to live in the Amazon jungle and have feet pointing backwards. And there are, of course, many more which are much more difficult to classify as either representing real objects or not: Let us think of “democracy”, “whiteness”, and “elegance”. Additionally, in some uses, certain words do not represent objects themselves, but only have a certain influence in the expressions they are part of: for example Davidson’s “father” in “Annette’s father” (Davidson, 1967). Now, the meaningfulness and usefulness of these words is not diminished by the fact that they do not have a referent, or that it is unclear what that referent is. One can actually produce true sentences with these words, like “Curupira is said to live in the Amazon jungle”. The point is that the fact that non-representational words can still be a meaningful part of the apparatus of language, without any need for reference. All this suggests that reference does not constitute the central nature of words in language.

Do words represent something other than objects? One might think that words represent a reality that in itself cannot be conceptualised or expressed in language, for that would be to have already used words. According to this idea, this reality would be a multiplicity of things, which in turn cause in us the multiplicity of our experience. One would then organise this multiplicity by means of concepts—and words, once one takes the linguistic turn—. Our words would in this picture represent those bits in the multiplicity of reality that they organise. There is, however, a problem with making sense of those bits of reality that are represented. How do we know that they exist, for example? How do we know that they are a multiplicity, if we cannot identify or differentiate them? About those inexpressible bits that cause in us preconceptual sensations or experience, Rorty has remarked the following:

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It is not an evident pre-analytic fact that such a manifold exists, how can we use the claim that sensibility presents us with a manifold as a premise? How, in other words, do we know that a manifold which cannot be represented as a manifold *is* a manifold? More generally, if we are going to argue that we can only be conscious of synthesized intuitions, how do we get information about intuitions prior to synthesis? How, for instance, do we know that there is more than one of them? (Rorty, 1979, p.154)

If the manifold cannot be made sense of because of its unknowable nature, to everyone², then the reality that causes that manifold cannot be made sense of, either.

The fact that the representational character of some words does not play a fundamental role, it is perhaps important to turn our attention now to sentences. However, I will first say something about the linguistic character of [systems] models.

Models are, or can be, objects in their own right; however, their possibly representational character would be derived from their linguistic properties. Do they behave like words, or like sentences? There is perhaps no answer to this question. However, if they are words, then their usefulness can only be derived out of the sentences expressing propositions that describe a model as an object. That is, it is what I can get to know about some thing which makes models of that thing useful. But what I can get to know is, for instance, *that* if A occurs then B will probably occur, *that* religion may numb people's autonomy, etc. It is actually sentences expressing propositions that I can get to know with a model. Alternatively, I could say that models are actually constituted by sentences, sometimes with the added possibility that new sentences can be further derived from them.

If models are sentences, in at least this basic sense, they are not epistemologically different from everyday talk. But what is the relation between models and reality, then? If there is a unique correct representation of reality, one of the objectives of modelling would be to represent reality as accurately as possible. This is, of course, an oversimplification, given that there are other criteria that may also apply. But, *ceteris paribus*, a model that represents reality more accurately is better than another which does so less accurately. If, on the contrary, many models are valid and represent reality in different ways at the same time, then there is no point in trying to construct the one accurate model. In this case what is possible and useful, it is said, is to construct a number of models which do not represent reality, but which instead are only mental constructions that can help us become aware of a larger number of aspects of reality. Models would be used as *epistemological devices* that enable us to formulate relevant questions about reality (Checkland, 1995). This is, then, where the distinction appears between representations of things "out-there" in reality on the one hand, and mental constructions on the other.

² It is this unknowability to everyone which makes this case different from, for example, that of invisible psychological structures not knowable by some individual, but known by the psychiatrist.

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THE REALITY-SENTENCE RELATION OF REPRESENTATIONALISM

Now, when we turn to sentences, the representation relation may take different forms depending on the kind of representationalism. In realist forms, sentences presumably represent *facts*, at least in the case of true sentences³. Actually, in this view a fact is what would make a true sentence true. In an anti-realist representationalism, there are again two possibilities. In one case different *bits* of reality would cause sensations—or the *manifold* of experience—which are then organised by means of concepts and judgements that belong to a scheme, thus producing sentences⁴. Here it is particular *bits* of reality which are represented by those corresponding sentences. As those sensations or the manifold of experience are pre-conceptual, they would be inexpressible in language. Checkland, for example, has claimed that “the world outside ourselves causes only the matter of sensation. Our brains order this matter and supply the concepts by means of which we understand experience” (1981, p.215). This remark seems to indicate that he follows this line of thought.

But there is a second possibility, according to which there would be some basic observational sentences that represent basic simple facts in reality. The rest of our sentences would be a construction made upon the observational ones. The reality thus represented is actually those facts just mentioned. Curiously enough, Checkland’s work also seems to suggest this path, as evidenced by the fact that his methodology includes stages in which reality is described, and, more significantly, in which *reality is compared with the systemic models produced* (see Checkland, 1981; and Checkland and Scholes, 1990). In Fuenmayor’s Interpretive Systemology there is a similar step of reality-systemic models comparison (Fuenmayor, 1991). The point is that here the comparison can only take place if somehow some observational sentences of the kind described above are available, which are, of course, not inexpressible.

About the first case, there is the same problem mentioned above concerning the possibility that we could have access to that pre-conceptual world of the uninterpreted experience.

Let us consider now the case in which those bits of reality are facts which are expressible somehow. This would be the case of all meaningful sentences in realist representationalism, and observational sentences in some cases of anti-realist representationalism. But how is reality divided into facts? Actually, there is an argument that has been attributed to Frege as well as Gödel, that shows that facts cannot be individuated according to the different meanings of the sentences that supposedly represent them. The argument indeed concludes that if true sentences represent facts, then they all represent only one and the same fact, which could be called *Truth*. Similarly all false sentences will refer to one and the same thing, which could be called *Falsehood* (see Church, 1956; Quine, 1953 and 1960; Davidson, 1967, 1969, and 1990; Neale, 1995). This argument, called the *slingshot* argument, would undermine the very idea of *facts*, for if there are only two facts—one true sentences correspond to and another false

³ False sentences would not represent anything.

⁴ Here, it is the scheme which would be arbitrary and in some versions subjective.

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sentences correspond to—then their postulation would be rendered useless, for it would add nothing to the old ideas of being true and being false. But then there is nothing

Neale has argued that, although it is not very clear that Frege did actually produce the argument, the one attributed to him and used by Church, Quine and Davidson makes somehow more assumptions than one constructed independently by Gödel (see Neale, 1995). The argument is very complex, though; here I will simply try to illustrate Neale's description of Gödel's slingshot argument by means of an example.

Suppose the following three sentences are true:

- (1) Alejandro Toledo won the 2001 presidential elections in Peru
- (2) Alejandro Toledo is different from the composer of *Bolero*
- (3) The composer of *Bolero* was French

Let us call the facts referred to by these sentences f_1 , f_2 , and f_3 , respectively. f_1 would also be the fact referred to by

- (4) Alejandro Toledo is the only thing which is the same as Alejandro Toledo, and which won the 2001 presidential elections in Peru

because it would be the same fact that would make true (1) and (4). Similarly f_2 would also be referred to by (5):

- (5) Alejandro Toledo is the only thing which is the same as Alejandro Toledo, and which is different from the composer of *Bolero*

The predicates of (4) and (5) are definite descriptions of unique things; and for these two descriptions that unique thing is the same; namely the person called Alejandro Toledo. If these descriptions are treated as complex singular terms referring to things (things like Alejandro Toledo), then changing a singular term contained in it for another with the same referent will not change the referent of the containing complex singular term⁵. Given this, then (4) and (5) refer to the same fact. Therefore f_1 is the same as f_2 .

Similarly, (6) and (7) would refer to the same facts as (2) and (3) respectively; that is, to f_2 and f_3 :

- (6) The composer of *Bolero* is the only thing which is the same as the composer of *Bolero*, and which is different from Alejandro Toledo
- (7) The composer of *Bolero* is the only thing which is the same as the composer of *Bolero*, and which was French

⁵ This way, for instance, “the town where Gabriel García Márquez was born” and “the town where the author of ‘100 years of solitude’ was born” refer to the same thing—the town of Aracataca—. This is so because the exchanged expressions—“Gabriel García Márquez” and “the author of ‘100 years of solitude’”—refer to the same person.

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And for the same reasons as expressed above in relation to (4) and (5), f_2 would be the same as f_3 . Given that f_1 was established to be the same as f_2 , then all three facts are the same. But it is strange to think that the fact denoted by the sentence “Alejandro Toledo won the 2001 presidential elections in Peru” is the same as the fact denoted by “the composer of *Bolero* was French”. What do these two sentences have in common? The answer is simply that they both are true. And, extending the argument, all true sentences refer to the same fact. Facts, according to this argument, cannot be individuated such that they are the referents of [true] sentences and simultaneously distinguish them according to their meaning. There seems, then, to be nothing like a reality which is already divided up into pieces which are [or can be] denoted by true sentences; nothing like a world which, as Rorty has put it, “splits itself up, on its own initiative, into sentence-shaped chunks called ‘facts’” (Rorty, 1989, p.5).

Now, if facts were supposed to be what make true sentences true, then it does not make sense that there is some thing in reality which makes true sentences true. Davidson puts it very well:

Nothing, however, no *thing*, makes sentences and theories true: not experience, not surface irritations, not the world, can make a sentence true. *That* experience takes a certain course, that our skin is warmed or punctured, that the universe is finite, these facts, if we like to talk that way, make sentences or theories true. But this point is put better without mention of facts. The sentence ‘My skin is warm’ is true if and only if my skin is warm. Here there is no reference to a fact, a world, an experience, or a piece of evidence. (1974, p.194).

THE REALITY-SENTENCE RELATION IN A NON-REPRESENTATIONALIST POSITION

It might look as if abandoning the idea of representation would lead us to some kind of idealism, in which language and reality go separate ways. But this does not need to be that way. The philosophy of Wilfrid Sellars provides an alternative (1956): Let us think, for the moment, of the production of an *occasional* belief like “Ana is pale today”. Reality will have produced some sensations in our sense-organs, which in turn produce our thought, and belief, expressed by the sentence “Ana is pale today”, which in turn may produce other beliefs like “Ana must be sick”.

But then how is one to understand the expressions “produce” in the above sentence? In the first case—the relation between the world and our sensations—it is accepted that there is a causal relation and not an epistemic one; to think otherwise would be to make the mistake of believing that the world speaks a language⁶. About the third one—the relation between our non-inferential and our inferential beliefs—however, it is accepted that the relation is logical and normative, or one of justification “in the space of reasons”.

⁶ Let us recall, for instance, Galileo’s famous remark that nature speaks the language of mathematics.

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The problem appears with the second relation. Relations between events can be causal, as when some event in the world causes some event in our sense organs, or even in our beliefs. Relations between propositions—and a belief can be said to be a proposition held true—belong to the “space of reasons” and justification, as when one infers some propositions from some others, or justifies one by invoking others. The second relation of production is necessarily causal.

The problem, as Sellars points out, is that to think otherwise is to confuse as if they were the same

the idea that there are certain inner episodes—e.g. sensations of red or of C# which can occur to human beings (and to brutes) without any prior process of learning or concept formation

with

the idea that there are certain inner episodes which are the non-inferential knowings that certain items are, for example, red or C#. (1956, pp.21-22).

This is a distinction between sensations and thoughts, and Sellars stipulates that sensations cannot play a direct role in justification. They can, and very usually do, play a role in the creation of beliefs about, for instance, what sorts of things redness or pain are, or about other related issues. But, as Rorty has argued, they are neither sufficient—for to have a sensation is not to have any kind of knowledge—nor necessary—for a blind person can still know many things about redness (Rorty, 1979, p.184)—. Regardless of whether one wants to understand thoughts as inner episodes, it is important to stress from Sellars’ argument that they are conceptual—in that they involve concepts—and cannot be separated from the process of learning those concepts. It is important to clarify that he does not intend to deny that there are beliefs which are non-inferential. Instead, by distinguishing them from sensations he denies that they can be had independently from any prior learning and that their validity can be justified by the very act of having them.

Davidson has argued for a similar conclusion:

The relation between a sensation and a belief cannot be logical since sensations are not beliefs or other propositional attitudes. What then is the relation? The answer is, I think, obvious: the relation is causal. Sensations cause some beliefs and in *this* sense are the basis or ground of those beliefs. But a causal explanation of a belief does not show how or why the belief is justified. (1983, p.311)

No doubt meaning and knowledge depend on experience, and experience ultimately on sensation. But this is the ‘depend’ of causality, not of evidence or justification. (pp.313-314)

Our beliefs do not, then, swing free from the world, as they are in direct touch with it. And furthermore, observational sentences (those more closely causally connected with

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the production of our beliefs) are *usually* good for basing other claims on them, as they are *usually* true. That is, they seem to cohere with each other in many ways, *and that is part of their justification*.

TRUTH AND SYSTEMS MODELS

If representationalism is rejected, then, one might wonder, what happens with the notion of truth? Well, it will have to be something not expressed in terms of representation or correspondence. Let us notice that in a correspondence theory of truth the idea that there had to be facts to which true sentences correspond, led to the ruling out of sentences in the realms of ethics and aesthetics from the domain of sentences with truth value. The idea of representation may have also led some anti-realist forms of representationalism to the idea that the nature of truth was different in the realm of the theoretical (in the Kantian sense) as compared to the realm of the practical (see Ulrich, 1983).

If we start, however, with the seemingly uncontroversial Tarskian idea that a sentence *s* is true if and only if *s* (Tarsky, 1956), then there is no such a distinction between different realms as concerns the nature of truth. According to this proposal, the sentence “it’s 3:45pm” is true if and only if it is 3:45pm. But it works equally well with other sentences for which representationalism poses the problem mentioned in the previous paragraph: The sentences “Ariel Sharon is an evil person”, “Keith Jarrett is a great pianist”, and “the best thing to do is give up” are true if and only if Ariel Sharon is an evil person, Keith Jarrett is a great pianist, and the best thing to do is give up, respectively. No mention is made of reality, facts, sensations, or experience. Neither there is mention of consensus under ideal conditions, internal coherence of the whole belief system, or anything similar. Furthermore, the procedures by means of which someone might want to verify whether actually these are true are not specified. And they should not be, for there may be various possible reasonable procedures for one and the same sentence, while at the same time no single one of them can guarantee the veracity of the conclusion. And how does one know, then, what it is for a sentence *s* to be true? Given that the truth conditions for the sentence *s* is *that s*, if one understands what it is that *s* then one understands its truth conditions. In this sense, meaning is truth conditions (see Davidson, 1983). That is, even though I do not know whether it is raining, I understand the meaning of the sentence because I understand what it would be for it to be raining; that is, the sentence’s truth conditions.

Now, I have already said that models are essentially complex sets of sentences. Can a model be true? Yes, it can; but of course, according to the argument, that does not mean that it represents reality in any way. Should we attempt to construct models which are at least approximately true? Well, yes, at least sometimes. Let us notice that that question somehow implies asking another one, which is, should we attempt to produce true sentences? Well, we all do, most of the time. Now, the dismissal of representationalism implies that the possible true models and sentences that can be formulated about a particular thing are infinite, for there are infinite true sentences that can be said about a thing (see Midgley, 2000, and his discussion of Bateson), just as there are infinite true

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sentences in which a word can appear. To think that there is a unique model that correctly represents some thing in reality would be to say that that model has exhausted everything that can be said about it. In this sense, let us grant that anti-realist representationalists and interpretive systems thinkers have a point here, in that if one assumes from the start one single model, one may fail to notice other relevant aspects not originally included in it. But realist representationalists may also be right in believing that it is actually possible to construct more accurate models, where the adjective *accurate* does not apply to a representation relation, but to the truth of sentences. Now, models do not necessarily have to deal with objects which more clearly have a referent in the world. There can be models of ethics, for instance. Moreover, once one derives recommendations from a model, one is also committing to the truth of sentences in the realm of ethics, or of the practical. Additionally, during the application of interpretive systems thinking methodologies models of reality are actually constructed that attempt to be true, particularly in the problem-situation description and comparison stages.

Similarly, it can be asked, should we attempt to construct models which are not true, or even deliberately untrue? Well, yes, at least sometimes. Apart from aesthetical considerations, one might want to create models whose virtue is to help us break through self-imposed restrictions, in what de Bono has called a *mode of movement*; that is, ideas which are valued for their capacity to get our thinking moving (see De Bono, 1985). In fact, in interpretive systems thinking models are used with the purpose of helping us ask relevant questions about reality, which take into account a variety of aspects which we would not perhaps have asked otherwise. It can be said that part of the purpose is to be cautious about the system definition that will be adopted. Arguably, in hard systems thinking approaches models are also constructed which are not necessarily true to the actual present situation being modelled, but which formulate possible futures. The design of a system is actually an intended future.

CONCLUDING REMARKS: HOW WOULD A NON-REPRESENTATIONALIST SYSTEMS THINKING LOOK?

I will try now to provide a brief and schematic characterisation of two elements of a non-representationalist form of systems thinking. I will not attempt to make a complete reformulation here, as that is way beyond the scope of this paper. Instead, I will give some points, most of which have already appeared in one way or another in the discussion of this paper.

The first point refers to the *system* idea itself. As long as it makes sense to talk of a set of elements that exhibit some kind of closure, it makes sense to talk about systems. The system idea may then be used to talk about presently constituted systems of some kind—as in talk of particular autopoietic systems—as well as about proposed possible systems, or *systems designs*. Given the holistic nature of language and of beliefs and ideas, the system idea can also be used to describe someone else's views on some particular topic—as in talk of other people's systemic perspectives—as well as one's own. All these are *descriptions* of systems. But, given that they are not representations, no exhaustion of the

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possible true—and perhaps relevant—sentences involving the systems in question will ever occur.

A second point concerns the fact that if there cannot be any epistemological certainty about any of our ideas about those systems, then that means that no systemic description will be epistemologically inescapable. In other words, descriptions of systems are as problematic as everything else. And this applies also to systems descriptions of anyone's views, beliefs, or perspective (for a more detailed explanation, see my other paper in this volume, Mejía, 2002). That is, one's description of somebody else's views is as problematic as one's description of any part of the world. Problematicity here, let me repeat the point so that it becomes clear, refers to the difficulty associated with producing and justifying true sentences, and not with exhausting the subject. Now, this conclusion further applies to attempts to produce critical descriptions of viewpoints. Presently, various systemic tools as proposed by various authors are available for describing viewpoints. They include Ulrich's boundary judgements (1987), Checkland's CATWOE (1981), and Espejo's TASCOI (Espejo and Bowling, 1999). Descriptions of systems produced using these tools can still be useful for saying relevant things about them. But on the one hand it should not be assumed that just by asking the questions, the answers will come about unproblematically, and that therefore the description will be inescapable. And on the other hand, neither should it be assumed that the descriptions so produced will express the nature or identity of system in question—actual, proposed, or whatever is the case—, as if it could be exhausted, linguistically speaking, with them.

These are, of course, only two elements of a non-representationalist view of systems thinking and of the system idea. Many more implications I can see as deriving from this position, which cannot be explained in this paper due to the scope of the issues discussed in it. These first elements explored here can be seen as rather conciliatory in terms of the reported differences between interpretive and hard systems thinking. But there is still much to be examined, and whatever further implications derived from the position are shown, they will have to be assumed regardless of their degree of accord with present systems thinking and practice.

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