**Ontological Dependence, Spatial Location, and Part Structure[[1]](#footnote-1)**

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Applied ontology, natural language ontology as well as the metaphysics of ordinary objects generally recognize that their domain of entities comprises a great range of ontologically dependent, minor entities. Such entities include what is called disturbances (entities of the sort of holes, folds, faults, and scratches) and tropes (particularized properties or features). A general approach to such entities is to take them to be ontologically derivative, introduced by an ontological operation from more basic entities or conditions, an operation which one may consider an operation of reification.

 There are two important operations of reification that have been discussed in the literature. One of them introduces an entity on the basis of the truthmaking relation (Mulligan/Simons/Smith 1984, Moltmann 2007, to appear, Guarino/Sales/Guizzardi 2016, Guarinao/ Guizzardi 2017). The other operation is more familiar from the philosophy of mathematics, namely abstraction in the Fregan sense (Frege 1884, Hale 1987, Wright 1983). In this paper, I argue that certain ontologically dependent entities, including disturbances and tropes, should be viewed as entities introduced by a combination of truthmaking and abstraction. This is needed in order to order to account for both their concreteness and a surprising lack of specification for certain types of properties.

 It is a standard view in contemporary metaphysics that concrete objects come with a spatial location and a physical part structure. This view faces a serious challenge from our intuitions about the spatial location and the part structure of certain ontologically dependent concrete objects. Those ontologically dependent objects, it appears, simply lack an independent (non-object-dependent) spatial location or the sort of part structure they are expected to have as concrete objects.

 I will call objects of this sort *attributively limited objects* and their peculiarity *attributive limitation*. Attributive limitation is more familiar from abstract objects as entities introduced by a form of Fregean abstraction, such as numbers or directions on the Fregan account. This paper will suggest that the attributive limitations of the relevant class of concrete objects be accounted by a form of abstraction as well. It will do so by drawing on a notion of an abstract state that is already an entity somewhat between abstract and concrete, and lays an important role in the semantics of natural language.

 I will first present standard assumptions regarding the distinction between concrete and abstract objects as well as particular views about the inheritance of properties of objects from more fundamental ones. I then present the central issue of the paper, intuitions about the spatial location and part structure of certain ontologically dependent concrete objects. Finally, I will suggest a way of applying an abstractionist account to the relevant types of ontologically dependent concrete objects.

**1. The abstract-concrete distinction**

The distinction between abstract and concrete objects is a central distinction in metaphysics, and according to the standard view, concrete objects and abstract objects are distinguished by different sorts of properties they may have, without there being agreement as to what sorts of properties best characterize the distinction. Properties that have been proposed as characteristic of abstract objects are being non-mental, nonphysical, being causally inefficacious, and not having a spatio-temporal location (Rosen 2018). Whether abstract objects have a temporal duration is a matter of controversy: abstract artifacts are abstract in the sense of not being physical, but they come into being at some point in time and may go out of being at some point in time as well. Having a spatial location, by contrast, is a less controversial characteristic that concrete objects are taken to have, but abstract objects lack.[[2]](#footnote-2)

 While the distinction between abstract and concrete objects is generally based on general conditions on what sorts of properties concrete and abstract objects may have, there is also an approach according to which objects do not come to bear properties directly, but derivatively, by inheritance from more fundamental entities (Fine 1999, Koslicki 2008).

 This particularly applies to material objects and the material that constitutes them. Entities individuated by their shape such as artifacts, inherit, on that view, color, texture, weight from the material constituting it (Fine 1982, Koslicki 2008). Also the spatial location of artifacts can be considered inherited from the spatial location of their material manifestation at a time.

 Fine (1982) applies property inheritance to another relevant case, qua-objects (which includes non-basic actions). A qua object such as John qua being a father is an object individuated by particularly restricted condition of property inheritance from its base (John). John qua being father inherits only those properties from John that John has while being a father (Fine 1982) or, better, that John has in virtue of being a father (Moltmann 1997). John qua being a father thus comes out as an attributively limited object, displaying a lack of specification for all properties that are not based on John being a father. Making use of property inheritance conditions thus deviates from the standard view according to which concrete objects comes with the same types of property specifications characteristic of concrete objects.

**3. The intuition about some ontologically dependent entities**

**3.1. Spatial location**

We can now turn to the central issue of this paper, intuitions about the spatial location and part structure of ontologically dependent concrete objects. Let us first consider entities like holes, folds, flaws and scratches. Entities of this sort are based on regular or irregular gestalt conditions in material objects, and are generally called *disturbances* (Karmo 1977, Simons 1987, Casati/Varzi 1994). We clearly treat disturbances as entities: they generally are countable and come into existence and go out of existence at particular points in time. Thus, we can say that a hole, fold, flaw, or scratch exists or no longer exist, and that there are several of them.

 Disturbances are ontologically dependent objects par excellence. They exist only if the object in which they are located (their base) exists. Also, for their identity, they require the identity of the object in which they are located. They are thus ontologically dependent in the sense of existence dependence and identity dependence (Fine 1994).

 Linguistically, the ontological dependence of disturbances is reflected in the applicability of the *have*-construction: *the bag has a whole, the cloth has a fold, the paper has a flaw,* and *the surface has a scratch*.

 Disturbances have a location relative to the object on which they depend, requiring a suitable spatial preposition. Thus, a hole is *in* the bag, a fold *in* the cloth, a flaw or a scratch *on* the surface. Now what is remarkable is that disturbances do not have an object-independent (absolute) location. If the bag is on the table and the hole is in the bag, it does not follow that the hole is on the table. In fact, the hole is nowhere but in the bag; it lacks a location independent of the bag.[[3]](#footnote-3) Similarly, a fold cannot be on the table even if the cloth is that has the fold. The fold is nowhere in fact but in a particular place in the cloth. A flaw or scratch on the screen is not on the table even if the screen is; the flaw or scratch is nowhere in fact but (in a particular place) on the screen. Thus disturbances do not inherit their location from the object on which they depend: they just do not have an object-independent location.

 Disturbances also cannot move, even when the object on which they depend moves. If the flag has a hole and the flag moves in the wind, the hole would not move in the wind. If the surface has a scratch and the surface moves, the scratch does not move (it can be said to move only when it is not clear that it is something on a particular surface). If Mary moved the bag, she did not thereby move the hole that the bag has. The hole cannot move, unless it does so within the object that has it.

 Tropes display the same sort of behavior as disturbances with respect to a spatial location. Tropes in recent one-category reductionist ontologies have been considered entities more fundamental than individuals and properties coming with two fundamental relations: similarity and co-location (Williams 1953). On such a view, tropes would not be ontologically dependent, but rather individuals and properties would be constituted by tropes. However, on the older, Aristotelian tradition, tropes (or ‘accidence’) are ontologically dependent objects par excellence. A trope exists only if its bearer exists and a trope is identical to another trope only if their bearers are identical, or so the standard view.

 Again the ontological dependence of tropes is reflected in the *have*-construction, though with more restrictions: Socrates ‘has’ wisdom, the painting ‘has’ an unusual quality, though the apple does not really ‘have’ redness, and the pillow does not really ‘have’ softness.

 Clearly, tropes clearly do not inherit a location from their bearer. If Socrates is in Athens and Socrates has wisdom, Socrates’ wisdom is not in Athens. The painting may on the wall and there may be an unusual quality in the painting, but the unusual quality of the painting is not on the wall. If the stone has an enormous weight (a quantitative trope), and the stone is on the table, the enormous weight of the stone is not on the table. Tropes have no bearer-independent location. Moreover, a great range of tropes cannot even be attributed a bearer-dependent location. Despite locutions Aristotle may have used, Socrates’ wisdom is not ‘in’ Socrates, Socrates just has it. The weight of the stone is not ‘in’ or ‘on’ the stone, the stone just has the weight.

 Not all ontologically dependent objects, though, behave that way with respect to their spatial location. Shadows, for example are generally considered ontologically dependent on the object throwing the shadow, but they can be attributed an object-independent location as well as movement. (The shadow may be here and there and moves across the wall etc.)

 Also material objects such as artifacts, should they be considered ontologically dependent on the material that constituted them (Karmo 1977), have object-independent locations and permit movement, and so for groups constituted by group members.

 What then are the conditions on objects unable to have object-independent locations? The condition appears to be that such objects need to be constituted by features of the base object whose location is properly included in that of the base object. This condition is not satisfied for the relation between material and the objects they constitute.

 A trope (such as the quality of the painting) need not be limited to a location properly included within the bearer (the paining). Thus, the relevant class of ontologically dependent objects should be characterized as those entities that have a location properly within the object on which they depend on or else are tropes.

 The attributive limitations of disturbances and tropes could not be accounted for by considering them qua-objects that fail to inherit a location from their bearer. Qua objects inherit whatever property they may have from their base. Disturbances and tropes are not individuated by restricted property inheritance from their base or bearer; rather they are constituted by features of (part of) the object on which they depend, without themselves having such features (e.g. a roundness trope is not itself round).

**3.2. Part structure**

There is another important case of attributive limitation that I want to mention, and that concerns the part structure of objects. Sometimes an object is expected to have part structures in different ‘dimensions’, but displays just a single part structure.

 Some objects come with a part structure based on partial content. Yet those objects may be physical objects at the same time and thus have two part structures, in two dimensions. An example is a book. A book is an entity that comes with two distinct facets, as a material object and as an information object, and they involve two part structures. ‘Part of the book’ can mean a material part of the physical object or else a partial content. However, there are also physical objects that lack a physical part structure. Entities of the sort of claims, requests, and offers are of this sort, that is, the non-enduring products of illocutionary acts, illocutionary products (Twardowski 1911, Moltmann 2014).[[4]](#footnote-4) A claim can be overheard and cause uproar and it is made at a particular point in time, at a particular place. Thus a claim has a range of features of concrete objects. But part of a claim can never be a physical part, say a temporal part of an action of claiming. Part of a claim can only be a partial content. A claim, intuitively, has only parts that are partial content of what is claimed. Thus, claims are peculiar in that they clearly display features of concreteness, but yet cannot have physical parts. They are thus what I will call *mereologically restricted objects*.

 Tropes in a way are also mereologically restricted. Tropes are particular property manifestations in objects, their bearer. The bearer may have a spatial part structure, yet tropes will never inherit a spatial part structure. The parts of tropes can only be features constitutive of the (complex) trope or perhaps a temporal part. For example, part of John’s happiness can be features of John constitutive of his happiness or else a perhaps a period of his happiness. This is different for events (Moltmann 2009, 2013a). Events may have several part structures in different dimensions at once, say a temporal part structures, a participant-related part structure, and a spatial part structure (Moltmann 1997). Part of the battle, for example, can be a temporal part of the event or a spatial part or a subevent constitutive of the battle at the time and place of the battle. Tropes are thus mereologically restricted in a way events are not. [[5]](#footnote-5)

**4. Towards an account of attributive limitations of disturbances and tropes**

Disturbances and tropes thus are entities that are attributively limited. The question then is, how are such attributive limitations to be accounted for? I want to suggest an approach to the puzzle of attributive limitation by drawing a connection to one particular ontological theory about abstract objects, namely abstractionism, the theory of an object being introduced by a form of Fregean abstraction (Frege 1884, Hale 1987, Wright 1983). Frege proposed that numbers be introduced by the abstractionist principle below, which gives identity conditions for objects obtained by the abstraction function g from entities *o* and *o’* that stand in some equivalence relation *R*:

(1) For an equivalence relation R, for all o and o’, g(o) = g(o’) ↔ R(o, o’).

Frege used (1) to introduce natural numbers as entities obtained by abstraction from concepts for whose extensions there is a 1-1 mapping.

 What is special about an abstractionist theory of an object type is that it introduces an object as an object that will have only those properties specified by the method employed for its introduction. Thus numbers introduced by the principle in (1) do not have other properties than could not be derived from the condition of their identity with other numbers introduced in the same way. The abstractionist account thus introduces a number as an object that is not specified as to whether it is identical to a non-number, the individual Ceasar say, or has any properties of concreteness.

 Abstractionist theories have not only been proposed for abstract objects in the context of the philosophy of mathematics. There is also an abstractionist theory of states (and of non-worldly facts).[[6]](#footnote-6) This is what Kim’s (1976) account of events amount to. Kim’s account, it is generally agreed, is not an account of events, but of states, more specifically of ‘Kimean states’ as Maienborn (2007) calls them or ‘abstract states’ (Moltmann 2013b, to appear), as I prefer to call them. Kim’s account is given below, now formulated as a theory of states (of a rather simple sort, consisting of a property holding of an object):

(2) The Kimian account of states

 a. For a property P, an object o, the state s(o, P) obtains at a time t iff P holds of o at t.

 b. For properties P and P’ and objects o and o’, s(o, P) = s(o’, P) iff P = P’ and o = o’.

Kim’s account is an abstractionist account: (1) can be generalized to n-place abstraction functions applying to *n* objects that stand in respective equivalence relations to each other. Kim’s account then introduces states on the basis of a two-place abstraction function applying to objects and properties and the equivalence relation of identity. On the Kimian account of states, states will have identity conditions and a temporal duration, but no other intrinsic properties.

 Kimean or abstract states are not on a par ontologically with events. Events involve a particular manifestation, a spatial location and can act as relata of causal relations (Moltmann 2007, to appear, Maienborn 2007). By contrast, states as entities introduced by abstraction as in (2) will carry only properties specified for them by the method of introduction. This means that they have a particular temporal duration and that their identity depends strictly on the property and object from which they are abstracted. But it also means that such states have no spatial location, won’t stand in causal relations, won’t involve a particular manifestation or particular manner, won’t be perceivable etc. They may act, though, as objects of mental attitudes and relata of causal explanation (Maienborn 2007).

 States in that sense play an important role in natural language semantics, as Davidsonian, implicit arguments of stative verbs such as *own, owe, know, weigh, resemble, weigh, measure*, have and *be*, or so it has been argued (Maienborn 2007). The states described by most stative verbs (including those just mentioned) accept only a very restricted set of adverbial modifiers. They resist in particular location modifiers, manner adverbials, instrumentals, and causal and perceptual predicates, representing just the sorts of properties that states introduced by abstraction as in (2) should not be specified for.[[7]](#footnote-7) If abstract states play a semantic role as implicit arguments of (most) stative verbs, this explains the resistance of stative verbs to adverbials of the relevant sorts. Abstract states also play a semantic role as referents of gerundive nominalizations of stative verbs such as *John’s owning the house, Mary’s owing an amount of money, John’s knowing French, Bill’s weighing over 100 kilo*, *Socrates’ having wisdom*, *Mary’s being happy* etc.

 Abstract states have a temporal duration and thus are in time, and they obtain (at a time) on the basis of what is going on in the world. Even though they do not contain the individual and the property from which they abstracted as parts, their identity and existence depends on them. Abstract states thus display some features of concreteness, yet they clearly show attributive limitations.

 I want to propose that ontologically dependent objects that are disturbances be viewed similarly, as entities obtained in a particular way by abstraction from relevant properties of their base. The abstraction principles however will be different from that of abstract states in that they should not involve a particular (possibly nonspecific) property, but rather a range of fully specific features of the base objects.

 Disturbances will be entities based on features of the base object that together meet certain gestalt conditions, a relation that can be viewed as a truthmaking relation. Disturbances will then be individuated as objects having only properties strictly pertaining to those features and their relation to the base object (in particular their location within the base object) and nothing else. Unlike abstract states, disturbances will involve a very particular manifestation of the particular gestalt conditions in question (truthmakers of the relevant gestalt conditions). But they will not be specified with properties in respects not strictly related to the manifestation of those gestalt conditions in the base object; and thus in particular they will lack an independent spatial location. Disturbances will then be fully specific in certain respects only, for example regarding the shape and size of a hole or fold as well as the location of the hole or fold with respect to the base object.

 Tropes have often been viewed as entities obtained by abstraction in a psychological sense, the act of attending to only one property of an object and abstracting from all others.[[8]](#footnote-8) But the relation between a trope and its bearer need not be understood in a psychological sense. It can be viewed rather in the same sense of a formal ontological operation of abstraction as in the case of disturbances. The relation of abstraction obtaining between the bearer and the trope involves two things. First, the trope will be based on features of the bearer fulfilling a particular condition, a relation that may be regarded as the truthmaking relation. Second tropes will have properties only pertaining to those features of the bearer and the bearer itself. Tropes will then lack a specification with respect to other types of properties such as that of an independent spatial location. Like disturbances, tropes will be fully specific with respect to some types of property attributions, but lack other types of property attributions.

 Disturbances and tropes thus would be introduced by a combination of truthmaking and abstraction, a complex ontological operation that of course needs to be developed in much further detail formally.

 The mereological restrictions of illocutionary products would be accounted for in similar ways. Illocutionary products would be introduced as products of illocutionary acts with specific physical features, but yet at the same time as being specified for parthood only in one respect, that of content.

**5. Conclusion**

Entities like disturbances, tropes, and illocutionary products are ontologically secondary, derivative objects. Yet they play an important role for ontology, in particular applied ontology, natural language ontology, and just the metaphysics of ordinary objects. This paper has pointed out that entities of this sort are attributively limited and challenge standard ontological views about the spatial location and the physical part structure of concrete objects.

 Such attributive limitations could not be accounted for if the entities in question were just the result of reification based on truth making in the sense of Guarino/Sales/Guizzardi (2016), Guarinao/ Guizzardi (2017). The paper rather argued that entities of this kind be viewed on

a par with objects introduced by abstraction, mathematical objects as well as abstract states, entities which have some features of concreteness and play a particular role in natural language semantics. Disturbances, tropes, and illocutionary products, on that proposal, are introduced by abstraction, ensuring they lack certain property specifications; at the same time, they would be based on a fully specific manifestation of a condition or set of conditions, a truthmaker of sorts in the case of disturbances and tropes. The proposal was presented as a sketch, of course, and needs to be developed in much greater detail on another occasion.

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1. I would like to than Kit Fine and Achille Varzi for exchanges on the material of this paper. [↑](#footnote-ref-1)
2. There is some controversy, though, regarding the spatial location of sets of concrete objects (see Rosen 2018). [↑](#footnote-ref-2)
3. See Varzi (1995) for observations about the non-monotonicity of *is in* for holes. [↑](#footnote-ref-3)
4. In Moltmann (2013a, 2017), I argued that such objects belong to a broader class of attitudinal objects, which also include state-like objects of the sort of beliefs, intentions, and desires. [↑](#footnote-ref-4)
5. One might also consider enduring material objects as mereologically restricted. Enduring material objects are in space and time, but have only a temporal part structure, according to our intuitive notion of them. Temporal stages of material objects do not intuitively count as parts of enduring objects. The part structure of enduring objects, however, is linked to their mode of persistence, to what is constitutive of their identity at a time. Enduring objects exist in time (or endure), which basically means they need to be (more or less) wholly present (present with all their parts) at each moment of the time at which they exist – at least according to one influential view of endurance. [↑](#footnote-ref-5)
6. Frege also proposed an abstractionist account of directions (the direction of a is identical to the direction of b iff a is parallel to b). [↑](#footnote-ref-6)
7. This is known as the *Stative Adverb Gap*. Some researchers have taken the Stative Adverb Gap to mean that stative verbs lack a Davidsonian event argument position, rather than having one filled in by abstract states (Katz 2003). [↑](#footnote-ref-7)
8. This is reflected in the term ‘abstract particular’ (Campbell 1990) as an alternative term for William’s (1953) term ‘trope’. [↑](#footnote-ref-8)