Fundamental Categories, Category Systems, and Ontological Form

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Tarkastelen tässä työssä yleisestä, ”metaontologisesta” näkökulmasta fundamentaaleja ontologisia kategorioita ja kategoriasysteemejä. Lähtökohtana toimii ennen kaikkea ”ontologisen muodon” idea (josta ovat puhuneet mm. E. J. Lowe ja Barry Smith) ja ajatus ontologiasta ”formaalina ontologiana”.

Pyrin aluksi selventämään ”ontologisen muodon” ideaa ja formaalin ontologian yhteydessä esiintyvää muoto/aine –erottelua. Päädyn toteamaan että ”aiheneutraalius” (*topic-neutrality*), johon usein viitataan tehtäessä erottelua ”muodollisen” ja ”aineellisen” välillä niin logiikassa kuin ontologiassakin, on riittämätön erottelemaan ontologista muotoa ”aineesta”. Perustelu tälle on se että kategoriaerotteluita ei tulisi sulkea pois ontologisesta muodosta. Tämän jälkeen siirryn tarkastelemaan ”formaali-ontologisen relaation” ideaa. Ajatus on että ontologisen muodon voitaisiin nähdä koostuvan tietynlaisista relaatioista olioiden välillä. Tarkastelen lähemmin kolmea piirrettä jotka on liitetty ”formaali-ontologisiin” tai ”formaaleihin relaatioihin”: taipumusta synnyttää regressioita, ”internaalisuutta” (ns. *internal relations*) ja ”ontologisen statuksen” puutetta (ts. että nämä relaatiot eivät ole omia erillisiä olioitaan). Totean näiden tarkastelujen lopuksi että sekä ”ontologiselle muodolle” että ”formaali-ontologiselle relaatiolle” kirjallisuudesta löytyvät karakterisoinnit ovat puutteellisia.

Seuraavaksi tarkastelen formaali-ontologisten relaatioiden mahdollista roolia kategoriasysteemeissä ja merkitystä kategoriaerotteluille. Käyttäen esimerkkinä eri tapoja tulkita Aristoteleen ns. ontologista neliötä erottelen kaksi erilaista tapaa joilla kategorioiden voisi nähdä määräytyvän olioiden välisistä relaatioista. Ensimmäisen tavan mukaisesti kategoriat muodostavat hierarkian jossa vain osa kategorioista määräytyy relationaalisesti. Toisen tavan mukaisesti kaikki kategoriat taas määräytyvät yhtälailla relaatioiden perusteella. Tämä jälkimmäinen tapa, jonka katson sopivan paremmin yhteen sen fundamentaalisuuskäsityksen kanssa jota olen päätynyt kannattamaan työn johdannossa, tuottaa eräässä mielessä strukturalistisen kuvan ontologisista kategorioista. Kategorioiden relationaalisen määräytymisen kohdalla hyödynnän myös ”reaalimääritelmän” ideaa josta on viime aikoina puhunut mm. Kit Fine. Käsiteltyäni lyhyesti E. J. Lowen versiota ontologisesta neliöstä tarkastelen vielä lähemmin ajatusta kategorioiden puhtaasti relationaalisesta määräytymisestä. Yritän vastata eräisiin kirjallisuudesta löytyviin vasta-argumentteihin ja puolustaa yleisesti ”kategoriastrukturalismin” mahdollisuutta, mutta viittaan myös lyhyesti joihinkin metafyysisiin seurauksiin joita tällaisella kategoriakäsityksellä mahdollisesti voisi olla.

Avainsanat – Nyckelord – Keywords

ontologia, metafysikka, kategoriat

Contents

1. Introduction

This work is (ultimately) concerned with the concepts of *ontological category* and *system of categories*. On what basis should ontological categories be taken to 'categorize'? In what way or ways do categories[1] form a system? What categories of entities we should recognize, and what precise form the system in which they are embedded should take, are, on the other hand, not questions I will be concerned with here. This is more a work in 'metaontology' or 'metametaphysics' than in ontology or metaphysics *proper*.[2]

The revival of metaphysics in recent decades has not in general been a revival of the theory of categories, although there are several notable exceptions (e.g. Chisholm 1996, Hoffman and Rosenkrantz 1994, Lowe 2006, Johansson 1989, Thomasson 1999, and Grossmann 1983). On the other hand, categories in some form or other, i.e. the basic types of entities, are arguably an essential concern of metaphysics. Thus, even those metaphysicians who do not put forward and articulate an explicit category system can still plausibly be expected to have an implicit and tacit one which could be gleaned from their work, and which structures their metaphysical theories and ontological commitments.

Correspondingly, there has been relative inattention towards the very concepts of ontological category and category system[3]. Perhaps the most extensive literature has accumulated around the idea of 'category mistake' and the concept of 'category' involved in it (see Magidor 2013 and the bibliography there). The idea of 'category mistake' is usually associated with Gilbert Ryle (see in particular his 1938/2009: 178–93), but can be traced back to the work of Husserl (1921, Investigation IV)[4]. My own understanding of categories will be broadly speaking Aristotelian. In particular, this means that, unlike the Ryleans (or, for that matter, Fregeans or Kantians), I am not interested in the category

[1] I will drop the qualification 'ontological' and just talk of 'categories' unless the context requires disambiguation.
[2] The questions I am concerned with in this work, though, do not have much to do with what has recently been much discussed in works that come under these two rubrics (see in particular Chalmers et al. 2009) — namely, existence, quantification, and ontological commitment.
[3] Westerhoff 2005 is perhaps the most extensive recent treatment. Most works, like the ones cited above, that present a system of categories also include material on categories and category systems in general. The work of Peter Simons and David Woodruff Smith (see bibliography) should also be mentioned here.
[4] Other conceptions of 'category' include the Kantian one and the Fregean one, neither of which I will discuss (see Thomasson 2013).

schemes involved in natural language or cognition. Instead, categories as I will understand them are supposed to be very general classes of entities in the world, and they are supposed to mark basic distinctions that are mind- and language-independent. If language or cognition enters into this, they will do so only incidentally.

Moreover, the sorts of categories I will ultimately be concerned with are *fundamental* ones, or categories of fundamental or basic entities. The distinction between 'fundamental' and 'non-fundamental' entities should be familiar from recent metaphysics. In using these terms, one usually has in mind some kind of hierarchical or 'stratified' picture of reality, one on which some things form the ground level — the 'fundamental level' — on which other things are (ultimately) 'based' or from which they are (ultimately) 'derived'. (The most familiar example of the relevant sort of hierarchy, and of all the complexities involved in such, is perhaps provided by the case of the relations between the mental and the physical.) The metaphysician or 'category theorist' need not be concerned with all the details of this hierarchy — not even with all the details of the 'fundamental level', which, on the most reasonable view, are to be given by fundamental physics. What she should (on my view, at least) be concerned with are the ontological categories involved and their relations to each other. But why confine one's attention to the categories of fundamental entities only, as I just proposed to do? Are not 'non-fundamental' entities entities too? This is certainly a reasonable view (see 3.111 below). Nevertheless, if we can get along without 'derivative' or 'non-fundamental' entities, I think we should; and I think we can, at least on one reasonable way of understanding what is 'fundamental' and what 'non-fundamental'.

Fundamentality is sometimes illustrated metaphorically using the idea of creation (see e.g. Barnes 2012: 876, Schaffer 2009: 351; the creation metaphor seems to be originally from Kripke 1980: 153, although Kripke does not talk about 'fundamentality' there): the 'fundamental level' is constituted by those entities that are all God would need to create in order to 'fix' or determine all the facts or truths about the world. 'Non-fundamental' entities, if they exist at all, need not have been brought into existence separately, for their existence follows with metaphysical necessity from what the fundamental level is like. In fact, there would be no way for God to create the fundamental level as it is without at the same time bringing into existence the non-fundamental entities. This is perhaps one reason why this theological metaphor is so striking: the relation between the fundamental

and the non-fundamental is here taken to be so intimate that not even God could conceivably sever them from each other. Now, what I would propose is that the fundamental or basic entities, the categories of which I will be concerned with, are just those that by their mere existence are together sufficient to 'fix' or metaphysically necessitate all the worldly facts. On this view, then, 'non-fundamental' entities would, it seems, be completely idle and redundant. Every truth about the world would receive a sufficient ontological account in terms of the existence of fundamental entities only. The fundamental entities are, in other words, those that constitute the complete *and also non-redundant*[5] set of *truthmakers* for all the truths about the world.[6]

I recognize that this is not the only way to interpret the creation metaphor and to conceive of what it would be for God to create the 'fundamental level'. In particular, one could also take the fundamental level to involve fundamental *facts* that cannot themselves be grounded in the existence of entities (something like this was David Lewis's view of what is fundamental; see Hall 2010). The set of fundamental entities would then not be the complete and non-redundant set of truthmakers. In fact, there would be no such set on this view: worldly truths would not be grounded in the mere *existence* of fundamental entities but also in something like '*how they are*' (for a very interesting moderate version of this view, see Dodd 2002). I am not completely unsympathetic to the basic idea here (see 2.34 below for some considerations that could be taken to support it, although I follow another course there). Nevertheless, I will adopt the standard truthmaking approach in this work.

Several necessary conditions can be given which a classification must meet in order to count as categorial. What is most well-known and most often recognized is that a categorial classification should be both *exhaustive* and *exclusive*, i.e., it should be a

[5] There are, however, at least two caveats about 'non-redundancy' here. First, it may be that there are no 'minimal truthmakers', i.e. truthmakers for some truth that have no parts or constituents which themselves are truthmakers for that truth. If this turned out to be the case, then either the 'fundamental level' of truthmakers would always be redundant because however one would restrict it, while retaining sufficiency, it would always have a further restriction that was also sufficient; or, alternatively, one would have to arbitrarily exclude some 'smaller' truthmakers, from some point onwards, from the 'fundamental level'. Second, as I will discuss further in 3.111 below, some entities that are 'redundant' in that they are not needed to *necessitate* truths may nevertheless have to be admitted (because they are in fact *not* 'redundant' in another sense of that term) when 'essential' or 'hyperintensional' considerations are taken into account.

[6] I say 'all the truths *about the world*' and not 'all the truths' in order to allow for there to be truths that have no truthmakers, e.g. the logical truths.

partition of what is classified: everything should have a category, and nothing should have more than one. A scheme of ontological categories should, first of all, have a place for everything (at least for every fundamental or basic entity); this is perhaps perfectly obvious: it just is the purpose of a scheme of ontological categories to classify 'everything' or all entities (again, at the fundamental level at least), and, as one writer puts it, it is in general an essential feature of good classifications or taxonomies that they 'subsume all the entities they purport to subsume' (Jansen 2008: 160). Category schemes often try to guarantee exhaustiveness by proposing to divide all entities by some sort of dichotomy (see e.g. Hoffman and Rosenkranz 1994: 14–16, Lowe 2006: 38–39, and Chisholm 1992: 1–2). Secondly, categories should be mutually exclusive or 'pairwise disjoint'. This condition is clearly met when categories are conceived, in the terms of the Aristotelian tradition, as the 'highest genera' that have nothing in common. But many contemporary category schemes in fact include 'higher' and 'lower' categories (see e.g. Hoffman and Rosenkranz 1994: 18, Chisholm 1992: 1), so that not all categories are 'pairwise disjoint' as some *include* others. Nevertheless, even in these systems all categories *of the same level of generality* are mutually exclusive; also, one may take the division at only one of the levels to be the properly 'categorial' one (so Lowe, for example, takes the division of entities into universals and particulars to be 'transcategorial' and not 'basic' (2006: 21)).

Another necessary condition that is not explicitly mentioned so often is that categories should be *essential* to their members (see at least Meixner 2004: 20). That is, nothing can, at least, change its category, nor could anything have been, counterfactually, of another category. The sense of essentiality involved in this formulation is, however, rather weak. I may note here that I believe it is in general advisable to use a stronger concept of essence. In particular, modal notions seem to be too coarse-grained to capture certain essential connections between entities (essential connections or essential relations will be much discussed in this work). The need for a stronger notion of essence has been illustrated by Kit Fine by means of the following example (see K. Fine 1994: 4–5): plausibly, Socrates and {Socrates} (i.e. the singleton of Socrates) have a mutual *necessary* connection, i.e. that necessarily, if either one of them exists then it is true that Socrates is a member of {Socrates}; but, on the other hand, it seems that they are not mutually *essentially* connected, in some important sense of 'essentially'; for (so Fine claims and it is indeed plausible) while it is somehow 'part of the essence' of {Socrates} to be related (by the

membership relation) to Socrates, it is *not* 'part of the essence' of Socrates to be conversely related to {Socrates}. The concept of essence that Fine introduces (or re-introduces; Fine takes himself to be following a traditional approach to essence) to solve such problems is one based on the idea of 'objectual' or 'real definition' (ibid.). Just as a linguistic definition says what an expression means, so a 'real definition' gives the essence or 'what it is' of an object (indeed, Fine believes that a linguistic definition is just a special case of a 'real' one: it gives the essence of a meaning; see ibid.: 13). Following such a notion of essence, then, we can say that the category of an entity determines an important part of its essence or 'what it is', or forms a part of its 'real definition'.

The idea of 'ontological category' as thus constrained forms the background to this work. In the first of the two central chapters I will look at the idea that ontology is concerned with certain (putatively) 'formal' notions; I will attempt to clarify what 'formal' is supposed to mean in this context. This idea in fact suggests an answer to the first question I put at the beginning: what ontological categories categorize 'by' are certain 'formal' features of entities. The 'formal' features of entities that ontology studies are frequently taken to be certain relations, the so-called 'formal ontological' ones. The second central chapter connects such 'formal ontological relations' more closely with categories and categorial distinctions. The chapter looks — through the example of one particular category system, the Ontological Square — at two different ways in which relations can assume a central role in a category system; on both ways the relations are taken to determine or 'generate' (a part of) the category system.

2. Ontological form

In this chapter, I will introduce the ideas of 'ontological form' and of 'formal ontological relation'. I will first examine one widespread view of the distinction between the 'formal' and 'material' in ontology that has also been applied to the analogous distinction in logic. I will then focus on what have been called 'formal' or 'formal ontological relations' and try, in particular, to extract a criterion for such relations from the literature.

2.1 Formal ontology and formal logic

Metaphysics or ontology is supposed to be a highly general, even the most general, sort of investigation into being or reality, and ontological categories, correspondingly, are supposed to be very general, or the most general, classes of entities. So far so good; but if one tries to derive from this a characterization of the subject-matter of ontology, or of the theory of categories, I don't think one will get anything very useful as a result. Generality admits of degrees and is thus often vague. Absolute generality is perhaps a different matter. But to characterize ontology merely as an investigation of the absolutely general features of reality seems to be in tension with the idea of ontological categories; for ontological categories, even if they are a very general matter, are yet not absolutely general, for their role is precisely to mark fundamental *distinctions* (see however the section below on topic-neutrality). Generality is without doubt a characteristic of the subject-matter of ontology; ontology does study something 'universal' and 'wide-spread' in reality. But the subject-matter of ontology is not, I think, constituted by its generality. One could take there to be a different sort of distinction at the bottom, distinction not between what is and what is not 'general', but one between '*formal*' and '*material*': ontology, the suggestion would go, is *formal ontology*.

One talks of 'formal ontology' in, roughly, at least two ways, depending on what 'formality' is supposed to be (these ways of understanding 'formal ontology' are nevertheless by no means incompatible). Perhaps most commonly today, 'formal ontology' refers to a theory of entities (e.g. the theory of entities as parts and wholes, or mereology) which is *formulated in a certain way*, namely 'formally' and axiomatically, using the resources of logic or mathematics (see e.g. Hofweber 2011, Sect. 4.3;

Cocchiarella 2007). Here 'formality' means the 'formality' of 'formal', artificial languages or of 'formal systems'. In another sense, one talks of 'formal ontology' as a theory, or as the discipline that aims at a theory, *of certain ('formal') aspects or 'moments' of entities*, whether formulated 'informally' or 'formally' (Husserl 1913a, 1913b, 1921, Ingarden 1964; see B. Smith 1978: footnote 11). What 'formal' aspects of entities are supposed to be is certainly less obvious than what 'formal' theories or languages are supposed to be. Nevertheless, it is the former, admittedly more obscure sense of 'formal ontology' that I primarily have in mind.

The 'formal' aspects of entities studied by formal ontology can be collectively referred to as *ontological form*.[7] But what are these aspects? What belongs to ontological form? To anticipate, I take ontological form to be at bottom a matter of certain relations between entities or structures formed by these. I will talk of *formal ontological relations* (as used in Lowe 2006, Chapter 3; also in e.g. Smith and Grenon 2004, Schwarz and Smith 2008, and Varzi 2010). Indeed, I suppose the question of 'ontological form' can be 'reduced' to the question of 'formal ontological relations'. To determine what belongs to 'ontological form', or what the formal 'aspects' of entities are, is to determine what relations between entities are 'formal ontological'. This will be one of my concerns in the last part of this chapter.

The idea of formal ontology, as the name suggests, is modelled on that of formal logic. Indeed, for Husserl — who originated the term — formal ontology was itself part of formal logic (Bell 1990: 94). For some more recent formal ontologists of Husserlian inspiration (e.g. B. Smith), as well as some of Husserl's students (e.g. Ingarden), though, formal ontology is a discipline distinct and independent from logic. This is how I will understand formal ontology here. A certain analogy between the disciplines nevertheless remains.

[7] The term 'ontological form' appears at least in E. J. Lowe (2006: 47–49, 2011: 105–6), David Woodruff Smith (2002, 2004: passim.), Barry Smith (1981, 2005), and Jan Westerhoff (2005: 228–29), although none of these authors uses the term very systematically. These authors also use the term mostly as a countable, instead of an uncountable or collective term as I do here: they talk mostly of 'ontological forms' of entities, states of affairs etc. In such a sense, the term 'ontological form' seems to refer either to particular *structures* of some kind, or in effect to the *categories* of entities (see, though, 3.2. below)

In what way is formal ontology (insofar as it is not just ontology that uses 'formal' methods) supposed to be a discipline analogous to formal logic? Well, what is formal logic? Why is it 'formal'? These are themselves controversial questions. Catarina Dutilh Novaes (2011), for example, distinguishes two groups of ways in which logic could be said to be 'formal': 'formality' of logic could mean that logic has to do with *forms*, in some sense, or it could mean that it has to do with *rules*. Insofar as formal logic is taken to be concerned with 'forms', what makes it 'formal' is that it somehow *abstracts from 'matter' or 'content'* (Dutilh Novaes 2011: 306). Formal as pertaining to rules, on the other hand, is a matter of *laws or norms and strict adherence to them*; its opposite is not 'material' or 'contentual', but '*informal*' (ibid.: 321). Now, whichever of these is closer to the truth about logic, it is at least clear that it is in the former sort of way that the 'formality' of formal logic is to be understood if formal ontology (as I understand it here) is to be modelled on it. For it is precisely the *formal-material* and not the *formal-informal* –contrast that is relevant here.

If formal ontology is taken to abstract 'forms' from 'matter' the question of course arises as to what the 'form'-'matter' –distinction is supposed to amount to in this case. Somehow, the relevant subject-matter — 'being' in ontology, language or 'thought' (perhaps) in logic — is supposed to divide into two parts, the 'formal' part and the 'material' part. But where does the line of demarcation go? What is distinctive of 'form' and what distinctive of 'matter' here? Given that 'form' is merely 'what remains once matter is removed' (Dutilh Novaes 2011: 306), the different options here can be surveyed by examining the different possible relevant senses of 'matter'. Dutilh Novaes again gives a useful inventory here. We are of course interested here in those senses which are relevant to ontology. According to Dutilh Novaes, 'matter' (in particular, of an argument) has been used in at least the following senses in logic: it has been used (1) of terms with an independent signification; (2) of the things referred to; (3) of the specific subject-matter in each case; (4) of intentional content; and (5) of meaning in general (ibid.: 306). It is obvious that (2) is relevant from our point of view. So is in fact (3). Dutilh Novaes takes (2) to be associated in logic with a corresponding sense of 'formality' as '*indifference to particulars*', i.e. as perfect variability in the entities referred to (ibid.: 306, 310–14). (3), again, is associated with a view of the 'formal' as what is *topic-neutral* (ibid.: 306). Interestingly, Dutilh Novaes claims that this sense of 'formal' is the one involved in the idea of 'formal ontology' (ibid.: 315–16). Although I do not think topic-

neutrality (as applicability to all subject-matters or 'domains') actually exhausts the senses of 'formal' in 'formal ontology' (however, I admit that the remainder — which involves 'formal' or 'formal ontological relations' in particular — is rather obscure), this is basically correct at least as a historical point. The idea that formal ontology is concerned with the topic-neutral ontological concepts has indeed been highly influential. In the next section, I will further examine the idea of topic-neutrality as a basis for distinguishing the 'formal' from the 'material' in ontology. In fact, I will also take 'indifference to particulars' as a species of topic-neutrality, for it is clearly a cognate idea, and has been so treated by other authors.

2.2 Topic-neutrality

Topic-neutrality, applicability to all subject-matter, would indeed seem to provide a promising way to understand the characteristic 'formality' of formal logic, and perhaps that of formal ontology as well, and thus perhaps to give us a criterion for demarcating both logical and ontological form from their respective 'matters'. But how, precisely, is 'topic' or 'subject-matter' to be understood here?

It seems there are at least two ways to understand these rather vague expressions in this context. 'Topic' and 'subject-matter' could be taken to refer to single *entities* — 'topic-neutrality' would then mean applicability to *any entities whatever* (this is, in effect, 'indifference to particulars'); or, alternatively, the expressions could be understood, perhaps more naturally from the point of view of ordinary usage, to refer to something like *domains* of entities (like the 'subject-matter' of psychology, physics etc.).

In the philosophy of logic, these two ways correspond, more or less, to the two approaches to topic-neutrality John MacFarlane (2009, Sect. 4) distinguishes. One approach takes topic-neutrality as 'indifference to the particular identities of objects' (*loc. cit.*). Examples of topic-neutral and thus supposedly logical expressions in this sense include the predicates 'is a thing'[8] and 'is identical with'. These predicates, as MacFarlane says, 'do not distinguish between *any* two particular objects' (*loc. cit.*; original italics); that is, one

[8] If you think 'thing' sounds too much like the name of a particular category here, replace it in your mind with 'entity', 'something', 'item', or whatever you think is the absolutely universal predicate, with the universal class as its extension

cannot make any distinctions between entities on the basis of them. Take any two entities or pairs of entities: the predicates ‘is a thing’ and ‘is identical with’ will apply to them with perfect ‘symmetry’ — the way they are true or false of the one, they are true or false of the other[9]. Thus these predicates are clearly different from a predicate like ‘is a dog’ which does make a distinction, between dogs and non-dogs, among entities. As MacFarlane notes, one can give a precise mathematical formulation to this idea of topic-neutrality, in terms of *invariance under arbitrary permutations of objects in a domain* (see Tarski 1986; see also MacFarlane 2009, Sect. 5).

It bears noting that ‘topic-neutrality’ in this first sense does *not* mean that a ‘topic-neutral’ predicate would be ‘applicable’ to absolutely everything in the sense that it would have to be *true* of absolutely everything. While the predicate ‘is a thing’ is obviously true of absolutely everything, the predicate ‘is identical with’, on the other hand, is obviously not so. ‘Is identical with’ is nevertheless permutation invariant. There are two basic possibilities as to truth in the application of this predicate. Either it applies to one single entity and it is true of it; or it applies to two distinct entities and it is false of them. In the first case, every permutation, as a one-one mapping, retains the truth, for it merely switches the one identical entity to which it applies. In the second case, every permutation (again because it is a one-one mapping) merely exchanges the two entities for another pair of entities (it need, of course, merely exchange the two entities for each other) and so the predicate is still false of its arguments. We can also note here that (binary) relations or relational predicates that are ‘topic-neutral’ in this first sense are one and all symmetrical.[10]

Another approach to the topic-neutrality of logic MacFarlane mentions is through what *he* calls just ‘universal applicability’ (MacFarlane 2009, Sect. 4), but which could perhaps more precisely be called *application to reasoning in any discipline*. On this approach, the expressions of arithmetic and set-theory — like ‘is a number’, or even ‘is prime’, and ‘is a member of’, which on the previous approach are topic-specific, because they make distinctions among entities — turn out to be topic-neutral, because they are plausibly

[9] I limit myself to predicates here because they are most relevant to what I am doing here, and disregard the ‘topic-neutrality’ of e.g. quantifiers and connectives

[10] In fact, there are only four binary relations (on individuals) invariant under all permutations: the ‘universal’ relation, the ‘empty’ relation, identity, and difference (Tarski 1986: 150).

relevant to any discipline or to discourse about any domain (anything whatever can be counted or gathered into sets) (*loc. cit.*)

Now, without bothering about whether these ideas could actually provide any solution to the problem of the demarcation of formal *logic*, let us look at their significance for the analogous problem in formal *ontology*. There is no doubt that 'topic-neutrality' in some sense has been thought to be of importance to the characterization of formal ontology. Husserl already said of the concepts of formal ontology that they are 'independent of the specificity of all material of knowledge' and that every other concept must be subsumable under them (Husserl 1913b: 244). Several contemporary formal ontologists, again, invoke topic-neutrality, now often under that very name (see e.g. Mulligan and Smith 1986: 118, Varzi 2010, Correia and Keller 2004). But how, again, should 'topic' etc. be understood?

'Material of knowledge', which is Husserl's equivalent of 'topic' in the passage cited above, is certainly not any less ambiguous a term. So which concept of topic-neutrality would have been more relevant to Husserl's idea of formal ontology? A glimpse at some of the items listed as 'formal objectual categories' by him at the same place (e.g. *object*, *state of affairs*, *relation*) (Husserl 1913b: 244) would seem to confirm (with the apparent exception of object) that it is not the first sort of topic-neutrality that is involved — at least if we interpret 'category' as meaning some sort of kind or type of entity, as we are obviously wont to do. But probably we shouldn't in fact take the word in such a sense here. These 'categories' would then perhaps rather be 'independent of the specificity of all material of knowledge' in the sense that anything whatsoever will be — not a state of affairs, obviously — but *the subject of* or *involved in* a state of affairs; and similarly, anything at all will, plausibly, be *related* or at least *relatable* to something. Whether this interpretation makes the topic-neutrality involved of the first sort depends then on whether relations, states of affairs etc. are themselves entities included in the range of 'anything', and on whether the 'categories' will then apply in a different way to those entities that are e.g. relations and the other entities that merely stand in relations.

Barry Smith, on the other hand, would seem to interpret Husserl as advocating a view of formal ontology that rather follows something like the second concept of topic-neutrality (according to which 'topic' means something like 'subject-matter', rather than simply 'entity'). He says the structures of Husserl's formal ontology are '*domain*-independent'

(2005: 156; my italics), that they are realized by objects in 'all material *spheres or domains of reality*' (1998: 19; my italics). Now, in fact, the distinction between the two concepts of topic-neutrality would seem to be somewhat obscured when brought into the Husserlian context, because, for Husserl, *entity* (or 'object') and *domain* (or 'region of objects') in a sense *coincide*. Formal ontology studies the 'form of region in general' — the 'form' that is common to all the different 'material' regions, like *physical nature* —, but this, again, is equivalent to the 'formal essence of object in general', to which 'belong' the 'formal categories' (like relation or state of affairs) (Husserl 1913a: 21). 'Object in general', we might say, *involves* the 'form' of a whole 'region'. While Husserl does call relations, states of affairs etc. 'objects', yet he also thinks they must be seen as mere 'modifications' (*Abwandlungen*) of what he calls the 'primary object' (*Urgegenständlichkeit*); for example, in the region of physical nature, the material '*things*' are the primary objects in relation to which everything else in that region (the material properties, relations etc.) is merely 'derivative' (loc. cit.). Thus, it seems, if the 'primary object' is the only proper 'object' or entity — which does not seem too hazardous an inference to draw from the way Husserl's talks of relations, states of affairs, and the rest — then topic-neutrality as applicability to all entities would seem to coincide with topic-neutrality as applicability to all domains or material 'regions'.

Among contemporary writers, some make clear that a 'topic-neutral' concept in formal ontology is one 'under which can fall objects of any kind', e.g. objecthood, existence, and identity (Correia and Keller 2004: 276), or that in formal ontology one looks for 'relations that are topic-neutral and *take absolutely all possible objects as arguments*' (Varzi 2010: 6; my italics). Sometimes, again, something more like the second concept of topic-neutrality seems to be involved in the characterization of the formal ontological. Simons (2009: 144, 147), for example, uses the term 'domain-neutral' instead of 'topic-neutral', and some of his examples of relations of this kind (e.g. causation) certainly do not seem to take absolutely anything as their possible arguments. D. W. Smith, again, gives as an example of a formal ontological distinction Descartes' one of substance and attribute; this distinction, Smith says, was supposed to apply to '*any* substantive or material domain of entities' (D. W. Smith 2004: 256, italics in the original). But, as we might add, it on the other hand cannot apply to everything *within* these domains, but its purpose, of course, is precisely to distinguish between the substances and the attributes proper to them.

Which approach to topic-neutrality holds more promise in providing a criterion for demarcating 'ontological form'? While I am not sure — unlike, perhaps, some of the writers cited above — that topic-neutrality in any sense should be taken as the guiding idea in formal ontology, the second concept certainly seems to me better suited to the task. The reason is that I believe fundamental categorial distinctions should be included in the subject-matter of formal ontology[11]. It is obvious that the first concept of topic-neutrality, designed as it precisely is to exclude notions that would make any sort of distinction among entities, cannot exhaustively characterize the subject-matter of a discipline that aims, among other things, at classifying entities by studying their fundamental differences. On the other hand, the second concept merely excludes those notions that are restricted to certain well-defined 'regions' or 'spheres' of being, e.g. the physical or the mental. Plausibly, many at least of the traditional categorial notions — like universality, particularity, or substantiality — would thereby count as topic-neutral, because they are at least supposed to be applicable in the categorization of entities from any material domain whatever. I would nevertheless not put too much weight on even this second sort of topic-neutrality as a characteristic of ontological form. In addition to being somewhat vague, the idea of 'region' or well-defined non-arbitrary material domain will do no work if it turns out that there is only one such 'region'. In fact, as we are concerned with 'fundamental' entities and their categories here, it would be enough if only one 'region' would turn out to be fundamental. And at any rate, if some domains are dependent on others (as e.g. the mental on almost any view is somehow dependent on the physical) it will at least be unclear whether the notions applicable to one will be applicable to another because the latter is dependent on the first.

While I would thus say that neither concept of topic-neutrality is likely to provide a satisfactory general way to distinguish ontological form from 'matter', both concepts may still find a place in the explication of at least some aspects of ontological form. The first concept of topic-neutrality can be taken to demarcate *something* important, even if what it demarcates is — in the case of *ontological* form at least, if not perhaps in that of *logical* form — not *all* that should be demarcated. *Identity* and *difference*, for example, can be considered important formal ontological notions (see e.g. Lowe 2006: 48–9), even if they

[11] Note that the ontological concepts characterized by the first sort of topic-neutrality are not excluded from formal ontology by endorsing the second one; for, plausibly, concepts which are topic-neutral according to the first are topic-neutral according to the second as well (but not vice versa).

are very far from exhausting what belongs to ontological form. The second concept, too, may at least provide something of an informal guide to tracking down formal ontological notions though the 'topics' or 'subject-matters' of the different sciences.[12]

2.3 Characterizing formal ontological relations

If the subject-matter of formal ontology, then, is not simply constituted by the topic-neutral (in any sense) ontological notions, we will have to look elsewhere for a characterization. In this section, I will concentrate on *formal* or *formal ontological relations* and their characteristic features. Such relations are a crucial part of ontological form; arguably, together with categories at least, they exhaust it.

Although formal or formal ontological relations have indeed been frequently characterized as topic- or domain-neutral (see e.g. Mulligan and Smith 1986: 118, Varzi 2010: 6), other ideas have been involved as well. I will look into three notions closely associated with formal ontological relations. The idea of formal ontological relations characterized in terms of these will fully accommodate 'categorial relations' as well.

2.31 Informal characterizations

The terms 'formal relation' and 'formal ontological relation' are used rather 'informally'. No extended systematic treatment of this type of relation, that I am aware of, exists; what one mostly finds are lists and accounts of such relations in the context of a particular ontological system (e.g. B. Smith 2005, Sect. 19; Lowe 2006, Chap. 3), or inventories of candidate ones (Simons 2010, 2012). Yet the idea that there are 'special' relations that ontology must take into account is much more common than the terms 'formal' or 'formal ontological relation'. Universal realism, as is commonly recognized, must give an account of 'exemplification' or 'instantiation', and one that respects the unusual features of this relation (see e.g. Vallicella 2000 for an overview of these issues); trope theory, another mainstay of modern ontology, must similarly give an analysis of the crucial relations of

[12] The 'plausible self-applicability' of 'formal ontological relations' discussed below (2.32) can also be taken to be a sign of something that is at least akin to topic-neutrality.

resemblance and ‘compresence’ (see e.g. Maurin 2002, Sects. 5.3, 6.3, 6.4). It is likely that every adequate ontology or system of categories will be required to give in such a way, not simply a list of ‘what there is’, but also a list and an account of the formal ontological relations between entities — an account of ‘how beings are’, as Lowe puts it (2006: 48). Indeed, in the next chapter I will explore the idea that ontological categories could be somehow defined in terms of such relations.

Can one give a general, ‘neutral’ characterization of formal ontological relations, not tied to any particular ontology? Before any real explication is attempted (in the next three sections), we may point at a general (extending farther than merely to formal ontological relations) intuitive difference there seems to obtain between certain relations, or, in general, predicates, concepts etc. *Identity*, *part-of* and *object* are intuitively ’empty’, ’schematic’ and ’contentless’ notions, while *love, parent-of* and *dog* are not so, but seem to have ‘qualitative content’, in a way in which the previous three do not. This difference could, not unfittingly, indeed be called one between ‘formal’ and ‘material’ notions. Kevin Mulligan (1998) has talked of a similarly intuitive difference between *‘thin’* and ‘*thick*’ concepts.[13] One might think that such intuitively ‘formal’ or ‘thin’ notions are simply the topic-neutral ones (the three examples I just gave certainly seem to be topic-neutral, in either of the senses distinguished above). But according to Mulligan, at least, ‘thinness’ does not coincide with topic-neutrality (he seems to consider only the first sort of topic-neutrality, though) (1998: 347–48). At any rate, ‘thinness’ and topic-neutrality seem to be conceptually independent.

So what examples can we find of such relations? Mulligan (1998: 342) gives the following list: *identity, resemblance, greater than/lesser than/same as, distance, dependence, entailment, justification, exemplification*. He also gives the following as relations of which it is ‘hard to tell’ whether they are ‘thin’ or ‘thick’: *occupation, location, parthood* (ibid.: 341). Here we can ignore justification and entailment, for even if they are ‘thin’ or ‘formal’ relations, they are not ontological ones — they are not relations between entities in general, but only between propositions or other ‘truthbearing’ entities. We may compare Mulligan’s list with some lists of formal

[13] One finds in Ryle (1960: 118) a somewhat similar distinction between ‘full-blooded’ and ‘meatless’ concepts. The latter are according to him the concern of the formal logician, and the only examples he gives are paradigm logical constants (‘not’ and ‘some’).

ontological relations given by other authors. Lowe gives the following: *identity, instantiation, characterization, exemplification, constitution, composition, dependence* (2006: 34); Barry Smith tentatively lists the following 'formal ties': *identity, parthood, instantiation, inherence, exemplification, existential dependence, is-a-subkind-of, temporal precedence, participation (in an occurrent), is-an-agent-of (-an occurrent), realizes (a function)* (2005: 168); the following relations, again, can be gleaned from Simons (2012: 134–37): *exemplification, dependence, part-whole, occupation, determination, numerical difference*. As can be seen, there is quite a bit of overlap.

Let us look at some of these relations. *Identity* (or *difference*) is found in all four lists. If identity is a relation at all, it is certainly a 'thin', 'formal' one. Lowe even takes identity to be something of a paradigm of a formal ontological relation, a 'model' for the rest, because of its clear status as a 'metaphysically necessary condition' of entities (he also points to its 'lack of content' as a 'reflection' of its formality) (Lowe 2006: 48–49). Again, mereological (*parthood, composition*) and 'predicative' relations (*exemplification, instantiation, characterization*) are included in all (although Mulligan hesitates with parthood). So are *dependence* relations. Spatiotemporal (*distance, occupation, location*) and comparative relations (*greater than, less than, same as, resemblance*) occur more sporadically. One reason for the fact that resemblance is not found in Lowe's and Smith's lists is certainly that Lowe and Smith, unlike Mulligan and Simons, are both universal realists and thus have no obvious need for the relation in their ontologies (Simons perhaps does not include resemblance or similarity because he thinks it is a mere 'auxiliary', non-ontological notion (see Simons 2012: 135)). Mulligan's hesitation with counting parthood, occupation, and location as 'thin' seems to be due to the fact that these relations are not easily taken as *internal*, i.e. as supervening on or following from their relata. Internality is Mulligan's preferred way to account for the 'thinness' of relations (I will consider internality in 2.33 below).

Several so-called 'formal relations' are sometimes thought not be 'relations' at all, or to be at most something like 'pseudo-relations', not relations properly speaking. Peter Strawson, for example, spoke of the predicative connection ('assertible link'), tellingly, as a 'non-relational tie' (Strawson 2002: 167). 'Exemplification' and the like predicative 'relations' are often taken to consist in something like the application of a function to arguments and for that reason not to be proper 'relations' (see e.g. Long 1982). The classic

example of a 'pseudo-relation' is identity. Perhaps most famously, Wittgenstein said that '[i]t is self-evident that identity is not a relation between objects' (TLP 5.5301). We will later see more examples of, and also some reasons for, such 'deflationism' with respect to 'formal relations'.

It is also a peculiarity of several 'formal relations' that they seem to relate 'formal relations' themselves as well. Identity is the obvious example: after all, we can e.g. count 'formal relations'. Another, according to Mulligan, is *dependence*. As Mulligan says, '[e]very internal relation involves dependence but dependence is itself an internal relation' (as are, according to Mulligan, the rest of his 'thin relations') (1998: 345) — in other words, dependence will *apply to itself as well*. This brings us in fact to the first candidate criterion of 'formal relations' in ontology.

2.32 Self-applicability and 'regress-proneness'

There is a well-known fact about exemplification[14]. Exemplification is supposed to 'connect' or 'tie together' a subject-entity and a property, or several entities and a relation; once it has done so, the entity will have the property or the several entities will stand in the relation, and the corresponding predications will be true; indeed, the entities and the properties and relations are supposed to be connected together and the predications are supposed to be true only if it has done so. But, to all appearances at least, exemplification is itself another relation in need of 'connecting' or 'tying together'. A moment's reflection will reveal that, unless one can find some reason to think that at some stage no more 'connecting' is needed, it will go on *ad infinitum.*

What does this fact tell us about exemplification? First, it seems to tell us that if exemplification cannot perform its explanatory role (of explaining why, or rather how, a thing has a property or some things stand in a relation) without being itself exemplified, it will be impossible for it to perform it; second, it shows us that it is in general not implausible for exemplification to apply to itself. Call the first feature of exemplification

[14] I will use the term 'exemplification' of the contingent 'tie' connecting universals and particulars which is discussed by the classics of analytic ontology, like David Armstrong (e.g. 1989, 1997) or Gustav Bergmann (see e.g. his 1967). This is also often called 'instantiation', but I reserve this term for a different, non-contingent connection discussed e.g. by E. J. Lowe.

the regress appears to reveal *self-connection*, and the second *self-applicability*. Both features make a relation *regress-prone*, one that tends to generate a regress, but only the first at most will guarantee that the ensuing regress is a vicious one. Self-connection is a stronger feature, and entails self-applicability: in order to connect itself to itself, a relation must apply to itself, but it need not, and usually does not, apply to itself as self-connecting. That is, it need not apply to itself *in virtue of itself* (or in virtue of the same sort of relation, or relation from the same 'family'), as exemplification does. Indeed, if one takes there to be a relation of (relational) exemplification, that will be the only self-connecting relation one is likely to have any need for.

Self-connection is in fact not the only type of explanatory (and thus vicious) self-application, only the best known one. Another is involved in the resemblance regress argument attributed to Russell (or to Guido Küng) (Russell 1940: 346–47, Küng 1967: 68–9, Campbell 1990: 34–7), in which a regress of resemblances of resemblance relations (as particular relational entities or tropes) is used to argue for universal realism (at least with respect to resemblance relations). The viciousness of the regress seems to arise from taking the 'content' of resemblance relations (their being resemblance relations) to be given 'from the outside' by their mutual resemblances, the 'content' of which is again given in the same way. This leads to the relations never receiving any determinate nature and thus to their being unable to perform their explanatory role (of explaining the resemblance of entities). Another example of explanatory self-application seems to be pointed out by Simons (2010: 206-7): if causing itself were caused (which is at least not immediately absurd, even if motivation for the idea may be hard to find), there would be an infinite regress of intermediary 'causings', so that the causal connection between the original cause and effect would never be achieved. Indeed, Simons uses this to argue that causation is a 'formal tie' (loc. cit.).

As already said, not all self-applicable relations apply as somehow explaining their own 'operation'. Spatiotemporal relations, for example, could be taken to apply to themselves: e.g. a location relation could itself be located; a temporal precedence relation could temporally precede something (or at least it does not seem immediately absurd to think so). There is no doubt that such a view will lead to problems (Where precisely would a location relation be located? Would temporal precedence be between what precedes and what follows?). The point is, though, that among these problems are apparently not

included unachievable explanatory tasks, as in the two examples of self-applying relations from the previous paragraph. Unless location, for example, is taken as a connecting relation (perhaps it could be made to do the work of exemplification, for example), there seems to be no way to take it as somehow applying to itself in virtue of itself (at least, I can think of no other such explanatory role for it). A regress certainly seems to ensue — 'higher-order' location relations will apparently be themselves located — but the location facts of different 'orders' will be independent from each other, at least in the sense that location facts lower in the hierarchy will not obtain in virtue of those higher up: for example, if location relation L1 is located (by L2) in l, this obtains just in virtue of whatever it is that connects L2 with L1 and l; the location of L2 (by a further location relation L3) does not enter into it. Other examples of conceivably self-applying relations include parthood (the parthood relation could be a part, e.g., if relations are parts of states of affairs and parthood 'facts' are themselves states of affairs) and dependence (this latter was already mentioned in the previous section and something more will be said about it in the next one). Resemblance, too, can on an alternative view be taken to be 'harmlessly' self-applying: resemblance tropes could be taken to resemble each other, but not so that they would receive their 'nature' from these resemblances; all resemblances could be taken to supervene on the prior 'natures' of the resembling items. There would still be a regress but it would apparently be a non-vicious one (see Campbell 1990: 37 for this view of resemblance).

As the examples above show, formal ontological relations seem to be often *prima facie* plausibly self-applicable. Now, I say '*prima facie* plausibly', because the ensuing regresses, at the very least (there are other reasons as well, as we have seen), certainly tend to provide a reason to in the end reject self-application. Yet formal ontological relations seem at first blush to be ontologically construable in such a way that they can be conceived to participate, as entities, in the types of ontological structure they themselves constitute. Thus it is at least not immediately absurd to ask e.g. about the spatiotemporal or causal status of formal ontological relations — including spatiotemporal or causal relations themselves. By contrast, such self-applicability does not seem to be at all plausible in the case of 'material' relations: to take motherhood to be a mother or a child or a collision to collide with something would of course be straightforwardly absurd. These relations are not 'formal ties' belonging, so to say, to the groundwork of reality. Simons talks of 'metaphysical bedrock'; he says it is a sign that

we are close to this 'bedrock' when 'the same questions keep arising about the basics as we use the basics to explain' (Simons 2012: 138). Such questioning leads of course to regresses, even if not necessarily to vicious ones (loc. cit.). Simons' point cannot be taken to be that these relations actually do generate regresses; he does not seem to think that the questions are really legitimate when asked about the 'basics'. He thinks the relations should be understood as internal, which (for him) means they should not be considered to be entities of any kind (loc. cit.). A 'basic', 'formal' relation should, then, not be understood as something which can belong to its own range of application (see, on the other hand, Lowe 2006: 51; Lowe thinks that one can take 'formal ontological relations' to relate 'formal ontological relations' despite their being 'non-entities'). Yet it remains true, that *if* we were to take relations like exemplification or resemblance to be entities, questions about their own exemplifications or resemblances would be (at least on certain ontological construals) legitimate, even obligatory (as, arguably, in the case of exemplification at least), and we would meet with infinite regresses. One could call this, alluding to Simons, the 'bedrock effect': when a relation tends to apply to itself, when the 'effect' is manifested, it is (probably) a 'basic', formal ontological relation.

The 'self-applicability' criterion certainly has its limits. For example, are '*greater than*' or '*less than*' plausibly 'self-applying'? That is, can they be ontologically construed as entities that have a 'magnitude'? I don't think this question has a clear answer. What it means that a relation 'can plausibly' (at least at first blush) be applied to itself (or to a relation of the same sort) is also not very clear. Nevertheless, tendency to generate infinite regresses when taken with ontological seriousness is, as is well known, an important feature of 'predicative' relations and, as is perhaps less well known, of several other sorts of relations as well, and this feature would seem to be due to the 'basicness' and 'bedrock' nature of the relations. But whether this feature is in any way constitutive of the supposed 'formality' of 'formal relations' I take to be doubtful.

'Regress-proneness' of relations motivates attempts to analyze them as *internal* or as *lacking ontological status* (we have seen that Simons does just this), so that no vicious regresses arise (e.g. Lowe 2006: 111, B. Smith 2005: 168). Internality and lack of ontological status seem to be often confused — and understandably so, for internal relations can easily be eliminated (see Mulligan 1998: 349–50), so that it may seem that lack of ontological status simply follows from internality — but I will treat of them

independently in what follows. Indeed, mere internality does not get rid of all regresses as such, only of vicious ones, as we will see. This is due to the fact pointed out in the last section: that internality involves dependence and dependence itself is a relation, even if an internal one.

2.33 Internality

The term 'internal' has been used of relations in more than one sense (for example, in his classic treatment of the 'theory of internal relations', A. C. Ewing (1934: 117–42) lists no fewer than ten different senses of 'internal relation'). Here the term will be applied exclusively to those relations that *supervene on or follow necessarily from the existence of their relata*[15]. The opposite of 'internal' is, of course, 'external'. Correspondingly, those relations are 'external' which do not obtain merely in virtue of the existence of their relata, but — from a truthmaking point of view which I adopt here — require the existence of something additional to them.

'Formal' relations are commonly taken to be internal (e.g. Lowe 2006: 46, 167, Simons 2012: 137–38). They are also said to 'come for free' and not to 'add anything to being' (Smith & Grenon 2004: 287). Indeed these two views usually go together. Thus Simons says that in fact '[i]nternal relations are badly named', because 'there are no such things' (2012: 138)[16]. But strictly speaking, internality as such simply means that once you have the relata, you have the relation obtaining between them. The relation can very well still be an entity of its own — only, it will be such that its relata are (together) *dependent* on it and it is itself dependent on its relata (as in Mulligan 1998). Now, of course, what reason one might have for taking there to be such supervenient, dependent relational entities is a different question (one possible reason is given below).

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[15] One of the first clear formulations of this sense of 'internal relation' is to be found in Moore 1919. More recent examples are to be found in e.g. Armstrong (1997: 87) and Campbell (1990: 110–13). The present sense of 'internal relation' could also be taken to be a restriction of a more general sense. Those relations are also often called 'internal' which supervene on the (intrinsic) properties, both essential and accidental, of entities (see e.g. Armstrong 1978: 85, Lewis 1986: 62). The 'internal relations', in the sense I have in mind, would then be those relations which supervene on the *essential* (intrinsic) properties of their relata (I take it here, in effect, that there are no non-existent entities).

[16] It seems that a 'no addition to being' claim could also be interpreted, not as a claim to the effect that something does not exist, but rather as a claim that something is what David Armstrong calls an 'ontological free lunch' (e.g. 1997: 12–13). If a relation is taken as such a 'free lunch', then it can be said to exist, but not as something 'extra', not as a distinct entity.

The concept of dependence or of *ontological dependence* calls for a short introduction, particularly as it figures repeatedly in this work. I will take ontological dependence to be a relation between entities; thus, I will not e.g. take truths to 'depend' (in the relevant sense) on their truthmakers or on other truths. The basic, minimal notion of ontological (existential) dependence can nonetheless be glossed with some sort of *necessitation*: x depends on y if and only if x necessitates y — i.e. if and only if *given that x exists, y must also exist.* Depending on the type of dependence, what replaces 'y' here can refer specifically to a particular entity (*specific* or *rigid* dependence) or just generically to an entity of some specified type (*generic* dependence). Thus e.g. a (non-empty) set, because of its extensional identity conditions, rigidly depends on its members[17]; a so-called Aristotelian universal, on the other hand, depends only generically on what exemplifies it: it must have *some* exemplifier or other (of a certain sort), but which individual entity or entities exemplify it is not determined. Dependence can also be *mutual*, or it can go in just one direction ('*one-way*' dependence). There are many other distinctions to be drawn between kinds of dependence, but these will be enough for our purposes at the moment (see Correia 2008, Tahko and Lowe 2015.)

Let us reformulate the characterizations given earlier of internal relations so as to make the connection with ontological dependence stand out clearer. Relation *R* is internal to *x* and *y* if and only if the existence of *x* and *y* (together) necessitates the obtaining of the relation *R* between them[18]. It is to be noted that what is necessitated here is '*obtaining*', not *existence* — at least not explicitly. Thus it may seem that one cannot actually have here a case of ontological dependence. But, in fact, one can take the obtaining of *R* between *x* and *y* to be explained by or grounded in, or take the corresponding truth to be *made true* by, the existence of an entity. Mulligan in his (1998), for example, takes that entity to be in each case a relational trope — i.e. a particular, non-repeatable relational entity. In such a case one will then have an ontological dependence between *x* and *y*

[17] Unless, of course, the members of a set can be nonexistent, and one can make sense of nonexistent entities. Even then there would still be dependence, only it would not be existential. The hyperintensional concept of essence I briefly described in the Introduction can be used to define an existentially neutral concept of dependence (see K. Fine 1995b).

[18] Here internality is formulated as *relative to* something, but usually one just calls relations internal *simpliciter*. What one then means, in effect, is that the relation is internal to whatever it is true of. Most examples at least of internal relations are indeed *always* internal. The relations I will discuss are also dyadic; I will ignore relations of higher adicity. But what I say can easily be generalized, I suppose, to cover such relations as well.

together and the truthmaker. On the other hand, we can also see here again why it is so easy to slip to some sort of reductivism or eliminitavism with respect to internal relations. For if the existence of *x* and *y* directly necessitates the obtaining of the relation *R* between them, why take there to be such a mediating relational entity? If one takes truthmaking itself to be necessitation, one has indeed probably little reason to believe in internal relational entities. But it is in fact controversial whether truthmaking is necessitation or something stronger (see e.g. MacBride 2014). Now, if one takes truthmaking to be, for example, an explanatory *in virtue of* –relation (as e.g. Gonzalo Rodriguez-Pereyra does in 2002: 32–35), then the internally related entities *x* and *y* perhaps do not themselves make true the relational predication (even if they necessitate it), because they are not themselves relevant enough to it; thus truthmaking may in fact require a relational entity even in cases of internal relational predication (cf. Rodriguez-Pereyra: even if Socrates is essentially human, 'what the proposition that Socrates is human seems to be true in virtue of is that Socrates is human, not just Socrates himself' (2006: 192); see also 3.111 below).

Internal relations seem to be an antidote to vicious regresses because, as already pointed out, plausibly, only those regresses are vicious which arise as a result of an attempt to ground or explain something, and the obtaining of internal relations (or the 'connection' of an internal relational entity to its subjects) need not be grounded in anything additional to the related entities themselves; thus the exemplification regress, for example, can be blocked by making exemplification into a trope internally connected by ontological dependence to the entities it 'connects' (the property or relation and its subject(s))[19]. On the other hand, if dependence relations themselves are taken to be entities along with the rest of internal relations, then regresses in general are not blocked: the exemplification trope and its relata, for example, will necessitate the existence of a dependence trope between them, and this along with its relata another one, and so on. We certainly have here a reason not to take internal relations, or at least not all of them, to be entities, because such a regress of relational entities is at the very least 'uneconomical', even if it does not seem to be vicious[20].

[19] A solution like this to the exemplification regress is proposed by Luc Schneider (2013: 427–31), and Anna-Sofia Maurin (2012: 802–3), for example. One also can, of course, take the exemplified property or relation itself to be such a trope instead.

[20] That infinite regresses in which each stage follows from the previous one are not vicious seems at least to be the common opinion. For example, the truth regress, which is of this sort, is usually thought to be benign (e.g. in Armstrong 1997: 119).

Is internality a universal characteristic of formal ontological relations? It would not seem to be, although many candidate formal ontological relations are indeed plausibly internal (e.g. identity, dependence, and, in certain cases, resemblance). For not *every* 'formal ontological' relation is plausibly internal. An example of a clearly 'formal', but plausibly 'external' relation is *exemplification* (even if it is not 'purely' external, see below). Moreover, not every internal (ontological) relation is plausibly 'formal ontological'. For example, *color-similarity* (between e.g. color tropes, or entities that have their color essentially), while it may have a 'formal' 'core', is at least partially 'material'.

There is another important connection between ontological dependence and certain sorts of internal relations that must be pointed out here. Even if we don't take internal relations to be ontologically dependent relational entities (or grounded in such), ontological dependence is still in many cases intimately involved in the internality of a relation. There seem to be many relations the obtaining of which is in each case necessitated not merely by the existence of both of the related entities *together*, but already by the existence of one or the other *on its own*. This means, in effect, that there is necessitation, i.e. ontological dependence, between the relata themselves, for the relation cannot obtain if both of its relata do not exist. Ontological dependence (the rigid variety) is itself an example of such a relation, but there seem to be other examples as well. The relation of 'inherence' or '*characterization'* between a 'non-transferable' trope and its subject, for example, is necessitated by the existence of the trope and the subject together, but the existence of the subject, moreover, is necessitated by the existence of the trope (see Lowe 2006: 37); thus 'characterization' is associated with a relation of rigid 'one-way' dependence, between the trope and its subject, in that order.

Ingvar Johansson has called those internal relations that are associated in such a way with rigid mutual dependence '*strongly internal'* (Johansson 2014: 233; see also Clementz 2014)[21]. He leaves open the possibility that one could also count in relations associated

[21] In an earlier work, Johansson calls these same relations simply 'internal', other internal relations (in the usual terminology) being referred to as 'grounded relations' (Johansson 1989, Chapter 8). Karen Bennett, too, discusses a very similar sounding variant of the internality of relations which she calls '*superinternality'*: '*A superinternal relation is one such that the intrinsic nature of only *one* of the relata — or, better, one side of the relation — guarantees not only that the relation holds, but also that the other relatum(a) exists and has the intrinsic nature it does' (Bennett 2011: 32).

with mere ‘one-way’ dependence (2014: 235); on the other hand, the dependence he talks of is always rigid. It is easy to understand why this is so: no obtaining of a relation between the particular entities *x* and *y* can be necessitated on the basis of generic dependence alone, for, although *x* may generically depend on a *type* (by requiring *something* of that type) of which *y* is a token and vice versa, there will not, it seems, thereby be any necessary connection in which *x* and *y themselves* are *together* involved. Thus, although the thing alone may indeed necessitate the obtaining of a relation between itself and *something* else on which it generically depends (i.e. it is necessary that, if *x* exists, there is a *y* such that *xRy*), this sort of necessitation will not make the relation ‘internal’, at least not in the sense in which the term has been used here and in which it is generally used.

In a sense, though, such relations are not purely ‘external’ either, for there is indeed necessitation between relata and relation, even if it is not necessitation of any particular relational connection between specific entities. The exemplification connection mentioned above, for example, is often taken to be governed by what is in effect mutual generic dependence (‘Principle of Instantiation’; see e.g., Armstrong 1978: 9): particulars must exemplify some universal or other, and universals must be exemplified by at least some particulars. Yet the particular combinations of universals and particulars are not thereby fixed. What is fixed is merely, so to say, the combinatorial ‘space’ in which particulars and universals must be ‘located’: a particular must be ‘somewhere’ in the ‘space’ of combinatorial possibilities constituted by the universals, and a universal, similarly, ‘somewhere’ in the ‘space’ constituted by the particulars (Wittgenstein would seem to be describing ‘generic dependence’ through such a metaphor in a passage from the Tractatus: ‘A speck in the visual field, though it need not be red, must have some colour: it is, so to speak, surrounded by colour-space’ (2.0131; Pears-McGuinness translation)). Although a relation like exemplification behaves in an importantly different way from a relation like characterization, so that the latter but not the former can be considered fully ‘internal’ in the sense of ‘necessitated by the existence of its relata’, what is common to both is that they *involve ontological dependence*.

Relations associated with or involving dependence, whether rigid or merely generic, are, I believe, relevant to the issue of fundamental ontological categories. In the next chapter, I will in fact look at how ontological categories could even be defined or ‘captured’ in

terms of such relations. But it may seem that to attempt to understand fundamental ontological categories through basic ontological relations is misconceived. For relations like characterization and exemplification would seem to be themselves simply definable in terms of categories and dependence relations (and, in the case of a 'generic' relation like exemplification, perhaps an additional external 'connection' relation to actually form specific connections; see the end of 2.34 below). Dependence relations (and the 'connection' relation) as such do not seem to be sufficient for characterizing categories. Similarly, it seems to be the view of Johansson that rigid (mutual) dependence simply is *the* 'strongly internal' relation: he *defines* the 'strong internality' of a relation as the mutual rigid dependence of its relata (2014: 233) (he seems to be prepared to give up mutuality here, though, as already indicated). In his (1989) Johansson refers approvingly to Ewing's (1934) definition of a corresponding notion of 'internal relation', which includes a reference to a relation *R* in addition to necessitation, but goes on to suggest that the additional 'relational term' be eliminated from it (1989: 117).

Lowe, too, recognizes the possible redundancy involved in having both relations like characterization and instantiation, and dependence relations in one's ontological system, although he does not seem to recognize the possibility of defining the first sort of relations in terms of dependence relations and the categories (2006: 37). He does not think, though, that either sort of relation should be eliminated or analyzed as 'derivative', although he does give a certain priority to characterization and instantiation. Lowe believes that dependence relations are always '*constituted*' by certain other formal ontological relations obtaining between the entities — for example, the characterization relation mentioned earlier 'constitutes' the rigid dependence of the trope or 'mode' on the substance it characterizes (2006: 37). There are no 'brute' dependencies (loc. cit.). Lowe seems to think, then, that dependence connections are *explained* in terms of other relations — this is what the rather odd use of the formal ontological relation of 'constitution' here seems to mean. In other words, one must ask: what does the ontological dependence of a mode on a substance (for example) *consist in*? Lowe's answer seems to be that it consists in the mode's characterizing the substance.

But why does Lowe not ground the dependence directly on the related entities themselves, and say that it consists in the mode's being the very mode it is and the substance's being that very substance? After all, dependencies are necessitated by the existence of the

dependent entities. It seems to me that Lowe sees expressed in the distinction between (what Johansson calls) ‘weakly’ and ‘strongly internal’ relations a difference that is deeper than simply the difference in what necessitates what (i.e. in whether the relation is necessitated by either of the relata on its own, or only by the relata together). And it is only ’weakly internal’ relations, Lowe seems to think, that are truly nothing ‘over and above’ the related entities.

Francois Clementz (2014) says something similar about the two sorts of internal relation. He characterizes the distinction between ‘weakly’ and ‘strongly internal’ relations — in Clementz’s words ‘grounded essential’ and ‘essential but ungrounded’ or ‘directly constitutive’ relations, respectively (ibid.: 209) — in terms of what has ontological priority in the relational situation, the relata or the relation (ibid.: 211). According to Clementz, when there is a ‘directly constitutive’ relation obtaining between some entities, the relation itself (or possibly the relational complex or fact), in effect, helps to constitute the identity of its relata (and it is for this reason that the relata necessitate both the relation and each other) (ibid.: 211, 220). Now, although Lowe would probably have no truck with the idea that a relation, or even a relational complex, is ontologically prior to its relata, neither is he, it seems, ready to say that when there is a relation associated with ontological dependence obtaining between some entities, the relation is simply supervenient or ‘grounded’ on its relata (see Lowe 2006: 46–47). Despite his view that formal ontological relations are not ‘entities’, Lowe hesitates to say that characterization and instantiation are ‘nothing in themselves’ (as is the case, he supposes, with a relation like *being taller than*); for instantiation and characterization mark, as he says, ‘real connections’ between entities; unlike the relata of the *taller than* –relation, the relata of instantiation and characterization are ‘made for each other’ and thus one cannot, he thinks, ‘simply’ say that these relations are ‘no addition of being’ (loc. cit.). What, then, is Lowe’s view on the status of relations like characterization and instantiation? Unfortunately, he does not elaborate. Nevertheless, perhaps one way to interpret these remarks is as pointing to a view on which ontological dependencies are to be explained by relations that are somehow *‘part of the natures’* of the related entities. This would perhaps constitute a compromise of sorts between ‘grounded essentiality’ and ‘ungrounded essentiality’ of relations. I will return to this in the next chapter.

2.34 Lack of ontological status

We come now to the final feature we will discuss that has been thought to characterize 'formal ontological' relations. It grows largely out of the previous one, for, from the truthmaking point of view here adopted, elimination of entities is acceptable only when their truthmaking tasks can be taken over by others. With internal relations this is of course easily done (at least given certain assumptions about truthmaking). Just by the definition of 'internal relation', the relata *x* and *y* themselves will together make true (or necessitate, at any rate) every internal relational truth about them. The case of external relations is, on the other hand, at least much less straightforward.

That 'formal ontological' relations lack an ontological status, that they are not themselves entities of any kind, is the view of e.g. Simons (2010: 206-7, 2012: 137–38), Lowe (2006: 46–47, 206), and B. Smith (2005: 168). These authors motivate such a view with, e.g., the need to avoid regresses (Simons 2010: 206-7; B. Smith 2005: 168), with the adequacy of the relevant relata as truthmakers (Simons 2012: 138; see also Lowe 2006: 205–7), or even with formal ontological relations' being 'metaphysically necessary conditions' which thus, supposedly, cannot themselves be part of the world (Lowe 2006: 49).

(It should perhaps be emphasized here that there is nothing wrong with the sort of reduction of relations in question here. It is of course well-known that one cannot in general reduce polyadic to monadic logic. But leaving out some relations from one's ontology does not require not admitting predicates corresponding to those relations in, so to say, one's 'ideology'. It is not relational talk that is being reduced — not polyadic *predicates* —, but only relations as *entities*. Polyadic logic is still the logic of formal ontological relational talk, never mind how predications of formal ontological relations are *made true*.)

Is it necessary to deprive formal ontological relations of ontological status in order to avoid regresses? As argued in the previous section, to avoid vicious regresses, it seems one need only 'anchor' the relations in their relata by ontological dependence (they will then perhaps do no work, however, and thus might as well be eliminated). But if one

wishes to avoid even ‘benign’, non-explanatory regresses, it seems one must also get rid of distinct entities corresponding to these relations.

What concerns the adequacy of the relata of formal ontological relations as truthmakers for formal relational truths, this seems of course to depend on how one understands truthmaking (as pointed out in the last section), as well as on whether formal ontological relations are all internal. Now, one can of course try to dispense with all ‘external’ formal relations by adopting an appropriate sort of ontology (as Lowe, for example, does); but if one wants to give an at least reasonably general and neutral account of ontological form, as I am trying to do here, one needs a stronger reason for excluding ‘external’, non-supervenient relations from it than merely the fact that there are indeed possible ontologies in which all formal ontological relations are supervenient. But are there any good ‘metaontological’ reasons why e.g. Armstrong’s state of affairs ontology, with its ‘external’ exemplification tie, should be taken off the table?

It may appear, though, that one could take there to be, in certain cases, a truthmaker for an external relational truth that is indeed in some sense not ‘over and above’ the related entities themselves. Armstrong — who at least sometimes took there to be a non-supervenient exemplification connection between particulars and universals — has proposed that the ‘fundamental nexus’ of exemplification ‘is nothing but the bringing together of particulars and universals in states of affairs’ (Armstrong 1989: 109–10). Such ‘bringing together’ seems to be an example of what Armstrong calls ‘nonmereological composition’ (ibid.: 93, 1997: 118); in particular, the ‘state of affairs’ is a ‘nonmereological’ whole because its existence does not supervene on the mere existence of its parts (universals and particulars). What, then, does ground the ‘composition’ or ‘bringing together’ of the parts of a ’state of affairs’ and thus the latter’s existence? Nothing, it seems, if not the existence of the state of affairs itself, for not only does the state of affairs exist if and only if its parts are ‘brought together’ or connected by exemplification, but to talk about the existence of a state of affairs and the connection between its parts is to talk ‘about the same thing’ (1989: 110). State of affairs talk is also ‘more perspicuous’ (loc. cit.), so that it seems all we really have here is the existence of the state of affairs (elsewhere Armstrong explicitly says that ‘states of affairs come first’, talk of exemplification being just ‘convenient’ (1997: 118)).

The crucial 'nonmereological' feature of states of affairs is found in their *existence-conditions*. 'Mereological' wholes or 'sums' are taken by Armstrong to exist 'universally' — i.e. every set of entities is taken to compose a mereological whole or sum. On the other hand, it is clear that not every set of entities can be taken to form a state of affairs. Some entities cannot form a state of affairs to begin with, e.g. two particulars; other entities are capable of composing a state of affairs, but do not actually do so. But Armstrong, in effect, takes states of affairs to differ from mereological sums in another way as well: in their *identity-conditions* (see e.g. Armstrong 1997: 121–22). For example, from an ordinary asymmetrical relation and two particulars, we can form two different states of affairs, e.g. the state of affairs that *a* is to the left of *b*, or that *b* is to the left of *a*; in other words, it seems that what the constituents of a state of affairs are is not sufficient to determine which state of affairs it is. This is not the case with mereological wholes (at least on the way Armstrong understands them, that is); their identity-conditions are extensional.

But can we really account both (1) for the difference between some entities combining into a state of affairs and their not so combining, and (2) for the difference between states of affairs with the same constituents but different 'modes of combination', without invoking any entities additional to what is combined (as Armstrong seems to think)? Now, in fact, it is not inevitable that we will need to address (2). It may be that, in the final analysis, all external, non-symmetrical relations are essentially restricted to certain types of terms in a certain order, as is the case with exemplification: the universal *F* and the particular *a*, for example, can combine (be related by exemplification) in only one way; thus the identity of a monadic state of affairs can be taken to be determined by its constituents alone. Russell once called 'complexes' like the monadic state of affairs, in which the order of the constituents cannot be changed without producing something impossible, *heterogeneous*, and 'complexes' in which the order can be changed (like the 'complex' formed by *a* and *b* when one is to the left of the other) *homogeneous*, and proposed, in effect, to analyze all homogeneous complexes into heterogeneous ones (Russell 1992: 123, 88). If something like this can be done, we need not worry about different 'modes of combination' (see MacBride 2012 for an overview of Herbert Hochberg's attempts to revive Russell's idea).

On the other hand, (1) is inescapable, and here there seems to be a serious problem, especially if one adheres to the truthmaker principle (as Armstrong does, and as we do

here). Particulars and universals, it is supposed, are not 'as such', 'internally' or by their natures, combined into definite states of affairs. It is true that it could perhaps be supposed that universals and particulars can, by their nature, only form one type of complexes to begin with, those in which particulars and a universal are related by exemplification (states of affairs); moreover, if there can be no variation in order among the constituents, to determine what the constituents are will certainly be sufficient for determining *what* their characteristic complex is. Nevertheless, it will not determine *that* it is: what can be taken to follow from the existence of the constituents is at most a *possible* state of affairs. Thus an *actual* state of affairs cannot be just its constituents. It is, instead, the particular(s) and the universal as 'brought together'. But what does this mean? What does 'being brought together' consist in? Now, perhaps one could simply take it to be a brute fact with no further analysis (this sort of move is made, for example, in Markosian 1998, in the context of discussing 'nonuniversalist' mereological composition): that *a* and *F* are 'brought together' is a primitive, unexplainable matter. But if one takes this road, it seems that the truthmaker principle will go by the board. For there will be truths — namely, ones about the composition of states of affairs — that have no truthmakers: no 'bringer-together' exists. If one, on the other hand, takes states of affairs to be entities distinct from and additional to their constituents, then one abandons the idea that states of affairs are nothing 'over and above' particulars and universals.

It seems, then, that formal ontological relations cannot always be taken to lack ontological status. Perhaps ontological form should indeed ideally constitute merely the 'ideology' of the theory of categories, and thus have no ontological commitments of its own (one could, for example, appeal to the need to avoid infinite regresses). But the truthmaking approach puts considerable restrictions on what can be taken to be 'mere' 'ideology' and I hesitate to say that we would never need to enrich our 'ontology' with additional truthmakers for formal ontological connections. However, I believe one can make do with a single kind of 'neutral' tie or 'connector' for all external formal ontological connections. For the way entities *can* be connected is, I believe, always given by their natures; for every collection of entities, there is at most one way they could be contingently or 'externally'[22] connected: in virtue of their 'categorial' natures, universals and particulars,

[22] 'Contingently' or 'externally', because it is true that, if there are sets and mereological sums, there is for every collection of entities at least these two different ways of being 'combined'; but it is plausible

for example, can only combine into states of affairs. Now, if this is the case, then the only difference that needs to be grounded is that between constituents actually combining into a complex and their not so combining. And to this one suitable[23] kind of entity is enough; one does not need an array of different relational entities. On the other hand, all truly 'internal' relations can, I take it, happily be taken not to be distinct entities, and can thus be excluded from 'ontology', and taken as 'ideology' — as purely a matter of 'how beings are', in Lowe's words.

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It seems we will have to conclude on the basis of the preceding discussion that no sufficiently clear and unitary concept of a 'formal' or 'formal ontological relation' is to be found in the writings of the ontologists who use these terms. This is not to say, however, that the idea of 'ontological form' would be worthless. There are several important and, I believe, connected issues that it brings together. Paradigm instances of 'ontological form' are relations like identity and exemplification. Even if it is difficult to find a criterion that would distinguish such relations from the 'material' ones, paradigmatic cases like identity and exemplification certainly do have in common several interesting and important features. They are ubiquitous, if not always topic-neutral; connected with this, there is at least a temptation to take them as 'self-applying', which is again connected with what is probably the most well-known feature of exemplification, tendency to generate an infinite regress; they are also essential to their relata (at least 'generically', as exemplification plausibly is), a feature which supports the idea that they are not distinct items in the ontology (although this idea is problematic in the case of 'generic' essentiality, at least if we adopt a truthmaking approach to ontological commitment); again, these features are connected with the role ontologists are ready to give these relations as determining the fundamental 'how they are' of entities (Lowe 2006: 48), the 'syntax' of being as opposed to its 'vocabulary' (see Clementz 2014: 220), or the fundamental 'ideology' as opposed to 'ontology' (in the Quinean sense, that is). I think we can also conclude, then, that formal ontologists are at least gesturing at

that the relevant sets or mereological sums exist necessarily, given merely the existence of their constituents.

[23] For what would be suitable, see e.g. Schneider 2013 and Maurin 2012.

something important with their talk of ‘formal’ aspects of entities or of ‘formal ontological relations’.

3. Categories and formal ontological relations

In this chapter my objective is to explore how ontological form, as consisting of formal ontological relations, bears on the drawing of categorial distinctions. I will try to show that ontological categories could be characterized through formal ontological relations or ‘structures’.

3.1 The Ontological Square and Two Types of Category System

In this section, I will look at Aristotle’s so-called Ontological Square (OS) as an example of a category system in which something like formal ontological relations are given a central role. I will present two interpretations of the OS. In both of them, the relations are taken to ‘define’ or ‘generate’ at least some of the categories in OS, but in different ways. Category systems as instanced by Aristotle’s OS according to the second interpretation (given in 3.112) will then be my primary concern in the rest of the chapter. I will briefly discuss Lowe’s version of OS as an example of this sort of category system in 3.12., before trying to answer some objections to the general idea involved in it of ‘relational accounts’ of category distinctions in 3.2.

3.11 Aristotle’s Ontological Square

The idea that category distinctions can somehow be made by means of a relation or ‘tie’ in which entities stand can apparently be traced back to Aristotle. In the second chapter of the *Categories* (= *Cat.*) (1a20), Aristotle appears to use two relations, *is said of* (or *predication*) and *is present in* (*inherence*), to distinguish between four types of things. The category system that results has been called the *Ontological Square* (OS) by Ignacio Angelelli (1967): the four categories it consists of can be arranged into the corners of a square, with the relational connections between the categories as the sides (see the figure

in Angelelli 1967: 12). Aristotle's OS has recently been picked up and modified by Lowe (2006), who also emphasizes the importance of the relational connections within it.[24]

Despite appearances, *is said of* or *predication* is not here a relation involving linguistic items. What is supposed to be predicated is *man* (the species or kind), not 'man' (the word or name) (see Ackrill 2002: 75). *Is said of* or *predication* is, then, supposed to be the relation that obtains between a kind and what is of that kind (note though that, for Aristotle, not only the individuals but the subkinds as well are instances of the species and genera in a hierarchy of kinds, see *Cat.* 3a37–3b5.) *Is present in* or *inherence*, again, seems to be explained by Aristotle in terms of some sort of ontological dependence. What is present in something is 'incapable of existence apart from' it (*Cat.* 1a22–23). It is not clear how precisely the dependence of what is present in should be understood. Dependent status does not seem to be a peculiarity of what is 'present in' for Aristotle; what is 'said of' seems to be dependent as well (see *Cat.* 2b5–6).

To be precise, rather than using the *is said of* and *present in* –relations as polyadic properties or predicates to distinguish between the four types of entity[25], Aristotle uses instead something like *relational properties*[26], and only one per relation (the converses are never alluded to): *is said of a subject* and *is present in a subject*. These then generate four categories in the following way (the order is that of Aristotle's exposition in *Cat.*, Chap. 2; this order will be used in what follows unless otherwise stated):

1. said of a subject, not present in a subject
2. not said of a subject, present in a subject
3. said of a subject, present in a subject
4. not said of a subject, not present in a subject

[24] Aristotle's famous ten categories (introduced in *Cat.,* Chap. 3) will be ignored here. All of them are subsumed by the OS, under substances and accidents. I make no apologies for using the term 'category' of the four types of entity distinguished in *Cat.*, Chapter 2, but it must be borne in mind that this is not the word Aristotle uses of them.

[25] Aristotle, as is well known, seems to lack the modern concept of a *relation*; the so-called category of 'relations' is actually one of *relatives* (pros ti), of entities that are essentially 'referred to' other entities, like *slave* or *equal* (*Cat.*, Chap. 7).

[26] It should be noted that there is no basis for taking either the 'relations' or the 'relational properties' discussed here to be themselves entities for Aristotle. They are probably best taken as *sui generis* formal relations that are nothing ontologically in addition to the entities they 'connect'.

The notion of 'subject' is never explained, but it is said that *primary substances* are the ultimate 'subjects' for everything else (*Cat.* 2a35). Primary substances themselves are those things that do not bear either of the relational properties — or that have their negations (type 4). Things of type 1 are called by Aristotle *secondary substances* (2a13–18); we can also talk about *universal substances* (or *substantial universals*). Things of types 2 and 3 are not given a special designation by Aristotle in *Categories*, but tradition knows them as *accidents*: things of type 2 are *particular* or *individual accidents*, those of type 3 *universal accidents* (or *accidental universals*).

Although primary substances are the *ultimate* 'subjects' in the OS, the general notion of 'subject' does not seem to coincide with that of 'primary substance': for example, while the subject in which a universal accident is present in is a substance, what it is said of is apparently an accident[27]; although this accident (a particular one) is itself present in another subject, which is a primary substance — and so the predication connection of the universal accident does ultimately 'lead' to an ultimate 'subject' — it seems that a universal accident cannot be immediately connected through predication except to another accident (because the definition of an accident is not predicable of a substance (*Cat.* 2a27–34), i.e. an accidental universal never gives the *kind* of a substance). Inherence, by contrast, would seem to admit both universal (secondary) and particular (primary) substances as 'subjects' (thus there are two inherence connections emanating from a universal accident in Angelelli's figure (1967: 12); Ackrill (2002: 74–75), though, thinks that universal accidents do not themselves inhere in anything, except perhaps derivatively). Nevertheless, primary substances are clearly supposed to have a privileged place in the OS. In particular, Aristotle says that 'if [primary substances] did not exist, it would be impossible for anything else to exist.' (2b5–6). What this text (at least the translation) seems to attribute to primary substances is some sort of existential priority or independence; although this is not said explicitly, one wonders what the point would be of only stating the dependence of other things on primary substance if primary substance again depended on them. In fact, though, it is not obvious that the independence attributed to primary substances in the passage is existential instead of some other kind of

[27] Whether this is actually so is not clear, see Angelelli 1967: 14; as Angelelli also notes, 'the distinction [between universals and particulars among accidents] is required by the system', yet it is not clearly made by Aristotle (Angelelli 1967: 15). I will at any rate assume that it is made.

ontological independence (see e.g. Corkum 2008: 72–76 for reasons against taking primary substances to be existentially independent; see also Koslicki 2013: 35–37).

While it is not quite clear what Aristotle is actually trying to do in Chapter 2 of the *Categories* — is he offering something like definitions[28], or are the two relations perhaps merely a convenient way to organize four independently given types of things by their characteristics? — I will assume that he is trying to give more than a merely accidental characterization of the four types of things (or of three of them; see below) in terms of the two relations. But even if one understands the role of predication and inherence in Aristotle's four-fold classification of entities in this way, much seems still to be left open for interpretation. *How* precisely are predication and inherence supposed to account for the categorial distinctions within the OS? What I will do next is look at two different ways of understanding the two relations and their role in Aristotle's OS. The purpose of the discussion, however, will not be to arrive at the correct interpretation of the OS in Aristotle. Instead, I intend merely to explore the general idea of defining categories in terms of relations (in the context of the view of fundamental categories I adopted in the Introduction), using Aristotle's OS just as material. Consequently, I will not be overly fussy about historical accuracy.

3.111 'Hierarchy of being'

As already pointed out, Aristotle does not seem to give an equal status to the four kinds of entity; instead, he seems to give some sort of priority to primary substances. Thus an interpretation which clearly gives such a status to primary substances would seem to be preferable. There is also the occurrence of the notion of 'subject' as a constituent in the relational properties Aristotle uses to 'generate' the four types of entities. Is this notion nothing but an accidental feature of Aristotle's formulation or something more? Here's an interpretation of Aristotle's OS on which the notion of 'subject' (or rather of a 'primary' or 'ultimate subject') is crucial; it is also one in which the priority of primary

[28] Aristotle has his own notion of definition which, certainly, would not seem to apply here. Something is 'defined', in the strict Aristotelian sense, only in terms of 'genus' and 'difference'. Just as the ten categories are famously the 'highest genera', and thus can have no Aristotelian 'definitions', so the four types of entity in the OS probably cannot be taken to be 'definable' in this sense.

substances is clear: *primary substances, as the ultimate 'subjects', are not themselves defined in terms of either 'tie'* (Aristotle, of course, seems to define primary substances as those things that do not stand in either 'tie' to a subject and thus to define them, in a sense, in terms of the 'ties'; but perhaps this could be taken merely to register the fact that, in a sense, neither 'tie' or relational property characterizes the category of primary substances); instead, all other entities (secondary substances, universal and particular accidents) essentially stand in one or both of the ties to a 'subject' which is either a primary substance or, so to say, a 'secondary subject' — a universal or an accident — which is again tied to another, 'less secondary' 'subject' (ultimately, everything of course has its 'foundation' in primary 'subjects' or substances); indeed, all entities except primary substances are, somehow, 'beings' only insofar as they are connected by the 'ties' ultimately to primary substances (this interpretation somewhat loosely follows that in Corkum 2008). It is a virtue of this interpretation that it is neutral as to whether primary substances *could exist* without universals and accidents. The sort of asymmetrical dependence it posits to obtain between primary substance and the rest of the categories is understood not in terms of existence; it is understood instead in terms of 'ontological status' (as Corkum does; see 2008: 76ff.) or in terms of 'essence' (as I will do below).

How do the 'ties' work in 'generating' the categories on such an interpretation? One way of looking at it could be this: the 'ties' 'operate on' the *antecedently given category* of primary substances to 'generate' three derivative categories. This happens in stages in the case of universal accidents: first 'present in' combines with the 'subject' category of primary substances to give particular accidents; then 'said of' takes particular accidents (which are relatively 'subjects') and gives universal accidents; similarly, we might perhaps take there to be a whole hierarchy of secondary substance categories (Aristotle explicitly says that species is 'more truly substance' than genus (*Cat.* 2b22), thus suggesting that there are different grades of 'secondariness' among secondary substances) generated by something like recursive application of 'said of', beginning with primary substances. The idea here is that primary substance somehow 'enters', through predication and inherence, into the nature of the rest of the categories, but not vice versa, and that this is why universals etc. are 'beings' only insofar as they are tied to primary substance, but primary substances are 'beings' independently. If one were to give an account of just what e.g. a secondary substance (as such) is — its 'real definition' (see K. Fine 1994) — one would have to invoke primary substance and the predication relation.

One can compare this with how it would be natural to think of the essence of a natural number: the 'real definition' of number 2, for example, could be that it is the successor of 1; although number 1 is, of course, the number the successor of which is 2 — and this is, moreover, a necessary truth — this fact should perhaps not be taken to be 'part of its essence', to enter into the 'real definition' of number 1 (this example is inspired by K. Fine 1994: 14). Similarly, an *infima species* (a 'first-order' secondary substance) is, according to the present interpretation of the OS, by its 'real definition' something that is 'said of' a primary substance — this is (part of) its essence *qua* or as an *infima species*; on the other hand, it is here thought not to be part of the essence or 'real definition' of a primary substance that it has something said of it — even if, as is plausible, there cannot be primary substances without secondary substances.

Questions are, without a doubt, raised concerning just how 'real definition' is to be understood. For one, what exactly is it for a thing to 'enter into' — or to be 'involved in', or to be a 'part' of — the essence of another thing? If something is a 'part' of the essence of something else, is it also a 'part' of the thing itself? Are primary substances, for example, supposed to be parts of secondary substances? Also, what exactly is covered by the 'real definition' of a thing, if not everything that is necessary to a thing is supposed to belong to its 'essence'? How is the line between 'essential' and merely necessary features of a thing to be drawn? To answer only the first group of questions here, no primary substance is, first of all, supposed here to be a 'part' of any secondary substance. What is rather meant in saying that *x* is 'part of the essence' of *y* is — as a terminology of 'involvement' (see K. Fine 1995b) would better suggest — that *what it is to be y* is, among other things, to stand in some relation (to be specified) to *x*. Of course, the whole idea of non-modal essence and 'real definition' that I am invoking here can be questioned. To discuss this general issue here would, however, take us too far afield.

It is important to note that when I talk about the 'real definition' of accidents or of universals, I do not mean the 'real definition' of specific accidents or universals; I am not talking about the essence of, e.g., the species man *qua that very species*, or of a particular color *qua that very color*, but of the essence of the species or the color *insofar as it is of that category* (a secondary substance, or a particular accident). The focus here is, after all, on the definition of categories. Michail Peramatzis (2011) presents an interpretation of the ontological priority of particular substances over 'non-substances' in Aristotle to

which the one I am suggesting here is rather similar (Peramatzis's view is rather close to Corkum's (2008), as he acknowledges (2011: 243, footnote 11)). On his view, 'particular substance, in general, or any particular substance whatsoever makes non-substance attributes the general kinds of being that they are' (2011: 246). Peramatzis admits that '[t]his notion of ontological primacy is undeniably attenuated' (loc. cit.). It is not said here that particular (i.e. primary) substances make the entities that depend on them the very entities that they are; the ontological priority in question obtains between substances and non-substances only insofar as these are of the 'general type' that they are. But surely, even if this is so, it does not make the priority any less real or important. Also, the dependence may in fact actually reach deeper at least in the case of particular accidents. As Peramatzis recognizes (ibid.: 236–37), the particular accidents of the OS could be interpreted as 'tropes' individuated in terms of their subject. If this is the right way to understand particular accidents, then it is not merely the 'formal', 'categorial' (my words, not Peramatzis's) nature of these entities 'in general' that will be constituted through a relational connection with primary substances, but their individuality as well (it does not seem plausible, on the other hand, to take their 'material' nature to be constituted in such a way; Socrates may make the wisdom of Socrates *that very instance of wisdom*, but it will not make it *wisdom*; see however the following paragraph).

There is another instance of 'deeper' dependence that one might take to obtain within the OS, although this seems to be more controversial. For are not primary substances and particular accidents (in part) made the very entities they are by having certain universals 'said of' them? Isn't Socrates, for example, a man by having the species *man* 'said of' him? Now, the present interpretation of the OS in fact cannot admit this, for it would make primary substances themselves essentially dependent. Instead, the 'said of' –relation is associated only with the dependence of universals on particulars. On the other hand, if this is so, then the present view of the nature and role of the relations in Aristotle's OS would perhaps be congenial to those who insist that Aristotle didn't take essential predication (i.e. what would correspond to the 'said of' –connection) to be a relational matter to begin with. Some think that Aristotle replaced Plato's relational account of predication with a 'non-relational' one, at least in the case of essential predication: while Plato thought that, e.g., Socrates' being a man was a matter of Socrates' standing in a relation (of 'participation') to the form Man, Aristotle (it is said) rejected such an explanation, and held that Socrates' being a man is not a matter of two entities being

related (see G. Fine 1983 for discussion; Fine has particularly in mind Matthews and Cohen's (1968) interpretation of Aristotle).

But the present interpretation of the OS, while it does take 'said of' to be a relation of some kind, yet takes primary substances to be what they are independently of both relations. Now, Matthews and Cohen present the following dilemma for relational accounts of essential predication: either Socrates is what he is independently of having *man* etc. predicated of him, and is thus a 'bare individual'; or he is what he is only in relation to something else, and is thus a 'mere relational entity' (Matthews and Cohen 1968: 643–44). The first horn seems to be incompatible with Aristotle's essentialism (with the view that Socrates could not have been, e.g., a dog or a turnip), the second with the very notion of substance as an 'independent' entity (G. Fine 1983: 229–30). Note, though, that 'relationality' is in these terms problematic only from the point of view of primary substance. It is unproblematic for secondary substances to be related by predication to primary substances in that the dilemma does not arise for them: there is no pressure against taking secondary substances to be 'relational entities', for Aristotle does take them to be 'dependent'. Thus, if one adopts an interpretation on which the nature of primary substances does not involve any relational connections, but in which the rest of the categories are defined as being related to primary substance, one may admit that primary and secondary substances are intimately connected through predication without compromising the status of primary substances as independent entities. At any rate, some place must be found for secondary substances and the 'said of' –connection, for Aristotle does posit them. Matthews and Cohen's criticism, if taken too far, risks pushing secondary substances (and universal accidents) into the margin, and eventually out of the whole system: indeed, Matthews and Cohen go as far as to say that 'there being the secondary substance cat is a matter of there being individual cats' (1968: 632; quoted in G. Fine 1983: 244).

Let us now return to the general issue of the 'real definition' of categories on the present view. From the difference in 'essential involvement' between primary and secondary substances that we have just discussed there would seem to follow a difference in *fundamentality*: secondary substances (and particular and universal accidents, too) are, after all, supposed to be 'derived' entities in a clear sense, while primary substances are supposed to be 'underived'. The sense of 'fundamentality' here, however, would seem to

have nothing to do with the one I discussed in the Introduction. To see why, note that particular accidents, for example, are taken to be 'derived' entities — and in that sense 'non-fundamental' — but that they nevertheless also seem to belong to the complete and non-redundant set of truthmakers; for primary substances as such would not seem, in Aristotle's ontology, to necessitate accidental truths like that Socrates is pale. Again, one could, as I will in fact do in the next section, take there to be *no* difference in 'fundamentality' between particulars and universals (by taking there to be reciprocal essential involvement) while holding on to the view that substances and accidents are necessarily of the kinds that they are, i.e. that Socrates himself necessitates the truth that he is a man, and this redness the truth that it is a color, and thus that particulars suffice as truthmakers.

Can one produce a compromise between these two notions of fundamentality? I think we could qualify the 'non-redundancy' condition for the truthmaking basis (or change what 'redundancy' means in this context) so that, even if e.g. particulars on their own do suffice to necessitate all true kind-predications, universals would still be admitted as well if particulars essentially involved them.[29] Particulars too, we might think, are in fact 'relational entities', and their being the kind that they are a relational matter; Socrates 'as such' might be taken to be an 'incomplete' entity, 'essentially related' to the secondary substances *man* and *animal* (cf. G. Fine 1983: 246); Socrates on his own would, then, not qualify as a sufficient ground for the truth that he is a man, although this truth *would* follow necessarily from his existence, for this necessitation would clearly just express dependence of Socrates on something else, which something (secondary substance) one surely could not then leave out when giving the relevant ontological account. *Why* 'externalize' in such a way the essential kinds of particulars is, however, a different question — as is, in the present connection, whether such 'externalization' is actually compatible with what Aristotle says so that it might be allowed in an interpretation of the OS (see however G. Fine 1983). Nevertheless, this is in fact how primary substances are understood on the interpretation given in the next section. I am, then, prepared to admit more entities in the truthmaking basis I talked of in the Introduction than what mere considerations of the necessitation of truths would allow. On the other hand, I am not at all ready to *exclude* truthmakers from the fundamental level only because they are

[29] As pointed out above in 2.33, the concept of truthmaking itself may, and indeed probably does, require some modification from the initial intuitive account in terms of necessitation.

'derived' entities. If something is required to 'fix' (i.e. necessitate) some truths, then it must, I believe, be part of the fundamental level. Thus particular accidents must be counted as fundamental even if primary substances do not essentially involve them. However, one could very well establish some kind of hierarchy *among* the entities of the fundamental level and admit that in some sense 'derived' entities like accidents are 'less fundamental' or 'basic'.[30]

On the view under discussion, then, Aristotle's OS is a category system that is *hierarchically ordered*. This hierarchy is hierarchy in 'real definition' or in 'essential involvement' among the categories. The role of the two relations in the system is to allow for the 'derivation' of further categories (universals and accidents) from an 'underived', 'undefined' category (primary substances). The order of 'derivation', beginning with the category (or categories) that is itself (or are themselves) 'underived', establishes an order of 'fundamentality', or of 'derivedness', among the categories. The notion of 'fundamentality' here is largely independent of the one I used in the Introduction. A category of entities required to necessitate truths could be 'derived' or 'underived'. I have proposed above to combine these notions of 'fundamentality' into one in which the idea of necessitation nevertheless remains in leading position. On the other hand, one could also adopt the new notion as *the* notion of 'fundamentality'. Now, what the effect of this, I believe, would be is that there would appear to be less 'fundamental' entities than on my view but, on the other hand, that it also would be much more plausible to take there to be 'non-fundamental' ones.

To illustrate this, take an author whom I believe to be one contemporary advocate of an approach to metaphysics in which one aims at constructing this kind of a category system, Jonathan Schaffer (see his 2009). On Schaffer's 'neo-Aristotelian' conception of metaphysics, the goal of the discipline is to find out what the 'substances' or fundamental entities and 'grounding relations' are, and what the '*hierarchy of being*' (ordered by the grounding relations according to 'priority in nature') that they 'generate' is like (2009:

[30] On the other hand, if one takes primary substances to be existentially dependent, even if only generically, on accidents, I think there is a case to be made that primary substances should then also be taken to essentially involve accidents (in their categorial nature at least, that is). This is because I suspect that all existential dependency connections should actually be *explained* in terms of essential involvement. At any rate, necessary connections between distinct entities should probably not be taken as brute.

351, 354). The 'primary' or fundamental entities are 'all God would need to create' (ibid.: 351), i.e. they determine in some way all of being (although they do *not*, apparently, necessitate all the facts; I'll come to this in a moment); yet the grounding relations[31] 'generate' on the basis of the fundamental entities 'an abundant superstructure' of further entities that are 'posterior' to and 'derivative' from them (ibid.: 351, 354). Moreover, Schaffer says explicitly that 'categories just are ways things depend on substances' (ibid.: 355), and that '[c]ategories are places in the dependence ordering' (ibid.: 356). According to Schaffer, moreover, this view of categories can be 'plausibly attributed to Aristotle' (ibid.: 355).

For Schaffer, to ask what is 'fundamental' is *not*, as it in effect is for me, to ask what really exists — indeed, the very point of his 2009 is to argue that metaphysicians should not be concerned with existence questions (whether something exists), which he thinks can usually be answered with a trivial '*Yes*' (see e.g. Schaffer 2009: 359), but with 'fundamentality' questions (whether something is 'fundamental'). Nor does what is 'fundamental' for Schaffer even seem to coincide with what is required to necessitate the worldly facts. For example, Schaffer seems to interpret Aristotle's primary substance in terms of his own notion of 'fundamentality' as the only 'fundamental' type of entity in Aristotle's system (ibid.: 351, 355–56). But, as I noted above, it is doubtful that one could take Aristotle's primary substances as entities that necessitate all truths, including accidental predications[32]. Thus Schaffer's conception of 'fundamentality', and of 'fundamental category' in particular, differs from the one I have advocated. Schaffer can take the 'fundamental level' to be much sparser than I can, for fundamental entities need not on his view necessitate all truths. But on the other hand, he admits in his ontology much more types of entity than I would ever be ready to admit.

How precisely should what is 'underived', the 'root' of the 'hierarchy of being', be understood? What are the 'fundamental' entities here if they are not the ones that necessitate all worldly truths? Perhaps some light can be shed on the idea of 'hierarchy

[31] For Schaffer, these relations are apparently themselves entities: any 'alleged entity', he says, is either a 'substance', or a 'grounded' entity, *or a grounding relation* (2009: 354). Grounding relations are thus, it seems, neither fundamental nor grounded entities, which is rather perplexing.

[32] This is not to say, however, that Schaffer would not take there to be a close connection between truthmaking and fundamentality (see 2009: 365, 375). Instead, he seems merely to reject the association of truthmaking with *necessitation*. Schaffer explicitly argues against the view that truthmaking is (or entails) necessitation in his 2008.

of being' and the notion of 'fundamentality' involved in it if we connect these with Aristotle's idea of the 'focal meaning' (using the term from Owen 1960) of being (this connection is made by Schaffer himself, see 2009: 355–56). According to this idea, not everything that 'is' 'is' in the same sense; some things (primary substances) 'are' in the 'absolute' and primary sense, and everything else 'is' merely insofar as it is *in relation* to what 'is' in the primary sense. 'Being' is like 'healthy' (to use a traditional example): 'healthy' is a 'systematically ambiguous' term that applies in different ways to animals, to the food they eat, and to the urine they excrete; yet of these different senses, the one in which 'healthy' applies to animals is the central and primary one; for 'healthy' in the other senses is *defined* in terms of this (and some sort of causal relation); food is 'healthy' insofar as it promotes health in animals, and urine is 'healthy' by being a sign of the health of the animal that excreted it. In a similar way, 'being' could be taken to apply in different ways to the different 'beings' in the OS, for example: e.g. particular accidents could be taken to 'be' only insofar as they are present in what primarily 'is', i.e. primary substance (see Berti 2001 for a good overview of the discussion on the 'focal meaning' of 'being' in Aristotle.)

The idea of such 'analogy of being' (as it is also called) may seem rather perplexing. What precisely can it mean to say that the 'being', or 'existence', of accidents (for example) is not of the same sort as, and is somehow 'secondary' in relation to, the 'being' or 'existence' of primary substances? 'Derivation' of entities is perhaps easy to understand; but here it is not merely the entities themselves that are supposed to be 'derived' but, in a sense, their 'being' or 'existence' as well. But what does this mean? Now, it was, apparently, the purpose of Aristotle's doctrine of the 'focal meaning' of 'being' to allow him to say that the science of being has a unitary subject-matter without having to take being as a common genus (which would lead to serious problems) (see e.g. Shields 2015, Sect. 5, Cohen 2012, Sect. 3). How is this supposed to be achieved? All the things that 'are' (insofar as they 'are') fall, of course, into the purview of the science of being. But, in a sense, it is only substance that forms its ultimate subject-matter; for Aristotle seems to think that an accident like Socrates' paleness, for example, 'is' only insofar as Socrates (a substance) *is pale*, and similarly, that the species man 'is' only insofar as some substances *are men*, and so on. To talk about paleness is, then, really only to talk about pale substances. Substance is not only the 'underived' or 'root' category, it

is also the ‘focal’ category (see Schaffer 2009: 356): that is, it forms something like the *ultimate subject-matter*; all facts ‘focus’ on substances by being ultimately ‘about’ them.

This would also give a very good reason for being maximally permissive (as Schaffer is) about ontology. For if the being or existence of the species man, for example, is, so to say, simply Socrates’ (or someone else’s) being a man (i.e. not another thing but rather just ‘how’ Socrates or someone else is from a certain point of view), then it must be *obviously* (it seems, in fact, analytically) true that the species exists if it is indeed true that someone is a man. That the fact of Socrates’ being a man does not (perhaps) require the existence of a species to necessitate it is here irrelevant. However, the being of ‘derivative’ entities may also seem to be excessively ‘deflated’ here. The existence of species etc. is supposed to be ‘improper’ or ‘qualified’; but does not this simply mean that they do not in fact exist *properly speaking*? The reason I have propounded this view of the ‘being’ of ‘derived’ entities is, nevertheless, that it seems to me to provide a very suitable background for the conception of metaphysics as concerned with what is ‘derived’ and what ‘underived’, when this is not understood as a concern with what entities provide the basis for the necessitation of all facts. The ‘fundamental’ entities are here those that these facts are really ’about’.

Such a view of ‘fundamentality’, and of what the ‘fundamental’ categories are, I, however, reject. It seems, on the other hand, to fit Aristotle’s OS very well. Primary substances are supposed to be the only ‘independent’ entities. This is problematic if the ‘independence’ is interpreted in terms of necessitation: primary substances do not seem to necessitate all the facts. But at the very least all facts certainly seem to ‘center’ on primary substances and to be ‘about’ them. Thus the essence of all the other sorts of entity is naturally taken to unilaterally involve primary substances, to be ‘derived’ from these. What results is a hierarchy of being in which primary substances hold the privileged position of ‘primary’, ‘underived’ entities, the ultimate ‘*subjects*’ of facts. I will next turn to another interpretation of Aristotle’s OS which is perhaps less plausible as an interpretation, but which is more congenial to my view of fundamental categories. It also involves an interesting view of the role of relations in category systems.

3.112 'Network of relations'

On another view, the notion of 'subject' plays no special role but, as Ackrill (2002: 76) puts it, 'it is the notions of "said of" and "in" […] which bear the weight of the distinctions Aristotle is drawing': 'subject' is 'a mere label for whatever has anything "said of" or "in" it' (loc. cit.). The 'ties', on this view, somehow do on their own all the work of distinguishing the categories. An interpretation of Aristotle's OS along these lines could go, roughly, as follows. The two 'ties' define each two '*roles*' which an entity can fill, corresponding to the positions or 'argument places' in the 'ties' — what inheres (I), subject of inherence (SI), what is predicated (P), subject of predication (SP)[33]; the four categories are distinguished in terms of *which of these roles the entities in them have or do not have*. A full assignment of 'roles' to the entities in the four categories requires more information than what we have in Aristotle's text, but something like the following can be given (this assignment of roles largely follows Angelelli 1967: 13 in which the four categories are described in a similar way):

1. ~I, SI, P, SP
2. I, ~SI, ~P, SP
3. I, ~SI, P, SP
4. ~I, SI, ~P, SP

(Note, again, that primary substances (type 4) are here taken to stand in the 'ties' in the same way as entities in the rest of the categories; entities in all four categories are similarly defined[34], *qua* members of their category, by the 'roles' they have or do not have.) In fact, though, this formulation of the idea is not quite satisfactory as it is. This is because nothing determines here *which* subject of inherence category goes with *which* inhering entity category, or which subject of predication category goes with which predicated

[33] Remember that 'subject' here is nothing but a 'label' (for a position in a relation); an independent 'subject' category is in no way involved.

[34] I am talking here, as in the previous section, of so-called 'real definitions' — that is, of the 'definitions' of the *categories themselves* (or of entities *qua* members of them), not of linguistic expressions signifying them.

entity category. But what we would like is, of course, for substantial universals (type 1), for example, to be predicated of primary substances (type 4), not of particular accidents (type 2), and for particular accidents to inhere in primary substances, not in substantial universals. To achieve this, we will need to add to the above characterizations by also specifying what other roles *the entities with the correlative roles* have or do not have; e.g., primary substance must not only be characterized as a subject of predication, but as *a subject of predication for something that does not inhere in anything*, for example.

It is also to be noted that the categories in the OS can in Aristotle's version only be distinguished, as above, by specifying the roles entities have *and* the roles they *do not* have. Particulars (whether substantial or accidental) are not distinguished from the universals 'said of' them by their filling the role of subjects of predication, for, on Aristotle's view, species too (e.g. *man* and *redness*) have something 'said of' them, namely their genera (e.g. *animal*, *color*). To distinguish particulars from universals, one must, then, add the further characteristic that particulars *are not predicated* (even if we bring in all the other roles involved particulars still cannot be distinguished without specifying the roles they lack). In the purest realization of the view of category systems discussed here, only the positions or 'roles' actually occupied by entities would need to be mentioned (Lowe's version of the OS discussed later seems to be such a system).

Why adhere to the present interpretation of Aristotle's OS? If the OS is to be taken as a system of fundamental categories, in *my* sense, it would seem natural to interpret the 'said of' and 'present in' –relations as ontological connections ('formal ontological relations') that must be invoked in giving an ontological account of two different sorts of predication: *essential predication* (kind-predication), as in 'Socrates is a man' or 'Redness is a color', would be analyzed in terms of one thing being 'said of' another (*man* being 'said of' Socrates, or *color* of redness), and *accidental predication*, as in 'Socrates is wise', in terms of one thing being 'present in' another (wisdom being 'present in' Socrates) (such a connection between types of predication and the relations is made, e.g., in Koslicki 2013: 36). On the other hand, as I already noted in the previous section, at least in the case of essential predication it is not obvious that such a 'relational account' is actually compatible with what Aristotle says. Primary substances are supposed to be 'independent' in some way, and entities in the rest of the categories are supposed to be 'dependent' on primary substances. But can this asymmetry be respected if the ontological analysis of

essential predications about primary substances (i.e. of their 'being just what they are') involves a connection of primary substances to something else?

But whether or not the present take on the OS works as an interpretation of Aristotle, it represents, I think, at least a viable general sort of approach to category ontology (I will nevertheless continue to use Aristotle's OS as an example). On the view under discussion, then, all categories are on the same level as regards the way they are defined or distinguished: they all 'essentially involve' each other. Primary substance, for example, is essentially characterized as a 'subject of predication', and so the category of secondary substances, which bear the correlative role of 'something that is predicated', is implicated in its essence[35]. Thus there is, from this point of view, no hierarchy (the relations can on the other hand induce their own hierarchical order; see the next section). But some may suspect that there is a vicious circularity involved in such reciprocal 'essential involvement', especially as there is apparently supposed to be distinction or 'individuation' of a number of items in terms of each other. It should be noted, however, that the categories (or entities *qua* members of these categories) are here not supposed to be *directly* defined or 'individuated' in terms of each other. In the type of category system discussed in the previous section, universals and accidents were directly defined in terms of primary substances. This was also possible, because the category of primary substances was itself not supposed to be defined in terms of anything else. Here, by contrast, one category is defined in terms of another only insofar as both are directly defined in terms of a single relationship which holds between them[36].

How precisely should one understand this definition of several items in terms of a relationship? One way is perhaps through Kit Fine's idea of '*collective essence*' or 'nature' (see K. Fine 1995a: 242–43, 249–50; 1995c: 65). Take Fine's example of the fictional characters Jeeves and Wooster: as Fine says, it is, on a certain view of the individuation of creatures of fiction, 'essential to both, *considered together*, that the one is valet to the other' (K. Fine 1995b: 282–83; italics mine). In this way, one seems to

[35] As I already pointed out, in order for the category implicated to come out right here — for it to be, in this case for example, that of *substantial* universals instead of that of *accidental* universals — it must be part of the essence of a category that the category with the correlative role *has such and such other roles as well*.

[36] I sometimes speak loosely of relations between *categories*, but what the relations strictly speaking hold of are of course *the entities in the categories*.

avoid the circularity that would be involved if one said instead that it is part of the nature of Jeeves to be valet to Wooster, and part of the nature of Wooster to have Jeeves as a valet. It is important to note, however, that, even if the 'real definition' of items that 'essentially involve' each other — like Jeeves and Wooster, or the categories of the OS — must be taken as 'simultaneous' or 'collective' (in order to avoid circularity), nothing prevents us from taking the corresponding claims about the individual items themselves (e.g. that primary substances have secondary substances said of them, and that secondary substances are said of primary substances) as logical consequences of this collective 'real definition'. The circularity is a problem only in essential truths that belong to the so-called *constitutive* essence, not in those that belong to mere *consequential* essence (for this distinction see Fine 1995c: 56–58, 1995b: 276). We can then indeed say that there is reciprocal dependence and essential involvement between such 'simultaneously defined' items and at the same time avoid vicious circularity, namely when we understand 'essence' 'consequentially' (Fine 1995c: 66).

Another potential way to conceive of the 'definition' of a number of items in terms of certain relations between them, that I take to be closely related to Fine's idea of 'collective essence', is one based on the idea of '*structure*', using as a model here the idea of mathematical structure as it is used by structuralists in the philosophy of mathematics. The structuralists' core idea is that the nature of mathematical objects — e.g. of sets or of numbers — is wholly determined by their occupying (or being) certain positions in certain structures — e.g. in the natural number structure, in the case of natural numbers (see e.g. Shapiro 1997, Chap. 3). How is this determination or 'individuation' to be understood? As Øystein Linnebo (2008: 68) notes, at least some structuralists seem to hold that there is in the realm of the mathematical what Linnebo calls '*upwards dependence*': that mathematical objects ontologically depend on the structure itself to which they belong (we met, in fact, a similar idea above in 2.33 when discussing the views of Francois Clementz on internal relations). It would thus be the structure itself, as an item somehow additional to what is structured, that determined the nature of the relevant entities. But what, in fact, is a 'structure'? Both Stewart Shapiro (1997: passim) and Michael Resnik (1997) also talk of 'patterns'. A 'pattern' is characterized by Resnik (1997: 202–3) as something consisting of 'positions' standing in 'various relationships'; a 'position', furthermore, 'has no distinguishing features other than those it has in virtue of being the particular position it is in the pattern to which it belongs' (ibid.: 203). It seems to me that

the structures or ‘patterns’ on which mathematical objects are supposed to depend are to be identified either with the structuring or ‘patterning’ ‘relationships’ themselves, or with some sort of ‘holistically’ conceived ‘complex’ of which the objects or ‘positions’ are ‘parts’. The ‘upwards dependence’ claim in both of these guises is bound to be controversial, however. The idea that relata could depend for their identity on the relation holding of them has for example been questioned by Geoffrey Hellman in his criticism of certain forms of structuralism (Hellman 2001). Linnebo paraphrases Hellman’s criticism as follows:

> This, I submit, is a vicious circularity: the structuralists claim that the identity of the relata is grounded in that of the relation; but any grounding of the identity of a relation presupposes that the relata have already and independently had their identities grounded. (Linnebo 2008: 70).

Now, certainly if one conceives of relations, for example, as sets of ordered pairs, or if one pictures a relational ‘complex’ as something arising from the ‘functional application’ of a many-place predicate to independently given terms, the idea that a relation or a ‘complex’ could individuate its relata or constituents will appear to get things the wrong way around. But I at least am not convinced that such conceptions of relations — as, in effect, ‘external’ — have no viable alternatives. Structuralists, it seems to me, should view their structuring or patterning relations as, in some sense, ‘internal’.

Let us turn from mathematical structures to what one would call ‘categorial structures’. The OS, for example, would be best taken as a single structure with two relationships (‘present in’ and ‘said of’, or inherence and predication) — as I noted above, the categories are not sufficiently characterized by specifying merely what direct relational connections they have or do not have (even if this is in fact sufficient to distinguish them from each other). In Aristotle’s version, in which there are ‘higher-order’ universals (genera and species) which are themselves ‘subjects’ of which something ‘is said’, there is also in fact a whole family of both secondary substance and universal accident categories of different ‘orders’[37]. The structure would, then, perhaps be more complex than what one at first thought. But a more important issue than what the structure would

[37] How many there are is a question best left unanswered. For Aristotle, at any rate, there is always a ‘highest genus’ and a ‘lowest species’, and the predication orders formed by the genera and species would not seem to be ‘dense’ on his view. So we can safely say that, for Aristotle at least, their number is finite.

be in the case of Aristotle's OS (which would, thus, perhaps not be a simple 'square' after all) is here the general question of what kind of a thing such a 'categorial structure' should be taken to be. Are we to imagine some complex relationship, taken as an entity, on which entities in the categories would depend? Or should the entities be taken as 'aspects' of a prior whole? Although I am in fact sympathetic to the idea of something like 'category structuralism' (see 3.2. below), I am not sure how 'categorial structure' should be understood, especially if one is to have no ontological commitment to anything called 'categorial structures' over and above the structured entities themselves (the entities in the categories)[38].

As I noted in the previous section as well, one must remember that what we are concerned with here is merely the *categorial* nature of entities. Even if the essence of things *qua members of their categories* can be given in purely relational terms, this does not mean that their *whole* essence or nature could be thus given. Adhering to a category system of the present sort does not, then, mean giving up 'objects' with intrinsic nature (*à la* 'Ontic Structural Realism'; see Ladyman 2014, Sect. 4). On the other hand, it does mean giving up (absolutely) independent entities. Insofar as the category of an entity is an indispensable component in the latter's 'identity', to that extent the 'categorial' relation also 'individuates' its relata (even if this is not necessarily 'full individuation'). Another thing that must be noted is that 'categorial' structures would not be, so to say, purely 'structural'. They could be said to be 'formal', too, at most in the sense I attempted to characterize in Chapter 2. Shapiro (1997: 100) characterizes mathematical structures as 'freestanding', as knowing no restrictions in what sorts of entities can instantiate them. Some of the 'formal ontological relations' I mentioned in Chapter 2 would perhaps constitute structures of such 'freestanding' nature; but 'categorial' relations — the likes of 'said of' and 'present in' — certainly would not. For these are supposed to be relations which induce a distinction of category between the entities of which they hold, so that

[38] Not all forms of 'structuralism' are, however, ontologically committed to structures. I think 'category structuralism' should not ontologically commit us either to 'structures' *or* to 'categories'. For this reason, if one looks to mathematical structuralism for inspiration, one should perhaps focus on the 'eliminative' versions (see e.g. Shapiro 1997: 9). Categories, the places in 'categorial structures', should not be conceived as 'objects', but as '*offices*' (to use Shapiro's term, see e.g. 1997: 10): when we talk about categories being related and so forth, we should take ourselves to be really talking in generalizations about the 'office*holders*', i.e. the entities in the categories (cf. Shapiro 1997: 85). There is at least one crucial difference, though: whereas eliminative structuralism of numbers, for example, obviously makes no claims about the individuation of the entities 'playing the role' of numbers, 'eliminative structuralism of categories', on the other hand, crucially would make claims about how the identities of the entities playing the 'categorial roles' depend on each other.

they never apply except to certain sorts of entities (although it would be misleading to put the matter by saying that they require certain sorts of entities as their range of application, as the sorts are not supposed to be determined independently of the relations themselves).

The present way of conceiving of the definition of categories in terms of relations is, then, certainly of independent interest, even if it does not fit Aristotle's OS very well. If the interpretation in the previous section took the OS as a 'hierarchy of being', the present one could be said to take it as, at bottom, a '*network of relations*'. The categories are here 'positions' or 'nodes' in a structure of relations which applies to or structures the entities which we say are 'members of' or 'in' the categories. As categories are essential to their 'members', so the relations here must be essential to the entities they relate. It follows that all entities are somehow interdependent. I will discuss the idea involved here of 'relational accounts' of categories or category distinctions further in the last section of this chapter, along with certain objections that can be raised against it. Before that, I will say something about Lowe's version of OS.

3.12 Lowe's version of the Ontological Square

The most important recent defender of the OS as a realistic system of ontological categories is undoubtedly E. J. Lowe (particularly in his 2006). We need not go here into all the details of Lowe's version nor to his reasons for adhering to it. What is important for our purposes in Lowe's version of the OS is the central role he gives in it to formal ontological relations and the way he proposes to use them to 'capture' the category distinctions within it. I will also look at Lowe's claim that, in some sense, substances form the most 'fundamental' category.

Whereas the original OS in Aristotle is, as we saw, perhaps best interpreted as being hierarchically organized with respect to how the categories in it are 'generated' — as having a category of primary substances that is independent from the 'ties', from which the rest are derived in terms of these — Lowe's version seems to have no privileged category in this sense. Instead, all the categories in it seem to be equally determined in terms of formal ontological relations. I will thus treat Lowe's version of the OS as an

example of a category system characterized in terms of a 'network of relations'. On the other hand, Lowe also seems to think that, in some sense, his system does have a 'root' category.

In the preface to his 2006, Lowe introduces the 'four-category ontology' or OS as

> a system of ontology which recognizes two fundamental categorial distinctions which cut across each other to generate four fundamental ontological categories, these distinctions being between the *particular* and the *universal* and between the *substantial* and the *non-substantial*. (2006: v; original italics)

Later in the book, Lowe says the following concerning the two 'fundamental categorial distinctions' (with some terminological differences):

> […] the best way, in my view, to capture the traditional distinction between particulars and universals is by appeal to the *instantiation* relation. *Universals are entities that are instantiated — that is they have instances — while particulars are the entities that instantiate them.* (ibid.: 114; emphasis of the whole sentence mine)
>
> Similarly, I consider that the traditional distinction between *subjects* and *predicables* [i.e. substances and 'non-substances'] is best captured by reference to the *characterization* relation. *Subjects are entities that are characterized, while predicables are the entities that characterize them* (loc. cit.; emphasis of the whole sentence again mine)

Hence, Lowe seems to adhere to the sort of view in which the two categorial distinctions of the OS, which combine or 'cut across each other' to give the four categories, are taken to be determined ('captured', as he says) purely in terms of the positions in two relations corresponding to the traditional predication and inherence 'ties' (called by Lowe 'instantiation' and 'characterization', respectively)[39]. Moreover, Lowe seems to prefer the simple version of this view, on which one need only specify what positions entities occupy to distinguish the categories so that one need not add anything about the positions they do not occupy. But he recognizes that this is possible only if there are no 'higher-order' universals or 'predicables'. Speaking in another chapter less discriminatingly about

[39] Ultimately, one should 'capture' the four categories as well, and not just the two combining categorial distinctions on their own, in terms of the relations. As we saw in 3.112, it is not enough just to extract the positions from the two relations and then determine the four categories as combinations of these positions. See however e.g. Lowe 2006: 117.

‘objects’ and ‘properties’, Lowe suggests taking ‘objects’ to be ‘property-bearers’, but, in order to secure the ‘absoluteness’ of the ‘object’-‘property’ –distinction independently of the question of ‘higher-order’ properties, also says that one may add the explicit requirement that ‘objects’ also not be capable of being themselves ‘borne’ (2006: 70–72). Yet Lowe is in fact skeptical of all ‘higher-order’ properties and includes none in his system (see e.g. 2006: 42, 72, 79, 114).

Taking all categories to be distinguished — ‘simultaneously’, as it were — in terms of positions in relations has, as we have seen, consequences for their status as to fundamentality (in at least some sense of ‘fundamental’). Two categories of which each essentially involves the other are necessarily ‘on the same level’ in some sense. Now, Lowe does indeed take all four categories to be ‘fundamental’ (see for example the first of the above quotations). But what does Lowe take this ‘fundamentality’ of categories to amount to? To say that a category is ‘fundamental’ is, he thinks, to say

> that the existence and identity conditions of entities belonging to that category cannot be exhaustively specified in terms of ontological dependency relations between those entities and entities belonging to other categories. (2006: 8)

‘Fundamentality’ of categories, as I have proposed to understand it, is related precisely to the existence conditions of entities. In effect, the ‘fundamental’ entities are for me those the existence of which does not ‘supervene’ or follow necessarily from the existence of other entities (*unless*, that is, they are involved in the essence of the entities which necessitate their existence; see 3.111 above) and which also themselves necessitate all the worldly facts. Identity conditions, on the other hand, I have not taken to be relevant to ‘fundamentality’. Now, there is plausibly a sense of ‘fundamentality’ to which identity conditions are relevant. But if Lowe’s four categories are all supposed to be ‘fundamental’, the sense in which they are so cannot be one which involves not having identity conditions specifiable in terms of dependence on entities in other categories; for Lowe takes the identity conditions of *modes* and *kinds*, two of the four categories, to be specifiable in terms of dependence (so-called ‘identity dependence’, an asymmetrical relation of essential dependence) on entities of other categories (2006: 116–17).

Now Lowe does also say that the category of *individual substances* is 'in a certain sense the most fundamental' (adding: 'even though in another sense all four of our categories are equally "basic"') (2006: 21). This 'fundamentality' of individual substances is apparently understood in terms of identity dependence. Identity dependence creates a difference in 'fundamentality' between the entities it relates, because it is asymmetrical: one of the entities related by identity dependence is always subordinate in ontological status to the other, because it depends for its identity, for its being the very entity it is, on the other, while the other does not depend in a similar way on it (see ibid.: 35). Now, it is clear that Lowe succeeds in creating at least 'local' hierarchy in his system with this sort of dependence. Modes are less 'fundamental' than individual substances and kinds less 'fundamental' than property and relational universals. But I am not sure that Lowe succeeds in creating a 'global' hierarchy in which individual substances alone would form the ground-level. For it seems that to achieve this he would need to establish a subordination of property and relational universals under modes and of kind universals under substances as well; but while all universals are existentially dependent on particulars, so are all particulars on universals. Moreover, even though the existential dependence is rigid to one and generic to the other direction[40], the stronger of these (rigid dependence) is actually in the direction of *universals* (ibid.: 117), so that if this establishes any hierarchy or subordination, it will be the wrong way around (Fraser MacBride (2004a: 327) also notes this — in fact in the very article to which Lowe is replying in the section of Chapter 7 in his 2006 that I have just cited).

But whether or not Lowe succeeds in giving the individual substances of his system a privileged status, he at least shows that there is a way to establish some sort of hierarchy even among categories that are, in another sense, equally 'fundamental'. Identity dependence, in particular, establishes differences in 'ontological status' among categories while also allowing these to be all 'non-supervenient'. I already recognized above that those differences in 'fundamentality' which arise from hierarchy in 'real definition' can be taken as differences *among* entities that are all 'fundamental' in a more important sense. Lowe, in a similar way, shows that among entities that all essentially involve each other there may still be difference in 'fundamentality', namely with respect to individuation (as e.g. between modes and substances in Lowe's system), but also, it

[40] Lowe in fact completely ignores generic existential dependence when describing the 'dependency patterns' among the categories at the end of Chapter 7 of his 2006 (2006: 117).

seems, with respect to rigid existential dependence (as between the universals and particulars in Lowe's system, although this difference does not happen to suit Lowe's Aristotelian purposes).

3.3 Objections to relational accounts of category distinctions

In this final section, I will look at some potential problems with and objections that could be levelled against category systems like that of Lowe and the general idea of distinguishing categories purely through relations which is involved in them. Some further development of that idea is also found in this section. The discussion will mostly have as a starting point the criticisms of the use of relations in accounting for category distinctions — especially the particular-universal –distinction — that Fraser MacBride (2004a, 2004b, 2005) has presented in several places (MacBride's line of criticism is heavily influenced by Frank Ramsey's classic paper 'Universals' (1925).).

In what follows, I will take it as given that all the relations used in distinguishing categories are associated with mutual ontological dependence (this could be taken to be just a consequence of the essentiality of categories to the entities in them when two categories are supposed to be essentially distinguished in terms of a relation), and also that (when they are asymmetrical) they apply in such a way that nothing ever occupies both positions in them, i.e. that there are no 'higher-order' connections (these conditions are met by Lowe's version of the OS, for example; we can, I believe, ignore some of MacBride's objections thanks to these suppositions). Now, take as a basis for discussion the following simple view of the distinction between particulars and universals, which is presented (but not endorsed) by MacBride:

> […] particulars are entities that figure in the first argument position of the [exemplification] relation; universals are entities that serve in the second. (MacBride 2005: 595–96; see also 2004a: 323)

Take the fact that *Socrates exemplifies wisdom*. According to the view under discussion, then, Socrates is a particular because he occupies the first argument position (the 'exemplifier' position) of the exemplification relation, and wisdom is a universal because it occupies the second (the 'what is exemplified' position; what precisely 'occupation of

positions in a relation' means is here left undetermined, but I will come back to this question below). It should be clear that the exemplification relation must here be taken as asymmetrical. For otherwise it would sometimes happen that *a* exemplified *b* and *b* also exemplified *a*, and hence that something was both a universal and a particular. This would be contrary to the 'categoriality' of the classes of universals and of particulars (for 'exclusivity' as a necessary condition for the 'categoriality' of a classification see Introduction).

Now, it is above all just the putative asymmetry of the exemplification relation that MacBride finds problematic. He presents from this point of view (as it seems to me) two types of objection: the first type does not question the asymmetry of exemplification as such, but raises doubts as to whether this asymmetry has any clear sense; the second type queries the asymmetry itself, in particular whether there is any reason to suppose that facts have an asymmetrical structure at all. I will discuss these objections in turn. I will at the same time present other potential objections as well, not attributable to MacBride, when the occasion arises.

The first sort of objection goes something like this (see MacBride 2005: 597, 2004a: 324; what follows is largely my own formulation, however). Grant first that exemplification is indeed asymmetrical. What we can say about exemplification is then at least that it is a relation (never mind here what ontological status it would have) that applies to each pair of entities that it applies to only in one 'direction' (or something to that effect; talk of 'positions' actually allows us to make the point without talking about different 'directions'). This much follows, of course, just from the meaning of 'asymmetrical relation'. Now, what we want is for this asymmetrical relation to 'induce' a distinction in category among the entities to which it applies; moreover, this distinction should be the one between universals and particulars, with each universal and particular being assigned to the right side of the divide. For this to be possible, each universal and particular must, of course, occupy the right 'position' in the relation. But what warrant do we actually have for taking this to be the case? Why should not the exemplification fact involving Socrates and wisdom rather be that *wisdom exemplifies Socrates*? To answer that it must be *Socrates* who exemplifies *wisdom* because Socrates is a particular and wisdom is a universal sounds circular. We could perhaps just *stipulate* that exemplification is a relation that applies in the right order. But surely the whole idea of distinguishing

particulars and universals through exemplification would then be pointless (one might also ask whether we actually could just stipulate that there is such a relation; this depends on what a 'relation' is here supposed to be). The notion of exemplification as such would, at any rate, seem to have too little content to determine which position can be taken to be occupied by which category of entity.

Is this last claim correct? Is it true that exemplification is so impoverished a notion that it cannot confidently be taken to impose the right sort of order within facts consisting of universals and particulars? Impoverished or not as a whole, it would seem at least that that its putative asymmetry is indeed at most very superficial. For example, exemplification is usually taken to be many-many: one thing can exemplify many things and many things can exemplify one thing. This determines one feature in which both exemplifiers and 'exemplifieds' will be indiscernible: they will both be 'one in many', 'common to' several other things (thus the idea, mentioned by both MacBride (2004a: 318) and Lowe (2006: 108), that particulars and universals are mere 'abstractions' from, or 'invariants across', facts or states of affairs). Again, what exemplifies and what is exemplified are usually taken to depend on each other in exactly the same way (namely generically): what exemplifies requires merely something or other to exemplify, and what is exemplified merely something or other as an exemplifier. But if we fail in this way to find any further content to the claim that exemplification is asymmetrical[41], then it would in fact seem to make no difference if we changed '*a* exemplifies *b*' everywhere to '*b* exemplifies *a*'.

But even if exemplification is indeed of meagre content, or does not in a sense involve enough asymmetry, it does not of course follow that all categorial relations or structures would share the same defects. Take Lowe's instantiation and characterization relations, for example. The asymmetry of these relations would seem to have clear content. In particular, the dependencies that they 'constitute' (as Lowe puts it) are in each case themselves asymmetrical: instantiation 'constitutes' in each case a rigid existential dependence of what instantiates on the instantiated but mere non-rigid (generic) dependence of what is instantiated on what instantiates; characterization always 'constitutes' an identity dependence, which is asymmetrical, although it is sometimes of

[41] One further question is whether there is a difference in how exemplifiers and 'exemplifieds' are spatiotemporally located. See MacBride 2004a: 318–21

what characterizes on what is characterized, and sometimes of what is characterized on what characterizes (see Lowe 2006: 117)[42]. Lowe argues explicitly that this allows him to meet an objection of MacBride's in which it is claimed that he does not have enough resources to distinguish from each other, or 'identify unambiguously', the positions in the relational structure of the OS — what seems to be a variant, more or less, of the objection that has been under discussion (Lowe 2006: 115–16; the objection is presented in MacBride 2004a).

The second type of objection MacBride presents goes further. Continuing with the example of the exemplification relation, it can be noted, first of all, that there seems in fact to be no need to take exemplification to be asymmetrical to begin with. For what is the point of exemplification if not simply to 'bind together' universals and particulars so that they constitute a fact (2005: 598) (compare with the idea of a 'neutral connector' I proposed at the end of the last chapter)? But mere connection or 'binding together' is of course symmetrical: if universals are connected with particulars, so are particulars with universals. What independent reason could we then have for taking facts to have 'structural asymmetry', instead of taking them to consist of entities that are just symmetrically 'bound together'? But if the structure of facts is symmetrical, then their constituents cannot have different sorts of 'position' in them which would provide a basis for distinguishing their categories (loc. cit.)

Does this objection transfer in some form to Lowe's instantiation or characterization, for example? Well, what is the point of these relations? Interestingly, it cannot be that of connecting or 'binding together', not in exactly the same way at least as with exemplification; for Lowe takes the entities that instantiation and characterization apply to not to stand in need of any external connecting. In part from this Lowe, somewhat tentatively (see below), concludes that instantiation and characterization are ontologically reducible to their relata. In fact, we light here upon the crucial question whether a relational account of a category distinction in general requires the relation involved to be an existent item additional to its relata. Indeed, immediately after presenting the objection just mentioned, MacBride presents the following. Perhaps universals and particulars are

[42] Although it is not to the present point, I should mention here that I worry what the consequences for the relational approach to category distinctions are when a relation is associated like this with dependence now in one, now in the other direction.

not in need of the 'assistance' of an exemplification relation at all: perhaps they are 'connected immediately' (2005: 598). MacBride points at the fact that we need no distinct symbol to 'depict' an exemplification relation in a linguistic representation of the fact that *Socrates exemplifies wisdom*; all we need is 'some concatenation device', e.g. a colon that has no direction associated with it (loc. cit.) (When it comes to exemplification, I believe MacBride is definitely right that we do not need any *asymmetrical* relation as an additional entity; but, as I concluded above in 2.34, there is probably still a need for something like a 'connector').

What MacBride seems to be saying here, is that if a relation is a mere matter of 'immediate connection' and not an additional entity, then the relation at least cannot be asymmetrical. That as such would of course mean that it cannot be used to draw a categorial distinction. But even if it could be shown that mere 'concatenations' and internal relations can somehow be meaningfully said to be asymmetrical, the further objection could perhaps be raised that one cannot claim to be drawing a category distinction in terms of a relation in the first place unless the relation is taken as an additional entity; for surely there *is* then no relation in terms of which to draw the distinction![43]

For someone like Lowe who denies that formal ontological relations correspond to distinct entities in reality these objections certainly seem to present a challenge. But what if we allow there to be such distinct entities (as I very tentatively did at the end of 2.34 above, although I also suggested one could make do with one that was symmetrical)? Well, one could go further yet and question the very idea of letting something as intrinsic to a thing as its category to be determined by a relation. Are not the relations a thing stands in something purely extrinsic that at most 'follow' from the thing's intrinsic nature, but which certainly themselves have no 'influence' of any kind on it? Perhaps we are even presented with something like a dilemma here — one that would be faced by anyone who wished to explain category distinctions relationally — when we combine this and an objection from above: either the relation in terms of which we want to explain a category distinction is not 'really' a relation at all but what corresponds to it in reality is merely something intrinsic, and so we do not really have a 'relational account'; or it is 'really' a relation, but for this very reason it cannot play a part in determining something intrinsic

[43] See MacBride 2004a: 323. MacBride himself seems to think, though, that this objection is easily answered by simply switching to talk 'at the level of truths' (loc. cit.). I, however, am not so sure.

like the category of an entity; so it follows that it is impossible to explain category distinctions in terms of relations. I will primarily tackle this last objection in what follows, for it is certainly the most general, and say something about the rest — the ones that specifically concern asymmetry, or the lack thereof — only in passing.

The objection is clearly premised at least on the ideas that (1) the category of an entity is something 'intrinsic' to it, and that (2) at least those relations that are supposed to account for category distinctions are always 'extrinsic'. The 'intrinsic'/'extrinsic' –distinction is notoriously difficult to make clear (see Weatherson and Marshall 2012), but I believe it is here enough simply to agree on an uncontroversial (I hope) intuitive version: what is *intrinsic* (to a thing) involves merely the thing itself (and its parts); what is *extrinsic* (to a thing) involves something distinct (and disjoint) from the thing, some other thing, as well. In the light of this understanding of the distinction, it would seem to be easy to assent to (1) and (2). But then the conclusion that there cannot be relational accounts of category distinctions would also not seem to be far away. Is there a way to avoid this result?

Let us begin by noting that it is possible (or so I have supposed throughout this work) for the nature of a thing 'itself' to involve another thing — this is just the phenomenon of ontological dependence (or, more specifically, of essential dependence). And this is precisely what is supposed to be the case here: the entities in the categories determined by a relation are ontologically dependent across the categorial divide. But does not this merely confront us with one horn of the above dilemma, the one on which there can be no relational distinction because there is 'really' no relation? For are not facts of ontological dependence, after all, fully grounded in the separate natures or 'identities' of the dependent items, so that there can at most be said to be a 'supervenient' internal relation here, something comparable to a similarity between two tropes? But let us also recall here a distinction I described above in 2.33, the one between 'weakly' and 'strongly' internal relations, and what I said there about its possible import. I noted that Lowe, for example, hesitates to classify his instantiation and characterization — which are relations associated with ontological dependence, i.e. 'strongly' internal — alongside the likes of similarity, and thus as not 'really' relations at all; yet at the same time, Lowe denies separate ontological status to all formal ontological relations. It seems, in other words, that Lowe would prefer to have something both ways: true relations, truly

connecting things with each other, which are nevertheless ontologically nothing additional to their relata.

To pass between the horns of the dilemma, and not merely to escape from one horn to the other, one needs, I believe, to show that something like the view that Lowe seems to hint at is possible. One needs to show that one can have 'relational accounts' of category distinctions without compromising either the intrinsicness of what one is accounting for or the 'relationality' of the account. Can this be done? Perhaps; here is one suggestion. Earlier I put it (following MacBride) that, when there is a relational account of a category distinction, the category of an entity is determined on the basis of its 'occupying' a certain 'position' in a certain relation. This is a thoroughly misleading way of putting the matter if the relation is not to be construed as a distinct entity equipped with 'positions'. There is nevertheless another way in which we could seek clarification here through the idea of something equipped with 'positions' or 'argument places'. While it is standard to take 'unsaturated' items, items with 'argument places', to require for their 'saturation' items that are themselves 'saturated' (having no 'empty places'), there seems to be nothing incoherent in the idea of 'reciprocal saturation' — namely, in the idea that 'unsaturated' items could fill each other's 'empty places' (perhaps the author of the Tractatus conceived of his 'names' and 'objects' like this; see e.g. Linsky 1992: 265–67). Now, if this is so, then why not conceive of entities the categorial nature of which is defined relationally in something like the following (frankly metaphorical) terms: the entities *themselves* have certain 'ontological valencies' which determine what other entities they must 'combine' with in order to exist; and these 'valencies' are in effect 'argument places' of a categorial relation, one in terms of which the categories of the matching entities are determined, as *'built into'* the entities themselves[44]. In this way, perhaps, we could have something that is 'really' a relation explain a category distinction without compromising the latter's intrinsicness.

Although I wouldn't go as far as to claim that the above is how Lowe would propose to understand his instantiation and characterization relations, he does present some ideas

[44] 'Unsaturatedness' is perhaps in general to be understood in terms of the 'incorporation' of a relation into an entity. The point of 'unsaturatedness' could be taken to be that some relations *must* be 'built in', otherwise there will be an infinite regress. Frege writes that 'the relation of subject to predicate is not a third thing added to the two, *but it belongs to the content of the predicate, which is what makes the predicate unsaturated*' (quoted in Currie 1984: 333, my emphasis; also see Currie's whole paper).

that seem to be very close. In a passage in Chapter 3 of his 2006, Lowe talks of the 'ontological forms of entities' (2006: 48). These are described as having to do with the entities' 'place in the system of categories' and as determining the 'ways of combining' of the entities; these 'ways of combining' are further identified with the formal ontological relations, like instantiation and characterization, and are thus also taken to be 'no addition of being' (loc. cit.). Lowe also presents a chemical analogy, comparing the combination of entities to the combination of chemical elements (loc.cit.).[45]

An entity can well have several relations 'built into' it. The four categories in the OS, for example, are distinguished in terms of two relations, not just one. The categorial nature of entities in the four categories of Lowe's system would perhaps be represented on the proposed view in something like the following way (1. = particular substance, 2. = mode, 3. = characterizing universal, 4. = substantial universal):

1. *x* is instantiated by **a** which is characterized by *y*
2. *x* is characterized by **b** which instantiates *y*
3. *x* instantiates **c** which characterizes *y*
4. *x* characterizes **d** which is instantiated by *y*

The incorporated relations should, by the way, be here viewed as '*neutral*' (see K. Fine 2000): although they are asymmetrical, they have no inherent direction. The four types of entity represented have themselves no direction, so that e.g. the 'mirror images' of the representations — in which the relational predicates part of the sign are replaced by their converses — represent exactly the same entities. For example

x is characterized by **c** which is instantiated by *y*

is the same as 3 above.

[45] The passage, in fact, also seems to suggest that an entity has its 'ontological form' in virtue of its category, rather than the other way around. For Lowe writes: 'The ontological form of an entity *is provided by its place in the system of categories*, for *it is in virtue of a being's category* that it is suited or unsuited to combine in various ways with other beings of the same or different categories' (2006: 48; my emphasis). Does this throw into doubt my interpretation of Lowe's system as one in which the categories are defined in terms of their relations? As we have to go here by mere hints that Lowe gives in different places, it is perhaps best to say that both views are compatible with what Lowe says.

However, as I noted in 3.112 when discussing Aristotle's version of OS, the relational connections in which a category of OS directly stands do not characterize it sufficiently, but we must, in effect, define it in terms of the whole relational structure of OS. Thus we will need in fact to incorporate the whole relational structure into each entity:

> 1. *x* is instantiated by **a** which is characterized by *y* which instantiates *z* which characterizes *w*
>
> 2. *x* is characterized by **b** which instantiates *y* which characterizes *z* which is instantiated by *w*
>
> 3. *x* instantiates **c** which characterizes *y* which is instantiated by *z* which is characterized by *w*
>
> 4. *x* characterizes **d** which is instantiated by *y* which is characterized by *z* which instantiates *w*

I will, however, not try to develop the idea further here.

What happens on the proposed view to the asymmetry objections? Are they gone or merely transformed? Our view makes entities into something like the 'links of a chain' of Wittgenstein's well-known metaphor (TLP 2.03). Now, MacBride claims that when a fact is conceived as such a 'chain' — with its constituents 'hanging together without benefit of a mediator' — then it has no 'asymmetric organization' (MacBride 2004a: 324). Indeed, do we not face the objection that 'immediate connection' obliterates asymmetry, even if we can, perhaps, insist that the relation itself is somehow retained (and so can answer the charge that no relation is involved to 'account' for anything)? But what was the reason the asymmetry was required, again? It was required so that the relation could provide a basis for distinguishing between the entities to which it applies in the first place. But now the categories are no longer taken to be determined 'relationally' in terms of an ordering imposed 'from the outside', but rather in terms of the entities' 'intrinsic' combinatorial 'powers'. Reverting now to the simpler example of the particular-universal –distinction and the exemplification relation, the elements to be 'combined' are no longer *a*, *x exemplifies y*, and *b*, but rather *a exemplifies y* and *x*

exemplifies b (although to put it in this way is somewhat misleading — this applies to the above linguistic representation of Lowe's OS as well; the elements should not be viewed as partially saturated *complexes* produced from the previous three elements, but as simple entities — just as *x exemplifies y* is supposed to be simple, even if it, superficially at least, looks complex). Prima facie, *a*, *x exemplifies y*, and *b* can be combined in two different ways — namely into either *a exemplifies b* or into *b exemplifies a* — and this is precisely why the question about asymmetry is raised. But when the simplest elements involved are *a exemplifies y* and *x exemplifies b* it seems that there is only one way to form a complex — namely, by letting each element fill the empty place in the other. But, of course, it is here merely taken for granted that the elements are not such that they could *also* be represented as *x exemplifies a* and *b exemplifies y*, respectively, or such that they would be *correctly* represented rather in this way. 'Absorbing' the relation into the relata decides once and for all these questions about asymmetry, but this is not an advantage of any kind if the questions are controversial.

I take it that Lowe's answer to MacBride's objection concerning the 'content' of the asymmetry of his categorial relations is sufficient as far as it goes (see above). On the other hand, whether there really are such asymmetrical 'dependency patterns' etc. as Lowe claims in reality is indeed a contentious metaphysical question. What if the correct ontology turned out to be one of states of affairs — of particulars and universals —, one in which no such asymmetries in ontological dependence or any other are to be found? There would then seem to be no ground for taking the relation connecting particulars and universals to be asymmetrical; so the simplest view, one with the least arbitrariness involved, would thus seem to be to take the relation to be symmetrical (or perhaps non-symmetrical). But then there could be no account of the distinction between universals and particulars in terms of the relation connecting them. Does this mean that it may turn out that there are categorial distinctions in the world which cannot be explained relationally? Well, it could be taken to mean that, but it could also be taken to mean that some *prima facie* category distinctions turn out, when correctly viewed (i.e. from the point of view of 'ontological form'), to be empty of content. That is, we might as well take the impossibility of a relational account here to show that particulars and universals are not really categorially distinct. This view would even seem to be in the spirit of the Ramsey-MacBride –objections. The lesson to be learned from MacBride's objection from the possibility of no asymmetry would then be, not that category distinctions cannot

always be explained relationally, but: so much the worse for those supposed category distinctions that cannot.

I have not provided any arguments for the *necessity* of relational accounts of category distinctions; I have merely tried, in a rather small way, to defend their *possibility*. But if one were to argue in the above way, one would need to provide those arguments. Now, I do not know whether there is really a case to be made here. Nevertheless, I am at least inclined to believe that category distinctions should not be taken as '*brute*' (I recognize that this probably goes quite a bit against the received wisdom concerning categories). If particulars and universals, for example, are to constitute genuinely distinct categories, the category of particulars must be, I think, more than merely different from or non-identical with the category of universals — that is, we should be able to say more than this about them. Because of this, some kind of 'structuralism', in which the categories are to be individuated in terms of a network of relations in which they are nodes, actually seems to me like an attractive option. Of course, one also must not simply suppose that there can be no non-relational differences between categories (although I must confess I at least have no idea what these would be). But looking at how different candidate ontological categories have been characterized, it is, I think, conspicuous how extensively such characterizations are based on relations. In addition to those that have been repeatedly used as examples in this work, spatiotemporal relations are, for example, often invoked (e.g. in the negative characterization of abstract entities as not located in space and time; see e.g. Hoffman and Rosenkrantz 1994, Appendix 1), perhaps combined with mereological ones (e.g. 'continuants' as having no temporal parts); causality provides another example (e.g. events as relata of causation and as individuated in terms of causality; see Davidson 1969). An exception, of course, would be provided by the characterization of the 'root' category in a 'hierarchy of being' type category system (as described in 3.111 above). But even there, no two categories are ever distinguished non-relationally; the 'root' category is the lone exception. (One should also remember the fact that such 'category structuralism' would require there to be at least generic dependence between all entities; but this is not that heavy a requirement if we are talking about fundamental entities).

The major trouble, nevertheless, with the idea of 'category structuralism' is that it is obscure how the relevant 'structures' should in general be understood. I am not

enthusiastic about (even if not completely against) taking there to be distinct relational entities corresponding to categorial relations or 'structures', and the idea that the categories of two entities could be determined by a distinct third entity seems in fact problematic anyway (for the same reason that the use of relations in general in accounting for the category of an entity seemed problematic above). Another way to conceive of 'categorial structures' would be as some sorts of 'organic wholes' (if you will) of which entities would be 'inseparable parts'. But this sounds like it would have very strong metaphysical consequences.

Does the view of entities as 'unsaturated' I sketched above provide an alternative to these? On the view I sketched, entities are taken to be inherently 'incomplete'; they involve in their very nature other entities; this 'involvement' is the categorial relation, associated with ontological dependence, by another name. It seems, however, that this view in effect collapses to the holistic 'organic whole' view[46]. For if one takes substances, kinds, modes, and properties (for example) all to be in themselves 'incomplete' in the way suggested, does not one thereby implicitly give some sort of priority to the complex units formed by these entities, perhaps even to the maximal complex that is the whole of reality? It may be noted that Lowe at least would probably not welcome such a consequence (although I am not claiming that Lowe would endorse the 'incomplete entity' view). First of all, he rejects views on which the 'fundamental building blocks' of reality are complexes like states of affairs (see e.g. 2006: 108, 128); secondly, although he seems to express some sympathy with monism, with taking reality as 'one' (2006: 191), I doubt he would be ready to give any sort of priority to the 'one world'.

Indeed, one seems to come dangerously close to taking substances, kinds, and the rest to be mere 'abstractions' from a prior whole, whether this is understood as the whole of reality or as something like a state of affairs. But if what we thought were fundamental entities are in fact such 'abstractions' or 'aspects', what we seem to have in our hands is a version of the 'hierarchy of being' view, now with *all* four categories as derivative. In effect, Schaffer advocates just this type of view on which the whole is prior to its parts or

[46] Compare with Frege, with whom the 'unsaturatedness' of concepts is associated with the view that the judgment is prior to its 'parts'; a judgment is not composed or 'put together' out of concepts and objects as prior elements, but these are instead arrived at through an analysis of the judgment as a prior unity (see Linsky 1992: 267–68).

'aspects'. He takes the fundamental entity to be the whole cosmos from which a 'that-aspect' and a 'such-aspect' (compare with the particular and the universal, respectively, of a state of affairs) can be 'abstracted' as derivative, non-fundamental entities (2009: 379). Note also that when categories are defined in terms of their mutual relations, while it is certainly then true to say that they *do not differ* from each other with respect to fundamentality, it does not follow that they are all fundamental — they might all be non-fundamental.

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Without doubt, much more would need to be said about these issues before definite conclusions about 'relational accounts' of categories or of 'category structuralism' could be drawn. Also, substantive metaphysical issues cannot be completely ignored, even if the issues we are concerned with are 'metaontological'. As we saw, there are category distinctions which seem to be resistant to a 'relational account'. And the reasons for believing in these category distinctions may very well outweigh the reasons for believing that categories must have a thoroughly relational nature. Another substantive issue that is important in the present connection is the metaphysics of relations. The idea that the essence of categories is relational depends on the coherence of the idea of ('strongly') internal relations. In fact, it seems that the metaphysics of internal and external relations is an issue foundational to all structuralism. But much work remains to be done in this area.

4. Concluding remarks

One of the major concerns of the metaphysician is, or should be, what the most basic types of entities — i.e. the categories — are. This work has explored some issues connected with ontological categories and category systems. One issue concerns the basis for ontological categorization: what do ontological categories *classify by*? Another way to put this question is: what makes a categorization *ontological*? I suggested that the answer is to be found in taking ontology to be 'formal ontology': ontological categories categorize by 'ontological form'. Another issue concerns relations between the categories. Categories form a system (and not just a classificatory one or a 'taxonomy'),

they have connections with each other. Relations, 'formal' or 'formal ontological' ones, have also been central in formal ontology. I examined the idea, which I took to be plausible, that relations between categories are not only an important part of any category system but actually constitutive (somehow) of the categories themselves. Non-taxonomical relations between categories are, properly speaking, relations between the *entities* in the categories. I took them to be certain kinds of 'formal ontological relation'. As I also took categories to be essential to the entities in them, a 'part of their nature', the relations constitutive of the categories were taken also to be constitutive of the entities themselves. I supposed throughout that categories themselves are not entities. Thus, to say that categories are 'really defined' or constituted by the relations they stand in is an imperspicuous way of saying what is more perspicuously put by talking of the entities themselves in their categorial nature: e.g., an Aristotelian particular accident *as such* is (on one view) just something that is present in a primary substance; this relational connection constitutes the categorial nature of a particular accident, the nature of a particular accident *qua* particular accident (see 3.111).

Another theme that recurred was that of fundamentality. This is because in the Introduction I endorsed the view that there are only fundamental entities, and consequently the view that ontological categories are categories of fundamental entities. My view of fundamentality was one based, in the first place, on the idea of truthmaking or on metaphysical necessitation. When 'real definition' was introduced, this view was somewhat modified. Nevertheless, I rejected distinct views of fundamentality that are wholly based on hyperintensional notions.

If this work makes any original contribution, I suppose it is the idea of a specific sort of (what I have called) '*category structuralism*'. I am not aware of *exactly* similar (explicit) suggestions in the literature (However, Lowe does, at least on the interpretation given above, come close to formulating this sort of view; Peter Simons has also emphasized the importance of formal relations in category ontology, and of what is 'behind the categories' (Simons 2012: 131); it is the work of Lowe and Simons that originally made me think of categories from the point of their relations. Westerhoff (2005) is the only author I know who does hold an explicitly 'structuralist' view of ontological categories; his structures, however, are structures among *states of affairs* on the basis of which the categorized entities, their 'constituents', are defined – a rather different idea). On the other

hand, analogous views are prominent, for example, in the metaphysics of properties. Shoemaker (1980) and, more recently, e.g. Bird (2007) have suggested that properties are wholly individuated by the causal roles that they play. There is nothing more to properties than their causally relevant relations to each other. My suggestion about categories is similar: categories are nothing more than their (formal ontological) relations to each other. Of course, there are important disanalogies as well. For one, there are no such things as 'categories' (on my view, at least), whereas 'property structuralists' at least tend to assume that there are properties. Categories are also essential to the entities in them; the corresponding claim in the case of properties is, on the other hand, much more controversial. For these reasons, my suggestion is in fact a suggestion of a *'partial'* (but *only* 'partial') *structuralism for all entities*: the natures of entities *insofar as they are of the categories they are* (I recognize that much more needs to be said about the import of the 'insofar as' or '*qua*' operator used here) are wholly constituted by certain mutual relations. It remains, however, to be seen whether a coherent view could actually be developed out of this sketchy suggestion (as I pointed out, it may also have some rather extensive general metaphysical consequences).

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