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Improper Parts, Restricted Existence, and Use: Three Arguments against Ted Sider's Four-Dimensionalism

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This paper raises and defends three classes of objections to Ted Sider's argument from vagueness in his recent work, *Four-Dimensionalism*. The first class argues that Sider's case for four-dimensionalism is superfluous, that is, “mereologically promiscuous three-dimensionalists”¹ can accept his argument yet maintain a compatible variety of three-dimensionalism that accepts the existence of temporal parts as improper parts of otherwise enduring wholes. Second, Sider's argument begs the question of unrestricted composition by presupposing an unrestricted conception of objecthood that the three-dimensionalist can freely reject. Finally, Sider's project offends ontology by undermining a deep ontological distinction between temporal existence and extension. Even assuming that any defense of this distinction will be circular, Sider's account contradicts our commonsense and reflective thought concerning existence without sufficient reason to justify this revision. Since three-dimensionalism can preserve our distinctions in conjunction with granting existence to temporal parts, it is to be preferred.

Introduction

In *Four-Dimensionalism*, Ted Sider argues from unrestricted mereological composition, the position that all potential cases of composition compose a whole, to the unrestricted diachronic fusion of perduring wholes composed of temporal parts. Since it cannot be indeterminate whether a class of objects fuse, and any possible restriction on fusion would make it a vague matter whether fusion occurs, Sider argues that it must be the case that fusion is unrestricted: that fusion *always* occurs.² This conclusion guarantees the existence of temporal parts. Further, persisting objects perdure, that is, they are extended in time like spatial objects are extended in space – by having distinct parts in different locations along a dimension. Sider claims that granting the soundness of this argument entails the truth of four-dimensionalism. In this paper I

will raise three criticisms against this argument:

- (1) Temporal parts are *superfluous* to the thesis of four-dimensionalism. Granting unrestricted composition and unrestricted diachronic fusion is fully compatible with three-dimensionalism.
- (2) Sider's argument is *presumptuous*: a controversial premise within the argument for unrestricted composition presupposes unrestricted objecthood which the three-dimensionalist can deny.
- (3) Sider's project entails *undue revision* to our commonsense distinctions between possible and nonsensical objects and an object's extension in space and existence in time.

In this paper, I will anticipate Sider's responses and argue that these objections undermine his case regardless. I will also argue that "Ontologese"³, the unrestricted language Sider claims to be speaking throughout *Four-Dimensionalism*, is wholly inadequate for this debate because it transforms genuine ontological questions into uninformative conceptual disputes.

Definitions

Four-dimensionalism is a thesis concerning the nature of how objects persist through time: it is the view that persisting objects *perdure* – that they are extended through time and composed of instantaneous temporal parts⁴. Three-dimensionalism is the view that objects persist by *enduring* - by being "wholly present at each time that they exist"⁵. The debate between these views is often framed over the existence or nonexistence of temporal parts. Several three-dimensionalists argue that this is only an ancillary assumption, however, and characterize the central disagreement as one over temporal extension and temporal existence⁶. While three-dimensionalists claim that the way objects are *extended* in space is distinct from the way they *exist* in time, the four-dimensionalist conflates the two forms of presence: objects extend in space by having parts at different places, while persisting objects extend in time by having parts at different times. This paper will assume that the bare existence of temporal parts, when divorced from additional claims about temporal extension, does not amount to *de facto* four-dimensionalism. My first objection will explore how this is possible.

In the argument from vagueness, Sider understands four-dimensionalism as a thesis concerning temporal locality: a claim that, necessarily, for any object (suppose *Ted*), and any distinct, nonempty sets of times such that their union comprises the time-span of the object (suppose T_1 and T_2), there will be two objects, (Ted_1 and Ted_2) such that Ted_1 has all the parts of *Ted* at T_1 , and Ted_2 overlaps *Ted* at T_2 ⁷. By definition, the objects Ted_1 and Ted_2 are instantaneous temporal parts. The temporal locality thesis

thus claims that all persisting objects necessarily have instantaneous temporal parts, and are extended in time by possessing them. But what does it mean to be an instantaneous temporal part?

While three-dimensionalists tend to index parts to time, the four-dimensionalist understands parthood atemporally, seeing temporal parts as parts of wholes *simpliciter*. To bridge the gap in terminology, Sider proposes a purportedly neutral definition of temporary parthood as: Necessarily, X is a part of Y at t iff: (i) X and Y each exist at t , and (ii) X's temporal part at t is part of Y's temporal part at t ⁸.

What does it mean to be a temporal part at t ? X is an instantaneous temporal part of Y at t iff: (I) X is a part of Y, (II) X exists at, but only at t , and (III) X overlaps every part of Y that exists at t ⁹.

These definitions will be crucial in Sider's step from diachronic fusion to four-dimensionalism proper, but it is not obvious that they are as neutral as Sider claims. In section two, I will explain how these definitions may prove problematic in cases of material coincidence and how the three-dimensionalist may reject these definitions, and hence, the argument from vagueness as a whole.

1. The Argument From Vagueness

Sider will argue for the temporal locality thesis first by establishing an argument for unrestricted mereological composition, the position that, given the indeterminacy of restricting composition, any and all potential cases of composition must compose a further whole. Sider then applies this argument to the notion of a minimal diachronic fusion, that is, the minimal cross-time assignment of a non-empty class of objects to a set of times at which the class of objects exist. This assignment generates temporal parts that compose perduring wholes. In this section I will briefly summarize the key steps of these arguments, beginning with unrestricted mereological composition.

1.1 Unrestricted Mereological Composition

Roughly, the case for unrestricted composition runs as follows: If it is not the case that every class of objects has a fusion, then we can conceive of two possible cases, one in which composition occurs and one in which composition does not occur, which are connected by a continuous series of extremely similar cases¹⁰. Since composition can never be vague, there must be a clear point in this series where composition abruptly ceases to occur¹¹. Such a cut-off is either vague, arbitrary, or anthropocentric, so composition must always occur. Given below is Sider's version of the argument¹²:

- P1 If not every class has a fusion, then there must be a pair of cases connected by a continuous series such that in one, composition occurs, but in the other, composition does not occur.
- P2 In no continuous series is there a sharp cut-off in whether composition occurs.
- P3 In any case of composition, either composition definitely occurs, or composition definitely does not occur.
- C Every class has a fusion.

In defense of P3, Sider launches a sub-argument which hinges on two presuppositions – first, that vagueness is a product of semantic indecision rather than genuine ontological vagueness or ignorance, (call this condition V) and second, that logic can never be a source of vagueness (call this condition L)¹³. Proof: Suppose P3 is false, and composition is a vague matter. Suppose further that there is a finite world inhabited by a finite number of concrete objects, where concrete is understood as excluding abstract entities. Alleging that composition is indeterminate would mean that it was indeterminate whether there was an object in this world that was the fusion of the present concrete objects. Thus a sentence of the form “there are n concrete objects” would be indeterminate in truth-value¹⁴. Consider the logical form of this sentence: $\exists x \exists y [Cx \ \& \ Cy \ \& \ x \neq y \ \& \ \forall z (Cz \rightarrow [x=z \vee y=z])]^{15}$

Presuming V , what term in this sentence admits precisification¹⁶? Presuming L , the only remaining potentially vague elements are the predicate C , the quantifiers, and identity. Sider argues none of these elements admit precisification, so it must be the case that the sentence has a determinate truth-value. Given this contradiction, we can conclude P3. From P1-3, we conclude C. But C only asserts that every class of objects fuse into another object. Whence four-dimensionalism?

1.2 Unrestricted Minimal Diachronic Fusion

“Under what conditions do objects begin and cease to exist?” Sider answers: in all cases¹⁷. Sider moves from unrestricted synchronic composition to the notion of a diachronic or cross-time fusion (hereafter D-fusion). D-fusions are products of an assignment function that takes one or more times as arguments and assigns nonempty classes of objects that exist at those times as values¹⁸. The minimal D-fusion argument exactly parallels the argument for unrestricted composition, substituting assignment for case, and minimal D-fusion for composition. It derives the following conclusion in place of C:

- U: Every assignment has a minimal D-fusion¹⁹.

What does U entail? Recall that Sider claims that the four-dimensionalist thesis is that every persisting object, X , has temporal parts X_1 and X_2 at times T_1 and T_2 , the union of which compose the timespan of the object X . Granting U, Sider believes that the four-dimensionalist thesis follows.

Here is how: if we suppose A to be the function which assigns some arbitrary object X to the instantaneous members of a set of times T at which it exists, then U guarantees the existence of an object X_1 , that is a minimal D-fusion of X assigned to some member t in the set of times T . Being a minimal D-fusion of X at t , X_1 exists at, but only at the time t at which X exists, X_1 is a part of X , and X_1 overlaps every part of X that exists at time t ²⁰. Recall Sider's conditions for instantaneous temporal parthood – X_1 is an instantaneous temporal part of X , and hence, a temporary part of X . Granting unrestricted D-fusion, it must be the case that every persisting object has, and persists by way of possessing, instantaneous temporal parts. Hence four-dimensionalism.

2. The Superfluosity Charge

2.1 The Superfluous Objection²¹:

1. An object may persist by enduring or perduring.
 2. If an object persists, it will have temporal parts.
 3. These temporal parts compose a perduring object which is at best spatially coincidental with, but distinct from the object itself, which may persist by enduring.
- ∴ Not all objects must persist by perduring.

This objection maintains that granting unrestricted composition and unrestricted diachronic fusion is entirely compatible with three-dimensionalism. While this much is not to claim the truth of three-dimensionalism, it does undermine Sider's argument from vagueness as a necessary truth. Although Sider has chosen to understand the debate between these views as one over the existence of temporal parts, the three-dimensionalist is free to accept their existence without the further claim that persisting objects are extended in time by way of possessing these temporal parts. The event-objects composed of the temporal parts guaranteed by U, which have as their temporal parts fusions of ordinary objects at times, are simply spatially or materially coincidental with thing-objects. While thing-objects may persist by enduring, the spatially coincidental event-object persists by perduring.

To clarify: suppose there is a case of unrestricted diachronic fusion. Let *Ted* refer to one of the many synchronic fusions guaranteed by unrestricted composition (that is, objects not assigned to times). Suppose now that *Ted* exists at T_1 and T_2 . Sider's argument for unrestricted minimal D-fusion guarantees the existence of some minimal diachronic fusion Ted_1 such that it has the value *Ted* at T_1 . Unrestricted composition

means that there is an object composed of Ted_1 and Ted_2 . Call this object, *Ted's life*. The existence of this object, which perdures and is extended temporally, is entirely compatible with the notion that the initial object, *Ted*, otherwise persists by enduring. *Ted's life*, is merely spatially coincidental with *Ted*. Thus, Sider's argument only guarantees the existence of an event-object, which is at best the *history* of a thing-object. To hold this, the three-dimensionalist will need to explain material coincidence, but this is a plausible auxiliary commitment²².

2.2 Sider's Counterargument

1. To endure, an object and all of its parts must be wholly present.
2. U guarantees that all objects have instantaneous temporal parts.
3. A persisting object with temporal parts cannot be wholly present unless all its parts are present.
 - ⊥ A persisting object with more than one temporal part cannot have all of its temporal parts present at any one time.
 - ∴ Therefore no persisting object can be wholly present, and no object can persist by enduring.

In response, Sider can claim that U guarantees the existence of temporal parts for any and all persisting objects. Ted_1 is a temporal part at t of any synchronically fused *Ted* that exists at t , and this part-whole relation cannot be not merely spatial coincidence. Recall both Sider's definition of a part *simpliciter* and an instantaneous temporal part. The fusions Ted_1 and Ted_2 guaranteed by U satisfy both definitions by being parts of *Ted*, existing at and only at times at which *Ted* exists, and by overlapping *Ted* completely at those times. Thus, if the object *Ted* is to be wholly present, it will have all *Ted's* parts present, which would imply having both temporal parts present. But this is impossible. Thus enduring objects with temporal parts are absurd. Hence four-dimensionalism.

Yet, the three-dimensionalist can accept the existence of the temporal parts without conceding absolute parthood to them, only improper parthood. Surely, temporal parts overlap, but neither the part nor the object is part of the other *simpliciter*. The error in Sider's counter-argument lies in (3). All that is required for an object to be wholly present is for its *proper* parts to be present – since temporal parts are improper parts, objects can have temporal parts and yet persist by enduring²³.

What does it mean to be an improper part? Consider for instance, the familiar example of the statue and the clay – the clay exists at the times at which the statue exists, is a part of the statue and wholly overlaps the statue at such times, satisfying Sider's definitions. Yet we do not confuse the statue and the clay as parts of one another *simpliciter* – they are improper parts because they are related to one another by *constitution*²⁴. A constitution relation just is the relation between any objects that are

materially coincidental at a time, that is, a constitution relation obtains when the same matter constitutes both objects²⁵. Likewise, while U guarantees that persisting objects have temporal parts, the three-dimensionalist can claim that these parts are materially constituted by the same synchronically fused object as the enduring whole, yet they are not part of one another absolutely. Temporal parts may compose a perduring whole over and above the enduring whole if we grant unrestricted mereological composition, but this event-object only stands in a constitution relation with the thing-object.

Sider could respond: if the three-dimensionalist grants that some event-objects persist by perduring, why posit a separate and unnecessary mode of persistence for ordinary objects? Further, if we grant Leibniz' law, what property distinguishes the enduring object from the otherwise identical perduring object besides the question-begging properties of their temporal presence?

First, three-dimensionalism is necessary because it vindicates our common conception of material objects while accommodating the intuition that events perdure. Second, distinctions may be drawn between enduring and perduring objects on the basis of whether the object's properties are possessed by the whole or just the temporal parts, and whether these properties are relative to a time or intrinsic. Thirdly, it is not clear that a perdurantist model can claim parsimony over the three-dimensionalist. Kit Fine raises an interesting objection with the case of aromas: composite aromas, such as the scent of coffee and vanilla extract, exist only when both parts are present, spatially and temporally²⁶. How can the four-dimensionalist account for these "fields" without requiring a separate, conjunctive mode of composition²⁷? The four-dimensionalist must either multiply entities themselves, or sacrifice explanatory power, and hence, cannot use this consideration as leverage over the three-dimensionalist. The three-dimensionalist can also claim that if parsimony requires a single mode of persistence (which, admittedly, it need not) endurance is the more fundamental, for enduring thing-objects are necessary to populate event-objects – there is no such event as a basketball game without the enduring particulars of the players, the court, and the ball that compose the event.

3. The Presumptuous Premise

Recall Sider's P3 proof: if P3 is false, then a sentence of the form "there are n concrete objects" would admit count indeterminacy – given presuppositions V and L , this cannot be the case. What motivation is there to presume V and L ? Suppose $\sim V$: one could argue that logic is never a source of vagueness, but that objects themselves can be. This would allow for count-indeterminacy to arise from indeterminacy inherent to the object being counted. The quantification is precise, but the object itself is vague (because reality is amorphous, for example). Sider argues at length in other works against vague existence, and the theoretical virtues acquired by adopting this position are scarce²⁸.

Instead, suppose $\sim L$. Perhaps three-dimensionalists can accept that the logical connectives and identity have definite meanings. Concerning unrestricted quantifiers, however, one could accept a definite meaning while maintaining that the domain over which the quantifier ranges is indeterminate²⁹. Thus the vague term in the numerical sentence “there are n concrete objects” is the term 'object', the restrictions on which must be settled before the (definite) truth value of the statement can be assessed³⁰. In P3 of his argument for unrestricted composition, Sider has presupposed an absolute domain – that any and all compositions count as a potential object within the scope of an unrestricted quantifier. If we reject this assumption, the count-indeterminacy in the numerical sentence arises from whether or not the fusion in question meets the conditions restricting objecthood (whatever they may be). This is not to say that objecthood is ontologically vague, because what it is to be an object may be precisely determined despite being ineffable, or otherwise accurately tracked by the conceptual structure of natural language. The three-dimensionalist could demonstrate that this restriction of objecthood is a logical joint in reality. So why accept bizarre “Siderian” objects as possible objects in the first place³¹? A plausible interpretation of the quantifier range could exclude Siderian objects on the same grounds a possible restriction on composition could exclude a class of objects’ composing - no such objects exist³². By assuming unrestricted existence, Sider's argument begs his conclusion.

Sider may contest: any proposed restriction on objecthood is as arbitrary as any proposed restriction on composition. Indeed, Sider considers conceptually relative or ineffable restrictions on objecthood too “wild” to argue against³³. But why reject informative restrictions if they track our ordinary understanding of what exists? In the next section, I argue that Sider is not justified in presuming an unrestricted conception of objecthood when it entails sacrificing and revising ordinary usage of the terms and deep ontological distinctions between existence and extension in time and space.

4. The Charge Of Undue Revision

Eli Hirsch objects to Sider's project on the grounds that it grants existence to bizarre objects. If there is no 'deep' ontological difference between eccentric “Siderian” objects and ordinary ones, Sider has reduced characteristically ontological disputes over what objects are real to conceptual disputes over what class of guaranteed existents are actually interesting or informative. For Sider, the question of whether two temporal parts compose a persisting whole is vacuous – they always do, even if these persisting wholes strike us as odd – my nose and the Eiffel tower, for instance, compose. Against this counter-intuitive implication, Kathrin Koslicki objects that by making the arrangement of matter irrelevant to composition, Sider's account is “exceedingly deflationary”³⁴. If internal unity makes no difference to the reality of objects, what meaningful ontological questions can be asked about them³⁵?

Eli Hirsch interprets Sider's project as being motivated by considerations of eligibility – that some properties are more eligible to be referred to in speech, and it is only if we are lucky that there may be corresponding linguistic consensus on terms for these properties³⁶. In *Four-Dimensionalism*'s introduction, Sider claims the purpose of ontology is to investigate the logical joints of reality, and if we interpret the quantifiers of a language as failing to quantify over equally eligible existents on account of their strangeness, our distinction will be unnecessarily vague³⁷. But why assume that considerations of eligibility override considerations of use when interpreting existence?

In his introduction, Sider presupposes that existence is univocal³⁸. Call this univocal existence *E'*. Sider grants that the use of quantifiers in natural language does not fit perfectly with *E'*, rather use fits best with our folk understanding of existence (the existence of ordinary, medium-sized objects). Yet Sider thinks we must suppose there is a natural kind *E'* since it satisfies “the core inferential role we associate with quantifiers”³⁹. Yet Sider argues that if ordinary use does not quantify over strange objects, this is because English quantifiers are ordinarily restricted. Sider thinks ontology is concerned with *E'*, and so the quantifiers quantifying over *E'* must be unrestricted. If this contradicts English, it is best to read Sider's work as if written in “Ontologese”, the language of fundamental ontology.

One could reply: isn't the purpose of ontology to investigate what ordinarily exists? Sider claims that one ought to care more about answers to existence statements phrased in terms of *E'* rather than ordinary statements, since “Ontologese” quantifiers carve reality at the logical joints, while the joints supplied by use are simply conventional⁴⁰. Sider further argues that reality is “ready-made” with a distinguished structure and all of its “subdivisions created equal”⁴¹. Fundamental to these subdivisions is a distinguished domain of existents, since all the other “eligible properties and relations presuppose objecthood and hence existence”⁴². Even Siderian objects are part of this class of existents, Sider argues, though they do not possess ordinary sortal properties, because of the equal nature of reality's subdivisions – since every joint is equal to any other, there is no reason to suppose languages privileges one over another. The strangeness of some existents is a product of their having the “wrong history” to possess sortal properties, not necessarily any incongruence with nature's joints⁴³. If their alleged impossibility is only based on our distaste for peculiar objects, then restricting their existence is ad hoc, and at best a conceptual truth imposed on nature, not an ontological truth *per se*.

Assume that any defense of use outranking eligibility is circular and that ontological questions concern truths phrased in terms of logical joints. Must we accept four-dimensionalism?

Adopting Sider's peculiar ontological project and the variety of four-dimensionalism it entails bears unwarranted revisionist costs to the joints we have reason to believe our common understanding of existent actually tracks. As Kit Fine recognizes, if the thesis of temporal locality dictates only that the three-dimensionalist accept the existence of temporal parts, the thesis proves relatively unproblematic⁴⁴. Yet Sider's thesis also implies that we are conceptually confused to draw a distinction between material thing-objects and event-objects – for instance, we are conceptually confused to distinguish between an event's occurring at a time, i.e. 'the party was yesterday', and a thing's occurring at a time, i.e. 'Ted existed yesterday'⁴⁵. Further, four-dimensionalism entails that enduring objects are absurd, so reference to their existence in time is patently false. Thus four-dimensionalism claims that the distinctions we had reason to believe tracked reality are fundamentally misguided⁴⁶.

But why presume that use is incapable of uncovering reality's joints when eligibility entails jettisoning a distinction between existence and extension that our experience and reflective thought confirms? Sider seems to want to avoid the dangers of anthropomorphizing reality. Revisionism without due cause is as dangerous as anthropocentrism, and to suppose that the subdivisions of reality are equal, and that objecthood is unrestricted is a positive metaphysical claim in need of strong defense – it is not a claim to be assumed uncritically. Without this premise, the argument from vagueness does not guarantee four-dimensionalism. Given the revision that follows from Sider's variety of four-dimensionalism, however, the burden of proof must effectively lie with the four-dimensionalist to demonstrate how our common judgments are so systematically in error, and to do so without reference solely to the existence of temporal parts, which the three-dimensionalist, as discussed earlier in this paper, can admit into our conceptual repertoire⁴⁷.

Conclusion

This paper has raised three objections to Ted Sider's argument from vagueness. First, I have argued that his temporal locality thesis is superfluous and entirely compatible with three-dimensionalism. Second I have argued that Sider's argument for unrestricted composition presumes an unrestricted conception of objecthood that the three-dimensionalist should not subscribe to. Finally, I have argued that Sider's project is founded on a meta-ontological project with troubling and unnecessary revisionist consequences. Insofar as four-dimensionalism excludes the possibility of enduring particulars, there is little motivation to accept it. Insofar as “Ontologese” is an error-theory about our commonsense distinctions between temporal existence and extension, there is little motivation to speak it. Three-dimensionalism can preserve our commonsense distinctions while granting the existence of improper temporal parts – three-dimensionalism can accommodate considerations of both use and eligibility. It is therefore to be preferred.

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¹This term is first coined by Kathrin Koslicki in “The Crooked Path from Vagueness to Four Dimensionalism”, p. 122

²Sider, Theodore. Four-Dimensionalism. (2001) p. 121

³Sider, Theodore. “Replies to Gallois, Hirsch and Markosian” (2004) p. 680.

⁴Sider, Theodore. Four-Dimensionalism. (2001) p. 61

⁵Hawthorne, John. “Three-dimensionalism vs. Four-dimensionalism” p. 263

⁶See Hawthorne, John. “Three-dimensionalism vs. Four-dimensionalism” p. 263 and Fine, Kit. “In Defense of Three-Dimensionalism” p. 699-700

⁷Sider, Theodore. “Four-Dimensionalism” (1997) p. 204

⁸Sider, Theodore. “Four-Dimensionalism” (1997) p. 200-1. Also see Sider, Theodore. “Parthood” (2007)

⁹Sider, Theodore. Four-Dimensionalism. (2001) p. 60

¹⁰Sider, Theodore. Four-Dimensionalism. (2001) p. 123

¹¹Ibid. p. 123

¹²Ibid. p. 123-126

¹³Sider, Theodore. Four-Dimensionalism. (2001) p. 130

¹⁴Sider, Theodore. “Four-Dimensionalism” (1997) p. 221

¹⁵Ibid. p. 221

¹⁶Sider, Theodore. Four-Dimensionalism. (2001) p 130

¹⁷Ibid. p.134

¹⁸Ibid. p. 133

¹⁹Ibid. p. 138

²⁰Sider, Theodore. “Four-Dimensionalism” (1997) p. 221

²¹See Miller, Kristie. “Blocking the path from Vagueness to Four-dimensionalism” for a similar argument.

²²See Thomson, Judith Jarvis. “The Statue and the Clay” (1998) and Thomson, Judith Jarvis. “Parthood and Identity across time” (1983) for defenses of this view.

²³Miller, Kristie. “Blocking the Path” p. 324

²⁴Ibid. p. 324

²⁵Thomson, Judith Jarvis. "The Statue and the Clay" p. 149-173 and Miller, Kristie. "Blocking the Path" p.324

²⁶Fine, Kit. "In Defense of Three-Dimensionalism" p. 708-9

²⁷Ibid. p. 709

²⁸See Sider, Theodore. "Against Vague Existence". To contrast this, also see Ecklund, Matti. "Sider on Existence".

²⁹Koslicki, Kathrin. "The Crooked Path from Vagueness to Four-Dimensionalism" p.119

³⁰Koslicki, Kathrin. "The Crooked Path from Vagueness to Four-Dimensionalism" p. 119

³¹Hirsch, Eli. "Comments on Sider's Four-Dimensionalism" p.658

³²Ibid. p. 659

³³Sider, Theodore. Four-Dimensionalism. (2001) p. 130

³⁴Koslicki, Kathrin. "The Crooked Path" p. 122-3

³⁵Ibid. p. 122-3

³⁶David Lewis, "New Work for a Theory of Universals," *Australasian Journal of Philosophy*, vol. 61. 1983. p. 372

³⁷Defended in Sider, Theodore. "Response to Gallois, Hirsch and Markosian" (2004) p. 679

³⁸Sider, Theodore. "Response to Gallois, Hirsch and Markosian" (2004) p. 679. He refers to E' as "existence".

³⁹Ibid. p. 679

⁴⁰Sider, Theodore. "Response to Gallois, Hirsch and Markosian" (2004) p. 681

⁴¹Hirsch refers to this aspect of Sider's project as 'Stalinist semantics', in Hirsch, Eli. "Comments" p.680

⁴²Sider, Theodore. (2004) "Replies to Gallois, Hirsch and Markosian" p. 682

⁴³Ibid. p. 683

⁴⁴Fine, Kit. "In Defense of Three-Dimensionalism" p.699

⁴⁵Ibid. p. 702

⁴⁶Fine, Kit. "In Defense of Three-Dimensionalism" p. 714

⁴⁷Ibid. p. 714