The Polysemy of 'part'

I.   Introduction

Some philosophers assume that our ordinary parts-whole concepts are intuitive and univocal. Moreover, some assume that mereology - the formal theory of parts-whole relations - adequately captures these intuitive and univocal notions. David Lewis (1991:75), for example, maintains that mereology is "perfectly understood, unproblematic, and certain." In consideration of those who might disagree with him on this, Lewis appeals to how we *use* parts-whole language in ordinary discourse:

> "It is common enough, and not especially philosophical, to apply mereology to things without thinking that they are in space and time. Trigonometry is said to be part of mathematics; God's foreknowledge is said to be part of His omniscience." (1991: 75)[1]

That we find sentences such as 'trigonometry is part of mathematics' and 'God's foreknowledge is part of His omniscience' perfectly acceptable is supposed to support the claim that our parts-whole expressions[2] are *topic-neutral* - i.e., they involve subjects or relata from any ontological category (and not merely spatial or spatio-temporal entities).

Kit Fine (2010) appeals to our ordinary use to make a similar point:

> "We happily talk of a sentence being composed of words and the of the words being composed of letters - and not just the sentence and work[sic] tokens, mind, but also the types. And similarly, a symphony (and not just its performance) will be composed of movements, a play of acts, a proof of steps...The evidence concerning our ordinary talk of part is mixed and complicated, but it does not seem especially to favor taking material things to be the only true relata of the relation." (2010: 561)

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[1] At the time, Lewis claimed that his view was a "minority opinion" and that many philosophers "view mereology with the gravest suspicion." (75) Yet I assume that the tides have shifted since *Parts of Classes*; most in the literature these days seem to follow Lewis (1991) and assume that mereology and our parts-whole concepts are relatively innocuous and topic-neutral.

[2] Some reserve the terms 'mereology' and 'mereological' to designate whatever obeys the axioms and principles of formal mereology. Others use these terms more generally, to designate our ordinary thoughts and talk about parts and wholes (and related concepts), regardless of whether those concepts end up obeying formal mereological principles. See Paul (2002: 579), e.g. To avoid confusion, I will use 'parts-whole' or 'compositional' to talk about the (supposed) broader notion(s). I will reserve 'mereological' to designate whatever obeys formal classical extensional mereology.

This strategy is common in the literature: given the broad and varying ways in which expressions such as 'is part of' are *used* in English, it is assumed that there is some broad, generalized notion that captures all of these acceptable uses, independent of the topic or metaphysical makeup of the entities referenced in these expressions.[3] Consider some examples from Varzi (2016):

(1) The handle is part of the mug.
(2) The remote control is part of the stereo system.
(3) The left half is your part of the cake.
(4) The cutlery is part of the tableware.
(5) The contents of this bag is only part of what I bought.
(6) That area is part of the living room.
(7)   The outermost points are part of the perimeter.
(8)   The first act was the best part of the play.
(9)   The clay is part of the statue.
(10)   Gin is part of a martini.
(11)   The goalie is part of the team.

Sentences (1)-(11) are not unusual. And while some of them may be a bit controversial among philosophers - (9) for example - most will agree that they are, for the most part, perfectly acceptable in ordinary English.

   Yet the acceptability of such sentences has led many to embrace one or more of the following claims:

   i.   expressions such as 'is part of' are univocal across uses; i.e., 'is part of' has only one meaning in sentences (1)-(11),
   ii.   our parts-whole expressions are *topic-neutral*; parts-whole relations hold independently from the ontological category of the relata,
   iii. our general, unified parts-whole expressions are latching onto a general, unified parts-whole relation - i.e., *compositional monism* is true.

This paper explores the rejection of (i)-(ii) and paves the way for a future project to reject (iii).

   In what follows, I argue that ordinary parts-whole expressions - 'is part of', 'composes', etc. - are *polysemous*: they have multiple distinct, but related, interpretations or meanings. In section

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[3] Fine (2010) appeals to how we use parts-whole expressions in ordinary English to defend the claim that our parts-whole concepts are topic-neutral, but he rejects compositional monism. I'm borrowing and using the phrase 'topic-neutral' and 'topic-specific' as it is used in McDaniel (2010b: 695).

II, I canvass several criteria by which to test for polysemy, following Viebahn and Vetter (2016). In section III, I apply these criteria to some of our parts-whole terminology. In section IV, I examine some philosophical examples involving abstracta and abstract parts. These examples, I argue, give us additional reasons to reject (i), as well as (ii). Yet if all of this is right - if we reject that parts-whole expressions are univocal *and* we reject that they are topic-neutral - then perhaps we should also reject (iii) compositional monism. In section V, I briefly discuss *compositional pluralism*, how it is related, and consider some open-ended issues.

II.   **Polysemy**

An expression is univocal if it has only one meaning; otherwise, it is ambiguous. If an expression is ambiguous, and the multiple meanings are somehow related, then the expression is said to be *polysemous*. If the multiple meanings are not related, the expression is homonymous. Some standard examples of polysemous expressions are the following:[4]

- Book (abstract work/concrete copy)
- Date (temporal indicator/rendezvous)
- Long (applied to animate objects/applied to food or activities)
- Mouth (part of an animal/ a river/ a bottle)
- Paper (material/newspaper/corporation issuing newspaper)
- Run (verb/noun or physical exercise/organize)
- Took (an object/an exit/leave)
- Get (an object/an idea)
- Wood (small forest/material)
- Healthy (flourishing/flourishing-inducing property)
- Lost (ordinary object/emotional control/direction)

It is readily accepted that many words such as those listed above in ordinary English are polysemous. It is less common for philosophers to claim that key philosophical words are polysemous. But some do defend this position. Hofweber (2009), for example, claims that existential quantifiers are polysemous. He maintains that words such as 'someone' can have a *domain conditions* (or *external*) reading, or it can have an *inferential role* (or *internal*) reading.[5]

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[4] See Hawthorne and Lepore (2011), Viebahn and Vetter (2016), et. al.

[5] This is a play off of Carnap's internal and external distinction, although Hofweber disagrees that external questions are meaningless. Hofweber (2009: 275-6) defends the view that the existential quantifier is polysemous

Viebahn and Vetter (2016), as another example, maintain that modals such as 'can' and 'may' are polysemous (in addition to being context-sensitive) between epistemic, deontic, and dynamic modality. McDaniel (2009b) discusses whether 'being' is *pro hens* equivocal, analogical, or polysemous,[6] and considers ordinary usage of 'is part of' for comparison. He ultimately claims that 'is part of' - like 'being' - is analogical, not polysemous, yet he seems sympathetic with considerations in favor of the latter.[7]

But how do we determine whether an expression is polysemous? And does it matter, philosophically? Do linguistic data have any bearing on seemingly related philosophical issues? Does it make a difference to whatever formal mereology we accept? Does it make a difference as to whether compositional monism is true or not? Let's begin with the first question first.

According to Viebahn and Vetter (2016), there are at least five criteria that can help distinguish between expressions that are polysemous from expressions that are merely context-sensitive, or from expressions that are both polysemous *and* context-sensitive. However, four of these criteria are also helpful in determining if an expression is polysemous, *tout court*. This is the focus in what follows.

i. *Linguistic Intuitions*
One of the first indicators of polysemy is that sentences in which the expression occurs intuitively *sound as if* they have more than one interpretation - that is, speakers intuitively judge

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by (i) explaining what the two different candidate meanings are (or could be), (ii) showing that depending on which meaning is used or intended, the truth conditions vary. Hofweber maintains that each interpretation has 'equal standing' and that neither are dependent on the other for determining truth (one is not a restriction one the other, one is not more 'strict' and the other 'loose', etc.). Arguably, Hofweber (2009) does not adequately show why the quantifier is polysemous as opposed to homonymous. Nonetheless, his proposed view serves as an example of those who maintain that certain key philosophical terms are polysemous.

[6] According to McDaniel, an expression is *pros hen* equivocal "just in case it has several senses, each of which is to be understood in terms of some central meaning of that expression." An expression is analogical "just in case it has a generic sense, which, roughly, applies to objects of different sorts in virtue of those objects exemplifying very different features." As McDaniel is using these terms, "no expression is both *pros hen* equivocal and analogical...an expression is *pros hen* equivocal only if it fails to have a generic sense." Further, an "expression is polysemous if it has many meanings that are closely related, but these meanings need not be related by way of a central sense or focal meaning...an expression is *pros hen* equivocal only if it is polysemous only if it is ambiguous, but none of the converses hold." (2009b: 294-295)

[7] McDaniel (2009b) thinks that there is a generic, univocal sense of 'is part of' that can be applied to different kinds of objects, such as material objects and regions of spacetime, which combines with his compositional pluralism (i.e., the view that there is more than one fundamental parthood relation). See also McDaniel (2010b: 696-698).

a sentence to have more than one available reading. A common strategy to test for these judgements is to use the suspected polysemous word or phrase in various sentence combinations to see if it exhibits *zeugma* - a linguistic dissonance that is created when one word is being used for multiple meanings. In short, we test to see whether using a sentence that requires two different readings for a single polysemous word *sounds funny*. For example:

- He took his hat and his leave.
- She got the drinks and the idea.
- Bob lost his coat and his temper.
- Jane used to work for the paper that you are reading.
- Sally ran a race and her business.
- This road and the movie are long.
- John and sweet potatoes are healthy.

The awkwardness or *funnyness* in each of the above examples is supposed to provide linguistic evidence for the claim that 'took', 'got', 'lost', 'paper', 'ran', 'long', and 'healthy' are polysemous. Each of these words has related, but distinct meanings, which we're exploiting in the above sentences by forcing just one instance of the relevant word to do double duty. To interpret each sentence, the relevant word needs to be assigned two different meanings or readings. The fact that it is ungrammatical or linguistically incorrect to do so is what creates *zeugma*.

Even in the above examples, the degree to which a sentence exhibits zeugma can vary from speaker to speaker. And the presumed linguistic awkwardness of any one of the sentences compared with any of the others can vary in degree for the same speaker. So, admittedly, using our linguistic intuitions to test for polysemy is tricky - and inconclusive. But it is a start.

ii. Numbers of Candidate Semantic Values

Polysemous expressions typically have fewer candidate semantic values than do expressions that are, say, context-sensitive (which have many - sometimes infinitely many - semantic values). But polysemous expressions also have more candidate semantic values than do univocal expressions, which have only one.[8] So, recognizing a number of (not too many but

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[8] For the moment, I am leaving it open as to what exactly semantic values are. A standard view is to say that semantic values involve a relatively simple word-world mapping from, say, predicates to properties and relations. So predicates such as 'is part of', and any variations, would pick out any parthood relation(s), however many there are. While I lean towards this kind of view, I have some reservations, which I'll discuss more fully in section V.

more than one) candidate meanings for a particular expression is a marker of polysemy. Contrast context-sensitive terms such as 'I' and 'today' with the polysemous words 'book'. Indexicals like 'I' and 'today' take as their candidate semantic values each speaker and day, respectively, on every occasion of use, which results in very many candidate semantic values. 'Book' in contrast only has a few: one for an abstract work, another for a hard copy, another for subdivision of a larger written work, etc. So, showing that an expression has a relatively small number of candidate meanings, as opposed to very many or only one, is another indicator of polysemy.

iii. *Relations Among Candidate Semantic Values*
Another feature of polysemy is that the candidate semantic values of the polysemous expressions are related in certain characterizable ways:

- constitutive relations - e.g., 'wood' as a material from trees, and a collection of trees.
- causal relations - e.g., 'milk' as a liquid, and the activity that produces is.
- instantiating relations - e.g., 'book' as a hard copy, and the abstract work.
- metaphorical extension - e.g., 'long' as a spatial distance, and a temporal distance (duration).
- pragmatic strengthening - e.g., 'since' as a temporal succession, and causality.

Some of this can be empirically determined. The etymology of the relevant words might reveal an answer to questions such as: Did one of the candidate semantic values get established before one of the others? Was one either historically or explanatorily prior to the other? Did one come about as a result of a metaphorical extension of the latter? Etc. Some of it can be ascertained by reflecting on how a word is applied. For example, 'mouth' as applied to an opening in a glass or cup is clearly a metaphorical extension of the more literal meaning, which refers to a particular opening in the face of humans and animals. Taking the concept of length as it applies to spatial distances and applying it to time is another characteristic example of metaphorical extension. So, if the relations between candidate semantic values of an expression are any of the above, this is another indicator that the relevant expression is polysemous.

iv. *Logical Form*
Finally, polysemous expressions typically have a predictable logical form. In particular,

polysemous expressions can often function as a verb or a noun. As such, polysemous expressions cannot be assigned a uniform meaning (in the way that, say, context-sensitive expressions such as "I" or "today" could). Viebahn and Vetter admit that this criterion is less helpful when the candidate semantic values of the relevant polysemous expressions are more closely related than verbs and nouns, but there still might be differences in logical form - e.g., mass vs. count nouns, or thing-meaning vs. substance-meaning, as in 'cabbage' or 'hair'. Moreover, whether a word functions as a mass noun or count noun will make some syntactic difference and will often be detected by our linguistic intuitions (our first criteria). So, if an expression can be shown to behave differently at the level of logical form, depending on the candidate semantic values assigned to it, this is also an indicator that the expression is polysemous.

III.   Polysemy of 'is part of'

Admittedly, each of the above criteria is only a guide to determining whether an expression is polysemous; none of them are intended to be either necessary or sufficient for polysemy. Nonetheless, showing that an expression satisfies most or all of the above criteria can be the start of a convincing case. And I think this is exactly what happens when we consider English expressions such as 'is part of' and related parts-whole terminology - all of the above criteria apply. Let's investigate.

First, recall the list of sentences from Varzi (2016):

(1) The handle is part of the mug.
(2) The remote control is part of the stereo system.
(3) The left half is your part of the cake.
(4) The cutlery is part of the tableware.
(5) The contents of this bag is only part of what I bought.
(6) That area is part of the living room.
(7) The outermost points are part of the perimeter.
(8) The first act was the best part of the play.
(9) The clay is part of the statue.
(10)   Gin is part of a martini.
(11)   The goalie is part of the team.

Such lists are generally produced to convince us that expressions such as 'is part of' in English can refer to a wide variety of portions - i.e., the portions can be attached, detached, arbitrarily demarcated, self-connected, gerrymandered, material, immaterial, extended, non-extended, spatial, temporal, etc.[9] They are also supposed to convince us that expressions such as 'is part of' are topic-neutral. But this all assumes that expressions such as 'is part of' are *univocal* - i.e., that this expression has the same semantic value in every occasion of use.

Of course, not everyone shares the view that mereology is topic-neutral. Nor does everyone agree that the mereologically relevant expressions in the above sentences are univocal. Mellor (2006) appeals to the following examples:

(12)   The proposition that p is a part of the proposition that p&q.
(13)   The property F is a part of the property F&G.
(14)   The set of women is a part of the set of human beings.
(15)   New South Wales is a part of Australia.
(16)   The Terror was a part of the French Revolution.

He then observes:

"Notice...how *heterogeneous* this list is. The entities that it says are related as parts to wholes are pairs, respectively, of propositions, properties, sets, geographical regions, events and things. But equally striking, given this heterogeneity, is the homogeneity of each pair. In none of them is the whole different in kind from the part. Properties and propositions are not paired with each other, geographical regions are not paired with sets, things are not paired with events, and so on." (2006: 140)

Because of this (along with some other reasons), Mellor proposes that parts-whole relations generally relate entities of the same kind - i.e., that our parts-whole concepts are *not* topic-neutral.

Simons (1987) also argues against mereology's topic-neutrality. Simons maintains there are (at least) several different meanings of 'part', each of which depend on the metaphysical make-up of the alleged composers:

"...there are different senses of 'part' according to whether we are talking of a relation between individuals, between classes, or between masses… [Extensional part-whole

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[9] Varzi does admit that the 'part' concept that mereology is about "does not have an exact counterpart in ordinary language." But then he - in line with others in the literature - appeals to how we use parts-whole concepts in English to justify and explain various philosophical positions about our mereological concepts.

theories] have several different, but analogous, applications. The connections between the different analogous senses of 'part'...are sufficient to prevent there from being a single, overarching sense of 'part' which covers all of them, despite their appealing formal parallels." (1987: 128)

Yet despite their rejection of the claim that mereology is topic-neutral (and their promotion of compositional pluralism), neither Mellor nor Simons directly argue that our parts-whole expressions such as 'is part of' are polysemous.[10, 11] But I think we should. Let's begin with the above criteria to see why.

First, consider *linguistic intuitions*. We said earlier that a common strategy to test our linguistic intuitions is to use the suspected polysemous word or phrase in various sentence combinations to see if it exhibits *zeugma* - a linguistic dissonance that is created when one word is being used for multiple meanings. Consider the following:

(17)   The handle and the remote control are (each) parts of something.
(18)   The left half of the cake is part of something, and so is the cutlery.
(19)   Here are two things that are parts: that area of the living room and the first act of the play.
(20)   Gin and the goalie are each parts of something.
(21)   Lacking empathy and inconsistent funding are the main parts of the problem.
(22)   The soul is composed of three parts, and so is this puzzle.
(23)   My car, his life, and Socrates' arguments all have parts.

To my ear, *all* of (17)-(23) sound odd (to varying degrees).

Yet sentences (17)-(20) are merely a combination of some of the sentences (1)-(16), all of which were presumably acceptable (i.e., they didn't exhibit zeugma), and all of which involve the predicate 'is part of' or 'are parts.' Sentences (21)-(23) are conjunctions of simpler sentences, each of which is presumably unproblematic and acceptable, yet the combination of which produce linguistically awkward or unacceptable sentences.

As noted earlier, many take the acceptability of sentences such as (1)-(16) as reasons to accept that our parts-whole concepts are topic-neutral. And even though some (e.g., Mellor and

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[10] Simons (1987) talks about different 'senses' of part but does not explicitly defend the view that such expressions are *polysemous*.

[11] See also McDaniel (2009b) and (2010b). McDaniel (2010b) claims that the parthood relation "might not be strictly topic-neutral (do numbers have parts?), but it at least enjoys a relatively high degree of topic-neutrality."

Simon) have commented on the heterogeneity of such lists, no one to my knowledge has explored the effect of combining these sentences together. Yet as (17)-(23) illustrate, doing so creates *zeugma*. But if so, then we have some reasons to think that the mereological words involved in such sentences are the guilty culprit. So, on one criterion at least (linguistic intuitions), it looks as if we have some reason to think that parts-whole expressions are polysemous.

One might object that in each of (17)-(23) there is some *other* expression that is responsible for the resulting zeugma, and that the parts-whole terminology in particular is not contributing to the awkwardness. Perhaps it is the existential quantifier or 'something' that is polysemous, in (17), (18), and (20), for example.

But consider: if the handle is part of the mug and the remote control is part of the stereo system, then not only is the handle part of something and the remote-control part of something, but the handle is a part, *simpliciter*, and the remote control is a part, *simpliciter*. If 'being a part' is univocal, then we should be able to say 'the handle and the remote control are each parts.' That sounds a bit odd to my ear. Admittedly, it is not as odd as 'that area of the living room and the first act of the play are parts' or 'gin and the goalie are each parts' or 'lacking empathy and inconsistent funding are (the main) parts.' But these all exhibit zeugma to some extent or other, and yet none of them explicitly involves any other non-mereological terminology that would be responsible for this. Moreover, locating the polysemy in the existential quantifier or 'something' doesn't account for the infelicity of (21) and (22).

One might respond that the very predicate 'being a part' involves the existential quantifier, and that this is where the polysemy occurs. Let 'x < y' stand for 'x is part of y.' Then 'being a part' may reasonably interpreted as: x is a part iff there is a y and x < y. Yet if so, then many of the sentences above will thereby involve the existential quantifier. Take sentence (19), for example, and let l = *that area of the living room* and p = *the first act of the play*. (19) might then be represented roughly as: there is a y and a z and (l < y and p < z). If the existential quantifier is polysemous, then "there is" may take different semantic values, potentially resulting in zeugma.[12]

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[12] Thanks to an anonymous referee for raising this point.

As noted earlier, Hofweber (2009) defends the view that the existential quantifier is polysemous. So perhaps his view could be useful here. He maintains that the quantifier is ambiguous between a *domains conditions* reading, and an *inferential role* reading. And, indeed, there *is* a reading of (19) which exploits the ambiguity Hofweber supports: there is a y and (l < y and p < y). This is what Hofweber calls the inferential role reading. But this is not the intended interpretation of (19), nor of any of the other sentences (17)-(23). The intended reading of (19) is rather: there is a y and a z (and y ≠ z) and (l < y and p < z). Yet even given this interpretation, (19) still exhibits zeugma.

Could the existential quantifier be ambiguous in another way? McDaniel (2010b), for example, thinks that 'existence' and 'being' - like 'parthood' - are analogous.[13] He claims that 'existence' behaves differently when applied to different ontological categories and that it is systematically variably polyadic: applied to ordinary material objects it is two-placed, applied to abstracta it is one-placed.[14] So, for example, material objects are "necessarily spatiotemporal beings" - they must exist at a place and a time. But other entities - such as numbers, abstracta, universals, etc. - do not exist at a place or time; they exist atemporally. Would interpreting the existential quantifier as ambiguous in this way this help diagnose the infelicity of sentence (19)?

Suppose for a moment that 'that area of the living room' is a material object and 'the first half of the play' is abstract. Then "there is a y and a z (and y ≠ z) and (l < y and p < z)" would assume a univocal interpretation of 'there is', which is not warranted given the assumption that l and p are different ontological categories. So, this might be one way to diagnose linguistic infelicity.

However, 'that area of the living room' presumably is NOT a material object. There may be entities *in* that area of the living room that are material objects - a couch, a rug, the dog, a lamp. But areas of spaces in the sense intended in sentence (19) do not seem to require existing *in* a

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[13] According to McDaniel: "Analogous features are something akin to disjunctive properties, but they aren't merely disjunctive. Analogous features enjoy a kind of unity that merely disjunctive features lack: they are, to put it in medieval terms, unified by analogy." (2010b: 696)

[14] McDaniel (ibid.) focuses primarily on analogous features, relations, or properties, but seems sympathetic with views where 'existence' and 'being' are analogous expressions, or ambiguous in ordinary language. Yet he also admits that one can be an ontological pluralist without thinking that that ordinary English reflects this. (2010b: 692)

place or a time as McDaniel claims that material objects do. On the contrary, areas *are* a place. As such, areas behave like spatiotemporal locations or regions of spacetime: existence applies to them monadically.

Even if one disagrees with this and insists that 'that area of the living room' is a material object (or if one grants that 'that area of the living room' is abstract but insists that 'the first half of the play is material), appealing to ontological pluralism will not help with some of the other sentences. In (17), for example, both the handle and remote control are both material objects. (20) involves a liquid (gin) and a person (goalie), but they are both material objects, and not abstract entities. So even granting that the existential quantifier or existence is equivocal, and granting that 'being a part' contains an existential claim, this cannot account for the infelicity of all of the sentences (17)-(23).

Moreover, consider the fact that standard polysemous expressions already inherit their variation of meaning based on metaphysical differences. 'Book' can refer to a concrete hard copy or an abstract work; 'long' can indicate spatial distances or temporal durations; 'get' can refer to acquiring a physical object or understanding an idea; 'lost' can mean that a material object is missing, or that someone's emotional well-being is gone. In each case, a metaphysical difference is defining the slight variation in meaning - a concrete vs. an abstract work, a spatial vs. a temporal length, a physical vs. a mental acquisition, a material vs. emotional control. If we already countenance distinct candidate semantic values on the basis of metaphysical differences out in the world, then it should be no surprise that our compositional notions do so as well. Whether something is abstract or concrete will make a difference as to how we understand whether and how it can be *part* of something else.[15]

Can the way that an abstract thing is part of another abstract thing (e.g., trigonometry is part of mathematics) *be similar* to the way that a concrete thing is part of a concrete thing (e.g., this brick is part of this house)? Absolutely. This is one of the advantages of thinking that 'is part of' is polysemous - polysemous expressions have distinct *but related* semantic values. But it also

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[15] I said it should be no surprise. But I did not say it necessarily follows. It may be that there is - in general - a hook-up between our words and the world. But as I mention above (footnote 8), I'm not ready to make that commitment here. This is in part because I think the evidence for whether our parts-whole terminology is polysemous holds independently of whatever semantic theories we accept, or what we take semantic values to be. More on this in section V.

allows us to distinguish concepts that might otherwise be blurred over if we maintained that our parts-whole concepts were univocal (and topic-neutral). Importantly (and plausibly), the truth conditions needed for determining whether trigonometry is part of mathematics are different than those needed for determining whether a brick is part of a house. (More on this below.)

One might simply flat-out reject the above intuitions. Perhaps someone doesn't find *any* of (17)-(23) odd. That is certainly possible and is one of the disadvantages of relying on linguistic data. What sounds odd to one person may seem fine to another. But that is why we have other criteria to appeal to. It is also why I will not hang everything on the linguistic data. There are philosophical examples that we'll see in the following section that will help support my claims as well, independent of the linguistic intuitions appealed to in this section.

Let's move on to the second criterion: the *number of candidate semantic values*. According to Simon (1986), Mellor (2006), and McDaniel (2010b, 2014), there are as many parts-whole relations as there are ontological categories or kinds that participate in such relations. For Mellor, there are several: one for propositions, one for properties, one for events and (possibly another for) things, and maybe some others. For Simon, it is three: one for occurrents (or individuals), one for classes, and one for masses. For McDaniel, there are at least three (perfectly natural) parthood relations: one for regions, one for material objects, and one for facts. For all of them, however many parts-whole relations there are depends whatever necessary conditions are needed to participate in that relation, as well as whether the relevant relation is irreducible to any others.

I don't want to settle on the issue of exactly how many candidate semantic values there are for 'part' at the moment. What's important is to notice that for those in the literature who do endorse *compositional pluralism* - the view that there is more than one basic parthood or composition relation - it is proposed that there are only a few (not too many and more than one) such relations. I am not endorsing compositional pluralism (yet). And compositional pluralism need not be true to make the present point. What matters presently is to recognize that compositional pluralists offer several natural and plausible candidate semantic values for

'part' - i.e., one for propositions, another for properties, another for events, classes, or masses, etc. Each of these would have distinct (but related) semantic values and distinct truth conditions. So, plausibly, there is roughly the same number of candidate semantic values for parts-whole terminology as (the compositional pluralists thinks) there are distinct parts-whole relations: one that captures the relations had between abstracta, another one for spatially or temporally (or spatiotemporally) extended objects, another for events, and so on.

Reinforcing a point I made previously, other polysemous expressions *already* distinguish a variation of meaning based on metaphysical differences - e.g., 'book', 'long', 'get', 'lost', etc. In each case, it is the metaphysical differences of the thing, relata, or relation that is accounting for the slight variation in meaning and contributing to the polysemous expression. So if we already countenance distinct candidate semantic values on the basis of metaphysical substance when it comes to non-mereological terminology, it is plausible that the same phenomena will surface in our mereological terminology. But then there will be a certain number (not too many but more than one) of candidate semantic values, which satisfies our second criteria for polysemy.

Moreover, it is clear that the *relations among the candidate semantic values* of parts-whole terminology are also typical of those of other polysemous expressions. Recall that that there are several typical relations evident in polysemous expressions:

- constitutive relations - e.g., 'wood' as a material from trees, and a collection of trees.
- causal relations - e.g., 'milk' as a liquid, and the activity that produces is.
- instantiating relations - e.g., 'book' as a hard copy, and the abstract work.
- metaphorical extension - e.g., 'long' as a spatial distance, and a temporal distance (duration).
- pragmatic strengthening - e.g., 'since' as a temporal succession, and causality.

In particular, metaphorical extension seems especially prevalent in our application of various parts-whole expressions. Consider this passage from Ted Sider, endorsing temporal parts:

> "A person's journey through time is like a road's journey through space. The dimension along which a road travels is like time; a perpendicular access across the road is like space. Parts cut the long way - lanes - are like spatial parts, whereas parts cut crosswise are like temporal parts...A road changes from one place to another by having dissimilar subsections...On the four-dimensional picture, change over time is analogous: I change from sitting to standing by having a temporal part that sits and a later temporal parts that stands." - Sider (2001: 2)

Discussion of temporal parts in the literature is often done in this way, by drawing an analogy between spatial parts, which we seem to understand and the majority of us accept, to temporal parts, which are often described as *analogous* to our concept of spatial parts. Consider this passage from Wallace (ms), endorsing modal parts:

> "A lump theorist claims that ordinary objects are spread out across possible worlds, much like many of us think that tables are spread out across space. We are not wholly located in any one particular world, the lump theorist claims, just as we are not wholly spatially located where one's hand is. We are modally *spread out*, a trans-world mereological sum of world-bound parts. We are lump sums of modal parts. And so are all other ordinary objects. - Wallace (ms: 2)

In such discussions, it is generally assumed that we have one general notion of 'part' and that certain philosophers are merely showing how it - the one, unified, general concept - applies in this way (temporally, modally, etc.) *as well as* in the old way (spatially). But a plausible alternative explanation of what's going on here is that the notion of temporal parts is being introduced via metaphorical extension of (our already widely accepted notion of) spatial parts.

As mentioned previously, since it is already admitted that words such as 'long' are polysemous between a spatial and temporal application, it is plausible that 'part' has a spatial and temporal application as well. But then the relations between the candidate semantic values of 'part' is typical of polysemous expressions, demonstrating that our fourth criteria for polysemy may also be satisfied.

One might object: what is the difference between merely using an expression in a metaphorical or non-literal way and a genuinely polysemous expressions whose candidate semantic values are related via metaphorical extension? How can we be so sure that using 'part' in different instances - once to indicate a spatial part, and another to indicate a temporal part - is invoking distinct semantic values of a legitimate polysemous word, instead of merely using a univocal word in a metaphorical way?

Kit Fine (2010) considers metaphorical expressions such as "the conclusion of a valid argument is contained in the premises" or "the mother or father is 'in' the child". Fine points out that such non-literal or metaphorical parts-whole talk will only extend *so far*.

> "Thus we cannot say that the premises are composed or built up from various conclusions or that the child is composed or built up from his mother and father; and nor can we meaningfully talk of replacing the given conclusion in the premises with

another conclusion or replacing the mother in the child with something else." (2010: 564)

But when philosophers argue for certain kinds of parts - temporal, modal, logical, etc. - they *do* think that we can keep extending the metaphor (for they don't think that it's a metaphor at all!). Defenders of temporal parts think that temporal parts are *literally* parts of things,[16] as do defenders of modal parts, structural parts, logical parts, etc.[17] Defenders of temporal parts insist that a four-dimensional spacetime worm is *composed of* or *built up* from certain (spatio)temporal parts; defenders of logical parts think that ordinary objects such as chairs are literally *composed of* or are *genuine sums of* their qualitative components, etc.[18] Those endorsing these various kinds of parts do not take themselves to be engaged in mere word play; they aren't speaking merely loosely or poetically.

So why not think that 'part' is univocal and that these various different kinds of parts - temporal, logical, structural, modal, etc. - are all participating in a broader, generalized notion (as defenders of these position assume)? First, because the criteria for polysemous expressions seem to indicate the contrary. Second, because admitting that our parts-whole concepts are polysemous gives us a fresh understanding of ontological debates in this area (a point we will discuss in a moment). Third, because doing so also provides us with an elegant explanation as to how it is that such expressions exhibit wide variability, and yet simultaneously exhibit notable commonality. Fourth, because doing so provides an explanation as to why there is so much cognitive resistance in the philosophical literature against the acceptance of non-spatial, non-concrete, or non-extended parts.[19]

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[16] Sider (2001: 61).

[17] Wallace (2014, ms), Koslicki (2008), Paul (2002), respectively.

[18] Paul (2002: 578)

[19] "I fully accept the argument of Chisholm and Geach for the conclusion that the idea of a temporal part is incoherent. I simply do not understand what these things are supposed to be, and I do not think this is my fault. I think that no one understands what they are supposed to be, though of course plenty of philosophers think they do." van Inwagen (1981(1997 reprint: 202)) Elsewhere: "…though I think that color blue and I both exist, I am unable to form a sufficiently general conception of parthood to be able to conceive of an object that has me and a color as parts." van Inwagen (1987: 35)

One might object that the notion of metaphorical extension I am employing here is slightly different than the notion used in the literature on polysemy. Veibahn and Vetter (ibid.), for instance, primarily rely on examples where the metaphorical uses have developed over a long period of time in natural language. Sweetser (1990) aims to give "a motivated account of the relationships between senses of a single morpheme or word, and of the relationships between historically earlier and later senses of a morpheme or word," in such a way that it could reasonably be claimed that there is "a close semantic and cognitive link between two senses if one is regularly a historical source for another." (3) In other words, it is by looking at long-term historical developments in language that we can discover the semantic and cognitive links needed to ascertain polysemous expressions whose candidate semantic values are related by extended metaphor. And one might argue that the philosophical examples I'm concerned with above (and throughout this paper) are not broad enough, long term enough, or historically significant enough to count as metaphorical extension as it is typically understood in diachronic linguistics. However, if there is a general trend in language, it should not be surprising to see those same trends on a smaller scale. After noting some evidence in the literature that seems to support that temporal vocabulary follows spatial vocabulary, Sweetser claims, "In general...more abstract domains of meaning tend to derive their vocabulary from more concrete domains, and...in some cases there is a deep cognitive predisposition to draw from certain particular concrete domains in deriving vocabulary for a given abstract domain." (18) If we are already cognitively predisposed to derive, say, temporal vocabulary from spatial, and abstract from concrete, then it is no wonder that we see a microcosm of this process in the philosophical literature. So while my use of extended metaphor may be slightly different than how it is used in diachronic linguistics, it nonetheless seems entirely apt.

Let us leave the above issues aside (for now) and consider our fourth final criteria for polysemy: *logical form*. First, it is notable that 'part' does sometimes function as a verb, and sometimes as a noun as in 'part of the handle is blue' and 'part her hair on the side.' This may give us some reason to think that 'part' satisfies the fourth criteria. But this noun/verb

ambiguity is not the one in play in the relevant sentences above. What's needed is a difference in logical form when using the predicate 'is part of' or 'is a part'.

Initially, it may appear that 'is part of' displays the required ambiguity, since it occasionally behaves as a count noun and occasionally, a mass noun. Compare: 'this bottle is part of the six-pack' or 'this egg is part of a dozen' and 'clay is part of the statue' or 'water is part of the mixture.' Our sentence (20) above - 'Gin and the goalie are each parts of something' - seems to exploit this double function, resulting in zeugma.

However, in other ways, 'part' does not behave as a mass noun. We can talk about 'some water,' 'more gin,' or 'lots of luggage,' but not 'some part', 'more part,' or 'lots of part.' This indicates that 'part' behaves consistently as a count noun and does not display this requisite ambiguity at the level of logical form.[20]

Nonetheless, there are other ways in which 'is part of' might display ambiguity at the level of logical form. As mentioned previously, McDaniel (2010b) maintains that 'existence' behaves differently when applied to different ontological categories: it is two-placed when applied to material objects, for example, yet one-placed when applied to certain abstracta. One might (as McDaniel does) think that parthood behaves similarly.[21] The principle of unrestricted composition maintains that whenever there are some objects, o_1 and o_2, there is an object composed of o_1 and o_2. One might think (as McDaniel does) that this principle applies to regions or areas of spacetime: whenever there are some regions R_1 and R_2, there is a region composed of R_1 and R_2. But it is not obvious that this principle applies to facts, numbers, temporal parts, ordinary objects, etc. Obeying or not obeying various mereological principles could very well

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[20] Thanks to an anonymous referee for raising this point.

[21] "Both the parthood relation defined on regions and the relation defined on facts is two-placed. One *could* say that there is one perfectly natural relation that is exemplified by both regions and facts. But note that the logic of this relation is ugly… but systematically ugly: when applied to objects of one ontological category, it behaves in one way, but when applied to objects of another ontological category, it behaves in a radically different way. The ''logic'' of parthood is most naturally expressed as a disjunctive list of two disjoint axiom systems, each such that the variables are restricted to objects of the relevant kinds. Parthood is systematically variably axiomatic. This is a bad way for a perfectly natural relation to behave: its behavior looks disjunctive at worst, less than uniform at best…Instead, there are three perfectly natural topic-specific parthood relations, one for regions, one for material objects, and one for facts." (*ibid*.: 699-700)

count as a difference in logical form, especially when we note that the difference in logical form hinges on differences of ontological category.

As Viebahn and Vetter (2016: 14) explain, this fifth criterion is a search for linguistic evidence at the syntactic level. Epistemic modals, for example, behave differently than non-epistemic modals, which can be seen by looking at their position (and scope) in a syntactic tree. Viebahn and Vetter grant that this criterion is helpful in some cases – such as when a polysemous word can function as a verb or a noun, or when a word varies in scope. But they admit that this criterion is less helpful in cases where the logical categories are closer, such as with terms that behave both as count or mass nouns. They claim that the syntactic difference needed for 'wood', for example, while small, nonetheless "accompanies an intuitive difference in meaning and provides further support for [the first criterion]." In other words, this criterion may often be used to bolster additional support if the other criteria are satisfied. So appealing to logical form may be less helpful for 'is part of' if the various candidate semantic values being proposed do not show up at the syntactic level. But that's to be expected if the proposed variations in meaning are more logically similar than, say, verbs and nouns. Even so, the case for the polysemy of our parts-whole terminology is still strong if only three of the four criteria apply.

Yet suppose all of the above is correct. Still, one might argue that the linguistic evidence is too weak to yield any significant conclusions about mereology or mereological relations. What philosophical difference does it make if 'part' is polysemous in ordinary English? We are philosophers asking philosophical questions - what the ordinary folk say is merely and only roughly a guide, and such talk shouldn't be taken to be metaphysically significant. These are important questions; the next section attempts to answer them.

IV.   **Abstracta, Logical Parts**

Let us begin by thinking fairly generally about how our spatially extended notions of parts might apply to things that are not spatially extended. Assume for the moment that Leonard and

Goodman (1940), Lewis (1991), et. al. are correct: our intuitive parts-whole terminology is univocal and topic-neutral. Our predicate 'is part of' and related parts-whole terminology can be applied to any entity from any ontological category. And let us think about how certain non-(spatially)extended entities - abstracta, such as numbers or sets – are supposed to have parts. How does an abstract entity have parts? Does the number two have parts, for example? Does it have halves or quarters? Can it be cut or split or break into parts?

Intuitively, no. But that's likely because cutting or splitting or breaking into parts is something that only happens to extended or material bodies - *i.e.*, abstracta cannot split! But why not? Let's assume abstracta are not mereologically simple.[22] Then why can't they be cut into two equal parts or split into half or broken into bits? Why do these expressions sound so bizarre? Perhaps it is because there is no non-spatial or non-extended way to understand the procedure of *cutting*, *splitting,* or *halving*. If the act of splitting requires the splitters to be (spatially) extended, and abstracta are non-extended, then the act of splitting is something that abstracta - by their very nature - cannot do. Moreover, any understanding of *splitting* or *halving* an abstractum - e.g., dividing a number by two, splitting a conjunction into its conjuncts, removing members from a set, disjunction elimination, etc. - is very likely only metaphorical. It is only by extending the metaphor of our spatial understanding of *splitting* or *halving* or *breaking into parts* that we can try to grasp what it might mean for a non-extended abstractum to split or have parts. But notice that we eventually run into incoherence if we try to reconnect back to the spatially extended notion. If the only way to understand a non-spatial thing having parts is to tinker with all of the (spatial)parts-related terminology - *splitting*, *halving*, *breaking*, etc. - and reinterpret them only metaphorically, then it is likely that we have moved from one idea (spatially extended parts) to another (non-spatially extended parts).

So instead of thinking that there is a single unified, general notion of 'part' that can apply equally to concrete or spatially or temporally (or spatiotemporally) extended objects as it can to non-extended, non-concrete abstracta or haecceities, it is more plausible that there are (at

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[22] An object is mereological simple iff it has no parts. If all abstracta are mereologically simple, then it is misleading (at best) to say that our parts-whole terminology is topic-neutral with respect to concreta and abstracta – *i.e.*, parts-whole terminology would only apply to abstracta vacuously.

least) two distinct, but related, notions of 'part' - one for abstracta and one for spatially extended objects.

Further, it is *because* our various parts-whole notions are related in a particular way - e.g., metaphorical extension - that we are sometimes tricked into thinking that there is a unified general notion. By extending the metaphor, we are often fooled into thinking the same concept is being employed. But this way leads to confusion. For if we do try to think of abstract objects as having abstract parts *in the exact same way* that concrete objects have concrete parts (as I did above), then we wind up equivocating on distinct but related notions. In short, we fall subject to a fallacy of equivocation.

In short, I'm suggesting that certain attempts to generalize parts-whole concepts beyond the metaphysical make-up of the alleged composers is not a way of understanding topic-neutral mereological concepts - it's a way of conflating metaphorically related, but importantly distinct, concepts. By accepting that our parts-whole concepts are polysemous, we have a nice explanation as to why, when it comes to abstracta, there are some ways in which we can understand how, say, a number might have parts (it's divisible by two!) or be a part (when it's double it makes four!), but other ways in which this seems incoherent.

Let us turn now to a particular philosophical example. L. A. Paul (2002) endorses what she calls "property mereology," and proposes that objects have "qualitative" or "logical parts." Here's the initial pitch:

> "But what if we were to think of the chair in a different way? We can think of the chair as
> having many different spatial components, but we can also think of the chair as having many different qualitative components. The chair has armrests, a headrest, a back and a seat, but it also has the properties of being red, of being large, and being comfortable. The chair is the sum of its spatial components, but it might very well be that the chair is also the sum of its qualitative components. In other words, it makes sense to think of the chair as composed of many smaller (and partly overlapping) objects that are spatial parts of the chair. Why not also think of the chair as being made up of many smaller (and partly overlapping) objects that are qualitative parts of the chair? … perhaps the chair is composed of a very large number of microparticles that lack smaller parts. The microparticles might not have (proper) spatial parts, but they may still be composed of 'smaller' qualitative parts such as having mass and having charge." (2002: 578-579)

Instead of thinking of concrete objects as being composed of concrete parts, we are encouraged to think of concrete objects as being composed of properties or qualities - i.e., abstract parts. Similar to bundle theory, we are to think of ordinary objects as mereological sums or fusions of various properties.

Initially, the above explication of logical parts is inviting and intuitive: you may have even nodded along, as I did, while reading it, seemingly comprehending how it could be that the qualitative features of an object are parts of that object in much the same way (exactly the same way?) that spatial bits of an object are parts of an object. And, so, we seemingly understand that an object can have at least two different kinds of parts - spatial and logical.

Put yet another way, suppose we have a chair over there, C, composed of spatial parts, and a desk over here, D, composed of logical parts. Then we might be tempted to say, "C and D have something in common: they both have parts." Here's another thing that we might say: "both C and D are composite objects." And finally, depending on some details, we might say: "C and D each have many non-overlapping parts." Whatever parts-whole concepts we ordinarily think might apply to concrete, composite objects, we are encouraged to apply to objects with abstract parts (i.e., logical parts). We are being asked to apply *the very same* mereological concepts that we have concerning concrete parts to abstract parts. That's one of the main points, after all - to think of objects as composed of, or as mereological sums or bundles of, properties *instead* of thinking of them as composed of physical, spatio-temporal parts.

Despite the initial plausibility, however, I think something has gone wrong. Consider a similar argument for comparison:

> "We can think of a person running a race, but we can also think of a person running a business. A person uses her legs to run a race, but she uses her brain to run a business. Running a race takes a lot of physical training, but it may very well be running a business takes a lot of intellectual training. In other words, it makes sense to think of participating in a race as a physical running-activity. Why not also think of participating in a business as an intellectual running-activity? If someone is running a race and another is running a business, then both are running, because both are running *something*."

Clearly, this last argument is erroneous. It is true that you may run a race and you may run a business. The world may even be weird enough that these running activities are somehow

bi-conditionally connected: e.g., it may be the case that you run a race iff you run a business. But it is a mistake to conclude from this that there are thus TWO things that you run: a race and a business. Moreover, if Abe runs a race, and Babe runs a business, it is *not* the case that there is something that Abe and Babe both do: running something. What's going wrong here is that these examples force a univocal meaning on 'run.' But 'run' is *not* univocal; it is polysemous.

Why should we think that 'part' is like 'run'? One indication is the fact that 'part' exhibits the typical characteristics of polysemous expressions, as discussed in section III. Another is to see if diagnosing certain known debates as plays on polysemous expressions helps clarify confusion. My purpose in this section is to make a case for this latter point.

Let's begin by noting that Paul (2002), a compositional monist, seems to have anticipated some of the complications resulting from conflating abstract and concrete parts - even though she seems not to have worried about it enough to modify of her view.

> "Sometimes it can be important to recall the distinction between...logical parts and other kinds of parts, such as spatial parts...We...have to be clear about what *kinds* of parts we are making claims about: when, for example, I say that a spatial part of my chair, the cushion, includes the logical part of being cushion-shaped, it does not imply that my chair includes the logical part of being cushioned-shaped, for we are talking about different kinds of parts. (Transitivity implies that a logical part of a logical part of O is itself a logical part of O. It does not imply that a logical part of a spatial part of O is a logical part of O.)" (2002: 581)

Yet if we have to be clear about and keep track of what *kinds* of parts there are, then in what way are these different kinds of parts the *same*?

Suppose that *x* is a logical part of *y*, and *y* is a spatial part of *z*. By traditional mereology (which does not qualify the 'part of' relation), this just means that *x* is part of *y*, and *y* is part of *z*. But Paul claims that the *kind* of part matters: if a logical part (being cushioned-shaped) of a spatial thing (the cushion) is also a spatial part of a concrete object (the chair), it does *not* follow that the property (being cushioned-shaped) is a logical part of the chair. But does it follow that the property (being cushioned-shaped) is *part* of the chair *simpliciter*? If x is a female sibling of y and y is a male sibling of z, it nonetheless follows that x is a sibling of z (in fact, it follows that x is a female sibling of z). If the relations 'logical part of' and 'spatial part of' do not each entail

the more fundamental relation 'part of', then it is not clear what exactly these qualified

mereological relations *are*. If a logical part isn't a part *simpliciter*, then what is it?

Paul isn't the only one to notice the importance of keeping track of the *kinds* of parts under

consideration. For comparison, Thompson (1983), in arguing against temporal parts, discusses a

metaphysical thesis she calls (M1):

(M1): If x is a temporal part of y, then x is a part of y.

She explains, "friends of temporal parts take it that the temporal parts of a thing are *literally*

parts of it." (1983: 206) She then adds parenthetically, after considering a temporal parts view

that might reject M1, "it is not clear exactly how appeal to temporal parts is to help anyone see

how H is related to W and W' if their temporal parts are not among their parts."[23] In other

words, Thompson does not see any advantage or point of accepting temporal parts, if temporal

parts are not parts *simpliciter*. I fully agree, and think the point generalizes: there is no

advantage to accepting qualified parts if they aren't also parts *simpliciter* (given the assumption

of compositional monism).

But if logical parts *do* entail the more fundamental 'part of' relation, then by transitivity, if *x*

is a logical part of *y* and *y* is a spatial part of *z*, it at least follows that *x* is a part of *z simpliciter*.

Moreover, in the chair example, given that *being cushioned-shaped* is a property, then if it is

part of something, it better be a logical part of something (for it certainly isn't a spatial part!).

So it should follow that being cushioned-shaped is a logical part of the chair. Yet this is

counterintuitive; the chair is chair-shaped, not cushioned-shaped. Being cushioned-shaped is

intuitively part of the cushion, not part of the chair, even though the cushion is part of the chair.

This is a problem; no wonder Paul wanted to avoid it. But the alternative is to claim that *is a*

logical part of and *is a spatial part of* do not entail the more fundamental relation *is part of*,

which is also problematic.

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[23] Where H = a Tinkertoy house on the shelf at 1:15, W = the fusion of the Tinkertoys on the shelf at 1:15, and W' = the wood on the shelf at 1:15.

You might think that the above reasoning does not go through unless we can show that Paul is committed to the following claim: if a property, p, is a logical part of an object, O, then O instantiates p.[24]

Paul neither explicitly accepts nor explicitly rejects such a claim. But there is some evidence that she is nonetheless committed to it - or something similar. First, it is worth noting that Paul commits to the primitive notion *are together*: "I shall use the primitive predicate 'are together' to apply to all and only fusions that are actual, that is, to all fusions that are objects." (2002: 580) Yet she also admits that accepting her property mereology, and defining objects as fusions of properties "...amounts to subsuming the bundle theory under the aegis of mereology." (579) Paul mentions that those bundle theorists who take objects to be sets of properties (rather than fusions) are often committed to 'coinstantiation' or 'compresence,' and (for various reasons) claims that she prefers 'coinstantiation.' Plausibly, for any properties that are coinstantiated, those same properties are also instantiated - that is, 'coinstantiation' is roughly 'instantiated together.' So, Paul sees her view of objects as the mereological equivalent to a set theoretical view where *being instantiated together* is the theoretical primitive.

Second, *all* of the examples she uses in her paper involving objects with logical parts instantiate the properties those objects are stipulated to have as logical parts: a red ceramic cup (581-2), two red ceramic cups (584), two pairs of red wooly socks (585), the enduring (and then perduring) Gloria (586-7), statues and clay (589), Goliath and Lump (590-2). There is not a single example in the paper where an object, O, has a logical part, p, and yet O does not instantiate p.

Third, Paul takes her view of logical parts to be an improvement on alternative views, such as a commitment to tropes or universals, for example, because she thinks her view can explain how both views are true. Paul claims that her view:

> "...collapses most of the differences between the realist and the trope theorist, and explains how the views are related. We can call the objects that have redness fused with different spatial and temporal properties 'red tropes' and *R*, the redness part by itself [which has no location properties as parts], the 'redness universal' without fear of contradiction. We might even redefine *instantiation* to be the fusing of objects like *R* with locations." (584)

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[24] Thanks to an anonymous referee for raising this point.

If instantiation is understood as the fusing of *properties absent location* together with *location properties*, then the above claim - or something like it - easily follows. That is, if an object, O, has a logical part, p, then O instantiates p iff O has p and some location property, l. Since the cushion and the chair in my argument above presumably *do* have location properties, we can assume that if the chair does in fact have the logical part of *being cushioned shaped* (by transitivity of having the spatial part of a cushion, which itself has the logical part of *being cushioned shaped*), then *being cushioned shaped* is instantiated by the chair. That is, the chair is cushioned-shaped. But it isn't. So something is wrong.

Although Paul says that it "can be important to recall" the distinction between different kinds of parts, this is an understatement. What is intended is considerably stronger: the *is part of* relation - as well as other mereological relations - are seemingly qualified by or relativized to certain kinds: spatial, logical, (temporal?), etc., and there is no cross-pollination between them. But this way leads to compositional pluralism, which Paul is not defending.

Paul's brief insistence that we need to keep track of the kinds of parts shows that she was at least aware of the awkwardness (if not outright inability) of moving from one kind of part to another. As I've been arguing, however, there is more than just awkwardness here. There's a deep problem once we've introduced or recognized different *kinds* of parts - not the least of which is the worry about how these distinct kinds of parts are related to parts *simpliciter*, assuming there is such a thing, or how these parts are interrelated or inter-defined (if that's even possible).

But all of the above assumes that there is a unified, univocal sense of 'part', that 'part' is topic-neutral, and that compositional monism is true. If we give up these assumptions, a better explanation of what's going on becomes available: what philosophers like Paul are doing when they are purportedly introducing or applying a univocal, topic-neutral concept "in a different way" is rather elaborating on a distinct semantic value for a polysemous expression. Polysemous expressions such as 'part' already have distinct but related candidate semantic values. When a philosopher elaborates on one of these, we can often be misled into thinking that one candidate semantic value (spatial-part) is the same as another (logical-part). But these are in fact distinct interpretations of the polysemous 'part', related by extended metaphor. So

we should not, for example, assume that if something is a logical part, then it is a part *simpliciter* (whatever that means) - for there is no unified, general notion of a part *simpliciter*. There are (say) logical parts, or spatial parts, perhaps temporal parts, or propositional parts, etc. But each of these are distinct but related notions, not restricted or qualified from a broader, more generalized concept.

In other words, it isn't just evident in ordinary English that our parts-whole expressions are polysemous; it is likely that certain philosophical debates have made this evident as well. Or, at the very least, diagnosing certain philosophical debates as confusions over polysemous terminology can provide a different (and perhaps better) understanding of what the disagreement is about.

V.   From Polysemy to Pluralism?

For Lewis (1991) it is especially important that the parts-whole expressions that mereology aims to be about are 'perfectly understood, unproblematic, and certain' - for the formal mereological system that he promotes relies on the acceptance of a theoretical primitive: part. But if 'part' or related parts-whole expressions are NOT univocal across uses - if such expressions are indeed polysemous - then taking 'part' as primitive is not trivial or uncontroversial. At least, we cannot be so cavalier in in basing our formal mereological principles on the basis of such a concept, if it is not clear which of many (but possibly related) concepts we are assuming.

One might object: look, it doesn't really matter what we ordinarily say and do. We are philosophers worried about philosophical issues, and worrying too much about our intuitive, ordinary concepts is taking the folk view too seriously.

Ordinarily, I think this is correct. But in fact entire mereological systems are built on certain theoretical primitives - 'part', 'overlap', or 'distinctness', etc. This appeal to theoretical primitives is usually dismissed as harmless because they are supposed to be one that we all intuitively grasp. So it is incredibly important that the primitive expressions being appealed to are intuitive, univocal, and topic neutral, and that the formal mereology we ultimately accept is a formalization of the *parts-whole* terminology already in use.

Moreover, classical mereology is often motivated by appealing to our intuitive notions of parthood, composition, overlap, or identity, as they apply to concrete, ordinary objects. A finger is part of a hand, and the hand is part of the body, hence the finger is part of the body. This provides intuitive support for the claim that the *part of* relation is transitive. My finger is part of my hand but my hand is not part of my finger. This provides intuitive support for the claim that the parthood relation is asymmetric. The sum of the left- and right-half of my coffee mug takes up the same portion of space as the sum of the top- and bottom-half of my coffee mug. Hence, we might think, the sum of the left- and right-half is the *same chunk of matter* as the sum of the top- and bottom-half. This provides intuitive support for the claim that parthood is extensional. Reflections on our *parts-whole* concepts involving ordinary objects help justify acceptance of formal mereological axioms and principles, and reinforces the assumption that such concepts are unproblematic and univocal.

Philosophers rely on our intuitions about spatial or extended parts to convince us that certain mereological principles are true. Acceptance of these principles, however, is then seen as justification for rejecting certain metaphysical views because such views violate these very principles (e.g., Lewis against Armstrong). But - very plausibly - appealing to these formal principles is assuming a particular spatial (or spatiotemporal) notion of part, which may not carry over to non-extended or abstract notions, and so it is illegitimate to use the acceptance of such principles as reasons to reject metaphysical odd ducks. (They can be rejected for other reasons, but not because they don't obey mereological principles that specifically excluded them.)

Moreover, many assume that our parts-whole concepts are univocal and topic neutral because if not, then compositional pluralism might reasonably follow, which is unacceptable. But what's so wrong with compositional pluralism?

Compositional pluralism does have some defenders. Before Lewis (1991), it seems to have been much more in vogue. Simons (1987), for example, explicitly endorses different composition relations for different entities (individuals, masses, and classes, and possibly some others), as does Sharvy (1980). Relatively recently, Mellor (2006), McDaniel (2004), (2009a), (2009b), (2010b) discuss compositional pluralism, as does Fine (2010).

In fact, Fine (2010) thinks pluralism is more plausible than monism, even though he admits it doesn't have many defenders in the literature:

> "Although pluralism would appear to be the more plausible view, if is not the view that has been most widely held. The majority of philosophers currently working in metaphysics have been monists. They have supposed that there is but one (basic) way for a given object to be part of another; and they have thought that this one way is the relation of part-whole explored in classical mereology, according to which a whole is a mere sum, or 'aggregate' or 'fusion'. Formed from its parts without regard for how they might fit together of be structured within a more comprehensive whole." (2010: 562-3)

McDaniel (2009a, 2014) also endorses the view that there is more than one basic parthood relation, whereby 'basic', McDaniel also means something like 'non-inter-definable.' Compositional pluralism pairs nicely with McDaniel's metaphysical views about degrees of being.[25]

Take a table and the shadow of a table, for example. McDaniel thinks that the relation enjoyed by a table leg to a table is different than the relation enjoyed by the shadow of a table leg to a shadow of the table. Similarly for regions of spacetime, material objects, or facts: the relation enjoyed by a smaller region of spacetime within a larger region of spacetime is likely a different relation, he claims, than the one between a table leg and the table, both of which are different than whatever sort of relation the components of a fact have to that fact.

There are a lot of options here; McDaniel himself provides us with several.[26] But the lack of wide acceptance of this kind of view is very likely because compositional pluralism is taken to be anti-Quinean: McDaniel accepts *degrees of being*, after all. While certain philosophers might be ok with that, many others are not.

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[25] McDaniel (2013).

[26] First, we might distinguish fundamental parthood relations by the category of things that participate in them: one for material objects, one for spacetime, one for facts, one for structure-making relations, one for classes or sets, haecceities, or abstracta generally, etc. These relations might otherwise be the same - they might obey the same rules (e.g., classical mereology - they are both transitive, unique, universal), they might all be 2-placed, have the same logical form etc. Alternatively, the different relations might differ with respect to their logical form. Material objects may have a 3-place parthood relations, relative to regions of spacetime, for examples, whereas regions of spacetime have a 2-place parthood relation. Third, they might obey different (but partially overlapping) axioms. If our part-whole talk in ordinary language is indeed polysemous as argued above, this might be a tempting option since it would explain how these relations are "different but related," which would in turn explain the linguistic data. Etc.

One might be inclined to think that the move from polysemy to pluralism is all too easy, if we assume that our polysemous words match up to a pluralistic world. Throughout this paper I have talked about 'semantic values' without committing to what I take them to be. This is in part because I think that the polysemy claims made here hold independently of whatever semantic theory we accept. It is also because I think that Sweetser (1990) makes a strong (and just short of convincing) case for rejecting objectivist or truth-conditional semantics when it comes to polysemous expressions. It is a theoretical possibility to be an objectivist about certain bits of semantics, and not about others. I am also not entirely sure myself whether compositional pluralism is true. So whether the polysemy of 'part' leads to compositional pluralism is not unconditionally obvious.

Unfortunately, I do not have the space to continue the discussion. But this paper is an attempted first step: if our our parts-whole concepts are not, in fact, univocal or topic-neutral, then compositional pluralism may be more plausible than most metaphysicians have (recently) taken it to be. If our parts-whole concepts are indeed polysemous and topic-dependent, then we should perhaps reconsider our commitments to compositional monism.

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