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**Natural Language Ontology**

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**Introduction**

Natural language ontologyis the study of the ontology (ontological categories, structures, and notions) implicit in natural language. Natural language ontology is part of 'descriptive metaphysics' to use Strawson's term, as opposed to what Fine calls ‘foundational metaphysics’, metaphysics whose interest is in what there ultimately is. Natural language ontology is a sub-discipline of both philosophy and linguistics, more specifically, of metaphysics and natural language semantics. It was recognized as a separate field of study relatively recently, through the development of natural language semantics over the last decades. At the same time, natural language ontology can be considered a practice that philosophers have engaged in throughout the history of philosophy when drawing on language in support of a metaphysical argument or notion. The ontology of natural language is to be distinguished from the ontology a speaker accept on the basis of philosophical or naïve reflection or reasoning using language, as well as from the ontology that is reflected in cognition in general. The ontology of a natural language is thus best characterized as the ontology competent speakers implicitly accept by way of using the language.

1. Natural language ontology as an emerging discipline and as a practice

1.1. Natural language ontology as a discipline

1.2. Natural language ontology as a philosophical practice

1.3. The ontology of natural language and its relation to reality

1.4. The ontology of natural language and truth conditions

1.5. The ontology of natural language and cognition

1.6. The relevance of natural language ontology for philosophy

2. Natural language ontology as a sub-discipline of both linguistics and philosophy

2.1. Natural language ontology as part of descriptive metaphysics

2.2. How does natural language reflect ontology?

2.2.1. Entities in different semantic roles

2.2.1.1. Semantic values of referential noun phrases and variables

2.2.1.2. Implicit arguments

2.2.1.3. Parameters of evaluation and truthmakers

2.2.1.4. Other semantic roles

2.2.2. The connection between ontology and compositionality

2.2.3. Ontological categories and syntactic categories and positions

2.2.4. Metaphysically relevant specific expressions and constructions

2.2.5. Chomskyean skepticism about reference to objects in the semantics of natural language

3. Distinctive features of the ontology of natural language

3.1. Complex NPs and constructional ontology

3.1.1. Reference to unrestricted sums and kinds

3.1.2. Introduction of objects by abstraction

3.2. Intentional (‘nonexistent’) objects

3.3. The mass-count distinction

4. The question of ontologies and the core-periphery distinction

5. Outlook

Bibliography

* General works on natural language ontology
* Specific references mentioned in the text
* Works on particular topics or particular approaches

**1. Natural language ontology as an emerging discipline and practice**

**1.1. Natural language ontology as a discipline**

The subject matter of natural language ontology is the ontology implicit in natural language, which is to be distinguished from the ontologies of the various metaphysical theories or naïve philosophical views formulated by using natural language. Natural language ontology has as its task to uncover the ontology that is reflected in linguistic intuitions, setting aside the question whether that ontology is real or merely apparent.

 I will use ‘natural language ontology’ as the term for the discipline and ‘the ontology of natural language’ as a term for its subject matter. The more accurate term for the subject matter of natural language ontology would actually be ‘the ontologies of natural languages’, since natural languages may reflect different ontologies and even the same language (or idiolect) might reflect different ontologies. For most of the entry I will simplify by talking about the ontology of natural language, addressing the issue of different ontologies only in Section 4.

 Natural language ontology had been suggested as a discipline first by Bach (1986), who uses the term ‘natural language metaphysics’. That term is in a sense more adequate than ‘natural language ontology’: ontology is often taken to be narrower than metaphysics, dealing just with what there is (the inventory of things) rather than, as metaphysics does, with the nature of things (Quine 1948). However, ‘ontology’ is increasingly used in the broader sense of metaphysics as well, especially when it has an empirical or applied dimension (e.g. ‘applied ontology’, a field of study that involves the practical application of ontological notions and theories to specific domains, such as management, biomedicine or geography). Also the count noun ‘ontology’ is better usable than ‘metaphysics’ to denote the subject matter of a branch of metaphysics since it comes with a plural, allowing talk about ‘the ontologies of natural languages’ and ‘different ontologies’ being the subject matter of different branches of metaphysics.

**1.2. Natural language ontology as a practice throughout the history of philosophy**

Natural language ontology is a developing discipline that is part of both metaphysics and natural language semantics. But in a way it has also been a practice throughout the history of philosophy. Philosophers throughout history, at times more often than others, have appealed to natural language to motivate an ontological view or notion, thus practicing a form of natural language ontology [SEP Logic and Ontology]. Appeals to natural language in the context of metaphysics can often be found in Aristotle and, more explicitly, in medieval metaphysics (Aquinas, Buridan, Ockham), in the phenomenological tradition (Bolzano, Brentano, Husserl, Meinong), and, again quite explicitly, in early analytic philosophy (Frege, Twardowski, Strawson, Austin, Vendler, Ryle). Drawing on natural language is also common among many contemporary philosophers that do not specifically pursue natural language ontology (Section 1.6.).

**1.3. The ontology of natural language and its relation to reality**

What does such an appeal to natural language amount to? One of the most common ways in which philosophers draw on language concerns the denotations of referential noun phrases (NPs). It is a standard assumption in both philosophy and linguistics that referential NPs stand for entities and predicates express properties of entities. The types of predicates acceptable with particular sorts of referential NP are thus indicative of the ontological category of the entity the NP stands for. Philosophers thus often appeal to (or at least use) particular sorts of NPs when arguing for a particular ontological category or for a particular way of conceiving of it, such as *wisdom* or *the property of wisdom* when arguing for properties; NPs like *Socrates’ death* when arguing for events, NPs like *Socrates’ wisdom* when arguing for tropes or particularized properties [SEP Tropes], NPs like *the number of planets* when arguing for numbers being objects, and NPs with the noun *fact* when discussing the nature and role of facts (Austin 1950, Strawson 1950). There are many other ways in which natural language appears to reflect ontology that have played a role in philosophical discussions (Section 2.2.).

 The appeal to natural language in the history of philosophy was generally based on the assumption that natural language just reflects reality and that natural language thus provides a particularly manifest indication for the way reality should be understood. While the view is still present in some of the ways in which contemporary metaphysicians draw on natural language, there is another view that has gained prominence, and that is that natural language does not in fact reflect the ontology of what there really is, or at least not fundamental reality. Rather, natural language comes with an ontology that may be quite different from what many philosophers consider the ontology of the real. For example, a lot of referential NPs in natural language seem to stand for entities that many philosophers would not consider real, let alone fundamental. These include ontologically dependent, minor, and derivative objects such as holes, shadows, smiles, homes, problems, reasons, advantages, and mistakes, as well as construction-driven objects such as pluralities like ‘the stones in the garden’ (Section 3.1.1.), functional, variable, or intensional objects like ‘the increasing temperature’ or ‘the book John needs to write’ (Section 3.1.1.), and intentional objects of the sort ‘the house John was dreaming about’ (Section 3.2.). There are also predicates of natural language that reflect notions that diverge from corresponding ‘philosophical’ notions. Thus whereas existence is generally taken to be a univocal notion applying to every actual entity, the predicate *exist* resists application to events (Hacker 1982, Cresswell 1986). Also categorial distinctions such as the mass-count distinction, which includes a distinction between ‘the water’ and ‘the quantity of water’, ‘the rice’ and ‘the rice grains’, as well as ‘the clothes’ and ‘the clothing’, are nowadays not generally taken to reflect a real ontological distinction, but, at best, a distinction at a level of ‘grammaticized individuation’ (Section 3.6.). Such discrepancies motivate distinguishing two ways of pursuing metaphysics: [1] metaphysics whose aim is to uncover the ontology reflected in natural language or other ‘data’ or intuitions, and [2] metaphysics whose aim is to uncover what there really is. This distinction raises important questions itself, though.

 First of all, how should reality itself be understood? Does reality just consist in what is fundamental, and what exactly does that mean? Or does reality also include ordinary objects, and perhaps entities ontologically dependent on them, or does it consist of a much greater range of entities, a plentitude of just anything conceivable that meets the conditions for its existence (Eklund 2008, [SEP Metaphysical Realism, Metaphysics, Existence]? Should reality include a realm of mere possibilia and perhaps nonexistent, merely intentional objects [SEP Nonexistent Objects], [SEP Possible Objects]? Does reality come with a structure or is it an ‘amorphous lump’, to be carved out in one way or another by language? Does reality consist of a single level of being or different levels ordered by relations of grounding or fundamentality? [SEP Metaphysical Grounding].

 A second question is whether the two metaphysical projects can be pursued independently of each other. While many contemporary metaphysicians aim to pursue [2] without engaging in [1], Fine (2017a) argues that the two branches of metaphysics cannot be pursued independently, but that [2] presupposes [1]: metaphysics that aims to figure out what there really is, ‘foundational metaphysics’ in Fine’s terms, has to take what Fine calls ‘naïve metaphysics’ (or the ‘metaphysics of appearances’) as its starting point, that is, the metaphysics whose aim is to uncover the ontology reflected in our ordinary judgments or in natural language (we will come to those terms in Section 2.1.). That is because naïve metaphysics provides the clarification of the metaphysical notions that foundational metaphysics aims to explain in more fundamental terms.

 A third issue is whether metaphysics that aims to uncover what there really is can even be pursued in the first place. There have been various movements in metaphysics that deny that, including Kantian and phenomenological approaches (Section 7.1.). In fact natural language ontology may very well be pursued while taking a skeptical stance toward the metaphysics of the real.

**1.4. The ontology of natural language and truth conditions**

Some central issues in natural language ontology bear on the question of how reality and existence are to be understood.

 One of them is how natural language ontology is compatible with what is widely regarded a fundamental requirement on semantic theory, namely that of giving truth conditions for sentences. For a sentence S about an entity *d* to be true or false, what makes S true or false, it seems, needs to be a part of reality that includes d itself, and thus d needs to be a real entity, rather than part of an ontology of ‘appearances’. There are various options to pursue, each of which may be adopted for just some part of the ontology reflected in natural language. One option is that natural language displays ontological notions or items that simply fail to be real, and thus speakers making use of them in their utterances are in error. Second, entities in the ontology of natural language may have the status of fictional entities, which means that a sentence about such entities may not be able to be ‘really’ be true (unless it predicates a property of the fictional entity *as* a fictional entity, with predicates such as *is a fictional character*) [SEP Nonexistent Objects, Section Nuclear and Extranuclear Properties]). Third, entities in the ontology of natural language, even if not considered fundamental, may be considered derivative, yet real, which would allow sentences involving reference to them to be true. Many proponents of natural language ontology, though, such as Bach (1986), remain agnostic regarding the metaphysical status of the items that natural language ontology posits, as long as they are motivated by empirical generalizations and theoretical linguistic considerations.

 Another general issue, skeptically addressed in particular by Chomsky, is whether referential NPs even have as their semantic function to be used to refer to entities and thus whether referentialist semantics is even possible (Section 2.2.5.). Not all approaches to natural language semantics have as their aim giving truth conditions (whether it is set aside or abandoned) and thus rely on referentialist semantics. Chomsky (2000) himself takes the view that the semantics of natural language can involve only our cognitive representation of the world, not entities and their properties themselves.

**1.5. Ontology reflected in natural language, in cognition, and in reasoning**

It is tempting to take the ontology of natural language to just be the ontology implicit in

cognition, including perception. In fact often researchers pursuing natural language ontology take research in cognitive science into account or pursue interdisciplinary research in both areas at once (e.g. Wellwood et al. 2012, Wisniewski et al. 1996). While there are without doubt important connections and a significant overlap, the two ontologies need to be kept distinct. To give an example, it is generally agreed that the ontology of ordinary objects is not closed under sum formation, but rather subject to constraints of gestalt (integrity) as well as function. Thus, the sum of the stuff in my room does not form an entity that is part of that ontology and neither does the sum of the Eiffel Tower and the Dalai Lama. But natural language appears to allow for unrestricted sum formation with definite mass and plural NPs and conjunctions of definite singular NPs (*the stuff in my room*, *the Eiffel Tower and the Dalai Lama*), at least on the dominant view on which definite plural and mass NPs stand for sums (Section 3.1.1.).

 How should the ontology of natural language relate to cognitive agents? In order to distinguish it from the ontology reflected in cognition in general, one might take it to be the ontology a speaker accepts *by way of using the language,* with the by-way-of-condition ensuring that the ontology of natural language is not an ontology the speaker just accepts when using language (which could be the case just by coincidence). But there is another cognitive dimension that matters, namely that of intuition vs. reflection/reasoning [SEP Intuition]. Natural language can be used for making and denying various ontological claims and for introducing revisionary ontological theories. Such uses of language do not display the ontology implicit in natural language. The ontology of natural language must be distinguished from ontological views based on reasoning, that is, from ontologies that philosophers accept when thinking about there is. It also must be distinguished from ontologies that non-philosophers (‘the folk’) naively accept when thinking about what there is, which are the subject matter of folk metaphysics (Schaffer 2019), the analogue of folk physics and folk biology. A distinction thus needs to be drawn between the ontology agents accept though reasoning and the ontology agents implicitly accept by way of using the language, so that we have:

(1) The ontology of a natural language is the ontology speakers *implicitly* accept by way of

 using the language.

The practice of natural language ontology, as it has been pursued by philosophers and linguistics, makes a clear distinction between the sorts of linguistic data indicative of the ontology implicit in natural language and those indicative of an ontology based on reasoning. Explicit metaphysical assertions, which may make manifest not just some philosophers’ views but also folk metaphysics, are not indicative of the ontology implicit in natural language, for example assertions of the following sentences (whether they are widely believed or not):

(2) a. There are artifacts.

 b. States are not events.

 c. There are things that don’t exist

No philosopher or linguist would appeal to sentences such as (2a-c) when arguing that natural language reflects an ontology of artifacts, of states distinct from events, or of nonexistent entities. Otherwise, another philosopher or linguists might just as well appeal to the equally acceptable negations of (2a, b, c) to argue for just the opposite. What matters for natural language ontology are ontological presuppositions, not assertions (Moltmann 2019). Ontological presuppositions manifest themselves, for example, as pesuppositions of ontological categories carried by predicates, referential NPs, quantifiers, or pronouns. Predicates may require as arguments entities of particular ontological categories on pain of resulting in a category mistake (Magidor 2013). For example, *stop* and *happen* require events as arguments, and *move* and *exist* (enduring) objects. Particular types of NPs may carry presuppositions regarding the ontological category of the entities they may stand for. Gerunds like *John’s buying of the house* can only stand for events, gerunds like *John’s buying the house* only for facts (Vendler 1967). Quantificational NPs like *every time* can range only over times or situations, quantifiers like *somewhere* only over places, and quantifiers like *somehow* only over qualities, pronouns like when and then can stand only for times.

 There are also linguistic data that only natural language ontology can take into account, but not folk metaphysics or linguistically uninformed philosophical reflection. These are sentences whose ontological commitments won’t be obvious to ordinary speakers (non-linguists), for example, by containing silent syntactic elements with ontological content, as is the case for certain syntactic structures posited in generative syntax. For example, Kayne (2005, chap. 8) argues that the sentence *John has few books* contains a silent (antecedent-less) occurrence of the noun *number*, which suggests that the actual structure of the sentence, *John has* few NUMBER *books*, involves reference to a number. Another example is lexical decomposition in syntax with ontological relevance. Thus, Harves/Kayne (2012) argue that the underlying form of the English verb *need* is *have need*, which involves an ontological commitment to things like needs that is not evident from the simple verb *need* alone. Underlying syntactic structures of this sort are posited in generative linguistics on the background assumption that knowledge of grammar is implicit and to an extent innate, and not available to rejection or revision. If ontological notions go along with such structures, then they should be just as much part of implicit knowledge as the syntactic structures themselves and will be unavailable to rejection through reasoning.

 This also would solve the puzzle of how it is possible for a speaker to reject upon reflection (part of) the ontology that is implicit in natural language while still committing herself to it through the continued use of the language. The implicit acceptance of the ontology of natural language may best be understood not as a form of belief, but rather as a form tacit knowledge on a par with that of grammar (Moltmann 2020a). Such a robust form of implicit acceptance, which resists rejection upon reflection as long as the agent uses the same language, appears rather different from the implicit acceptance orbias in ethics, which does permit rejection upon reflection.

 Distinguishing implicit acceptance of an ontology through the use of language from metaphysical reflection does not mean that the latter may come into play *when building a theory* of the ontology reflected in natural language: natural language data may give only a partial reflection of a particular ontological domain or notion.

**1.6. The relevance of natural language ontology for philosophy**

There are two general questions that arise regarding natural language ontology as an emerging discipline. [1] Why should natural language ontology be pursued in the first place? [2] Why is its pursuit relevant to philosophy?

 As regards [1], at least given certain general assumptions about semantic values, truth conditions and compositionality (Section 2.2.). natural language ontology is an integral part of theoretical linguistics and thus as important to pursue as theoretical linguistics itself. Theoretical linguistics has grown enormously over the last 70 years providing a wealth of semantic and syntactic generalizations and theoretical considerations, which permits a more systematic and accurate use of natural language for metaphysical purposes. When pursued within the context of theoretical linguistics, natural language ontology will also set its own ambitions regarding universals, the alignment of ontology with syntax, the relation of ontology to lexical semantics, and the connections of the ontology reflected in natural language to that reflected in cognition.

As regards [2], there are specific reasons for a philosopher to pursue natural language ontology. First of all, natural language ontology has an important contribution to make to descriptive metaphysics (Section 2.1.), as it focuses on linguistically manifest intuitions and stable judgments about the acceptability of natural language sentences. There are a range of issues in metaphysics where linguistic intuitions play a particularly important role, such as material constitution (Fine 2003) and existence and persistence (Fine 2006). The use of linguistic intuition here is meant to show that that certain widely held identity theories are mistaken, if at least one of the items is identified as part of the ontology of natural language. Thus, given the sorts of properties we ascribe to them in ordinary speech, material objects such as artifacts cannot be identical to the matter they are made of and events and objects cannot just be three-dimensional space-time regions. A revisionary metaphysician would face the considerable challenge of explaining why the items have such different properties.

Second, many topics in metaphysics have evolved historically around linguistic facts, generally used as manifestations of common sense intuitions or of reality itself. For example, linguistic facts have played an important role in the debate surrounding universals at least since the middle ages, pursuing questions such as whether *wisdom* a term that picks out an abstract universal or just its various instances. Natural language examples play a significant role also in contemporary discussions of abstract objects (Zalta 1983, Boolos 1998), properties (Chierchia/Turner 1988, Bealer 1993), and types (Wetzel 2009), which generally maintain the view that natural language allows reference to a wide range of abstract objects (but see Section 4.1.). Linguistic facts, at least since Frege (1918/9), have also played a central role for motivating abstract propositions as truthbearers: *that*-clauses appear to act as singular terms standing for abstract propositions, truth bearers that are both meanings of sentences and objects or contents of thought. Using a different range of linguistic data from Polish, German, and French (in three versions of the same article), Twardowski (1911) argued for non-enduring products of acts (‘claims’, ‘judgments’, ‘assumtpions’), rather than propositions, being truth bearers, proposing a novel cognitively realistic yet not psychologistic account of the content of attitudes as well as the subject matter of logic and even the humanities in general.

Finally, linguistic facts play an important role in the debate about the existence and nature of numbers. Frege’s (1884) theory of numbers as abstract objects was motivated by sentences such as *the number of planets is eight*, an apparent identity statement containing twoapparent number-referring terms. More recent linguistically oriented research has put into question whether *eight* in that sentence really refers to a number rather than keeping its ‘adjectival’ meaning (as a quantifier or plural property) and moreover whether *the number of planets* in that sentence is really a number-referring term rather than acting as a ‘concealed question’, standing for the question about how many planets there are (Hofweber 2016, Moltmann 2013, Romero 2005). Such debates show that when metaphysical arguments rely on linguistic data, those data need to be subject to linguistic examination, in the recognition that natural language ontology is also part of linguistics.

**2. Natural language ontology as a subdiscipline of both linguistics and philosophy**

Natural language ontology as a subdiscipline of both linguistics and philosophy raises a number of general questions. First, how does natural language ontology situate itself within metaphysics and how is it to be understood as a part of metaphysics? Second, how exactly does the semantics of natural language involve ontology and thus in what sense is natural language ontology part of linguistics? Third, what sorts of linguistic data reflect the ontology implicit in language, and how is that ontology itself to be characterized? In what follows, these questions will be addressed in turn.

**2.1. Natural language ontology as part of descriptive metaphysics**

A dominant view of metaphysics is that its subject matter is that of fundamental reality, the task of metaphysics being, in Plato’s words, to ‘carve nature at its joints’. If the subject matter of metaphysics is fundamental reality, then natural language ontology will have no place in it. There is another view of metaphysics, however, on which metaphysics, at least in part, has as its subject matter the general nature of things *as reflected* in a particular range of ‘data’. Those data may consist in common sense intuitions or ordinary judgments, experiences (as in phenomenology), or in linguistic intuitions about the acceptability, truthconditions, and inferential relations of natural language sentences (natural language ontology). On such an approach to metaphysics, it is left open what such data may reflect, whether it is physical reality, a realm of actual but derivative entities, entities constituted by the experience itself, or a realm of conceived reality. Older traditions of metaphysics that fall under the approach include the Kantian tradition, which deals, for example, with ontological categories, but as preconditions of accessing the world, rather than as categories of how things really are, as well as the phenomenological tradition (Brentano, Husserl, Ingarden), where ontology was also pursued, but based on how things appear (or are constituted by appearance), rather than assumptions about a mind-independent reality.

 In contemporary analytic philosophy, Strawson’s (1959) notion of descriptive metaphysics most clearly focuses on what is reflected in data. The subject matter of descriptive metaphysics is what Strawson calls our ‘shared conceptual scheme’, a term indicative of a Kantian background (SEP Strawson). Nowadays descriptive metaphysics is more commonly taken to have as its subject matter the ontology reflected in shared commonsense intuitions or ordinary judgments (since metaphysics is generally taken not to be about representations or concepts, but things and their nature). Strawson contrasts descriptive metaphysics with what he calls ‘revisionary metaphysics’, which aims to produce a better structure of our thought (or a better ontology, as one may better say). Strawson does not elaborate how ‘better’ is to be understood; it may be meant to be metaphysics that better carves nature at its joints, provides a better foundation of the natural sciences, or is better able to meet whatever the standard a given revisionary metaphysician may have in mind.

 Given the Strawsonian distinction, natural language ontology clearly belongs to descriptive metaphysics, in the sense that its subject matter is the ontology reflected in linguistic intuitions regarding the truth conditions or acceptability of natural language sentences.

A distinction somewhat similar to the Strawsonian distinction between descriptive and revisionary metaphysics is Fine’s (2017a) already mentioned distinction between ‘naïve metaphysics’ and ‘foundational metaphysics’. Naïve metaphysics is interested in the general nature of things, without regard for whether they are real, with our ordinary judgments being an important guide. As it does not distinguish between appearance and reality, Fine also calls it the ‘metaphysics of appearances’. The subject matter of foundational metaphysics, by contrast, is the ontology of what therereally is, fundamental reality. Foundational metaphysics is defined in terms of its subject matter, not in terms of its deviation from naïve metaphysics. What is novel in Fine’s distinction is how the relation between naïve and foundational metaphysics is understood: foundational metaphysics must take naïve metaphysics as its starting point (as mentioned in Section 1.3.); naive metaphysics, by contrast, should be pursued without regard to foundational considerations

Given the Finean distinction, natural language ontology will be part of naïve metaphysics. The term ‘naïve metaphysics’ is potentially misleading, though, when applied to natural language ontology. The ontology implicit in natural language needs to be distinguished from the ontology of what non-philosophers naively think there is (the subject matter of folk metaphysics). The ontology of natural language, by contrast, is the ontology that competent speakers of the language implicitly accept, whether philosophers or non-philosophers and whether they would naively or not so naively agree with it upon reflection. For that reason, I will stay with the better established and less misleading Strawsonian term ‘descriptive metaphysics’, suitably understood.

The view that descriptive metaphysics is to be pursued without foundational considerations also defines a methodological principle for natural language ontology, namely that the decision whether to posit entities of particular ontological categories as semantic values should not be made based on assumptions about what is fundamental or what really exists, but rather on the grounds of the semantic behavior of expressions.

It is not clear, though, that natural language ontology can be pursued just as a form of ‘metaphysics of appearances’ without foundationalist considerations. Considerations as to what is more fundamental certainly enter decisions as to how to understand derivative entities as semantic values. More importantly, considerations regarding truth play a central role in semantics as well as natural language ontology. The guiding principle for natural language ontology may just be taken to be that of giving priority to linguistic intuitions over foundationalist considerations when linguistic intuitions are available.

 One might think that involving metaphysical considerations in natural language ontology means mistakenly imposing a sophisticated metaphysics on the ‘folk’ (competent speakers that are non-philosophers). Clearly, however, what matters is whether the ontology posited is the correct one, as the ontology speakers implicitly accept by way of using language, not whether it has been posited through reflection by the ontologist.

**2.2. How does natural language reflect ontology?**

It is a guiding assumption of natural language ontology that natural language reflects ontology. That is, the semantics of natural languages involves entities of various ontological categories, ontological structures, and ontological notions on the basis of syntactic roles of expressions, syntactic categories and features, and lexical words. The following will elaborate some of the ways in which natural language reflects ontology.

**2.2.1. Entities in different semantic roles**

First of all, entities may play various roles in the semantic structure of natural language sentences. To an extent, it depends on particular semantic theories about relevant constructions or expressions, though, what entities play what sorts of roles (Section 2.2.2).

**2.2.1.1. Semantic values of referential NPs and variables**

Most importantly, entities play a role as the semantic values of referential noun phrases (NPs), as the things that quantificational NPs range over, and as arguments of predicates. Referential NPs are occurrences of NPs in sentences in which they have the function of standing for entities. Natural language contains a wealth of expressions referring to or quantifying over entities, and it comes with a wealth of expressions that express properties of entities (or relations among them). The standard view is that with the utterance of a simple sentence like *that thing is red,* the property expressed by *red* is attributed to the entity the speaker refers to with *that thing*.

 The notion of a referential NP has played a central role in philosophical discussions about ontological commitment; it is an important notion in semantics and also plays a role in syntactic theory. Names and definite NPs can serve as referential NPs, as can specific indefinites and certain determinerless (bare) plurals and mass nouns. Only certain syntactic positions are reserved for referential NPs, such as the subject and the object position of extensional predicates, as opposed to intensional transitive predicates like *look for*, intentional predicates like *imagine*, and existence predicates like *exist* and *occur*. There are various syntactic and semantic criteria for referential NPs. For philosophers, since Frege, they include the ability of an NP to support anaphora, to be replaceable by quantificational NPs, and to serve as arguments of ordinary (i.e. extensional) predicates (Frege 1892, Hale 1987). For syntacticians, referential NPs also must satisfy certain syntactic conditions: they are generally taken to have the more complex structure of a determiner phrase (DP) rather than just that of what syntacticians take to be an NP, NPs being able to be used only predicatively (Abney 1987, Borer 2005).

 The notion of a referential NP (or *Eigenname* ’name’ as it was called at the time) already plays a central role in Frege’s (1892) philosophy of language and even provides a syntactic criterion for being an entity. For Frege, an entity is what can be the semantic value of a referential NP, since standing for an entity is the role of a referential NP in the context of a sentence.

 Entities also play a role as semantic values of quantificational NPs, more precisely, the variables that serve to formalize them. Ontological commitment has been tied to the role of semantic values of variables by Quine (1948), who put forward the dictum ‘to be is to be the value of a variable’. This was meant to apply not so much to natural language, though, but to regimentations of it in formal theories of science. Yet being the semantic value of a variable or being in the domain of a quantificational NP has become a well-established criterion for being an entity in the practice of natural language ontology.

 Some caution needs to be applied to both the Fregean and the Quinean criterion of objecthood. There are apparently referential NPs whose function is not that of standing for an actual entity, such as the subjects of negative existentials (*Santa Claus does not exist*) and the arguments of intentional verbs (*John is thinking about Santa Claus*). Furthermore, there are Meinongian views according to which reference and quantification are not actually existence-entailing but only lexical predicates are (Section 3.2., Priest 2005). Moreover, there are views according to which referential and quantificational NPs do not always range over entities, but may just have an inferential role (Hofweber 2016). Finally, not all quantificational NPs have the same semantic role, ranging over entities that will also act as arguments of the embedding predicate. Quantificational NPs of the sort *something, everything*, and *several things* in English, which can take the place of predicative complements as well as other nonreferential positions, may have a nominalizing function introducing a new entity into the semantic structure of a sentence (Moltmann 2013) or are non-nominal quantifiers ranging over the same higher-order entities that are the semantic values of the expressions they may replace (Rosefeld 2008).

 The notion of a referential NP also plays a central role in the tradition of Montague Grammar, where referential NPs are taken to be of type *e*, the type of entities (Thomason 1970). Montague himself, though, also proposed type-lifting referential NPs to the type of individual concepts. This allows for semantic uniformity with respect to NPs standing for individual concepts, such as *the rising temperature*, *the golden mountain* and *the mathematician John claims to be* (but see Section 3.1.1.). The move, however, no longer maintains a straightforward notion of a referential NP and thus a criterion for entities being part of the ontology of natural language.

**2.2.1.2. Implicit arguments**

Another role entities may play in the semantic structure of sentences is that of implicit arguments, that is, arguments of predicates that are not also the semantic values of referential NPs. For example, on Davidson‘s (1967) influential analysis, the sentence *John walked slowly* states that there is an event which, together with John, is an argument of *walk* and of which *slowly* (now treated as a predicate of events) is true (∃e(walk(e, John) & slowly(e)). The very same considerations that lead Davidson to posit events as implicit arguments apply to adjectives and motivate tropes as arguments of adjectives. *John is profoundly happy* will then state that there is a happiness trope that, together with John, is an argument of *happy* and of which *profoundly* is true (∃t(happy(t, John) & profoundly(t)). Instead of tropes, degrees have been used widely as implicit arguments of adjectives (Kennedy 2007, Wellwood 2015). Other implicit arguments proposed in the literature are implicit location arguments for weather predicates (*it is raining*) (Perry 1986) and implicit taste parameters for predicates of personal taste (McFarlane 2014). Generally, implicit arguments are motivated by observations about expressions (e.g. adverbials) acting as predicates targeting an entity for which there is no overt NP.

 The semantic role of implicit arguments raises the question whether there is a difference in ontological status between entities that are implicit arguments and entities that are semantic values of referential NPs. Davidson’s arguments for events are generally treated as stronger arguments for events being part of the ontology of natural language than the fact that there are event-referring NPs. This may be because Davidsonian motivations for events (adverb drop) relate to logical form only, rather than the lexical meaning of nouns. There are alternatives to Davidson’s semantics of adverbials, though, which do not posit such implicit arguments (Kim 1976, Copley / Harley 2015).

**2.2.1.3. Parameters of evaluation and truthmakers**

Another important role of entities in the semantic structure of natural language is that of a parameter of evaluation for the truth of sentences. The standard semantic view takes a sentence to be true or false not absolutely, but relative to a time and a (possible) world. This first of all gives justice to the intuition that sentences can be true or false in actual as well as counterfactual circumstances. Moreover, there are natural language expressions that have been considered operators shifting a parameter of evaluation. Tenses and temporal adverbials are standardly taken to act as operators shifting the time of evaluation and modals as operators shifting the world of evaluation. Also conditionals are generally treated as potentially shifting the world of evaluation for antecedent and consequent.

 There is generally taken to be a difference in ontological commitment between parameters of evaluation on the one hand and semantic values of referential terms and implicit arguments of predicates on the other. It is generally understood that parameters of evaluation do not involve an ontological commitment on the part of the language user, but are mere posits in the semantic theory, which means they have a status as entities only in the semantic metalanguage. Parameters of evaluation, involve an ontological commitment on the part of the language users only if there are referential expression in the object language making reference to them, or so the general view appears to be. For example, there are referential expressions in English referring to times (*today, that day, that moment* etc), but not those referring to worlds, at least not from the core of language (Section 4.1.). Frege’s criterion of objecthood of course does not apply to parameters of evaluation (and, in fact, it did not even apply to implicit arguments).

**2.2.1.4. Other semantic roles for situations**

Situations have been considered parameters of evaluation, but they play yet other semantic roles within particular approaches to natural language semantics [SEP Situation Semantics]. Thus, in Austin’s (1950) theory of sentence meaning, a speaker, when uttering a sentence, refers to a situation that provides semantic values for context-dependent expressions. Does this mean an ontological commitment to situations? The answer to that question bears on another criterion for ontological commitment, that of an entity being part of the intended meaning of a sentence. Certainly, an ontological commitment to situations is in place if situations must form part of the intention of speakers when correctly using a sentence, as is the case on that theory. This is also the case for various roles of situations in semantic analyses of definite and quantificational NPs, as well as E-type pronouns (Elbourne 2005). By contrast, situations play a role strictly outside the (intended) meaning of a sentence in Recanati’s (2010) theory of pragmatic enrichment.

 In the more recent development of truthmaker semantics (Fine 2017b), situations play somewhat similar roles to worlds in their role as parameters of evaluation, though truthmakers are based on a more restricted relation of exact truthmaking between situations and sentences. Situations in their role as truthmakers, it has been argued, also act as semantic values of referential and quantificational NPs, namely NPs with *case* as head noun (Moltmann 2021a), which would amount to an explicit ontological commitment, in both the Fregean and the Quinean sense.

**2.2.2. The connection between ontology and compositionality**

The ontology of natural language is intimately linked to compositionality, the chief tenet of natural language semantics. Which entities play a role in the semantic structure of

 natural language depends very much on what the semantic contribution of occurrences of expressions to the composition of the meaning of the sentence is taken to be. Different compositional semantic analyses of the language may thus go along with different ontologies. This means that the correctness of an ontology may depend on the correctness of the compositional semantic theory. Generally, the contribution of referential NPs is taken to be that of standing for entities and the role of predicates that of expressing properties that are applied to entities. There are formal alternatives, for example, on which predicates stand for functions that are applied to objects to yield truth values, or on which referential NPs denote higher-level functions (individual concepts) that apply to predicate denotations to yield truth values. What is most important is that for the purpose of compositionality the contributions of referential NPs and of predicates are the same in different types of sentences.

 There is also a view according to which the semantic role of expressions reflects ontology. Specifically this view has been held by Frege, for whom predicates stand for concepts, that is, unsaturated entities that need to apply to an object to yield a truth value. (SEP Frege, Liebesman 2015, who takes a critical stance).

**2.2.3. Ontological categories and syntactic categories, positions, and structures**

Natural language appears to manifest ontology also in its syntactic categories, which often appear to reflect ontological categories. Thus, verbs are generally taken to reflect the category of events (Szabo 2015), and adjectives the category of tropes or particularized properties (Williams 1953, Strawson 1959). Syntactic categories do not strictly correlate with ontological categories, though. *Be in a hurry*, *be hurried* and *hurry* all are predicates seemingly standing for the same property, but based on the lexical content of a noun, an adjective, and a verb, respectively. Another, mere tendency of a correlation is that of the syntactic mass-count distinction with the distinction between stuff and individuals (Section 3.6.).

 There is no agreement, at this point, as to the ontological content of syntactic category distinctions. Such correlations make a difficult topic also because there is a lot of crosslinguistic variation as to what syntactic categories natural languages display (Gil 1999). Moreover, there are theoretical developments in syntax that put familiar syntactic category distinctions into question and require at least a recasting of the issue. For example, in distributive morphology (Halle/Marantz 1993, Borer 2005), lexical elements (roots) are not associated with syntactic categories in the lexicon. Only when they are inserted in a syntactic structure will they be associated with syntactic categories, which means they cannot owe any ontologically relevant lexical content to a syntactic category. Another example is the theory of radical lexical decomposition (Hale/Kayser 2002), which has proposed, for example, that a range of full verbs are derived from combinations of a light verb and a noun e.g. *walk* from *take a walk* (*take* being the light verb and *walk* the noun). This view gives up a close connection between events and the category of verbs, but posits a much greater range of nouns instead that underlie full verbs.

 Ontological categories in natural language may be reflected in other ways in syntax than in syntactic categories, for example in syntactic positions. On the recent cartographic theory of syntax (Cinque/Rizzi 2010), syntactic positions in a sentence or an NP are associated with a semantic content, which often amounts to an ontological category, for example different positions for adjectival modifiers in an NP are distinguished for modifiers of number, size, shape and color.

 Another correlation of syntactic structure with ontology may concern the different types of situations that serve as truthmakers for different types of modal auxiliaries (Ramchand 2019).

**2.2.4. Metaphysically relevant specific expressions and constructions**

Besides syntactic categories, natural language displays particular types of expressions and constructions that appear to express metaphysical notions. Examples are of course the copula *be*, which conveys identity, predication, existence and perhaps other related notions, modals that convey metaphysical modality (*may, must, essential, the nature of*), existence predicates that convey existence or ways of being (*exist, occur, obtain*) (Fine 2006, Moltmann 2020b), ontological dependence (which may be conveyed by *have* or the possessor construction), part-whole-related expressions (Vieu 2006), expressions of causation (*make, cause*) (Swanson 2012), and truth (Hinzen/Wiltschko 2018, Moltmann 2021b). In addition, there are various nominal constructions that serve to denote entities of particular categories, perhaps introduced in particular construction-specific ways (Section 3.1.)

 With metaphysically relevant expressions, there is a general issue whether they may be used as technical terms pertaining to a particular philosophical view, in which case the expressions may be regarded as part of the periphery of language, not displaying an ontological notion that is part of the ontology of natural language (Section 4.1.). Nouns such as *existence, property, being, event,* and *number* may be candidates since they can be used with particular philosophical notions in mind, unlike the verb *exists* (Section 1.3.), copula and modal verbs, for example, which do not permit a non-ordinary, ‘philosophical’ use.

**2.2.5. Chomskyan skepticism about reference to objects in the semantics of natural language**

As mentioned in Section 1.3., the view that referential NPs stand for objects is not uncontroversial. It has been the target of critique particularly by Chomsky’s (1986, 1995, 2013), who put forward a range of different cases of co-predication as challenges to the traditional notion of reference as a relation to mind-independent, real objects. They generally are cases of inconsistent property ascriptions that objects on standard views would not be able to bear. For example, what we refer to as a ‘door’ could be painted, replaced, and walked through, properties that could not be attributed jointly to material objects as standardly understood. Another example Chomsky gives is a home, which unlike a house may have peculiar combinations of properties: one can own or sell a home, but not, for example paint a home. Other examples of Chomsky’s include cites, which can be destroyed and rebuilt at a different location, artifacts, which can undergo complete replacement of their parts, and persons with their relative independence of the bodies. Even terms like *water*, Chomsky (1 995) argues, do not stand for an external substance, but are individuated in part by their roles in people’s lives. For example, water can be polluted but not H2O. Moreover, Sprite has the same percentage of H2O as tab water, but one would not call it water, water being individuated by function, not just chemical composition. Chomsky’s conclusion is that natural language does not involve the reference relation, as a relation to real objects. The semantics of referential noun phrases rather involve lexical/conceptual structures deployed by speakers in particular contexts to refer to particular aspects of reality. Instead of a semantics with the (traditional) notion of external reference as its central notion, referential terms should have an internalist semantics, involving another level of syntactic representation, that of lexical-conceptual structure. This view will then require a different conception of compositionality than the standard one: rather than being based on objects and properties, compositional semantics will have to do with concepts only or concepts together with mental instructions (Pietroski 2018).

 Chomsky’s position, which denies that speakers using referential NPs refer to objects on any standard understanding, appears to imply a rejection of natural language ontology as such. There are different kinds of responses to the various Chomskyean challenges from the point of view of natural language ontology. First, one may adopt a different conception of reality. Reality need not be conceived as a mind-independent realm of material objects, subject to particular constraints on spatio-temporal location, but may consist in a plenitude of entities, including entities that are individuated by function and purposes. Moreover, reality may include derivative or complex objects that obtain properties from simpler entities in different ways, allowing for apparently contradictory property attributions (Arapinis & Vieu 2015). Another type of response is to revise standard views of predication. One such proposal is to have predicates apply to underspecified conceptual units (‘dot objects’) and only then map them onto real objects (Pustejovsky 1995). Another may be to have predication be based on particular ways of property inheritance from parts or constituting matter (Liebesman/Magidor 2017).

**3. Distinctive features of the ontology of natural language**

**3.1. Complex NPs and constructional ontology**

The pursuit of natural language ontology appears to go along with a view of ontological pluralism, according to which there is not a single ontology, but several ontologies associated with different cognitive or representational functions, in addition to the ontology of what there ultimately is. The following sections will discuss cases that appear to show a discrepancy between the ontology of natural language and the reflective ontology of ordinary speakers, that is, the ontology speakers naively accept when thinking about what there is, an ontology that includes the ontology of ordinary objects. They are just some of examples of the wealth of ‘derivative’ or ‘minor’ entities that referential NPs may stand for and that are likely to be rejected by speakers of the language when thinking about there is. Referential NPs standing for such controversial entities satisfy the very same criteria of referentiality as NPs standing for less controversial entities, by accepting the same sorts of predicates as ordinary referential NPs, supporting anaphoric pronouns, and being replaceable by quantifiers.

**3.1.1. Reference to unrestricted sums and kinds**

The first case involves definite plurals and mass nouns as well as conjunctions of definite NPs. The dominant view in natural language semantics is that the semantics of such NPs involves an ontology of unrestricted sums of individuals (in the case of plurals) and of quantities (in the case of mass NPs). That is, *the things in my garden* stands for the sum of the things in my garden, the definite mass NP *the sand in the Sahara* stands for the sum of the sand quantities in the Sahara, and *the Eiffel Tower and the Dalai Lama* stands for the sum of the Eiffel Tower and the Dalai Lama (Link 1983, Champollion/Krifka 2017, Ojeda 1993). Motivations for that view are that plurals and mass NPs exhibit standard criteria of referentiality and share predicates with singular NPs with the same readings. Thus, *heavy* displays readings applying to the entire referent of the definite NPs below:

(3) a. The stone is heavy

 b. The stones are heavy.

 c. The sand is heavy.

A sum of individuals is generally understood on the basis of a part relation specific to plurals and distinct from the part relation applying to individuals (Link 1983, Ojeda 1993).

 If definite plural and mass NPs and conjunctions of definite NPs stand for sums, they do not impose any restrictions on sum formation, which means that the ontology of natural language displays mereological universalism [SEP Mereology]. Mereological universalism is generally not taken to obtain for the ontology of ordinary objects, where sum formation appears subject to conditions of integrity (such as having a form or boundary) that the potential sum must fulfill (Simons 1987) or by teleological conditions of purpose (Schaffer/Rose 2017) (Section 1.5.). Such restrictions need not obtain for sum formation in the ontology of the real, where mereological universalism is a plausible view.

 A similar issue arises with the denotation of bare (determinerless) plurals and mass nouns such as *dinosaurs* or *water.* Bare plurals and mass nouns in English are generally taken to be able to act as terms referring to kinds (Carlson 1977):

(4) a. Pigeons are widespread

 b. Water is transparent

Predicates of kinds include those conveying properties of the kind as a whole, as in (2a), and those conveying properties characteristic of the instances of the kind, as in (2b). The kind-referential status of the bare nouns in (2a, b) is supported by the usual criteria for referentiality.  *Pigeons* will thus stand for a kind whose instances are particular pigeons, and *water* will stand for a kind (substance) whose instances are particular water quantities.

 The semantics of bare plurals and mass nouns involves a particular notion of kind: kind formation for the purpose of the semantics of bare plural and mass nouns is unrestricted. Bare plurals like *typographical mistakes*, *old pink buttons* or *cheap red wine* are semantically entirely on a par with *pigeons*, displaying the same semantic characteristic readings of predicates. Those would hardly be considered kinds in folk metaphysics or the ontology of the real, where not just any instantiated (non-natural) property corresponds to a kind.

 The point extends to qualities. In the tradition of Aristotle’s Categories [SEP Aristotle], bare adjective nominalizations such as *wisdom* in (3) can be regarded terms for qualities, universals whose instances have been taken to be tropes (modes or Aristotelian accidents) (Lowe 2006):

(5) Wisdom is better than cleverness.

As a universal, ‘wisdom’ will have as its instances tropes such as Socrates’ wisdom or the wisdom of that remark. With bare plurals and adjective nominalizations, English appears to reflect the Aristotelian four-category ontology (Moltmann 2013) ofindividuals (primary substances) - kinds of individuals (secondary substances), tropes (accidents/modes) – kinds of tropes (qualities). Like Aristotelian secondary substances, the kinds that bare plurals stand for generally inherit their properties of their instances (*Pigeons can fly*) and exist only if instantiated (*Pigeons exists* implies the existence of an individual pigeon). However, qualities as denotations of bare adjectives are unrestricted. *Irregularity, dirtiness,* and *underserved wealth* will likewise stand for qualities, but not in any sense of naturalness that would put them on a par with natural kinds.

 The view that definite plurals and mass NPs and bare plurals and mass nouns refer to unrestricted sums or kinds is not uncontroversial. An alternative view that has been pursued for definite plurals is that of plural reference, according to which the definite plural *the stones* refers to each stone at once, rather than referring to a single plurality (Yi 2005, 2006, McKay 2006, Oliver/Smiley 2013) [see SEP Plural Quantification]. There are various motivations for plural reference. One of them is the intuition that a sentence such as (1b) is about the stones, not a distinct object that is the sum of stones. Another motivation is the applicability of *many* and numerals like *ten* to plurals (*the stones are many / ten*), but not sums (?? *the group / sum of the stones is many / ten*). Plural reference is also motivated by the way the predicates *are some of* and *is one of* are understood. If *Genie* is the name for the sum of Russell and Whitehad, only (6a) will be true, not (6b) (Yi 2005, p. 472):

(6) a. Genie is one of Frege and Genie.

 b. Genie is one of Frege and Russell and Whitehead.

Similarly, quantities as denotations of definite mass NPs appear to behave neither as one nor as many and may ultimately require a different account than the standard one based on reference to quantities (Laycock 2006, McKay 2016).

 Similar considerations shed doubt on bare plural and mass nouns referring to kinds as single entities. For example, just as (7a), unlike (7b), cannot express the existence of a sum as an entity distinct from the individuals, (8a) cannot possibly be used to make a claim about the existence of an entity that is a possibly uninstantiated kind or property (Strawson (1959, Woltersdorff 1970, Chap. 7), as opposed to (8b), which can be used that way:

(7) a. The books exist.

 b. The sum of the books exists.

(8) a. Wisdom exists.

 b. The property of being wise exists.

There are two alternatives one might pursue for kind terms of the sort of bare plurals and mass nouns: first; positing entities that fail to have properties themselves but have properties strictly on the basis of inheritance from their instances; second, extend plural reference to bare plurals and mass nouns, by taking them to plurally refer to all the possible instances (Moltmann 2013). This would mean that definite plural and mass NPs and bare mass nouns won’t involve unrestricted sum formation or mereological universalism.

**3.1.2 Intensional definite NPs**

NPs such as *the increasing air in the balloon, the rising temperature*, *the people that can fit into the car*, or *the book John needs to write*) appear to behave like referential NPs and have been analysed as standing for particular sorts of entities, variable objects (or embodiments) (Fine 1999, Moltmann 2013), entities that are hardly part of the ontology speakers in general accept when thinking about what there is. There are alternatives to the ontological analysis, though, such as that of Montague (Thomason 1974), who took *the temperature* to stand for a functional concept, and Grosu / Krifka (2007), who took the related NP *the gifted mathematician you claim to be* to stand for an individual concept.

**3.1.3. Introduction of entities by abstraction**

An important way of introducing abstract objects that has been discussed in the philosophical literature is that of abstraction from concepts (Frege 1884, Wright 1983, Hale 1987). A related view is that of pleonastic entities introduced by ‘something-from-nothing transformations’ on the basis of nonreferential expressions (Schiffer 1996). Are these strategies part of the (constructional) ontology of natural language? On the Fregean view, abstraction is part of the semantics of functional number terms like *the number of planets*, a term that introduces a number on the basis of a concept (the concept of a planet) and the relation of equinumerosity. The pleonastic account was originally applied to *that-*clauses and nominals like *the property of being wise* (Schiffer 1996). The method of introducing objects on the basis of nonreferential expressions appears to be associated with the compositional semantics of close appositions of the sort *the number eight* and *the truth value true*, as well as other ‘reifying terms’ of the sort *the property of being wise* and *the fact that* S (Moltmann 2013, chap. 6). The use of the abstraction strategy may serve the purpose of enlarging the domain of the ontology of natural language by choice, if reifying terms are part of the ‘periphery’, not the ‘core’ of language (Section 4.1.). The introduction of entities by abstraction also appears to underlie the Kimean notion of events, as opposed to the Davidsonian one of events as primitives (Kim 1976, Davidson 1967, Maienborn 2017).

**3.2. Intentional or nonexistent objects**

The view that there are nonexistent or intentional objects, Meinongianism, is a highly controversial philosophical view (van Inwagen 2001, SEP Existence, SEP Nonexistent Objects SEP Fictional Entities). But it is a view that is often motivated or defended by appeal to natural language (Fine 1982a, Inwagen 1977, Kripke 2013, McGinn 2000, Parsons 1980, Priest 2005, Salmon 1987, 1998, Thomasson 1999), namely sentences with existence predicates or intentional verbs such as *look for* or *think about*:

(9) a. Pegasus does not exist.

 b. John thought about / was looking for Pegasus.

The Meinongian takes *Pegasus* in (9a) and (9b) to stand for a nonexistent object. An alternative takes it to be an exceptional, empty occurrence of a name (Sainsbury 2005). Linguistic support for the Meinongian view comes from the fact that *Pegasus* in (8a) and (8b) fulfills standard criteria for referential terms such as supporting anaphora and allowing for replacement by quantifiers (*something*) as well as from the compositional semantics of constructions with relative clauses as below (Moltmann 2016a):

(10) a. The building John thought about does not exist.

 b. John thought about a building that does not exist.

A compositional semantics of the relative clause constructions in (10a, b) can hardly be achieved without positing intentional objects as arguments of both *think about* and *exist*. Intentional objects are generally restricted to predicates as in (10a, b), since other predicates, it has been argued, are existence-entailing (Priest 2005). The task for natural language ontology then is to develop a theory of intentional objects that is both coherent and does justice to their restricted occurrences in the semantic structure of sentences.

 If descriptive metaphysics is conceived as metaphysics of ‘appearances’, this might suggest that non-existent objects would have to be posited as semantic values of referential NPs even with extensional predicates. Referential NPs should reflect entities of a certain sort whether or not they exist. However, in extensional contexts only actual entities as semantic values of referential NPs contribute to truth conditions: *the building is tall* is true only if the building being referred to is an actual building that is tall. In extensional contexts, referential NPs that turn out not to refer to actual entities better fail to have a semantic value rather than standing for nonexistent objects.

 Intentional objects have also been posited as semantic values of anaphora across sentence boundaries, both within an intensional context of a single agent (with nonfactive attitude verbs such as *think* or *claim*). and across intensional contexts involving different agents (Edelberg 1986). In those contexts, they serve as discourse referents (Karttunen 1977) and thus interact with dynamic semantics, being individuated not just by what properties agents attribute to them, but also by the flow of information in the discourse (Edelberg 1986). Discourse referents in fact have sometimes been conceived ontologically even in extensional contexts (Landman 1986), though this is not the dominant view in dynamic semantics (SEP Dynamic Semantics).

**3.3. The mass-count distinction**

The mass-count distinction displays in a particularly striking way a discrepancy between the ontology displayed by natural language and the ontology tied to cognition or what is generally taken to be the ontology of the real. Various criteria distinguish count nouns from mass nouns in English. Most important is the availability of the plural and the applicability of cardinal and ordinal numerals with count nouns, but not mass nouns (Pelletier/Schubert 1989/ 2003, Doetjes 2012). The mass-count distinction, it is generally agreed, has semantic content, but there is much less agreement as to what that content amounts to [SEP Metaphysics of mass expressions]. The mass-count distinction has often been taken to reflect the ontological distinction between individuals (*chair, door*) and matter or stuff (*metal, wood*), a distinction that has been cast either in terms of the notion of having a boundary or integrity or being an atom. However, more recently linguists have drawn attention to a number of generalizations that indicate that the distinction between singular count, mass, and plural nouns does not strictly go along with an ontological distinction between different types of beings (Pelletier/Schubert 1989/ 2003, Chierchia 1998, Moltmann 1997, Rothstein 2017). First, singular count NPs seem to be able to stand for the very same things as definite plural or mass NPs (*the (loose) collection of stuff on this desk – the stuff on this desk, the quantity of liquid in the container – the liquid in the container*). Second, languages may make a choice of mass as opposed to count without apparent grounds for a perceptual difference (*rice – oats*, *corn – peas*, *cattle – horses*). Also crosslinguistically, the choice of mass vs count for particular entities appears to an extent arbitrary (Engl.  *hair* - Italian *capelli*, English *pasta* – French *pâtes*). Third, there is an important class of so-called object mass nouns, mass nouns that appear to stand for pluralities of well-individuated objects, such as *hardware, jewelry, luggage, staff*, *police force*, often competing with apparent co-extensional plural nouns in the same language (*clothes – clothing, policemen – police force, cows – cattle, carpets – carpeting*). Yet like other mass nouns, object mass nouns resist numerals (\* *the three police force*) as well as a range of other predicates applicable to plurals (*John listed the clothes* / ??? *the clothing*, *The policemen* / ?? *the police force are / is numerous*). Whether a language chooses a singular count, plural, or mass noun appears to an extent arbitrary; yet the choice between mass and count plays a role for the applicability of number-related predicates and quantifiers. The mass-count distinction thus displays a form of ‘grammaticized individuation’ (Rothstein 2017), involving a language-driven notion of unity that may diverge from the notion of unity that pertains to cognition or to what is taken to be the real structure of things,. Setting aside the syntactic mass-count distinction, the ontology reflected in the lexical content of nouns still plays a semantic role as well, for example in the choice of ‘classifiers’ for mass nouns standing for different sorts of entities (in English the choice of *piece of furniture, head of cattle,* or *glass of wine*).

**4. The issue of ontologies**

**4.1. The ontology of natural language and the core-periphery distinction**

Not only metaphysical assertions, but also technical philosophical expressions or uses of expressions are generally set aside when pursuing natural language ontology. Philosophers or non-philosophers when engaging in ontological reflection may use or introduce expressions specifically meant to convey their ontological views (Heidegger’s *the nothing* being an example). But those (uses of) expressions are not indicative of the ontology of natural language. Instead they motivate a distinction between the (ontological) *core* of natural language (or the use of it) and its (ontological) *periphery* (Moltmann 2020c), so that only the core reflects the ontology of natural language of language, not the periphery. Such a core-periphery distinction appears to have been tacitly made throughout the history of philosophy as well as in the practice of contemporary semanticists and philosophers pursuing natural language ontology. Without a core-periphery distinction any ontological view or notion, as reflected in particular technical terms or uses of them, would be part of the ontology of natural language.

 Apart from technical terms introduced as such, one kind of expression that appears to belong to the periphery is reifying NPs of the sort *the number eight, the property of being happy, the proposition that it is raining*, or *the truth value true*. Philosophers generally stayed away from reifying NPs when drawing on natural language for motivating an ontological category. For example, Frege (1884) did not motivate numbers as objects by appealing to the construction *the number eight* in natural language, and he did not motivate truth values as objects by appealing to *the truth value true*. Rather he used expressions from the core like *the number of planets* and *eight* when arguing for numbers being objects, and his motivations for considering truth values to be objects did not come from particular natural language sentences at all. Likewise, Hale (1987) argued for properties being objects not on the basis of terms like *the property of mercy*, but rather simple terms like *mercy* from the core of language. Finally, Link (1983) motivated mereological sums being part of the ontology of language not on the basis of terms like *the sum of the students* from the periphery of language, but rather simple definite plurals like *the students*. Given such a core-periphery distinction, (1) will need to be revised as follows:

(11) The ontology of a natural language is the ontology a speaker implicitly accepts by way of

 making use of the *core* of the language.

The core-periphery distinction raises the question whether there are linguistic criteria for the distinction, that is, syntactic or lexical conditions that determine which expressions (or uses of expressions) will be part of the periphery rather than the core, perhaps relating to the lexical-functional divide. For example, as mentioned in Section 2.2.4., whereas *exist* belongs to the core, not permitting a non-ordinary use on which it conveys a univocal, philosophers’ notion of existence (Section 1.3.), the noun *existence* does allow for such a use and is able to convey just any notion of existence a particular metaphysician has in mind (Moltmann 2020b, c).

 The question also arises whether and how the distinction relates to the core-periphery distinction that Chomsky (1981, 2006) introduced for syntax, where, very roughly, the core of the syntactic system of a language represents universal grammar and the periphery exceptions and outside influences.

 The core-periphery distinction in natural language ontology will be important also for the quest for universals of natural language ontology. Clearly, only the core, not the periphery can represent a form of universal cognitive language-related ontology. While research in natural language ontology arguably involves an implicit restriction to the core of language for generalizations meant to be universal, the core-periphery distinction appears explicitly in the general hypothesis about reference to abstract objects in natural language in Moltmann (2013):

(12) The Abstract-Objects Hypothesis

 Natural language does not involve reference to abstract objects in its core, but only in its

 periphery.

On that view, what appeared to be expressions in the core of natural language, referring to abstract objects (numbers, properties, propositions, degrees, expression types) are in fact expressions referring to particulars, pluralities of (actual or possible) particulars, or variable objects, or else they are expressions that fail to have a referential function in the first place (numerals, clausal complements, predicative complements, complements of intensional transitive verbs). The particulars include tropes, including quantitative tropes (John’s height) and number tropes (the number of planets). Only in the periphery, on that view, is reference to abstract objects possible, for example through the use of reifying terms such as *the number eight*, *the property of being happy, the word ‘happy’* or *the proposition that it is raining.*

 The periphery by itself also imposes challenges for natural language semantics and natural language ontology. The periphery, from a linguistic point of view at least, is a legitimate part of natural language (or a legitimate extension of it): technical (uses) of terms certainly have a semantics and will reflect an ontology, even if it is not the ontology of natural language, but one that may diverge from it. It is part of the task of natural language semantics to in principle allow for an account of a compositional semantics and an ontology of sentences with technical (uses of) philosophical terms.

**4.2. The question of ontologies**

Distinguishing different branches of metaphysics goes hand in hand with the view according to which there is not a single ontology, but several, at least apparent, ontologies: such as ontologies pertaining to language, to cognition, and to fundamental reality. But there is also the question whether there is in fact a single ontology of natural language. First of all, it is not necessarily the case that there is a single ontology shared by all natural languages, an assumption, though, generally made implicitly in the practice of natural language ontology, at least in philosophy. The issue touches upon the Sapir-Whorf hypothesis and the controversy surrounding it (Pinker 1982, Hespos/Spelke 2004, Pelletier 2011) and raises further questions as to whether there are constraints on how the ontologies of different languages may differ from each other, and what linguistic phenomena (of the lexical or functional part of grammar) such differences may pertain to. If a a core-periphery distinction is made, then even for a single language a distinction between the ontology of the core and the ontologies of the periphery needs to be made. If there is a universal ontology shared by human languages, it should pertain to the core only.

**5. Outlook**

Natural language ontology is just at the initial stage of a developing discipline of its own. The methodological issues surrounding it still await a serious discussion, such as the relation of the ontology reflected in language to different conceptions of reality and to ontologies tied to other representational or cognitive functions, the particular notion of implicit acceptance that the ontology of natural language involves, a potential core-periphery distinction, the ontological status associated with different semantic roles, the way ontological categories are reflected in natural language given recent theoretical syntactic and crosslinguistic research, and the different connections of the ontology of natural language to the functional and the lexical part of grammar.

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