



Representational Advantages

Roberto Casati

► **To cite this version:**

Roberto Casati. Representational Advantages. Proceedings of the Aristotelian Society, Wiley, 2003, 2003, pp.281-298. <ijn_00000331>

HAL Id: ijn_00000331

http://jeannicod.ccsd.cnrs.fr/ijn_00000331

Submitted on 20 Feb 2003

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

XIII*—REPRESENTATIONAL ADVANTAGES

by Roberto Casati

ABSTRACT Descriptive metaphysics investigates our naive ontology as this is articulated in the content of our perception or of our pre-reflective thought about the world. But is access to such content reliable? Sceptics about the standard modes of access (introspection, or language-driven intuitions) may think that investigations in descriptive metaphysics can be aided by the controlled findings of cognitive science. Cognitive scientists have studied a promising range of representational advantages, that is, ways in which cognition favours one type of entity over another. The notion of representational advantage is investigated and some scepticism is expressed as to its appropriateness for use in descriptive metaphysics.

I

S*upplementing Descriptive Metaphysics with Psychology.* A cluster of notions appears to play an important role in experimental psychological explanations. (These are opposed here to folk psychological explanations; in what follows, ‘psychology’ will be a shorthand for ‘non-folk psychology’.) The cluster includes *figure-ground* articulation (Wertheimer, 1923), *salience* (Talmy, 1983), *prototypicality* (Rosch et al., 1976), *preference rule systems* that output *default values* (Jackendoff, 1983: Chs. 7, 8; 1992: 46–48; Hoffman, 1998), *selective* recruitment for functional purposes, preferential *lexicalization*, *core* domain-specific theories (Spelke 1994), *grounding* of some semantical items in others (Lakoff and Johnson, 1980), *selective access* by conscious processes, *relevance* (Sperber and Wilson, 1986, 2002), among others. The common feature of these notions is that they indicate that cognitive systems have made a selection within the referents of a mental representation between several available items or types of item. I propose to investigate the case in which it is assumed that the chosen item is *advantaged*, as a member of a certain ontological category, by studying some claims that have been made about material objects as typically advantaged items. The notion of a representational advantage is itself widely used

*Meeting of the Aristotelian Society, held in Senate House, University of London, on Monday, 2nd June, 2003 at 4.15 p.m.

in cognitive science (see Scholl, 2001 for an overview related to objects and attention). It has at least a superficial analogy with some philosophical ideas about the structure of conceptual schemes familiar from descriptive metaphysics. For instance, it has been held that particulars of a certain type enjoy a kind of *priority* over particulars of some other type (e.g., there may be an *identification dependence* of the second type upon the first; Strawson, 1959: Ch. 1),¹ or that some types of entities appear *natural* from the viewpoint of naive metaphysics, as opposed to others that appear *contrived* (Goldman 1994: 45).

Indeed, the goal of the present study is an assessment of the possibility of using the tools of psychological research for backing claims in descriptive metaphysics. Descriptive metaphysics can be characterized as a thorough description of the world as it is given in our thought and perception; the world so described may not be in agreement with the content of the scientific image of reality. The methodological question one may ask is: from where do we get such a description? In the literature, the preferred source of evidence in descriptive metaphysics appears to be semantic analysis or phenomenological introspection. However, these are unstable and uncontrolled methods. On the one hand, there is a high degree of semantic and conceptual variability, even in use by one and the same subject. And we have been warned against taking linguistic surface form at face value, so that we are sceptical about the type of information that we can extract from ordinary sentences. (Do you really *mean* to say *of* the present king of France that *he* does not exist when you say that the present king of France does not exist?) On the other hand, phenomenology can deliver illusory contents—we are not very transparent to ourselves. Thus, we may want to look for tools for making controlled claims about what people actually think about or perceive that we can use within descriptive metaphysics, and techniques that elucidate representational advantages appear relevant. We may also hope to explain some of our conscious

1. It may be surmised that the ‘philosophical’ notions are explained by their psychological counterparts: philosopher’s intuitions in deciding which entities have a conceptual priority may be shaped by philosophers’ cognitive makeup. I would not claim that this has actually been suggested by Strawson, but in a sense his idea that asymmetries in identification may be reflected in asymmetries in linguistic practices (e.g. referential dependence) goes in the direction of an inference to the best (in this case, cognitive) explanation of the latter by the former.

(introspectively accessed) contents in terms of the functioning of cognitive mechanisms, so as to flag warnings about the contents we seem to access. Knowledge of the actual preferences of the cognitive mechanisms will impose useful constraints on the description of these.

The purpose of this paper is to assess the heuristic value of representational advantages. Any such analysis raises empirical questions. What, in each case, are the purported advantages? Which entities are representationally advantaged? But broader conceptual questions are pertinent as well. What is it for an entity to be representationally advantaged? Can an entity be represented without being advantaged? How do we define the contrast class of non-advantaged entities? Is the notion of an advantage unambiguous? Is it rational that certain entities, and only they, are advantaged? Are there normative constraints on advantages? I shall consider what appear to be the most urgent problems. After characterizing through examples what advantages are commonly meant to be (Section II), I shall decompose the notion of an advantage along three main lines. We want to understand what advantages are for, what gets advantaged over what (Section III), and in which sense the detection of an advantage for a certain cognitive system can allow us to make claims about the representational structure of that system (Sections IV and V).

II

Examples of Advantages. In a first, rough characterization, an advantage is registered whenever some entities or classes of entities appear to be systematically selected for representation over other entities or classes of entities, or when the former enjoy some differential cognitive treatment. The multifarious advantages of figures in figure-ground displays provide one of the best-known examples.² They include the fact that the figure is more readily seen than the ground, and its shape is kept in short-term memory as opposed to the shape of the ground—indeed, according to some authors, only the figure is assigned a shape. Moreover, boundaries in the display are considered to be *oriented* or

2. Peterson and Kim 2001 for a recent assessment.

asymmetrical, in that, although they separate the figure from the ground, they are assigned only to the figure.

For a metaphysically more interesting example, consider our pre-theoretical intuitions about concrete material objects, how we perceive them, and how we talk about them. Objects like pebbles and tables seem to form the backbone of our ontological structuring of the world. We believe ourselves to live in a world of middle-size, concrete, rigid, moveable objects; if asked, we would say that we mostly see entities of that sort. Construed as a descriptive metaphysical claim, this appears to be largely agreed, so much so that even so revisionary a metaphysician as Quine could claim that humans are instinctively body-minded. A certain natural view of ontology would have it that our world is taken to be inhabited, *prima facie*, by concrete objects such as pebbles and tables and objects similar to those, and that this basic articulation informs much of our mental life. These intuitions and philosophical refinements have ramified into empirical research and generated hypotheses about ‘object advantages’. It turns out that object names form a large proportion of vocabularies in all languages, a fact which becomes all the more evident during language learning (MacNamara, 1982; Bloom, 2000). Infant cognition (Spelke 1994; Soja, Carey, Spelke, 1991) seems to be very sensitive to concrete objects. Not only are these perceived, and very soon aimed at in grasping, but about them infants appear to have quite clear ideas and preferences: their perceptions and conceptions seem preferentially to represent objects. And early language could be biased towards concrete objects *because* perception and conception are (Bloom, 2000). Adult perception and attention seem to fall pretty well in line with this object prejudice: adults have systems devoted to identifying and tracking objects. Finally, evolutionary psychological accounts of the primacy of objects are relatively straightforward: it is natural to claim that it is because our interest is focused on ecologically salient entities, which appear to be massively of the type of concrete objects,³ that we have evolved systems devoted to identifying, tracking, and recognizing concrete objects.

3. A notable exception to this line of thought is Gibson (1986: 16): ‘We are tempted to assume that we live in a physical world consisting of bodies in space and that what we perceive consists of objects in space. But this is very dubious. The terrestrial environment is better described in terms of a medium, substances, and the surfaces that separate them.’

It also looks as if the intuitive notion of a ‘concrete object’, natural as it may appear, is skewed toward entities with very specific characteristics that may be summarized in the feature of *wholeness*. Typical concrete objects are whole objects. Wholeness decomposes into two notions, *self-connectedness* and *maximality*.⁴ Intuitively, an object is self-connected or of a piece when, given any two parts of the object, there is a path joining them that never travels outside the boundaries of the object; it is maximal when it is not a proper part of another self-connected object. Now, as Quine was fond of stressing when he proposed his own moderately revisionary account, there is no particular reason to claim that the material world is inhabited by *whole* objects *only*. On the face of it, proper parts of objects exist, and so do scattered sums of whole objects, as well as sums of proper parts of possibly distinct whole objects. No matter if we never think of them, those things are there whenever there are material objects around. It does not take much conceptual stretching⁵ to contend that if two tables exist, then so also do their respective left halves, and so does the sum of the two tables, and so does the sum of the left halves of the two tables. None of those entities (different from the tables themselves) is a whole object. However, these other entities have pretty much the same ontological respectability as whole objects: they are concrete, spatio-temporally extended lumps of matter, with a shape and a size. We are not opposing whole objects to ephemeral or abstract entities, such as shapes or spatio-temporal regions or numbers, but to other ‘portions’ of concrete reality. The main difference between these other portions and whole objects relates to the structure of their respective boundaries. In the case of the table, the boundary is self-connected and unitary, and it divides the object from an environment which is qualitatively different from the object itself (the boundary is a wood-air boundary at each of its points). In the case of the left half of the table, the boundary does not always divide the object from a qualitatively different area (it is at least in part a wood-wood boundary); and in the case of the sum of

4. ‘Whole’, in the literature, is tacitly meant to indicate *both* self-connectedness *and* maximality. But maximality is an oft-neglected ingredient.

5. As we shall briefly see in the next paragraph, the ontological innocence of sums and undetached parts is not uncontroversial.

the two tables, the resulting composite object has *two* disconnected boundaries.⁶ All these differences are interesting in themselves, and they appear to be exploited by vision and by cognition in general; but they hardly mark a huge ontological difference.⁷ This indifference is at odds with the fact that whole objects are salient in cognition. Whole objects seem to be singled out as a privileged kind.⁸

Not everyone agrees about the ontological innocence of mereological sums and of undetached parts. However, the issue of object advantages lurks in the background of many metaphysical discussions on parts and wholes. As an example, consider how van Inwagen (1990) contrasted two rival metaphysicians, the nihilist and the universalist.⁹ Both accept the existence of elemental ontological items, but they disagree on what exists in addition to those items: the universalist bestows existence to any mereological composition out of the elements; the nihilist denies the existence of any such composition. Both positions are generally assumed to be at odds with common sense, which is less ontologically greedy than the universalist and more generous than the nihilist. Both the universalist and the nihilist have to complete their stories with a psychological account of this discrepancy with common sense. For universalists, any lump of sand on a beach trivially ‘exists’, however disconnected and gerrymandered. So

6. Possession of two disconnected boundaries is not a foolproof criterion for disunity: a sphere with an internal cavity has two disconnected boundaries and is a whole object nevertheless. The invisibility of the internal boundary in standard conditions ‘corrects’ the problem such entities could pose to a visual system that has to compute object unity by counting boundaries.

7. Creative ontologists have suggested other fancy types of individuals as contrast classes for whole objects, entities that are aggregates of scattered portions of matter in complex spatio-temporal patterns. However, undetached proper parts and sums, which have no such temporal complexity, are intuitive enough to create an interesting problem, without resorting to individuals that can be conceptualized only through mildly complex definitions.

8. Claiming that naive ontology is skewed towards whole objects is not the same as saying that it does not countenance *some* instances of concrete objects that are not self-connected, or not maximal, or neither. We do have names for *some* scattered objects, such as ‘flock’, and for *some* salient non-maximal (undetached) parts, such as ‘handle’ and we can perceptually track and recognize flocks and handles, in a way that makes one think that we have perceptual mechanisms dedicated to entities like these (Hoffman and Richards, 1984; Giralt and Bloom 2000; Bloom 2001). Thus the whole-object advantage claim should be restated as a *relative* advantage.

9. I am not going to follow closely his formulation of the debate, and adjust it in order to highlight the terms of the discussion.

they must explain why those existing entities do not enjoy any representational advantage. For nihilists, no lump exists, only (mereologically atomic) elements do. But then not even a pebble or a table exists. So they must explain why such non-existing things are assumed to exist, and enjoy representational advantages. In both cases we are left with the psychological problem of explaining the belief that more things exist than are recognized by the nihilist, and fewer than are recognized by the universalist.

Whatever the truth of the matter may be, it seems reasonable to state that whole objects are indeed cognitively privileged by us out of a set of entities that are not privileged, possibly not even acknowledged. This means that whole objects might have not been privileged, that is, that it is just a contingent fact that they have been privileged. However, we need to proceed with some care at this point.

III

The Advantage Notion. Advantages are *for* a cognitive system and are assigned *to* certain entities *over* other entities or would-be entities. The first aspect of the notion (what or whom advantages are advantages *for*) concerns the fact that advantages are investigated and found in various cognitive systems. The prospects of doing naive metaphysics through empirical psychology would appear interesting if we found out remarkable differences between the endorsements of, say, a subpersonal system and those of conscious vision, or between those of human perception and those of ape perception. We might lump together all the cognitive systems that are not to humans consciously and within a first-person perspective under the label of ‘alien systems’¹⁰—the class being meant to include subpersonal systems. Suppose that your visual system parses the world in terms of objects, but your motion system parses it in terms of properties at places. Can we say that two different naive ontologies co-habit in you?¹¹

10. Although even within conscious vision one may observe different endorsements. The world of conscious peripheral vision seems to fade into unstable, non-objectual bundles of properties, with uncertain localization.

11. One side consequence that beleaguers cognitive science is the modern equivalent of the Molyneux question: ‘visual objects’ risk being of a completely different nature than ‘nameable objects’ or ‘tactile objects’, so that cross-disciplinary comparisons are difficult to establish.

Do the two naive ontologies highlight two different aspects of one and the same reality? Are there ‘multi-sided’ representational items,¹² whose sides are exploited differently by different sectors of cognition?

This type of potential opposition between naive ontologies brings us to another point. When we discuss a given advantage we must be clear in making it explicit not only what it is an advantage *of*, but at the same time what it is an advantage *over*. Circumscribing the contrast class we have in mind is to be done simultaneously with circumscribing the class of advantaged objects. Of course, some types of advantages are not particularly interesting from the viewpoint of descriptive metaphysics—for instance, if the system advantages whatever is in the centre of the field of vision, it might so do without showing any sensitivity to categorial differences. The interesting advantages are those which indicate that an entity of a certain ontologically interesting type has been preferred over entities of other types.

If we look briefly at the philosophical discussion, we find that a standard opposition is often proposed between concrete material whole objects (‘substances’) and other classes of entities that are alleged to ‘compete’ with whole objects on various grounds. Objects have been variously opposed to—or equated with—events, regions of space, (bundles of) properties, sequences of object stages, sums and parts of objects, abstractions, and, as we just saw, scattered sums and undetached parts of whole objects. In all these cases, objects have been said to be primary, or secondary,¹³ relative to the entities in the contrast class.¹⁴ And, in each case, the contrast has illuminated some aspect of the notion of an object. What kind of contrast classes do we find in the psychological literature? Here are some examples out of vast range.

Bloom (1996: 90) raises the question ‘what sort of entities are naturally thought of as individuals’, that is, ‘entities that can be

12. Alvin Goldman suggested this possibility in conversation.

13. For instance, they have been said to be reducible to, or provide a reduction for these other entities. However, most authors are adamant in claiming that if objects are not primary in the ontological order, we still appear to pre-reflectively consider them primary in the naive-conceptual or in the perceptual order.

14. There are other oppositions in the literature, such as the distinction between properties as universals and particularized properties: here however we concentrate on contrast classes for objects.

categorized, counted, and tracked over space and time’—like dogs and mugs. He claims that ‘not every logically possible individual is acceptable from the standpoint of human psychology’: for instance, not every conceivable individual is such that we can learn a name for it easily. We cannot easily learn names for non-salient parts or gerrymandered collections, unless these things behave in very specific ways. So the contrast class here is whatever is mereologically sub-objectual or supra-objectual. Soja, Carey and Spelke (1991) claim that ‘children may approach the task of learning language with a pre-existing set of ontological categories’. A default rule would empower the baby who hears a new word to assign it to the whole object category wherever it appears to refer to anything concrete: ‘Test to see if the speaker could be talking about a solid object: if yes, conclude the word refers to individual whole objects of the same type as the referent.’ The contrast class for objects is cut within the class of concrete entities and includes loose portions of matter. The account of perceptual tracking in Pylyshyn (1998) finds a special position for object-like entities, the only ones that appear to be able to seize perceptual indices. Object-like entities (Scholl, Pylyshyn and Feldman, 2001) include figures on a computer screen (maximal uniform connected areas, paradigmatically squares subtending small visual angles) and contrast with parts or groups of such figures. Scholl (2001), in a review paper on the advantages attention allocates to concrete objects, observes that ‘among the most crucial tasks in the study of any cognitive or perceptual process is to determine the nature of the fundamental units over which that process operates’, and asks how ‘objects of attention ... [are] related to other fundamental concepts, including locations, reference frames, perceptual groups, surfaces and parts’, and whether there is a contrast between objects and ‘the individual visual features which characterize them’ (2001: 3). So here the various contrast classes include features, locations, parts, aggregates, and reference frames.

We could say, as we did in the case of the contrast classes for objects in philosophical literature, that the differences between the privileged objects and the members of the contrast classes highlight different aspects of the notion of an object that is part of the naive ontology that we are attributing to the system. However, this is where a major problem with the notion of advantages arises.

IV

The Ambiguity of Advantage Claims. Claims about advantages may be construed as *behavioural* claims or as *contentual* claims. Consider this claim:

- (a) Visual perception confers an advantage on three dimensional, bounded, unitary solid bodies, moving in continuous trajectories.

Interpreted behaviourally, claim (a) says little about perceptual content. It states that external entities satisfying certain (clusters of) properties tend to be successfully targeted in some perceptual tasks. This is not a claim about visual ontology, but about the responsiveness of our visual system to certain aspects of the world. Interpreted contentually, claim (a) is a little more ambitious. It purports to articulate the structure of the ontology that is implicitly or explicitly endorsed by visual cognition. Now, given that we can ascertain that it is entities of a certain type that cognition behaviourally gives an advantage to, how can we proceed and make the claim that cognition represents the world as inhabited by entities of the type it advantages? How do we derive a contentual claim from a behavioural claim?

The interest of the derivation lies in the fact that our statements about ‘folk ontology’ are obtained by just unpacking statements expressing cognitive content. If you want to know what the visual world of the baby or of the chimp or of subpersonal parts of yourself or of some other type of alien is like, you are not going to stop at the registration of a mere regularity in the relevant behaviour, nor at the description of the entities (in the relevant environment) that this behaviour seems to be tuned to. You want a statement to the effect that the world looks a certain way to the alien. For instance, it is not enough to claim that aliens respond with joy to the sight of a bright lemon. You want to know whether they represent the entities to which they respond happily *as* three-dimensional objects or as yellow circles.

The question is in part, but only in part, the methodological question how psychologists can control the various parameters that enter the assessment of advantages. For these parameters can only be controlled behaviourally. Is the subject responsive to object unity, or is it sensitive to the presence of a convex shape,

which in a given experimental setting happens to be co-instantiated with object unity? In order to settle the issue one needs to identify a control situation in which the two features are not co-instantiated. Much ingenuity has been devoted to the issue of control, but control can extend only so much. When it comes to very abstract categories, scepticism spreads across the board. (Rubin and Kanwisher, 1986 on Chen, 1982 make an interesting point about topological categories.) Generally speaking, the issue here connects with the familiar one of the inscrutability of reference.

However, the question is not how to scrutinize reference by looking at the overt behaviour of subjects in experiments. We may even assume that psychologists can ascertain which entities are advantaged (that is, entities of which type). And, granted the assumption, we can still ask whether there are reasons to claim that, whenever perception so advantages a certain type of entity, perceptual content represents the world as including entities of that type.

A simple answer to the question of what licenses deriving attributions of content from behavioural attributions of advantages could consist in endorsing a straightforward inference to the best explanation. The inference consists in claiming that, say, aliens are responsive to objects *because* they represent the world as inhabited by objects. We explain success in referring to objects by the availability of object-structured content. We can thus consider the behavioural claim as criterial for the corresponding contentual claim. However, the possibility remains open that advantages are allocated non-conceptually to certain entities. Responsiveness to a certain property is not to be equated with representation of that property. Non-conceptual responsiveness may explain the behavioural allocation of advantages. Alternatively, advantages can be said to be allocated (behaviourally) to entities which are in fact described by perceptual content in a way different from that which the psychologist would use for describing them. The alien can (behaviourally) advantage objects such as lemons either because it just happens to be tuned to them non-conceptually, or because it (contentually) advantages representations of those objects (lemons) as being yellow circles, and it just happens that yellowness and rotundity, in the alien's environment, are jointly instantiated mostly by lemons.

We can account for the non-conceptual allocation of advantages to objects by referring to the internal features of the representational system. We may invoke a theory of how a cognitive system could compute the relevant information in the given ecological contexts, and decide that a certain type of advantage, for example the object advantage, is the most likely one. The object advantage could be the most economical solution to a computational problem in a given ecological situation. This is tantamount to claiming that, given certain internal features of the representational system, material objects enjoy advantages which strictly depend upon what they are, that is, upon the ecological (hence non-conceptual) structure of the world. Objects would be, so to speak, natural attractors of representational advantages, given the existence of representational systems with certain internal features.

Two things are relevant to the illustration of this possibility. The first is the contingent fact that whole objects have *natural boundaries*.¹⁵ The second is the fact that wholeness, in the sense of self-connection and maximality, is not only pre-conceptually given. It is also a ‘fixed point’ in the space of possible parsings, and this is important if the interest of the visual cognitive system is to work with a stable set of entry-level elements for further processing.¹⁶ Call ‘objectual’ parsing a parsing into whole objects.¹⁷ There is an endless number of divisions of the visual field at the sub-objectual level to produce non-maximal parts, there is an endless number of divisions at the super-objectual level to produce scattered objects, and there is an endless number that cuts across levels. But there is only one division at the objectual level: the largest units that result from a sub-objectual division coincide with the smallest units that result from a super-objectual division. So if you consider a system that is supposed to register divisions, it will find the fixed points in the mappings

15. Ayers (1994). Natural is here opposed to ‘conceptual’ or ‘fiat’ in the sense of Smith and Varzi (2000).

16. Such a necessity was pointed out by Palmer and Rock (1994). They observed that for more than half a century Gestalt psychology had ignored the fundamental question of how the visual system can get the entry units that are then processed gestaltically to constitute macro-units. Their proposal is that the system finds out connected patches of uniform quality in the visual field and treats them as units. (It should be added that these patches must be maximal.)

17. Plus the remainder constituted by the complement of their sum.

from the space of sub-objectual divisions to the space of super-objectual divisions precisely at whole objects. It is apparent that Quinean objects (most of which are non-objectual in the defined sense) offer in general no stable solution to the problem of parsing. There are too many mutually exclusive ways to aggregate zones in the visual field. How could the system choose among them?

The possibility of saying that the objectual parsing is stable or a fixed point depends of course, on pain of triviality, on 'objectual' being definable independently of 'divisions'. But this is exactly where boundaries enter onto the stage. For objectual boundaries are independently defined as qualitative boundaries; independently, and not, on pain of circularity, just as the result of some computation on the maximality of parts of an entity (say).¹⁸ In this sense, the fact that objects have natural boundaries can be exploited by a representational system in a pre-conceptual way, as an element within a computation that looks for a stable parsing. All the mechanism needs is an algorithm for matching boundary discontinuities with fiat boundaries induced by 'formal' wholeness (that is, maximality *cum* connectedness). And in this sense the mechanism would not need a *concept* of a whole object or a representation *as of* a whole object in order to be sensitive to whole objects. Pre-conceptual mechanisms would do the trick. The difficulty, perhaps, was sorting out the inner structure of the mechanism.

We have thus provided a schema of what could be a non-conceptual explanation of object advantage. The solution relies on contingent ecological features and internal constraints of the visual system. Given the constraints, and the ecology, the system will end up advantaging whole objects.

These possibilities appear to motivate a sceptical conclusion: in the presence of a non-conceptual explanation of representational advantages, we are not entitled to study naive ontology cognitively when it comes to alien systems. This could mean either of two things. Either there is no such ontology. That is, the content of alien systems is not articulated in an ontologically

18. This is to say that all this, of course, is relative to an appropriate characterization of the property which the object satisfies maximally. One should beware of trivial maximalities, as defined in relation to properties such as the one expressed by 'being part of a part *p* of a stone'.

meaningful way. Or, alternatively, there is an ontology for those systems, but we cannot study it as it is inscrutable, and we may mistakenly take it for something else. It further follows that claims about ‘object’ advantages may simply be artifacts of the psychological theory, posits that depend on the theoretically loaded language (and conceptions) used by psychologists. In particular, such a language endorses whole objects (or any other entity it in fact endorses); but the use of ‘object’-oriented language may simply be loose talk when it comes to the study of alien content.

V

The Inscrutability of Alien Content. The inscrutability of alien content appears to be a harder problem than the problem of the inscrutability of reference, which relates to non-alien foreigners—people who speak a language different from our own. For these are conspecific, and we can always try to learn their language in order to understand what they mean by their utterances. Or we can rely on our empathetic simulation of their understanding, which is only justified insofar as we recognize them as conspecific, and we may then be able to interpret the little behavioural feedback we get from interacting with them.¹⁹ But when we approach alien content we can only hope to be able to see through a glass darkly. Here are two examples of the difficulty.

1. In a classical experiment (Duncan, 1984) on object-based attention, subjects are presented with drawings in which a square (of varying size) and a line (of varying length) are superimposed. The square has a gap that could lie either on its left or right side, and the line follows an orientation that can slightly deviate from the vertical. Some subjects are asked to judge about features of the ‘same object’ (size of the square and side of the gap), other subjects are asked to judge about ‘different objects’ (size of the square and orientation of the line). It turned out that ‘subjects were less accurate at reporting two properties from separate objects, but were able to judge two properties of a single objects

19. I am only considered here justified empathy: it may well be that we mistakenly empathize with aliens, and even with a pebble.

without any cost: this has been termed a “same-object advantage” (Scholl, 2001:7). Now it is assumed that the square counts as one object, the line as another, that subjects (subpersonally, in this experiment) register the difference and the superposition, and that they compute on items that correspond to this parsing. However, the results could be explained in an alternative way if we credited the subjects with a different parsing, according to which only one object is perceived, whose parts are the line and the two halves of the box. The accuracy in reporting would then be explained by a same-part advantage (the line is one such part, and the relevant half of the box another). Advantages will be ‘local’. How can we choose between attributing either of these different parsings to our subjects?

2. In another classical type of experiment (Spelke, 1993) infants are shown two screens separated by a vertical slit. A toy appears from behind the left screen and then disappears behind it. Another toy, indistinguishable from the previous one, performs a similar show in relation to the right screen. The screens are then lifted; in the control situation, two toys are left to be seen, whereas in the test situation only one toy is left. Infants (and adults alike) show relatively more surprise at the second outcome. Now, they could have expected one single toy to be there, assuming it could travel from the area behind the left screen to the area behind the right screen without appearing through the slit. Hence the results are interpreted as showing that infants spontaneously take objects as moving on continuous trajectories: objects do not jump metaphysically, as it were. But here is the problem: a number of alternative ontological structures are compatible with the data (surprise at the one-toy display). As Hirsch (1997: 410, commenting on Xu, 1997) suggested, the infant could be a Quinean who views ‘any space-time portion of reality, however discontinuous and gerrymandered, as an object on a ontologically equal footing’. Surprise could be simply due to the fact that Quinean infants ‘do not expect to be confronted with that kind of discontinuity’ (ibid.)—in the case at stake, we may suggest, they do not expect a scattered object to lose one part, and the contrast situation of movement through the visible portion of the background was never a possibility. We need an independent motivation for assuming that the toy behaves for the child in the

way Spelke suggests, that is, as a concrete object that does not jump metaphysically. And this independent motivation can come from the experimenter's own ideas about what objects can or cannot do, or what it is reasonable to expect the infant to refer to. But then, aren't we just 'retracing' the properties attributed by the experimenter to the toy back into the content of the infant's mental state about it?²⁰

VI

Conclusions. Charles Darwin wrote in his *Notebooks* that 'he who understands the baboon would do more toward metaphysics than Locke'. But if object advantage turns out to be explained to our satisfaction in a non-conceptual way, then we must conclude that the prospects of exploring the naive metaphysics of aliens are less bright than we might have expected. We have lost sight of a way to derive from a behavioural claim about object advantage the contentual claim that could articulate the naive ontology of the alien. In particular, empirical research about the alleged content delivered by subpersonal systems turns out to be uninformative. But then, if we also accept that the standard ways of describing naive metaphysics are jeopardized by the unreliability of introspection and of semantic-driven thought experiments, we leave descriptive metaphysics in dire straits. We can, of course, go along with an 'as if' construal of naive metaphysical claims for aliens, or accept less stringent methodological constraints on phenomenology, or accept the surface form of linguistic contents at face value.

Another, more immediate, cautionary conclusion is that we ought to beware of the very suggestive descriptions that we happen to find in psychological literature. Empirical research may just project the common sense categories of the experimenter into

20. Paul Bloom (in correspondence) finds the suggestion that psychologists have no way of testing these alternative hypotheses too strong. But no matter whether we can come up with a test for Hirsch's proposal, the problem is that such a test would only settle the issue for *one* type of alternative ontology. But if there are countless such alternative ontologies (and very many they surely are already, plus some fancier cases philosophers have not invented as yet), then we need to test *each* of them. The methodological burdens on an experimental setting meant to establish our ontological set-up would become unbearable.

the explanations of advantages. Entities that are seen as advantaged by the experimenter may simply not be endorsed by the cognitive system under study.²¹

Roberto Casati
Institut Nicod
CNRS-EHESS-ENS
1 bis, avenue de Lowendal, 75007 Paris
casati@ehess.fr

REFERENCES

- Ayers, M., 1994, *Locke: Epistemology and Ontology* (London: Routledge).
- Bloom, P., 2000, *How Children Learn the Meaning of Words* (Cambridge, Mass.: MIT Press).
- Bloom, P., 1996, 'Possible Individuals in Language and Cognition', *Current Directions in Psychological Science*, 5, 90–94.
- Chen, L., 1982, 'Topological Structure in Visual Perception', *Science*, 218: 699–700.
- Duncan, J., 1984, 'Selective Attention and the Organization of Visual Information', *Journal of Experimental Psychology: General*, 113, 501–517.
- Fantz, R. L., 1961, 'The Origin of Form Perception', *Scientific American*, 204, 66–72.
- Gibson, J. J., 1986, *The Ecological Approach to Visual Perception* (Hillsdale: Lawrence Erlbaum).
- Giralt, N. and Bloom, P., 2000, 'How Special Are Objects?', *Psychological Science*, 11, 497–501.
- Goldman, A., 1992, 'Metaphysics, Mind, and Mental Science', Ch. 2 of *Liaisons* (Cambridge, Mass.: MIT Press), 35–48.
- Hirsch, E., 1997, 'Basic Objects: A Reply to Xu', *Mind and Language*, 12, 407–412.
- Hoffman, D. D., 1998, *Visual Intelligence* (New York: W. W. Norton).
- Hoffman, D. D. and Richards, W. A., 1984, 'Parts of Recognition'. *Cognition*, 18, 65–96.
- Jackendoff, R., 1983, *Semantics and Cognition*. (Cambridge, Mass.: MIT Press).
- Jackendoff, R., 1992, *Languages of the Mind* (Cambridge, Mass.: MIT Press).
- Lakoff, G. and Johnson, M., 1980, *Metaphors We Live By* (Chicago: University of Chicago Press).
- MacNamara, J., 1982, *Names for Things: A Study of Human Learning* (Cambridge, Mass.: MIT Press).
- Peterson, M. A. and Kim, J. A., 2001, 'On What is Bound in Figures and Grounds', *Visual Cognition*, 8, 329–348.
- Pylyshyn, Z. W., 1998, 'Situating Vision in the World', *Trends in Cognitive Sciences*, 2, 10–18.

21. Thanks to Nicolas Bulot, Paul Bloom, Barry Smith, Dario Taraborelli and Achille Varzi for discussions and formal comments on an earlier draft. Research for this paper was made possible partly by grant COG 66b et 141b of French ACI Cognitive.

- Rubin, J. M. and Kanwisher, N., 1985, 'Topological Perception: Holes in an Experiment', *Perception and Psychophysics* 37: 179–180.
- Scholl, B. J., 2001, 'Objects and Attention: The State of the Art', *Cognition*, 80, 1–46.
- Scholl, B. J., Pylyshyn, Z. W., and Feldman, J., 2001, 'What is a Visual Object? Evidence From Target Merging in Multiple Object Tracking', *Cognition*, 80, 159–177.
- Smith, B. and Varzi, A., 'Fiat and Bona Fide Boundaries', *Philosophy and Phenomenological Research*, 60, 401–420.
- Soja, N., Carey, S., and Spelke, E., 1991, 'Ontological Categories Guide Young Children's Intuitions of Word Meaning', *Cognition*, 38, 179–211.
- Spelke, E., 1993, 'Object Perception', in Goldman, A.I., *Readings in Philosophy and Cognitive Science*, Cambridge, Mass.: MIT Press, 447–460.
- Spelke, E., 1994, 'Initial Knowledge: Six Suggestions', *Cognition* 50, 431–45.
- Sperber, D. and Wilson, D., 1986, *Relevance: Communication and Cognition* (Oxford: Blackwell).
- Sperber, D. and Wilson, D., 2002, 'Truthfulness and Relevance', *Mind*, 111, 583–632.
- Talmy, L., 1983, 'How Language Structures Space', in H. Pick and L. Acredolo, eds., *Spatial Orientation: Theory, Research, and Application* (New York: Plenum Press), 225–282.
- van Inwagen, P., 1990, *Material Beings* (Ithaca: Cornell University Press).
- Wertheimer, M., 1923, 1938, 'Laws of Organization in Perceptual Forms', in W. D. Ellis (ed.), *A source book of Gestalt Psychology* (New York: Harcourt Brace), 71–88.
- Xu, F., 1997, 'From Lot's Wife to a Pillar of Salt: Evidence that *Physical Object* is a Sortal Concept', *Mind and Language*, 12, 365–392.