The Special Phenomenal Composition Question

by

Holger Thiel

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Supervisor:

Professor Howard Robinson

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I hereby declare that this dissertation contains no materials accepted for any other degrees in any other institutions and no materials previously written and/or published by another person, except where appropriate acknowledgment is made in the form of bibliographical reference.

Budapest, Holger Thiel

Abstract

This dissertation is concerned with the composition of phenomenal consciousness. The guiding question is van Inwagen's Special Composition Question (SCQ) and asks under what condition is it true that there is some whole object such that the parts compose it. The first part of this thesis lays out the foundations from general metaphysics and presents possible answers to SCQ. One answer under special consideration is moderatism according to which there is some whole object under the condition that the parts are integrated. Correspondingly, the second part of this thesis discusses the Special Phenomenal Composition Question (SPCQ) and asks under what condition is it true that there is some total phenomenal state such that single phenomenal states compose it. Among the possible answers to SPCQ phenomenal moderatism is prominently discussed according to which it is true that there is some total phenomenal state under the condition that the single states are integrated.

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Content

List of Abbreviations

CAI: Composition as Identity Principle
CEM: Classical Extensional Mereology
E: Extensionality
GSP: General Sum Principle
LPEM: Loose Phenomenal Existence Monism
LPPM: Loose Phenomenal Priority Monism
PEM: Phenomenal Existence Monism
PM: Phenomenal Moderatism
PN: Phenomenal Nihilism
PPM: Phenomenal Priority Monism
PPP: Proper Parts Principle
SCQ: The Special Composition Question
SPCQ: The Special Phenomenal Composition Question
SPEM: Strict Phenomenal Existence Monism
SPPM: Strict Phenomenal Priority Monism
SSP: Strong Supplementation Principle
UC : Unrestricted Composition
UPC: Unrestricted Phenomenal Composition
UqC: Uniqueness of Composition
UqPC: Uniqueness of Phenomenal Composition
WSP: Weak Supplementation Principle

Synopsis I: Logical Space of Compositional Positions and Respective Principles

Part I	**Part II**
The Questions:	
The Special Composition Question (SCQ)	The Special Phenomenal Composition Question (SPCQ)
The Answers:	
Extreme	
Universalism	Phenomenal Universalism
Classical Extensional Mereology (CEM)	
Axiom 1: Asymmetry	
Axiom 2: Transitivity	
Irreflexivity	
Axiom 3: Weak Supplementation Principle (WSP)	
Strong Supplementation Principle (SSP)	
Proper Parts Principle (PPP)	
Extensionality (E)	
Products	
Axiom 4: General Sum Principle (GSP)	
Unrestricted Composition (UC)	Unrestricted Phenomenal Composition (UPC)
Uniqueness of Composition (UqC)	Uniqueness of Phenomenal Composition (UqPC)
Composition as Identity Principle (CAI)	
	Thin Notion of Phenomenal Summation
	Thick Notion of Phenomenal Summation
Atomism	Phenomenal Atomism
Atomicity	Phenomenal Atomicity
Atomlessness	Phenomenal Atomlessness
Non-Atomicity	
Nihilism	Phenomenal Nihilism (PN)
Existence Monism	Phenomenal Existence Monism (PEM)
	Loose Phenomenal Existence Monism (lPEM)
	Strict Phenomenal Existence Monism (sPEM)
Moderate	
Priority Monism	Phenomenal Priority Monism (PPM)
	Loose Phenomenal Priority Monism (lPPM)
	Strict Phenomenal Priority Monism (sPPM)
Basicness Principle	
Covering Principle	
No Parthood Principle	
Moderatism	Phenomenal Moderatism (PM)
Principles of Unity	Principe of Phenomenal Unity
Integrity	Principle of Phenomenal Unity
First condition: Relation-Family	
(see Synopsis II for the logical map)	
Division	
Partition	
Closure (left and right)	Phenomenal Closure
Connectedness	Phenomenal Connectedness
Closure System	Phenomenal Closure System
Biconnectedness	
Biclosure System	
Relation Family	Phenomenal Relation Family
Integrity	Phenomenal Integrity
Second condition: Dependence Relations	
General Dependence	General Phenomenal Dependence
Weak Rigid Ontological Dependence and Integrity	Weak Rigid Ontological Phenomenal Dependence and Integrity
Generic Ontological Dependence and Integrity	Generic Ontological Phenomenal Dependence and Integrity
Functional Dependence and Integrity	Functional Dependence and Integrity

Introduction

The present thesis concerns the composition of phenomenal consciousness. At the most general level, and independently of consciousness, the entities that compose some other entity are parts. And the entity that is composed of parts is a whole. Composition is a part-whole-relation. The philosophical theory that has this part-whole relation as its subject matter is mereology. So this thesis undertakes a mereological approach to phenomenal consciousness and investigates in what way and if at all phenomenal consciousness as a whole is composed of parts.

At the most general level, and independently of mereology, is phenomenal consciousness the qualitative and subjective aspect of your experience of the world and your bodily states. It has become conventional to speak of phenomenal consciousness in terms of states. Phenomenal consciousness as a whole is the subjective and qualitative total state of your mind at a certain point of time that encompasses all and at once the phenomenal aspects or properties of sensory experiences you undergo at that time. This totality of your phenomenality is build-up of various single states that accompany the various particular experiences you have. A mereological approach to phenomenal consciousness inquires in what way and if at all single phenomenal states compose the total phenomenal state.

I think an intuitive and precise approach to composition comes from van Inwagen and his Special Composition Question (SCQ). He is primarily concerned, like almost the entire discussion in the literature about composition, with our familiar dry and mid-sized material objects. Yet, composition and hence also the question concerned with it are purely formal matters so that there is no principled reason why it should not be applied to the phenomenal domain.[1] Accordingly, in what follows, in the first part of this thesis, I introduce van Inwagen's Special Composition Question as well as the panoply of possible answers to it. In the second part, I run through the same schema with respect to phenomenal consciousness. Also here, by answering what I label the Special Phenomenal Composition Question (SPCQ), various positions will evolve. Introducing SCQ and its answers as well as and applying it to the phenomenal domain in the shape of SPCQ and its answers can be seen as the fundamental question of this thesis.

[1] See also Kathrin Koslicki, *The Structure of Objects* (Oxford University Press, 2008), p.16 for a remark concerning the generality of mereology. Also Achille Varzi, "Mereology" (*The Stanford Encyclopedia of Philosophy*), <http://plato.stanford.edu/archives/win2015/entries/mereology/>, section 4.5.

I consider this fundamental approach as some piece of groundwork research. That means, on the one hand, that discussing SPCQ based on SCQ in general metaphysics yields genuine results by relating to each other existing positions as well as developing new ones regarding phenomenal composition. Thereby I systematize the debate about the compositional structure of phenomenal consciousness and revise the logical space of positions in this field. On the other hand, as is the nature of fundamental approaches as opening up more questions than answering them, discussing SPCQ brings it about that not every thread of the debate can be follow up to its details. This is to the effect that in many places I flag points where I stop elaborating and suggest further issues for research.

In order to answer the SPCQ, I make extensive use of mereology in standard metaphysics. This strategy of applying a rigid mereological machinery to phenomenal consciousness stems from the observation that, on the one hand, mereological approaches to phenomenal consciousness recently are on the rise in the literature, but, on the other hand, do not spend much effort on mereology itself. Many approaches carry the label of mereology but in fact this label only derives from an under-complex allusion to some sort of part-whole relation in the analysis of phenomenal consciousness without in fact referring to mereology. In other words, the study of phenomenal consciousness lets the resource of mereology in classical metaphysics lie more or less idle. This is the motivation for the mentioned fundamental aspect of the present thesis: Utilize and make fertile what classical mereological metaphysics has to offer for the study of the structure and nature of phenomenal consciousness.

The other and more specific task of the present thesis concerns the development of a conception of phenomenal consciousness that respects our common sense intuition concerning its compositional structure: This position is called moderatism and holds that each subject possesses a somewhat unified and closed, call it holistic, phenomenal consciousness at a time. My ambition in this part is rather modest. I just lay out the formal and general conditions for, say, each and only your single phenomenal states and each and only mine compose one total consciousness as opposed to all of our phenomenal states together. In short, these conditions say that the set of single phenomenal states have to be integrated as to compose a total phenomenal state. However, I do not propose one special phenomenal relation that accounts for moderatist phenomenal

composition. Any relation that satisfies the criteria might do so.

As is the strategy in the entire thesis, also the moderatist stance towards phenomenal consciousness follows a moderatist answer to SCQ in general metaphysics that is presented in the first part. Although adopting the label moderatism and hence being part of the array of answers to van Inwagen's SCQ, my account of moderatism considerable differs from his in that it combines Johnston's Principles of Unity with Simon's account of integrity. I choose to develop an alternative moderatist stance because I take it to be more general as well as more logically precise than van Inwagen's rather particularistic and loose discussion and hence as such to facilitate a likewise general and precise compositional approach to phenomenal consciousness.

Part I

The guiding question of this thesis is whether and if yes under what conditions single phenomenal states compose a total phenomenal state. Part one of this thesis is meant to provide the metaphysical framework as to answer this question. Systematically, the metaphysical groundwork is mainly a combination of van Inwagen's Special Composition Question (SCQ) and Simons' mereological account of integrity. As regards content, this choice is motivated by the following reasons.

Accounts of phenomenal composition are numerous, but so far have been developed in isolation. That is to say, the various suggestions in the philosophy of mind pertaining to phenomenal composition are not connected by some fundamental and comprehensive question, namely simply the one about if at all and if yes under what condition composition occurs. In standard metaphysics, compositional approaches are bound together by van Inwagen's SCQ. With regard to the according question in the philosophy of mind, I suggest to proceed in the same way. Hence, in the first part, I introduce SCQ and discuss the logical space of positions that it gives rise to as a template for the second part where this strategy is applied to phenomenal composition.

I also supplement two monistic answers to van Inwagen's SCQ. First, existence monism is a possible answer to SCQ by holding that composition does not occur at all, yielding the entire cosmos as one single simple individual. Second and in contrast to existence monism, though Schaffer's priority monism also holds that all the parts of the world yield the entire cosmos as one single whole, he also holds that it is not simple. The parts do still exist, even if just derivative to the prior whole. I add monistic answers to the set of possible positions based on SCQ since in both domains, physical as well as phenomenal, it yields positions that are viable and worth discussing.

The second locus where I supplement the theoretical framework of van Inwagen's SCQ is moderatism. Moderate answers to SCQ are delimited from extreme answers in that the former posit some conditions under which composition occurs, whereas the latter simply hold that composition never or always obtains. The moderate answers that van Inwagen provides are deficient in being rather specific and exclusively concerned with the material domain. In contrast, mereology as a compositional theory is general and hence pertains to all domains, including the mental one. Simons' account of integrity provides such general, though logically precise account of a moderate answer or SCQ. He develops

integrity as a set of conditions under which composition is restricted that ubiquitously apply to all possible domains. In the first part I introduce Simon's account of integrity in a general way and apply it to the phenomenal domain in the second part.

I.1. The Special Composition Question

Based on van Inwagen, there are two questions regarding composition. The first questions thematizes the nature of composition itself and generally asks "What is composition?"[2] Accordingly, Inwagen labels it the General Composition Question. I omit discussing the general composition question here since it is quite independent of the following special composition question and thus not relevant to the present thesis as well as, according to Van Inwagen, even "immensely more difficult" to answer than the latter.[3] In contrast, the Special Composition Question (SCQ) pertains to the particular circumstances under which composition occurs and asks:

> "When is it true that there is some whole object such that the parts compose it?"[4]
> or more formally
> "When is it true that ∃y such that the x's compose y?"[5]

The answers to the SCQ can be divided into two main camps, extreme and moderate. The extreme camp consists of two diametrically opposed theses, nihilism and universalism.[6] The universalist holds that it is always true that there is some whole object such that the parts compose it. Mereological Universalism is connected to the notions of Classical Extensional Mereology (CEM), unrestricted composition and entities called sums and fusions. According to CEM, which is the standard theory of mereological metaphysics, no restrictions obtain on when it is true that there is some individual object

2 Peter Van Inwagen, *Material Beings: The Crucial Balance*, Second Edition. (Ithaca, N.Y.: Cornell Univ. Pr., 1995), pp.38ff.

3 Peter van Inwagen, "When Are Objects Parts?," *Philosophical Perspectives 1* (1987): 21–47, here p.24. See Katherine Hawley, "Principles of Composition and Criteria of Identity," *Australasian Journal of Philosophy 84*, no. 4 (2006): 481–93 for an attempt to answer the GCQ.

4 Inwagen, *Material Beings*, p.30.

5 Ibid., p.30. Varzi, "Mereology", section 4.1, provides van Inwagen's SCQ with a formal phrasing. He starts with the weakest possible principle ξ, an upper bound of two entities, that is already almost trivially satisfied by the existence of 'something bigger' or some entity that just includes the partial ones in an extremely universal and general sense. He then phrases SCQ in terms of how ξ can be cashed out in a more substantial and restrictive way. The candidate of mereological overlap for ξ then represents the standard answer to SCQ as formulated by GSP in CEM. Other candidates for satisfying ξ involve an universal relation as used by Whitehead's mereology of events (in his A. N. Whitehead. *An Enquiry Concerning The Principles Of Natural Knowledge.* The University Press. 1919); Alfred North Whitehead, *The Concept of Nature* (Cambridge, The University Press, 1920).

6 Inwagen, *Material Beings*, p.72ff. See also E. J. Lowe, "How Are Ordinary Objects Possible?," *The Monist 88*, no. 4 (2005): 510–33, here p.512.

such that the parts compose it because whenever there is a non-empty set of parts there is an individual object, the sum or fusion, that is composed of this set. Universalism is contrasted with nihilism. The nihilist claims that it is never true that there is some individual object such that the parts compose it.

As indicated, in what follows, I also include two forms of monism, existence and priority, among the answers to SCQ. Since van Inwagen is not concerned with monistic answers to his question, I am not sure where they fit in his compositional topography. Tentatively, I conceive existence monism as a member of the extreme nihilist camp, since it involves the denial of composition. Matters are more intricate with respect to priority monism, since it posits the existence of parts and wholes and hence some sort of composition to the effect that this position does not belong to the extreme nihilist camp. Compositional universalism also drops out as an etiquette, since priority monism contains a holistic aspect and hence some restriction on composition. Therefore, I allocate it to the moderatist camp.

The moderatist camp is more multifaceted but all positions maintained here have in common the stance that composition is restricted, that is, that it is sometimes true that there is some individual objects such that the parts compose it, and sometime not. More specifically, all positions hold that under some conditions it is true that there is some individual composite object. The variety of conditions that have to apply in order for a set of parts to compose a whole bring about the multifacetedness of this moderate camp.

As has been mentioned, the theoretical and formal framework in terms of which compositional questions are discussed is mereology. So in order to understand what certain answers to SCQ amount to we need some groundwork in mereology. This particularly pertains to the main dispute between the universalist and moderatist camp, which can be broken down to opposing stances towards what is regarded as the classical corpus of mereological principles, that is, CEM. In order to know why universalists embrace and moderatists deny CEM, we first have to know what CEM actually is. The following section is meant to provide an introduction to CEM and also to universalism, since the latter just means entertaining the former.

I.2. Compositional Universalism: Principles of Mereology

Mereology is guided, at least in its contemporary form developed by Leśniewski's *Foundations of the General Theory of Sets* and *Foundations of Mathematics* as well as Leonard and Goodman's *The Calculus of Individuals*, a set of logical principles.[7] All mereological theories in this vein share surprisingly few core principles and the main systems based on Goodman and Lewis base their entire mereology on three of them. In what follows, I gradually lay out standard mereology as presented by Simons, but I think it is instructive as an introduction to mention the three core axioms introduced by Lewis[8], since they are stated in a rather colloquial way. Axiom 1 is called Unrestricted Composition and concerns the above mentioned notorious sums or fusions: Whenever there are some things, then there exists a fusion of those things. Axiom 2 is labeled Uniqueness of Composition and states that it never happens that the same things have two different fusions. Axiom 3 contains the familiar transitivity and posits that if x is part of some part of y, then x is part of y. All three axioms are defined formally in what follows.

Simons calls the system of standard mereology Classical Extensional Mereology (CEM) in which Lewis' principle of unrestricted composition appears as the General Sum Principle (GSP). The latter yields the infamous sums as individual wholes, which will be of consideration when we get to universalism below. In what follows, I will sketch the three core principles mainly based on Simons' book "*Parts: A Study in Ontology"* and Koslicki's condensed formulation of it in her work "*The Structure of Objects."*[9] My exposition will be in places amended by Varzi's entry in the Stanford Encyclopedia of Philosophy.[10]

Since standard mereology entails unrestricted composition and accordingly the positing of sums it represents an answer to SCQ, namely that its it always true that some

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7 Leśniewski, S., *Podstawy ogólnej teoryi mnogości*. I, Moskow: Prace Polskiego Koła Naukowego w Moskwie, Sekcya matematyczno-przyrodnicza (1916); Eng. trans. by D. I. Barnett: 'Foundations of the General Theory of Sets. I', in S. Leśniewski, *Collected Works* (ed. by S. J. Surma et al.), Dordrecht: Kluwer, 1992, Vol. 1, pp. 129–173. Leśniewski, S., 1927–1931, 'O podstawach matematyki', P*rzegląd Filozoficzny 30*: 164–206; 31: 261–291; 32: 60–101; 33: 77–105; 34: 142–170; Eng. trans. by D. I. Barnett: 'On the Foundations of Mathematics', in S. Leśniewski, *Collected Works* (ed. by S. J. Surma et al.), Dordrecht: Kluwer, 1992, Vol. 1, pp. 174–382. Nelson Goodman and Henry Leonard, "The Calculus of Individuals and Its Uses," *Journal of Symbolic Logic 5*, no. 2 (1940): 45–55.

8 David Lewis, *Parts of Classes* (Blackwell, 1991), p.74.

9 Koslicki, *The Structure of Objects*; Peter Simons, *Parts: A Study in Ontology* (Clarendon Press, 2000).

10 Varzi differentiates between decomposition and composition principles that build upon the core one. I will omit the decomposition principles since this thesis is based on Van Inwagen's special Composition question for which issues of decomposition do not apply. Achille Varzi, "Mereology" (*The Stanford Encyclopedia of Philosophy*), <http://plato.stanford.edu/archives/win2015/entries/mereology/>, section 3 for the decomposition principles, section 4 for composition principles.

parts compose a whole. Hence, by introducing CEM, I am also also already presenting an answer to SCQ, and even the most common one, viz. universalism.

I.2.a. The Basic Axioms of Standard Mereology

Mereology is concerned with the parthood relation and asks how mereological complexes, compounds, composites or wholes are related to their parts. On the most general level, parthood is a partial ordering over a domain of entities, where the ontological category of these entities is not further specified or restricted. Indeed, it is an advantage of mereology over set theory, and the reason why mereology was invented as an alternative to set theory, that the parthood relation applies to all sorts of entities, be it abstracta or concreta, events, states, properties, types or spatio-temporal regions.[11]

Partial orderings are various in metaphysics. Take, for example, ontological priority or grounding, where the domain of kinds of entities is ordered along certain relations of first or second, or fundamental and derivative. So the parthood relation is one among several relations that might be utilized to structure reality. Yet, as a kind of partial ordering the parthood relation inherits the same formal properties which in turn represent the core of mereological metaphysics: Transitivity, asymmetry and irreflexivity. To be precise, these properties pertain to the proper parthood relation as opposed to parthood simpliciter. The difference between parthood generally and proper parthood is that parthood includes cases where an entity is a part of itself whereas such case is excluded by proper parthood. We write "≤" for parthood, saying that one individual is either part or equal/identical to another, and "<<" for proper parthood, excluding the latter case.

Proper parthood is predominantly the primitive notion of mereology (additionally, identity is assumed and sets are excluded[12]) and conceived of as a relation of strict partial ordering. The mereological axioms are then phrased in terms of proper parthood. So for any individual holds:

Axiom 1 (Asymmetry):

$x << y \rightarrow \neg y << x$

If one thing is a proper part of another, then the second is not

[11] Ibid., section 1.

[12] Simons, *Parts*, p.26; Koslicki, *The Structure of Objects*, p.18.

a proper part of the first.

Axiom 2 (Transitivity):

$x<<y \wedge y<<z \rightarrow x<<z$

If one thing is a proper part of another, and the second is a proper part of a third, then the first is a proper part of the third.[13]

The third formal property of the proper parthood relation, irreflexivity, is not among the basic axioms for it follows directly from asymmetry and transitivity:

Irreflexivity

$\neg(x<<x)$

Nothing is a proper part of itself.[14]

With axioms 1 and 2 at hand, we still do not capture what it means to say that something is a proper part of a whole. This is for, as Simons notes, it is hardly intelligible that some whole has only one part whereas this one part is not identical to the whole, for this is what it means to be a proper part as opposed to a part simpliciter. Intuitively, we think of a whole having at least two parts, one of them supplementing the other, like one half of the cake making up for the remainder left out by the other half.[15] Accordingly, the third axiom is called the Weak Supplementation Principle. This principle is meant to rule out two cases that also do not capture the characteristics of proper parthood. The first concerns an infinitely descending chain of objects, in which the whole has more than just one proper part, but still no supplementation obtains. Take for illustration some weird kind

[13] Simons, Parts, p.27.

[14] I take this from Koslicki, *The Structure of Objects*, p.11 who also mainly bases her work on Simons. Simons takes as the third axiom the weak supplementation principle, which I find rather unconventional. This principle is saying that "if an individual has a proper part, it has a proper part disjoint from the first" (Simons, *Parts*, p.28).
In section 2.1 of his entry to the Stanford Encyclopedia of Philosophy, Varzi takes parthood and not proper parthood as a primitive for mereological systems and hence lists reflexivity as a formal property of the parthood relation instead of irreflexivity of proper parthood. This is for the parthood relation is defined as "part of or equal to" whereas a part cannot be identical to the whole, viz. be an improper part, when both are related by proper parthood. I find Simons choice preferable since the mereological discourse is predominantly phrased in terms of proper parthood.

[15] Simons, *Parts*, p.26; Koslicki, *The Structure of Objects*, p.18.

of vertically aligned wedding cake with one cake per level and where every lower cake is part of the upper one, without being identical to it but also without the lower entirely infilling the upper. The other case that also diverts from our commonsense understanding of proper parthood is one in which the proper parts overlap each other. Imagine our wedding cake that now consists of two or more proper part-cakes on the second level, but where the part cakes are partially meshed into each other. Instead, we want proper cake-parts to be separated and disjoint as to stay intact when they make up the whole cake.

As opposed to my sugary example, overlapping and disjointness are technical mereological terms that deserve introduction at this point before we get to the formal phrasing of the Weak Supplementation Principle. The relation of overlapping holds if two individuals share a common part.[16] We symbolize overlap by writing x0y. Intuitively, two intersecting roads overlap by sharing the crossing as their common part.[17] Further characteristics of the overlap relation can best be clarified if we take a look at its formal properties, which are, by the way, diametrically opposed to the ones that characterize the proper parthood relation.[18] Overlap is reflexive, that is, every object overlaps itself. An implication of this is that two identical individuals also overlap (in contrast, two identical individuals cannot be a proper part of each other). Overlapping is also symmetric, since if an object overlaps another, then the latter also overlaps the former. So it is not only that case that the whole cake overlaps its proper part-cake, but also vice versa. Also note here the difference to the proper parthood relation: Whereas, if x overlaps y, then y also overlaps x, it is not the case that if x is a proper part of y, y is also a proper part of x. Similarly, transitivity-issues essentially diverge the two relations: Overlap is intransitive, that means that just because cake one and two overlap, same as cake two and three, it is not necessarily the case that also cake one and three do. If the three cakes are related by proper parthood, the situation would be to the contrary.

The definition of disjointness can be quite simple if we operate with the notion of overlap: Two individuals are disjoint in case they do not overlap. We write xιy for disjointness. Furthermore, the disjointness relation is described by its formal properties.[19] According to the symmetry of disjointness, if an object is disjointed from another, then the

[16] Simons, *Parts*, pp.11/12; Koslicki, *The Structure of Objects*, pp.12/13.
[17] Simons, *Parts*, p.12.
[18] Koslicki, *The Structure of Objects*, p.13.
[19] Simons, *Parts*, p.13; Koslicki, *The Structure of Objects*, p. 13.

latter is also disjoint from the first. Irreflexivity tells us that noting is disjoint from itself. Lastly, disjointness is intransitive, which is to say that just because one individual and a second are disjoint, same as individual two and three, it is not necessarily the case that also individual one and three are disjoint.

Having the notions of overlap and disjointness at hand, we can proceed to state the third basic axiom of CEM that involves the notion of disjointness and rules out the two mentioned cases in order to arrive at a solid understanding of what it means to speak of proper parthood.

> *Axiom 3 (Weak Supplementation Principle, WSP):*
>
> $(x<<y) \rightarrow (\exists z)(z<<y \wedge z\imath x)$
>
> If x is proper part of y, then there is some z such that z is proper part of y and disjoint from x.

With the weak supplementation axiom, we rule out the counterintuitive cases that arise out of an exclusive consideration of axiom 1 and 2. But now there is another problem: Even given WSP the mereological system developed so far allows for two objects consisting of the same parts. And this seems to also contradict our conception of what it means for a complex object to be composed of parts: If we imagine two things made up of exactly the same proper parts we expect them to be one and not two objects, in other words, we take it that the imagined two objects are identical.[20] This is for the implausibility of assuming that the same set of parts constitute two distinct individuals rather than one.

In order to exclude this case, two options are viable. Either we amend the Proper Parts Principle (PPP), or we replace the Weak Supplementation Principle with his strong sibling, the Strong Supplementation Principle (SSP) which entails WSP and PPP.[21] Here I just mention the fact that these principles and others to follow entail each other in certain

[20] This also concerns the above mentioned Composition as Identity Principle (CAI) that I will discuss later on in more detail. Here let me just mention that it might seem contrary to common sense that two objects that consist of the same parts are identical because we can imagine that, for example, different objects can be built out of 10 Lego bricks. But note that this is only the case if we add structure or arrangement of the parts to their mere existence. But structure as an existence condition is something that CEM does not allow for, and this might be the aspect of CEM that is counterintuitive. But once we disregard structure the mentioned case in the text and CAI might seem more tenable. If not, I refer the reader to the discussion of compositional universalism below in this thesis, where the absence of structure as an existence condition for composite entities is thematized.

[21] Koslicki, *The Structure of Objects*, p.19.

ways. For the exact exposition of those ways I refer the reader to Simons who lays out the paths that lead from one principle to the other in a formally precise manner.[22]

As per the option one, PPP is formalized as follows:

Proper Parts Principle (PPP):

$((\exists z)(z<<x)\wedge(\forall z)((z<<x)\rightarrow(z<<y)))\rightarrow x\leq y$

If it is the case that, for each and all z, if x has a proper part z then also y has the proper part z, then x is a part of or identical to y.

Option two involves SSS, whose precise formulation is:

Strong Supplementation Principle (SSP):

$\neg(x\leq y)\rightarrow(\exists z)(z\leq x\wedge z\imath y)$

If x is not part of or equal to y then there is some z such that it is part of or equal to x and disjoint from y.

Another way of formulating the claim that the same set of parts yield one individual and not two amounts to the extensionality principle, emphasizing the identity of individuals in such case:

Extensionality (E)

$(\forall z)(z<x\equiv z<y)\rightarrow x=y$[23]

If all z are the part of x and y then x and y are identical.

Vulgo: Individuals with the same parts are identical.[24] This principle is called

[22] Simons, *Parts*, chapter 1, for an overview see p.30.

[23] Ibid, p.112.

[24] Varzi distinguished three mereological principles in connection to extensionality, all of which express the nominalist doctrine of "No difference without a difference maker", that are, in his view, different but often equated: Extensionality of Parthood (EP): If x and y are composite objects with the same proper parts, then x =y; Uniqueness of Composition (UC): If x andy are sums of the same things, then x =y; Extensionality of Composition (EP): If x and y are composed of the same things, then x=y. See Achille C. Varzi, "The Extensionality of Parthood and Composition," *Philosophical Quarterly 58*, no. 1 (2008): 108–33.

extensional because we can also paraphrase the doctrine by saying that individuals are the same if they have the same extensions where the extensions then can further be specified as being spatial, spatio-temporal or modal.[25] For example, according to E, two individuals are identical if they occupy the same spatial region, like a cake and the slices it consists of. Complex objects like cakes and the set of slices they consist of, if they form a sum and according to CEM they always do, seem to be perfect candidates for such identity: The cake and the plurality of slices take up the exactly same spatial region to the effect that they have the same identity conditions and hence are identical. Moreover, E comes in various versions in the literature, like Lewis axiom of Uniqueness of Composition, Goodman's content principle, and the Composition as Identity (CAI) thesis.[26] Since I will mainly operate with Lewis' version of E, also in the second part of this thesis, let me state it explicitly:

> *Uniqueness of Composition (UqC)*
> If a set of parts composes individual x and individual y, then individual x and individual y are identical.

E might not be one of the four core axioms constitutive of the logical apparatus of standard mereology but it is nevertheless one of its essential ingredient.[27] In Simons words, standard mereology equals Classical Extensional Mereology, CEM, so that without its E, standard mereology reduces to some sort of minimal mereology, lacking its logical

[25] Kit Fine, "Compounds and Aggregates," *Noûs 28*, no. 2 (June 1994): 137-158, here pp.139 and 151.

[26] Varzi, "The Extensionality of Parthood and Composition", p.109; Daniel Cohnitz and Marcus Rossberg, "Nelson Goodman," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Spring 2016, 2016, http://plato.stanford.edu/archives/spr2016/entries/goodman/, section 3.1; Goodman's nominalistic content principle says that sameness of content equals identity. Thomas Sattig, *The Double Lives of Objects: An Essay in the Metaphysics of the Ordinary World,* (OUP Oxford, 2015), p.3. For a rather colloquial approach to CAI, see Lewis, *Parts of Classes*, section, 3.6 where Lewis argues that the truth of the composition as identity thesis supports the truth of the ontological innocence thesis. For criticism to the contrary, see: Peter Van Inwagen, "Composition as Identity," *Philosophical Perspectives 8* (1994): 207–20; Alex Oliver, "Are Subclasses Parts of Classes?," *Analysis 54*, no. 4 (1994): 215–23; Koslicki, *The Structure of Objects*, pp.41ff. For an approachable overview's, see the unpublished Master Thesis of Joel Smid, "Composition as Identity and the 'is One Of' Argument," 2012, http://www.axiom.vu.nl/~jeroen/MaThesis_Jeroen_Smid.pdf, particularly p.8/9. The "one of-argument" dealing with the putative misbehavior of predicating that the whole is one of the parts, is also at issue in Einar Duenger Bohn, "Unrestricted Composition as Identity," in *Composition as Identity*, ed. Donald Baxter and Aaron Cotnoir (Oxford University Press, 2014), pp.146ff. For a comprehensive and contemporary reading, see A. J. Cotnoir and Donald L. M. Baxter, *Composition as Identity*.

[27] In some mereological systems E represents an axion, in some other it is derived as a theorem, see Achille C. Varzi, "The Extensionality of Parthood and Composition," Philosophical Quarterly 58, no. 1 (2008): 108–33, here p.108.

neatness. However, as we will see below, there are good reasons to reject the thesis that composition is identity, hence to exclude extensionality from mereology and to reject CEM altogether. But back to the main plot.

Now we took proviso that CEM excludes the case in which two individuals share the same proper parts. What is still not taken care of are cases in which several individuals that overlap yield another individual. This case is in some intuitive sense reverse of the case of an individual that encompassed a multiplicity of individuals as parts. Whereas the former individual is the common part of the others, in the latter case the encompassing individual is a common whole of the others. The individual that is a common part of others is technically called a product and the individual that is the common whole of other individuals is named the sum. Imagine the public transport system of medium sized cities where various metro lines run through the central station. The central station does not include as parts all and the entirety of the metro lines, it is just one little section of every line that falls together with and is the same as a small section of all the others. Mereologically, the central station is the product of the metro lines. And the axiom that has to be added to standard mereology in order to account for such cases is the Product axiom:

Product

$x0y \rightarrow (\exists z)\,(\forall w)((w \leq z) \leftrightarrow (w \leq x \wedge w \leq y))$

If x and y overlap, then z is the product just in case everything that is a part of or equal to z is also a part of or equal to x and y.

The last case that is still missing as being explicated in axiomatic manner in standard mereology is the one mentioned in connection to products, namely its reverse, the sums. These cases are even more important since they stronger reflect intuitions about what it means if we speak of some individual or objects being composed or consisting of various others as its parts. Simons and Koslicki further discuss various kinds of sums, like binary ones, in which only two parts compose a further individual, on their way to the final Principle of sums.[28] I omit these here since they do not contribute to the understanding of

[28] Koslicki, *The Structure of Objects*, p.19; Simons, *Parts*, pp.32-37.

what follows in the application of CEM to phenomenal consciousness. I just mention the logical symbol for a binary sum here for it involves the symbol for conjunction which is of some importance in a subsequent chapter. It is simply (x+y).

The axiom with which the development of CEM comes to an end is the General Sum Principle that covers cases in which an infinite number of parts compose a common whole, the sum. Also, the General Sum Principle logically entails the axioms PPP, SSP and Products because of which I did not flag the latter ones as distinct axioms (as before, I also abstain from executing the according entailment relation here).[29] So the entirety of CEM can be states in just these four axioms.

> *Axiom 4 of CEM (General Sum Principle, GSP)*
>
> $(\exists x)(F(x)) \rightarrow (\exists x)(\forall y)\ ((y0x) \leftrightarrow (\exists z)(F(z) \wedge (y0z)))$
>
> If there is an individual x that satisfies a certain predicate, there is a x for all y, such that if y overlaps x there is some sum z that satisfies the predicate in question and y overlaps z.[30]

Focusing on F, the predicate that the individuals have to satisfy, GSP posits no restriction. So in this form, GSP entails the doctrine of unrestricted composition since it holds for all possible predicates.[31] For example, if we take F to denote *being a single phenomenal state*, GSP says that whenever there is a set of phenomenal states that instantiate F, they form a sum, that is, another total phenomenal state. As such, GSP, in its colloquial form, for example as stated by Lewis above, says that whenever there is a set or series of individuals, there is another individual, a sum or fusion of that set, that has the members of the set as parts and hence expresses the doctrine of unrestricted

29 Refer to Simons, *Parts*, pp.32-37 for a fine grained exposition of the logical relation between the various mereological principles.

30 Out of the many, I choose the formulation provided in Koslicki, *The Structure of Objects*, p.20.

31 Varzi, "Mereology.", section 4.3/4. Varzi arrives at the principle of an unrestricted sum in 4.4 by way of the general sum principle in 4.3. The difference between the two formulae is that the latter includes a second conjunct of the antecedent requiring that the individuals that are F (phi in his symbolism) have to satisfy another condition (psi). Hence, the General Sum Principle in Varzi's sense is a version of restricted composition. The psi-antecedent drops in GSP resulting in unrestricted composition. So caution is in place here regarding the names of the principles: Koslicki's GSP foregoes the second conjunct in the antecedent, resulting in unrestricted composition, whereas Varzi includes it under the same name, yielding restricted composition (also see the beginning of his section 4.5.), so that Koslicki's GSP actually corresponds to Varzi's Unrestricted Sum Principle.

composition.[32] As mentioned, with the statement of GSP the full scope of CEM is accomplished. Thus, this standard mereology is inseparably connected to unrestricted composition and the resulting notorious entities of sums and fusions. Accordingly, the standard answer to SCQ is indeed "always" and universalism the majority view in compositional theory.[33]

We have to make one proviso for the connection of SCQ with GSP. The notion of composition and the notion of the sum are conceptually bridged by the notion of overlap. The notion of a sum is more permissive, so to say, when it comes to overlap of the parts than the one of composition. This is for it is entailed by the latter but not by the former that the parts do not overlap.[34] For example, given that the molecules of my desk and its top-board overlap, it is allowed to say that my desk is a sum of all the molecules and the top-board, whereas it is not permissible to hold that the desk is composed of all its molecules and its top-board since both overlap. It will not have grave implications for what follows in this thesis but it is nevertheless important to be precise about this slightly differing existence conditions for being a sum and being a complex, viz. an object composed of parts. Accordingly, a precise statement of the principle of unrestricted composition involves the condition of non-overlapping:

> *Unrestricted Composition (UC)*
> Necessarily, for any non-overlapping x's, there is a y such that
> y is composed of the x's.[35]

Same as GSP is the strongest axiom, it is also the most controversial one, raising worries about the plausibility of postulating objects that are composed of scattered or disparate parts. The majority of objections against standard mereology and CEM is concerned with two main issues: the (im)plausibility of unrestricted composition, and the

[32] See Peter Inwagen, "The Number of Things," *Philosophical Issues 12*, no. 1 (2002): 176–96, here p.189-193 for a brief analysis of the sum in terms of the + sign and the stating of intuitive reasons for rejection this sign as some guide to wholes in reality and outside the boundaries of mereology.

[33] Koslicki, *The Structure of Objects*, p.20; van Inwagen, "When Are Objects Parts?", p.35.

[34] Ned Markosian, "Restricted Composition," in *Contemporary Debates in Metaphysics*, ed. Theodore Sider, John Hawthorne, and Dean W. Zimmerman (Blackwell Pub., 2008), 341–63, here p.342.

[35] Ibid. The corresponding principle postulating not Unrestricted Composition (UC) but Unrestricted Sums (US) hence reads as follows: "Necessarily, for any x's, there is a y such that y is a sum of the xs" (p.361).

according entities like sums and fusions along with it, and extensionality.[36] I discuss both in turn for, in this thesis, I adopt both worries in application of CEM to phenomenal consciousness: I think that it is implausible to conceive of phenomenal consciousness in universalist and extensionalist terms. In a slogan that combines both points: Not any set of single phenomenal states yields a total phenomenal state because the latter is more than the sum of the former.

I.2.b. Criticizing Compositional Universalism

The majority of attacks against CEM aim at its two core principles: Unrestricted Composition based on GSP and Uniqueness of Composition based on E[37], also called the Extensionality Principle where the latter two are connected to the Composition as Identity Thesis (CAI). Moreover, the two camps of critique are conceptually connected to identity and existence conditions of sums: Since the Principle of Unrestricted Composition guides the conditions under which sums come about, criticizing the former entails disagreeing with the latter. The same holds for the Principle of Uniqueness of Composition that is concerned with the identity conditions for sums. I start with presenting attacks aiming at Unrestricted Composition.

I.2.b.i. Unrestricted Composition (UC): Existence Conditions For Mereological Sums

As to start with the criticism aimed at unrestricted composition and sums, the first thing to note is that, although both are a crucial ingredient to CEM, denying them does not entail denying CEM in general. This is for the GSP is a principle that guides criteria for the formation of an individual and is just indirectly connected to what we understand by proper parthood or being a part. Even if one is opposed to the claim that for every set of individual there is another individual, namely the sum of the set, she might still agree on what it is to be a sum, individual or part. Its just that she is disagreeing about in which cases and if at all the term individual is applicable. A critique might query applying the term individual to sums, but might agree that some medium dry and compound objects deserve this attribute.[38]

[36] Simons, *Parts*, pp.106-108 mentions two further problems connected to the notions of proper parthood and non-transitivity, but also does not pay much attention to them. I follow him in that especially because I think that these problems are negligible in application to phenomenal consciousness.

[37] Again, as mentioned in the introduction to this section, I take Lewis' principles to be colloquial phrasings of the axioms of CEM stated by Simons.

[38] Ibid, p.109.

Another way to put it is that CEM is perfectly fine as a theory: it is precise, consistent and serves many purposes, first and foremost for philosophers of nominalist predilection for CEM allows the existence of composites without resorting to universals or abstract objects. The worries rather concern the aptness of sums for being applied to reality and reliably differentiating cases of composition and cases of non-composition, as opposed to them "to exist just because there is a form of expression which requires a referent."[39] This is for common sense would not consider the set of entities like Metallica's first album, a sack of rice in China and your thought that unrestricted composition is queer to be a further object or individual, whereas, according to CEM, this is the case.[40]

So the general worry here is that unrestricted composition commits us to an ontology teeming with entities that us folk, or our scientists, would never count as being composite wholes, and hence fails to be a guide for our understanding of what it is that lets common objects to be wholes as opposed to being mere heaps or aggregates, that is, no individuals. However, our psychological bias might not be an apt guide to ontology. The fact that we feel uneasy about individuals composed of scattered or even cross-categorical parts, like star-pens or nose-virtues, allows no inference to the fact that they do not exist. Any ontology based on a precise mereological theory, and such is CEM, is in any case an overrider for any psychology-based objection, no matter how well motivated by common sense.[41] Yet, that does not mean that we should drop the intuition, just that we should find the suitable mereological theory supporting it. With respect to the composition of phenomenal consciousness, this is the aim of my thesis. But before we discuss more specific points of criticism regarding CEM, let us first look at reason for the conviction that there are no such apt mereological theories.

Interestingly enough, many arguments in favor of sums do not posit them for their own sake; commonsense intuitions seem to be still present even in the minds of advocates of CEM. Rather, unrestricted composition seems plausible ex negativo, simple because there is no better theory at hand as to conceptualize composition. So arguments in favor of unrestricted composition usually take the form of arguments against restricted composition. An influential line of thought in this vein is launched by Lewis, roughly holding that any theoretical alternative that restricts standard CEM-composition is vague

39 Ibid, p.109.

40 Examples here are abundant, take for example Lewis' trout-turkey in Lewis, Parts of Classes, p.7.

41 Varzi, "Mereology", section 4.5; James Van Cleve, "Mereological Essentialism, Mereological Conjunctivism, and Identity Through Time," *Midwest Studies in Philosophy 11*, no. 1 (1986): 141–56, here p.145.

and hence to be rejected.[42] But as we will see, the vagueness argument can also be invoked as to entertain other compositional positions than universalism.

I.2.b.ii. The Plausibility of Unrestricted Composition: Vagueness

The vagueness objection has various appearances in this thesis, since we will meet this argument again soon in connection to others answer to SCQ besides universalism, namely "no" and "once" and hence related to positions like nihilism and existence monism. Hence, I just briefly introduce this objection here and postpone detailed discussion until later. The starting point of the argument is similar in all cases: Take a sorites of cases of composition, claim that there is neither a sharp-cut off between cases of composition and non-composition nor cases of vague composition, and draw your conclusion. The nihilist and existence monist conclude that there is no composition at all whereas the universalist bites another bullet and infers that composition always occurs and, hence, that there is an individual for all classes of individuals. But let us go through the Lewis argument in a bit more detail, as is provided by Koslicki and Sider.[43]

The argument takes the form of a sorites thought experiment. If one thinks that not every class of individuals yields a further individual, then there are cases in which composition occurs and cases in which it does not. So let us imagine a continuous series of numerous connected cases that are different yet extremely similar to each other. Start with the case in which composition does definitely occur and move along the line case by case until you reach the opposite end where composition does definitely not occur. Somewhere in the middle we come across borderline cases, in which the occurrence of composition is either not clear because two adjacent cases are, as it is with sorites, extremely similar, or we encounter such clear transition from the occurrence of composition to the failure of composition, a sharp cut-off. If both possibilities are rejected because on the one hand the existence of complex objects that result from composition cannot be vague and on the other it cannot be plausibly explained why in adjacent cases composition does obtain in one but not in the next case then one reaches the conclusion that composition either always or never occurs.[44] In the former case she entertains

42 David K. Lewis, *On the Plurality of Worlds* (Blackwell Publishers, 1986), pp.211ff.

43 Theodore Sider, *Four Dimensionalism: An Ontology of Persistence and Time* (Oxford University Press, 2001), pp.121ff; Koslicki, *The Structure of Objects*, pp.30ff.

44 Korman, "Ordinary Objects.", section 2.2. Also see Lowe, "How Are Ordinary Objects Possible?", p.511.

universalism, in the latter nihilism. As I said, both positions are discussed in more detail below. Let us now turn to reasons for thinking that CEM is implausible and extend on existence conditions for sums.

I.2.b.iii The Implausibility of Unrestricted Composition: Temporal Existence Conditions

In the introduction of the discussion of Unrestricted Composition, I mentioned the classical critique that CEM allows for highly counterintuitive objects being composed of widely scattered parts. What usually is in play here is spatial scatteredness. Yet, that is not the only way for CEM-individuals to be scattered, as Fine posits. He criticizes extensionality and CEM's omittance of structure in terms of temporal existence conditions for sums.[45] His objection is that mereological sums do not capture the time-relative existence conditions of ordinary objects. So as opposed to the identity conditions that are of issue below and regarding which I omit the temporal dimension, when theorizing existence conditions, I include a temporal aspect in the discussion. This is because the discussion of time-relativized existence conditions actually aims at clarifying the composition of an ordinary individual at a time and hence pertains to synchronic existence of objects, whereas the debate about time-relativized identity conditions aims at fixing the identity of an ordinary individual over time, and hence pertains to diachronic identity of objects.[46] But now to the actual objection.

Besides spatial scattering and hence the lack of spatial structure, mereological sums are also characterized by the possibility of temporal scattering and hence the lack of temporal structure. Johnston summarizes this point as follows:

> As we shall see, whether there really are mereological sums will depend on whether there are wholes which are utterly undemanding and unstructured; utterly undemanding in that they ask no more of their parts than that they exist at some time or other, and unstructured in that they confer on their parts no distinctive structure of their own.[47]

[45] Fine appears to agree with Simons (*Parts*, pp.109/10) in that the problem with CEM is not so much that it is inconsistent or deficient as a logical theory. The problem, particularly with respect to its extensional component, is rather that CEM seems unapt for an application to the world and a conception of ordinary objects, as opposed to the way we commonly conceive and speak of them. Fine puts the point as follows: "The material world is standardly conceived in extensional terms. It is allowed, under this conception, that material things may have properties or enter into relations, but these properties or relations are not themselves taken to be constitutive of material things in the same kind of way that they are constitutive of the propositions concerning those things." Kit Fine, "Things and Their Parts," *Midwest Studies in Philosophy 23*, no. 1 (1999): 61–74, here p.73).

[46] See for the classical example Judith Jarvis Thomson, "Parthood and Identity Across Time," *Journal of Philosophy 80*, no. 4 (1983): 201–20.

[47] Mark Johnston, "Parts and Principles," *Philosophical Topics 30*, no. 1 (2002): 129–66, here p.130.

In a more detailed manner, Fine entertains the same line of objection and follows that CEM fails not only spatially but also temporally to conceptualize the parthood relation with respect to our familiar ordinary objects.[48] Here is his argumentation.

In CEM, individuals are part of another individual in case the former are a sum. According to this what Fine call "aggregative" understanding of a sum, the existence conditions of sums is extremely permissive in two respects: As we already mentioned, the sum exists *wherever* the parts exist, that is, irrespectively of the spatial region the parts are located in. Moreover, the existence conditions of the sum is also flexible when it comes to the temporal region, that is, the sum exists *whenever* the parts exist.[49] Fine uses the example of a sandwich: Not only, according to CEM, that the two slices of bread and the ham are part of the sandwich whether or not they are spatially close to each other, they also are part whether or not they are temporally close to each other. So it might very well be the case that the ham is part of the sandwich without the slices of bread actually being there with it because the ham is part of the sandwich if it forms a sum with the two slices of bread irrespectively of the slices coming into existence sooner or later or at the same time as the ham does. This conception of a sum and hence what it is for the slices of bread and the ham to be part of the sandwich flies in the face of our understanding of the latter since intuitively we do assign existence conditions to the sandwich that include spatio-temporal cohabitation of the parts: there is simply no sandwich unless the slices of bread and the ham are where and when the sandwich is.[50]

Fine subsequently experiments with other strategies to remedy CEM. First, by considering an extended sense of being a part that is characterized by a restriction on the existence of the sum such that the sum exists only "at all and only those times and places at which the ham sandwich exists."[51] Second, he alludes to his own suggestion for conceptualization of the composition relation, that is compounding as opposed to the standard aggregation. According to the conception of compounding, parts form a sum only if they are scattered spatially, not temporally. However, both strategies fail. The first based on the "Monster Objection", according to which not only the ham is part of the restricted sum but also any other arbitrary object that the ham is part of to the effect that

48 Fine, "Things and Their Parts."
49 Ibid, p.62.
50 See also Koslicki, *The Structure of Objects*, pp.73/47 for a discussion of Fine's argumentation.
51 Ibid, p.73.

these monstrous objects would also count as part of the ham sandwich; a consequence of the restricted sense of parthood that makes it hard to accept. Also the compounding relation does not suffice as a conception of parthood since now, although we assure the temporal cohabitation of the sum and the whole, the parts still do not spatially cohabit. They could be wherever as to compose the ham sandwich, even on the compounding model. And this seems to be Fine's general point: there is no way to capture what it if for a part to be part of a whole unless we add a structural element to the existence condition for sums.[52] Let us now move from existence to identity conditions of sums and related worries regarding CEM.

I.2.b.iiii. Uniqueness of Composition (UqC): Identity Conditions For Mereological Sums

The general point of this section is to present objections that mainly aim at identity conditions of sums and affect CEM by way of threatening its crucial extensionality principle and Lewis' according UqC. If it turns out that two individuals with the same set of parts are not identical then the extensionality principle falls and with it CEM and the doctrine of UqC. Usually structural, modal and temporal properties are thematized as such "difference-makers". Additionally, I find sortal differences illuminating, so that I will also include sortal or kind properties as being responsible for the non-identity under the condition of sameness of parts. I view identity conditions in two slightly different ways of making a difference between two individuals that are composed of the same set of parts. First, as I will discuss structural properties, two individuals might instantiate two different structural properties that render them non-identical. Second, as I will elaborate with respect to sortal or kind properties, and with special consideration in the second part of this thesis, the two individuals are non-identical in case one of them does not instantiate any sortal property at all.

As a disclaimer and to limit the scope of discussion, I first mention that this thesis is concerned with synchronic phenomenal consciousness, and hence does not focus on its diachronic form. This has also implications for the kind of identity discussed. As mentioned before, many ontologists resort to temporal or diachronic identity and theories like fourdimensionalism in order to save CEM. Since only synchronic phenomenal consciousness is my concern here I will exclude temporal questions and limit the

[52] Fine, "Things and Their Parts", p.63. Koslicki, *The Structure of Objects*, p.75.

discussion to synchronic identity.[53] Also, as mentioned above, in the metaphysical literature the thesis that composite individuals are identical if their set of parts are is debated under the label of the *Composition as Identity* (CAI) thesis.[54]

Similarly to the forms of identity, as was mentioned in the disclaimer, I omit the temporal properties here. Also, I exclude modal properties because the application of the discussion involving them to the composition of phenomenal consciousness would exceed the scope of this thesis.[55] First I discuss structural properties, followed by sortal or kind properties.

Structural Properties

I introduced the objections against CEM by alluding to the slogan that something, in this thesis phenomenal consciousness but usually this point is made regarding ordinary and material objects, is more than the sum of its parts. Conceiving of individuals based on extensionality and hence regarding them as mere sums, according to the worry, misses out on something. And based on Simons and others, this something is some sort structure, order, arrangement, organization, or generally some relation among the parts. Mereological sums are unstructured wholes.[56] We find the *locus classicus* of such line

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53 Francesco Berto and Matteo Plebani, *Ontology and Metaontology: A Contemporary Guide* (London ; New York: Bloomsbury Academic, 2015), pp.188ff.

54 CAI also seems not only to bear on E and hence UqC but also on UC. See See Bohn, "Unrestricted Composition as Identity," pp.14 for an example of the latter.

55 For following this discussion see David Wiggins, "On Being in the Same Place at the Same Time," *Philosophical Review 77*, no. 1 (1968): 90–95; Achille C. Varzi, "Mereological Commitments," *Dialectica 54*, no. 4 (2000): 283–305; Simons, *Parts*, p.115; Berto and Plebani, *Ontology and Metaontology*, p.190; Bohn, "Unrestricted Composition as Identity," pp.148ff. For a critical assessment of this anti-extensionalist argument involving modal properties, see Varzi, "Mereological Commitments"; Varzi, "Mereology" section 3.2. For objections specifically from modal supervenience, see Michael Jubien, *Ontology, Modality, and the Fallacy of Reference* (Cambridge University Press, 1993); Theodore Sider, "Global Supervenience and Identity Across Times and Worlds," *Philosophy and Phenomenological Research 49*, no. 4 (1999): 913–37. For a defense of anti-extensionalism against these argument from modal supervenience, see Kit Fine, "The Non-Identity of a Material Thing and Its Matter," *Mind 112*, no. 446 (2003): 195–234.

56 Sattig, The Double Lives of Objects, pp.3-5. As the connection to extensionality, Sattig differentiates between a three- and four-dimensional version of CEM: "Ordinary objects are typically capable of change in parts over time and incapable of surviving massive scattering. This expected mereological variability and unity of ordinary objects is incompatible with the three-dimensionalist version of extensionality stated above. The four-dimensionalist version, by contrast, allows for a derivative notion of temporary parthood that secures compatibility with mereological change and unity" (p.5). See also Kathrin Koslicki, "Mereological Sums and Singular Terms," in *Mereology and Location*, ed. Shieva Kleinschmidt (Oxford University Press, 2014), 209–35, here, p.209. The argument she gives can be seen as a version of the general line of objection against CEM that this abstract mereological machinery is not frictionlessly applicable to the world and does not reflect our conception of what it is for a complex object to be composed of parts. She argues "that our practice of using singular terms to refer to objects, at least on the face of it, pretty obviously does not track mereological sums." (p.210).

objections in Rescher:

> The extensionality property, which entails that wholes are the same if they possess the same parts, rules out those senses of "part-whole" in which the organization of the parts, in addition to the mere parts themselves, is involved. Different sentences can consist of the same words.[57]

Anti-extensionalist views like this hold that two individuals that share the same set of parts but not the same structure are not in fact identical, hence the extensionality principle is to be rejected, and CEM along with it. In a nutshell, they claim that sameness of parts is not sufficient for identity because sameness ignores structure.[58]

For the start, take a simple example of a set of parts consisting of 20 white, 20 red and 20 blue Lego bricks. A student that has discussed nationalities at school might notice, while back home and playing with Lego, that he can compose two different flags out of the suchlike partitioned set of bricks. He arranges three rather oblong rectangular for each color and puts the white one on top, then blue then red, yielding the Russian flag. In contrast, he can take the same set of Lego bricks, puts them in a more squarish shape and places the white block to the left of the blue one and the red block next to the white one, resulting in the French flag. The result is that same bricks form two different flags, which means mereologically that the same set of parts yields two different individuals.

What might be of mildly spectacular importance for the scholar drives the mereological metaphysics into deep problems. This is for his axiomatic system contains two crucial principles guaranteeing extensionality that have to be rejected if he accepts cases in which two different individuals are composed of the same set of parts.[59] The problematic principles in the light of such cases are the Proper arts Principle (PPP) and the Strong Supplementation Principle (SSP). As we saw above, both are an essential ingredient of the axiomatic system of CEM, particularly because they exclude models in which two individuals consist of the same parts and as to meet our intuition that in such cases we usually assume that those individuals are identical.[60] However, in some cases this intuition fails and the standard mereological system CEM that is meant to formalize our understanding of the parthood relation likewise fails to accommodate such cases. Cases in which two individuals consist of the same parts but are still not identical also are

[57] Nicholas Rescher, "Axioms for the Part Relation," *Philosophical Studies 6*, no. 1 (1955): 8–11, here p.10.
[58] Varzi, "Mereology", section 3.2.
[59] Simons, *Parts*, p.117.
[60] Varzi, "Mereology", section 3.2.

justified and plausible candidates for understanding what it is to be a part of a superordinate whole. That leaves two strategies for the classical extensional metaphysician. Either abandon the two principles from standard mereology or explain away cases of different individuals being composed of the same parts.

The first strategy is hard to swallow for the aficionado of extensionality since PPP and SSP present the core of CEM. Still, as Simons remarks, even if one expels these principles, mereology does not cease to capture the parthood relation. Granted, to abandon these principles leads to a considerable loss in theoretical neatness and simplicity. However, although rejecting PPP and SSP is a high cost, the remaining axiomatic system still retains the WSP, saying that in order to be a proper part of the whole, another parts that is disjoint from the first also needs to be a part of the same whole, as to capture the appropriate conceptualization of the parthood relation. Finally, since cases of non-identical individuals being composed of the same set of parts constitutes a solid part of reality, it is plausible to hold that the gained explanatory and descriptive power of a mereology devoid of PPP and SSP outweighs its loss in logical conciseness.[61]

The second strategy includes either denying that one of the non-identical individuals in fact exists, or claiming that they are nevertheless identical, or residing to the metaphysics of fourdimensionalism.[62] The third possibility opens up a completely new field of metaphysics and would extend the scope of this thesis, so I remain neutral with respect to it.

Regarding the first option to resist the rejection of PPP and SSP as well as the extensionality principle along with it, a way of denying the existence of one of the mereologically alike flags is to claim that only one can exist at the same time, not both. With the set at hand one can arrange the Russian flag at time t1, subsequently rearrange

61 Simons, *Parts*, p.117.

62 Ibid., pp.114/5. See Varzi, "Mereology", section 3.2 for problems for extensionality based on the necessity of sameness of proper parts for identity, as opposed to the sufficiency of sameness for identity. The former is essentially connected to questions about how extensional mereology is capable of accommodating changes over time, for example, since people that get older cannot said to have the same parts anymore but are still, at least from a commonsensical standpoint, identical. In order to resist these line of objections, philosophers usually reside to fourdimensionalism (or relativizing properties and relations to time. See Judith Jarvis Thomson, "Parthood and Identity Across Time," *Journal of Philosophy 80*, no. 4 (1983): 201–20 and Koslicki, *The Structure of Objects*, chap. II.2; Simons, *Parts*, chap.5.2). Since, as applied to phenomenal consciousness, these worries rather concern diachronic than synchronic forms, and I am concerned with synchronic consciousness, I circumvent this issue in this thesis. For an illuminating discussion of why CEM and its principle of unrestricted composition entails four-dimensionalism, see Markosian, "Restricted Composition", here pp.345ff.

the same set of bricks resulting in the French flag at time t2. So both individuals exist at different times but only one exists, and the other one does not, synchronically.[63] However, with a bit of imagination, one can also construct a synchronic case. If the Russian flag is viewed at from an angle altered by 90 degree one suddenly looks at a different flag, since some flags are vertically oriented, like the Russian one, and some are horizontally oriented, like the French one. So even if the colors are not in the same order if one turns around the Russian flag and hence does not turn into the French one, some other vertically oriented flag of another country that matches the colors and order from the Russian flag is conceivable to the effect that we have two flags with the same parts at the same time, which results in being two non-identical flags.

However, here a critic might resort to the second strategy of mitigating the thread for the three principles and claim that the two flags are still identical, even in this synchronic case. This is for it remains questionable whether there exist indeed two flags and not just one being looked at from different angles. This case resembles the one of the duck/rabbit drawing where two person look at the same single drawing, just that one person sees a duck and the other one a rabbit. And also here it seems unreasonable to claim that there are two drawing just because two people see different animals in it.[64]

Let us now see how sortal properties fare as difference-makers for identity between two individuals with the same set of parts.

Sortal Properties

Sortal properties have some interesting features. Whereas ordinary properties can be instantiated by the same individuals at the same spatio-temporal extension, sortal properties cannot. The same object might be square and red at the same time and place but the same object cannot instantiate the properties of being a man and a rock at the same spatio-temporal location.[65] Sortal properties function as criteria for non-identity: As opposed to two objects not being necessarily different by instantiating two different ordinary properties, two objects that are of different kinds necessarily are non-identical.[66]

63 Varzi, "Mereology", section 3.2. See also Lewis, *Parts of Classes*, pp.78ff for this way of resisting the rejection of, as Lewis calls the extensionality principle, the principle of the Uniqueness of Composition.

64 Cf. Varzi, "Mereology", section 3.2.

65 E. J. Lowe, *More Kinds of Being: A Further Study of Individuation, Identity, and the Logic of Sortal Terms* (Wiley-Blackwell, 2009).

66 See also David Wiggins, *Sameness and Substance Renewed* (Cambridge University Press, 2001), chapter 3; Berto and Plebani, *Ontology and Metaontology*, p.189.

In connection to synchronic identity, the point of alluding to sortal properties is not so much to claim that the non-identity of two individuals stems from the instantiation of different sortal properties but rather from the fact that one individual does not instantiate such property at all. In correspondence to what I said regarding structural properties, anti-extensionalist views also hold that two individuals that share the same set of parts but not the same kind are not in fact identical, hence the extensionality principle is to be rejected, and CEM along with it. In a nutshell, those views claim that sameness of parts is not sufficient for identity because sameness ignores kinds.

To use a related term from Fine, mereological sums are kind-obliterating.[67] They might instantiate relations among the parts and belong to a certain kind, like ordinary tables conceived as mereological sums, but the higher-order kind-property is accidental and not constitutive for the sum.[68] Same as modal and temporal properties, sortal properties present apt difference-maker[69]: They determine non-identity. See also Sattig who additionally connects the absence of kind properties with the one of structural properties in mere sums:

> (…) there are sums that are familiar and useful to us, such as tables, and hence count as ordinary objects, and there are sums that are too spatiotemporally scattered to be recognized by ordinary folks, such as the sum of my left arm and the moon. While ordinary mereological sums have properties and relations that realize ordinary kinds, such as table, the identity of a table does not depend on any table-realizers. In general, the identity of an ordinary object construed as a mere sum does not depend on the instantiation of any kind-determining properties. Ordinary objects are not fundamentally characterized by any specific kinds; they have a kind-independent nature. The identity of a table depends solely on which material objects are its parts, irrespective of whether these parts are arranged table-wise. Such an arrangement is not constitutive of the table's nature.[70]

Since we are now equipped with CEM, the position that answers "always" to SCQ and hence entertains CEM, that is, compositional universalism, as well as with some reasons to reject both, let us proceed to other answers to SCQ.

67 Kit Fine, "Compounds and Aggregates," Noûs 28, no. 2 (June 1994): 137, p.137.

68 Sattig, *The Double Lives of Objects,* p.5. He speaks here of any kind-specific arrangement not being constitutive to the nature of the object. I think it is fair to interpret this passage in the direction of kinds-properties not being constitutive for the identity of a sum.

69 The notion of a difference maker I adopt from Varzi, "The Extensionality of Parthood and Composition" p.108.

70 Sattig, The Double Lives of Objects, pp.4/5.

I.3. Compositional Atomism

I conclude the technical scaffolding of CEM by adding one more axiom that turns classical mereology into a different position than the standard universalism, namely atomism. Atomism is of importance generally but also with respect to the structure of phenomenal consciousness for the main controversy in this debate revolves around the antipodes of holism and atomism. Yet, formal mereology itself stays neutral on these questions and just provides the debate with precise and rather unostentatious and uncontroversial formulation of mereological atomistic possibilities. The actual debate then concerns rather whether and if yes these axioms reflects material, or in case of this theses, mental reality than quarrels about an exact formulation of the doctrine itself. Hence, as with universalism, I confine myself in this section to merely stating the atomistic axioms and postpone the discussion about its ontological appropriateness to later.

The basic term for these axioms is "being an atom", formally At(x), and applies to individuals that have no proper parts and hence are indivisible.[71] Formally:

Atom

$At(x) \equiv \neg(\exists z)(z << x)$[72]

It is not the case that there is some individual z such that it is a proper part of x.

Note that we speak here of atoms in the mereological terminology; that means that everything is an atom that is taken to be such by the theory, whether or not it is such in other domains. For example, we can mereologically set the axiom in such a way that the universe is composed of atoms, although it is scientifically clear that it is not such since thanks to physical science atoms ceased to be indivisible a century ago.

With the notion of At(x) at hand we have three mereological options to modify CEM, namely adding Atomicity, Atomlessness and Non-Atomicity.

[71] Koslicki, *The Structure of Objects*, pp.14/15; Simons, *Parts*, chap.1.6; Varzi, "Mereology", section 3.4.
[72] Simons, *Parts*, p.41.

Atomicity

$(\forall x)(\exists y)\ At(y) \wedge (y \leq x)$

For every individual x there is some individual y such that y is an atom and y is a part of or equal to x.

A bit less formal, the atomicity axiom requires that every individual is either itself an atom or composed of such.[73]

With atomism, combining the SCQ with CEM gets slightly intricate. This is for SCQ keeps atomistic matters simple. According to SCQ, nihilism and atomism coincide since if only atoms exist and no complexes then no composition occurs and the answer to SCQ is simply the nihilistic "Never". Hence, the notion of atomism is hardly to be found in Inwagen and his view that only mereological atoms or living things exist is a form of conditioned nihilism.[74] However, in CEM atomism is explicitly included as (de)composition principle.[75] In contrast to nihilism in SCQ, according to which nothing is composed, in CEM atomism says that everything is composed, and then restricts composition by postulating that those entities that compose everything are atoms. Hence, strictly speaking, Koons and Pickavance are wrong in asserting that "Atomists insist that composition never occurs (...)."[76] It is true that according to both approaches all there is are atoms, but that does not entail that also based on both approaches composition does not occur. The latter is only the case in SCQ, whereas based on CEM one would say that in an atomistic universe or cosmos composition occurs, even if, so to say, just once. This difference, though, might be verbal, since if there is only the cosmos and atoms, speaking of a parthood relation is empty. Nevertheless, keeping the difference in mind that atomism at least in principle involves composition and nihilism does not can do no harm.

Simples

Another debate connected to atomistic entities is the one revolving around simples.

73 Cf. Jonathan Schaffer, "Monism: The Priority of the Whole," *Philosophical Review* 119, no. 1 (2010): 31–76, here, pp.61-65 for the possibility of atomless gunk as an argument against pluralism and in favor of monism.

74 Cf. Theodore Sider, "Van Inwagen and the Possibility of Gunk," *Analysis 53*, no. 4 (1993): 285–89, here p.285.

75 Varzi, "Mereology", sect 3.4.

76 Robert C. Koons and Timothy Pickavance, *Metaphysics: The Fundamentals* (Wiley-Blackwell, 2015), p.139.

Notions of atoms and simples are equivocated based on both being characterized as partless entities. Perhaps based on this conceptual entanglement, it is also conventionally assumed that simples are infinitely small and do not have any extension in space. According to Markosian, conceiving of simples as such point-sized objects is the "Pointy View of Simples."[77] However, in a number of publications a view of simples is promoted that objects to the pointy view and asserts that there is no need to infer extensionessless from simplicity.[78] They postulate extended simples, namely partless and hence atomic entities that occupy "at any time an extended region, called its locus (…)."[79] It is noteworthy that this view puts no restriction on the size of the locus so that it is possible that an extended simple occupies a region as voluminous as the entire cosmos.[80] At this point atomism shades off into monism, a view that is discussed below. This if for monism, in its existential form, is exactly the same view and holds that the cosmos is one simple partless entity, viz. an extended simple that occupies the entirety of the spatio-temporal universe.[81] There is another interesting parallel between the proponents of extended simples and existence monism. Both face the problem of how to account for our folk conception that our familiar ordinary objects are qualitatively heterogeneous.[82] This is for it is natural to assume that properties are instantiated by the parts of a composite object, so that a variation of qualities correspond to various parts of the compound, and that simple entities are not capable of instantiating more than one, at least intrinsic, property. In reaction, both views resort to the argumentational strategy of developing a semantic apparatus with the help of which they explain away the common sense conception of ordinary objects instantiating multiple qualitative properties. According to this, as we might call it, adverbialism, both views hold that the folk conception derives from talking of

77 Ned Markosian, "Simples," *Australasian Journal of Philosophy 76*, no. 2 (1998): 213–28, here pp.216ff. Accordingly, the view of composite objects is that they are extended and occupy a certain region of space where the parts that they are composed of occupy the respective subregions of space. See Simon's Geometric Correspondence Principle in Peter Simons, "Extended Simples," *The Monist 87*, no. 3 (2004): 371–85, here pp.372, 377. And McDaniel's Doctrine of Arbitrary Undetached Parts, in Kris McDaniel, "Extended Simples," *Philosophical Studies 133*, no. 1 (2007): 131–41, here p.138.

78 Markosian, "Simples"; Simons, "Extended Simples"; Kris McDaniel, "Extended Simples," *Philosophical Studies 133*, no. 1 (2007): 131–41; Josh Parsons, "Must a Four-Dimensionalist Believe in Temporal Parts?," *The Monist 83*, no. 3 (2000): 399–418; Kris McDaniel, "8. Brutal Simples," *Oxford Studies in Metaphysics 3* (2007): 233-265.

79 Simons, "Extended Simples", p.376. See McDaniel, "Extended Simples", p.132 for a discussion of the occupation relation.

80 McDaniel, "8. Brutal Simples", p.239; Simons, "Extended Simples" p.378.

81 As is also noted in Jonathan Schaffer, "Monism: The Priority of the Whole," *Philosophical Review 119*, no. 1 (2010): 31–76, here p.34 and with reference to Horgan and Potrč's 'blobject'.

82 McDaniel, "Extended Simples", p.138 calls this intuition the Principle of Qualitative Variation (PQV).

"conceptual parts" and qualities, although those concepts do not really correspond to "metaphysical parts."[83] More of this is at issue when I discuss existence monism below.

The second way to modify CEM based on the notion of At(x) is atomlessness.

Atomlessness

$(\forall x)(\exists y)(y<<x)$

For every individual x there is some individual y such that y is a proper part of x.

In other words, every individual has parts. So even the individuals that compose another are composed of parts. Atomlessness amounts to what Lewis calls gunk.[84] A gunky world is one in which all individuals are infinitely divisible.[85] Also, if the universe or any other object is composed of gunk, then this object has an infinite number of parts for the parthood relation descends infinitely.[86] A precursor of this view, Leibniz, has a picturesque way of phrasing this view:

> Every portion of matter can be thought of as a garden full of plants, or as a pond full of fish. But every branch of the plant, every part of the animal, and every drop of its vital fluids, is another such garden, or another such pool. [...] Thus there is no uncultivated ground in the universe; nothing barren, nothing dead.[87]

Clearly atomlessness is conceptually linked to atoms and simples, for the former involves the denial of the latter. Note that also there is another important difference between the two for atomlessness involves the presence of parts whereas atoms and simples are characterized by partlessness. So, as a side-note, atomlessness does not involve partlessness but partlessness entails atomlessness.

Finally, atomism involves non-atomicity:

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83 Markosian, "Simples", pp.223-6. See below the discussion of "blobjectivism" for such argumentational strategy. See McDaniel, "Extended Simples", p.139 for a discussion of such counterarguments and the notion of adverbialism in this context.

84 Lewis, *Parts of Classes,* p.20. Also Robert C. Koons and Timothy Pickavance, *Metaphysics: The Fundamentals* (Wiley-Blackwell, 2015), pp.140ff. Cf. Schaffer, "Monism," 2010, section 2.4; Hud Hudson, "Simples and Gunk," Philosophy Compass 2, no. 2 (2007): 291–302.

85 See Leibniz' "Primary Truths" for an early expression of this view, in Gottfried Wilhelm Freiherr von Leibniz, *Philosophical Essays* (Hackett Publishing, 1989), pp.33/34.

86 Ned Markosian, "Simples," *Australasian Journal of Philosophy 76*, no. 2 (1998): 213–28, here pp.215/6.

87 Gottfried Wilhelm Freiherr von Leibniz, *The Monadology and Other Philosophical Writings* (Oxford University Press, H. Milford, 1898), §§67/9, taken from the Internet Encyclopedia of Philosophy: http://www.iep.utm.edu/leib-met/, section 9.2.

Non-Atomicity

$(\exists x)(At(x))\wedge(\exists x)(\forall y)(y\leq x \leftrightarrow (\exists z)(z<<y)$

There is an individual x such that it is an atom and there is an individual such that for every individual y, y is part of or equal to x is equivalent to there being an individual z such that z is a proper part of y.

Or simply, some individuals are atoms and some are atomless. According to Simons, Non-Atomicity seems not to be revealing, leading to an uninteresting anything-goes-ontology, and so does not satisfy the common quest for a unified worldview.[88] I am not that dismissive towards this view for I see no reason why reality would not allow for both and thus is more pluralistic than we think, just because it would not be as intellectually interesting as a unified one. But having said this, I also know of no serious discussion of this view, neither in formal mereology nor in metaphysics, so I lay this issue to rest.[89]

[88] Ibid, p.24.

[89] Varzi, "Mereology", section 3.4 mentions some further formulations for non-atomicity, but also remarks that research is rather sparse in this sub-field.

I.4. Compositional Nihilism

With respect to positing non-composition, an akin view to atomism is nihilism. As a disclaimer, in this section, I speak at times of lower level entities instead of parts. I choose this terminology in order to differentiate between entities that in fact add up to a totality, where the application of the terms parts and whole is appropriate, and entities where this summation is not the case. Since in the latter case there is no whole, there are, strictly speaking, also no parts, just some lower level entities that happen to be arranged in a way such that a whole merely appears to exist, but not in fact does.

Nihilism entail two theses: first, the lower level entities themselves have no parts and, second, they do not yield a composite object.[90] The latter claim is important because it separates nihilism from atomism according to which there are also only atoms, but they compose the universe. Accordingly, the nihilist holds that the only entities that exist are simples, where simples are defined as not having parts. And although the universe is exclusively made up of them, it is false to say that the universe (or other complex objects) is *composed* of them.[91,92] Simples are also called atoms, from the greek word for "not to be divided."[93] So the thesis that no composition occurs is equivalent with the thesis that the only entities that exist are mereological atoms (if anything exists at all, of course).

For illustration, to your statement that the set of atoms of your cat compose your cat, the nihilist would reply that this is false because there are only simple things and composition does not occur. So, according to the nihilist, what there is are the atoms only, or, more general, innumerable simple (sub)microscopic particles.[94] But definitely no unified object that sometimes purrs on your lab. Objects like that are not part of the nihilist ontology.[95]

In order to make this view more palatable for you, the nihilist would add that your

90 For paradigmatic positions see Peter Unger, "There Are No Ordinary Things," *Synthese 41*, no. 2 (1979): 117–54 and Peter Unger, "The Problem of the Many," *Midwest Studies in Philosophy 5*, no. 1 (1980): 411–68; Cian Dorr and Gideon Rosen, "Composition as a Fiction," in *The Blackwell Companion to Metaphysics*, ed. Richard Gale (Blackwell, 2002), 151–74. Nihilism as an answer to van Inwagen's SCQ is equivalent to Eliminativism in the debate revolving around the (non)existence and compositions of our familiar and ordinary objects: According to both views, since composition does not occur, complex macrophysical objects simply do not exist (Trenton Merricks, *Objects and Persons* (Oxford University Press, 2001), §1.1).

91 Ibid., p.72/3; van Inwagen, "When Are Objects Parts?", p.34.; Robert C. Koons and Timothy Pickavance, *Metaphysics: The Fundamentals* (Wiley-Blackwell, 2015), p.126.

92 Trenton Merricks, *Objects and Persons* (Oxford University Press, 2001).

93 Varzi, "Mereology.", section 3.4.

94 E. J. Lowe, "How Are Ordinary Objects Possible?," *The Monist 88*, no. 4 (2005): 510–33, here p.510.

95 Crawford L. Elder, *Familiar Objects and Their Shadows* (Cambridge University Press, 2011), p.114.

appearance of there being an unified cat-object is understandable because the microparticles, even if they do not compose your cat, are arranged cat-wise.[96] Accordingly for predication, your sentences that operate with singular terms as to denote complex objects get paraphrased by the nihilist, due to her conviction that those complex objects do not in fact exist, by sentences that avoid singular terms and use the -wise locution instead. So by paraphrasing the nihilist attempts to be semantically accurate in the light of her view on the one side but also to get the skeptic on board by developing expressions that are accessible to common sense intuitions about composition. Interestingly enough, this paraphrasing strategy is a commonality between the nihilistic and, as we will see below, existence monistic answers to SCQ. Both extreme approaches require providing some semantic or explanatory apparatus as to mitigate the apparent irreconcilability with common sense. Yet, in both cases the success of such strategy is highly doubtful.[97]

To be clear, nihilism is not a thesis about the metaphysical nature of the simples or alleged complexes themselves, it is a thesis exclusively about mereology and answer to the negative the question whether the former compose the latter. When nihilists hold that there are no complex macrophysical objects but just k-wise (k for kinds) arranged microparticles, then this implies that those atoms instantiate the same properties and maintain the same relation to each other as they do in the manifest folk ontologists picture who assumes ordinary objects to exist as complexes.[98] The only difference between the nihilists on the one side and the folk ontologists on the other side consists in that the former deny and the latter accept the claim that the same natured simples compose a complex object.

The consequence of nihilism, namely that there are no complex objects, are usually hard to swallow for the layman in ontology and he might want to know how one gets to be convinced of it. The first reason is fueled by the argument from sorties of decomposition and the well-known argument from vagueness, that we already

96 Timothy Williamson, *The Philosophy of Philosophy* (Blackwell Pub., 2007), p.219; E. J. Lowe, "How Are Ordinary Objects Possible?," *The Monist 88*, no. 4 (2005): 510–33, here pp.527–531; Crawford L. Elder, *Familiar Objects and Their Shadows* (Cambridge University Press, 2011), §6.1, p.133; Crawford L. Elder, "On the Phenomenon of 'Dog-Wise Arrangement,'" *Philosophy and Phenomenological Research 74*, no. 1 (2007): 132–55, §1, p.114; Trenton Merricks, *Objects and Persons* (Oxford University Press, 2001), §1.1.; See Inwagen, *Material Beings*, pp.108/109 for the origin of the 'arranged k-wise' locution.

97 Cf. Markosian, "Restricted Composition", pp.347ff.

98 Merricks, *Objects and Persons*, p.4.

encountered in connection to universalism.[99] If universalism seems unpalatable, one ends up with entertaining nihilism, as van Inwagen himself does, with the exception of complex objects like you and me, viz. one that constitute a life.

Another reason to get convinced of nihilism concerns the number of denizens of the world. Nihilists argue that they are unnecessarily multiplied if we assume the existence of complex objects in addition to the parts they consist in. And to assume such metaphysical luxury is unnecessary because the complex objects that result from composition are causally redundant or overdetermined: whatever is allegedly caused by them can more parsimoniously explained by being caused by their the parts only.[100,101] Why should one posit the existence of a complex baseball over and above the multiplicity of microparticles that the baseball is composed of, if everything that the baseball does can also be explained solely by the micro-parts being arranged baseball-wise?

With regard to objections claiming that complex and hence almost all of our familiar ordinary objects do not exist, nihilism demands a lot of our common sense intuitions already. But to most philosophers the theory is going too far when it comes to us human beings. We surely are complex and do exist. Hence, even some nihilists draw a border here and exempt human beings from their otherwise nihilistic convictions based on the fact that humans either constitute a life or are conscious.[102] Moreover, nihilism at large faces a powerful objection here given the additional assumption that no distinct borders can be drawn between living or conscious beings and non-living or non-conscious ones.[103]

Whereas the objection from living or conscious being attacks the nihilistic claim that there are no complex objects, another counterargument denies the existence of simples

99 Daniel Z. Korman, "Ordinary Objects," The Stanford Encyclopedia of Philosophy, n.d., <http://plato.stanford.edu/archives/fall2015/entries/ordinary-objects/>, section 2.2. For the particular shape of this argument, called the "sorites of decomposition by minute removals", see Unger, "There Are No Ordinary Things", p.120.

100 Korman, "Ordinary Objects", section 5; Lowe, "How Are Ordinary Objects Possible?", p.511.

101 Jonathan Schaffer, "From Nihilism to Monism," *Australasian Journal of Philosophy 85*, no. 2 (June 1, 2007): 175–91, here pp.176ff, calls a version of this argument the explanatory exclusion argument. In order to explain a complete causal story of the world, "composites would be explanatorily redundant or epiphenomenal entities (p.177)."

102 See Inwagen, *Material Beings,* and Merricks, *Objects and Persons*, who claim that parts compose a whole in case the resulting complex constitutes a life (van Inwagen) or is conscious (Merricks). In Inwagen, living things have two argumentational functions. They figure as an exemption from the otherwise nihilistic stance and they function as an argument against universalism and in favor of nihilism. For a view defending mereological universalism against van Inwagen's argument, see Michael C. Rea, "In Defense of Mereological Universalism," *Philosophy and Phenomenological Research 58*, no. 2 (1998): 347–60.

103 Lowe, "How Are Ordinary Objects Possible?", p.512.

or atoms. Here the point is not so much that nihilism holds that simples are the only objects that exist, but rather that it posits simples generally. So the so called argument from atomless gunk, originated in Lewis, attacks all theories that postulate atoms and simples, not only Nihilism.[104] This argument imagines a possible world that is infinitely divisible and in which therefore no fundamental atoms or simples as parts of higher order complex entities exist.[105] Even if one thinks that a gunky world is as much counterintuitive as one without any complex objects, and it is not task of this thesis to settle this dispute, the possibility of atomless gunk renders nihilism false for the latter posits what the former denies.[106]

104 David Lewis, *Parts of Classes* (Blackwell, 1991), p.20.

105 Sider, "Van Inwagen and the Possibility of Gunk.", here 286. Cf. James van Cleve, "The Moon and Sixpence : A Defense of Mereological Universalism," in *Contemporary Debates in Metaphysics*, ed. Theodore Sider, John Hawthorne, and Dean W. Zimmerman (Blackwell Pub., 2008).

106 See also James van Cleve, "The Moon and Sixpence : A Defense of Mereological Universalism," in *Contemporary Debates in Metaphysics*, ed. Theodore Sider, John Hawthorne, and Dean W. Zimmerman (Blackwell Pub., 2008)., p.325.

I.5. Compositional Monisms

I.5.a. Compositional Existence Monism

As we saw, nihilism involves two principles: the *no composition principle* according to which the answer to SCQ is "never", and the *no parts principle* that holds that only simples exist. Nihilism then concludes that there are only simple microparticles that never compose anything. But this is a, let us say, pluralistic nihilistic conclusion involving many things that are simple and do not indulge in composition.[107] Yet, a monistic conclusion is also possible, that is, one that posits only one entity that is simple and likewise defies composition.[108]

This conclusion is entertained by, as Schaffer calls it, Existence Monism, or Strong Monism in the vernacular of Horgan/Potrč, or Eleatic Monism by Rea.[109] In opposition to priority monism, which is discussed below, the mentioned monisms represent in different veins the general thesis according to which the world is a partless, single, simple, and concrete particular.[110] Since as such they support also the two core principles of nihilism these monisms are a variation of the latter.[111]

Existence monism is conceptually linked to nihilism by the argument from vagueness. The existence monist takes the same line of argument but just draws different conclusion from it.[112] She also starts with the sorites of decomposition, claims that neither can borderline cases of composition be vague nor clear-cut, and also rejects universalism. From here she does not draw the conclusion that because composition never occurs there must be many single simple entities but arrives at the thesis that because

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107 There are also compositional pluralistic solutions, namely atomism, according to which there are also only simples, but they compose the cosmos.

108 Peter van Inwagen, *Metaphysics*, ed. (Boulder, Colo: Westview Press, 2008), pp34ff.

109 Schaffer, "From Nihilism to Monism"; Jonathan Schaffer, "Monism: The Priority of the Whole," *Philosophical Review 119*, no. 1 (2010): 31–76; Jonathan Schaffer, "Monism," in *Stanford Encyclopedia of Philosophy*, ed. Jonathan Schaffer, 2008; Jonathan Schaffer, "The Internal Relatedness of All Things," *Mind 119*, no. 474 (2010): 341–76; Jonathan Schaffer, "Why the World Has Parts: Reply to Horgan and Potrč," in *Spinoza on Monism*, ed. Goff, 2012. Terry Horgan and Matja Potrč, "Blobjectivism and Indirect Correspondence," *Facta Philosophica 2* (2000): 249–70; Terry Horgan and Matja Potrč, *Austere Realism: Contextual Semantics Meets Minimal Ontology* (The MIT Press, 2008), chapter 7. Michael Rea, "How to Be an Eleatic Monist," *Philosophical Perspectives 15*, no. s15 (2001): 129–51.

110 Horgan and Potrč, *Austere Realism*, p.165.

111 Schaffer, "From Nihilism to Monism", pp.179ff. Schaffer calls existence monism maximal nihilism because the universe is the maximal scale of possible simples (p.181).

112 There is a quite specific vagueness-based discussion between Jonathan Schaffer, "Why the World Has Parts: Reply to Horgan and Potrc," in *Spinoza on Monism*, ed. Goff, 2012, and Terry Horgan and Matja Potrč, "Existence Monism Trumps Priority Monism," in *Spinoza on Monism*, ed. Philip Goff (Palgrave Macmillan, 2012), pp.51–76. about which thesis to adopt, existence or priority monism. Yet, since this debate primarily involves semantic and epistemic as opposed to metaphysical vagueness, I omit this line of discussion.

composition never occurs there is only one single simple entity, the cosmos.

Schaffer provides a precise formulation of existence monism.[113] If C denotes actual concrete objects, u the cosmos[114] and ∃! is the quantifier for singular existence that reads "there exists exactly one of the x's and x is an individual", then existence monism is defined as follows:

> *Existence Monism*
>
> (∃!) Cx∧Cu
>
> There exist exactly one actual concrete individual and it is the cosmos.[115]

The most influential version of existence Monism is Horgan/Potrč's blobjectivism, postulating the 'blobject', their name for the world conceived of as a simple concrete particular.[116] Besides the standard ingredient of existence monism of positing one simple actual concrete objects, Horgan/Potrč also maintain that their One maintains structural complexity although it is not composed of any proper parts. One might ask how an entity instantiates such structural complexity without it being itself complex.[117] To that end, Horgan/Potrč deploy a complicated semantic machinery involving a conception of truth as an indirect world-language correspondence.[118] With this truth conception at hand they then claim that commonsensical and scientific beliefs that postulate the multiplicity of

[113] Schaffer, "Monism," p.65. Actually, he provides two formulations: In the entry to the *Stanford Encyclopedia of Philosophy* he states the formula ∃x(Cx&∀y(Cy->y=x), which I take to be logically equivalent since in the newer version he just replaces the more simple singular existence quantifier for the former formulation that if there is another concrete individual y then it is identical to x (Schaffer, "Monism," 2008, section 2).

[114] In Schaffer, "Monism," section 2, Schaffer tentatively defines the cosmos as the sum of all concrete objects. In the light of existence monism this definition seem to fail, since existence monism posits the one concrete object (or blobject) but emphasizes that it has no parts, i.e. is seamless, so to say. But Schaffer's definition of the cosmos presupposes a plurality of concrete objects, the sum of them, which does not exist in the eyes of the existence monist. To do justice to this and other composition-cum-plurality-obliterating views, perhaps the cosmos needs to be defined disjunctively, as either the sum of all concrete objects or the existence of one single simple object, expressed by the logical phrase ∃!xAx.

[115] And not ∃x∀y(y=x), which would translate into the claim that there is only one entity that exists. As opposed to this claim, the existence monist still allows for abstract objects, spatiotemporal points and the like.Ibid.

[116] Horgan and Potrč, *Austere Realism*. Horgan and Potrč, "Blobjectivism and Indirect Correspondence." Schaffer, "Monism," section 2.

[117] Cf. Schaffer, "Monism," section 2.3 for a relevant discussion of how to reply to objections that claim that monism contradicts the apparent heterogeneity of the world.

[118] Horgan and Potrč, *Austere Realism*, pp.177ff.

complex objects inclusive of their parts, properties, and structure are true, "even though nothing in the world answers directly to these posits."[119]

Horgan/Potrč's deployment of a sophisticated semantic apparatus in order to reconcile their blobjective metaphysics with our folk way of predicating a multiplicity of objects to reality is a highly specified and elaborated version of the monist's more general strategy to paraphrase folk-statements that express a pluralistic and commonsense stance towards the manifold denizens of the world.[120] The paraphrases involve holding that all the changes and differences that the folk perceives in the world are in fact mere modifications of the one single simple entity, like Spinoza does.[121] These modifications are something like dents in a car or waves of the ocean.[122] To the paradigmatic pluralistic truism from Moore "Here is one hand hand.. and here is another"[123], the monist would then reply that it might appear as if the two hands are different and distinct parts of the world but in fact they are just the one concrete simple object that is handish twice where one sees the hands.[124]

However, it seems puzzling how paraphrases as semantical and linguistic means are apt or capable to mitigate or reverse intuitions about complex objects in general and their structure specifically that foot on solid perceptions and thoughts.[125] Relatedly, existence monism does not only fly in the face of common sense but also seems not to be tenable in the light of fundamental scientific beliefs.[126] If existence monism it true, then scientific postulates about the multiplicity of constituent parts of physical objects, including their token properties, are all false.[127] And this is an rather implausible idea that is hard to swallow.

Or the monist indulges in the even stronger claim that discrete things are mere

119 Schaffer, "Monism," section 2. Cf. Horgan and Potrč, *Austere Realism*, p.165, 168ff; Horgan and Potrč, "Blobjectivism and Indirect Correspondence.", p.249.

120 Schaffer, "Monism," section 2.

121 Cf. Benedict Spinoza and Stuart Hampshire, *Ethics*, trans. Edwin Curley, New Ed (London; New York: Penguin Classics, 1996).

122 Inwagen, *Metaphysics*, p.35. Though van Inwagen rightly objects here that this metaphor presupposes parts that undergo changes or instantiate the modifications, which contradicts the monist thesis that the cosmos is a simple.

123 G. E. Moore, *G.E. Moore: Selected Writings* (Routledge, 1993), p.166.

124 Schaffer, "Monism," section 2.

125 Ibid.

126 The reader might refer to Horgan and Potrč, *Austere Realism*, pp.173/4 and decide herself whether she is satisfied with Horgan/ Potrč's reply to this worry.

127 Yet, this charge also applies to the positions like nihilism. Here also, if nihilism is true then scientific theories about the composition of things have a hard stance. Thanks to Howard Robinson for pointing this out.

appearances and do not even exist in their own right, like absolute idealists like Bradley did.[128] But even then ordinary people might require reasons to believe in individual things as mere modifications or plain appearances and I am not sure whether discussions based on Spinoza and Bradley help in a contemporary setting.[129]

In the light of the questionable paraphrase strategy, the monistic skeptic might ask for tenable argumentational motivations as do override her commonsensical pluralistic beliefs. Existence monism inherits such motivation from its metaphysical sibling nihilism.[130] On a general level, this motivation stems from the claim that existence monism offers the most sufficient and parsimonious ontology.[131] The existence monist might even be the champion of parsimony since he makes do with even fewer entities then the already very thrifty nihilist. Both do without any proper parts, but in contrast to the nihilist and his myriads of simples, the existence monist postulates only one simple. Moreover, the according parthood-relation, same as any other relation, is abandoned from ontology.

However, the existence monist pays way too much for his parsimony. The absence of proper parts requires a complicated machinery, like the one deployed by Spinoza or Bradley, to explain always rock-solid commonsense intuition concerning the complexity of the world. And it is not clear that these explanations are less counterintuitive and obscure than the original view so that they might even add perplexity rather than defy it. Moreover, resorting to all those argumentational maneuvers might support the ontological simplicity but does not, as Schaffer remarks, result in the other virtue of an overall gain in 'comparative theoretical simplicity.'[132]

Yet, there is more sophisticated version of the parsimony argument. Let us call it the argument from explanatory parsimony. Similarly as the nihilist, the existence monist holds that his one partless cosmos is sufficient to tell all the causal stories in the world.[133] If this is so, then any further entities over and above the one concrete object, like proper parts in general, are explanatory redundant or epiphenomenal. By being suchlike, proper parts

[128] Inwagen, *Metaphysics*, p.36. Cf. F. H. Bradley, *Appearance and Reality: A Metaphysical Essay,* (New York: Oxford U.P., 1893).

[129] If the reader is of different opinion, she will find apt discussion in Inwagen, *Metaphysics*, pp.38ff.

[130] Schaffer, "Monism," section 2.

[131] Horgan and Potrč, "Existence Monism Trumps Priority Monism", p.74; Schaffer, "Why the World Has Parts", p.85.

[132] Schaffer, "Why the World Has Parts", p.86.

[133] Schaffer, "From Nihilism to Monism." According to Schaffer, existence monism is even preferable over nihilism because the former postulates only one single simple entity and hence provides the "simplest sufficient ontology" (p.187).

get scythed by Occam's Razor for they unnecessarily proliferate ontology.[134] The pluralistically inclined might respond to the claim that proper parts are explanatorily redundant by resorting to the doctrine of CAI: If the cosmos simply is the multiplicity of its constituent parts, then postulating the cosmos amounts to postulating its parts. This doctrine has problems on its own, but this is not of issue here.[135] Or the pluralist rivals Occam's razor with competing methodological considerations. However useful the razor might be, it is not the only criterion for a plausible philosophical theory. Schaffer mentions a certain conservativeness that favors distinct concrete objects.[136] However, simply continuing to think what others thought before is not a good methodological guide and hence is clearly worsened by Occam's Razor. A more promising methodological objection involves Schaffer's second point, namely the beforehand mentioned theoretical simplicity.[137] Existence monism is ontologically parsimonious as it is theoretically exuberant for its near-crazy implications need to be flanked by folk-soothing explanations.

Yet, as we will see in the section to follow, there might be a way to maintain a good degree of the argumentational advantages like parsimony of the nihilistic and monistic answers to SCQ without overly straining common intuitions about the composition of objects.

134 Schaffer, “Monism,” section 2.2.2. Also refer to this section for possible replies.
135 See Schaffer, “Monism,” section 2.2.2 for such problems.
136 Schaffer, “Monism,” sect 2.2.2.
137 Ibid.

I.6. Compositional Moderatism

The answers to the SCQ so far considered have been fairly extreme. Either composition always occurs, leading to universalism, or never, entailed by the positions nihilism, existence monism and atomism. The monisms are not included in van Inwagen's original list of extreme answers, but I think to maintain that, like existence monism does, the world is one extended simple and hence does not consist of parts also can be considered as a radical answer and legitimately added to the list. And as we will see below, priority monism is not an extreme answer. Also, as a side-note, I think there is an interesting relationship between nihilism and universalism: universalism posits objects and individuals without arrangement whereas nihilism posits arrangement without objects or individuals. The remainder of this first part discusses positions somewhere in the middle of the two, and structure and arrangement will also play an important role in these so called moderate answers to SCQ.[138]

To a first approximation, moderate answers are less radical in that they accord with the common sense intuition of most people about the occurrence of composition. Intuitively, sometimes some parts yield a superordinate individual and sometimes not. Parts of a car seem to definitely add up to an cohesive and continuously connected further entity that instantiates some properties that the parts do not, for example being able to move around and cause accidents. In contrast, some random objects, even if close to each other, like your desk, the computer and your foot on top of it, seem not to compose some further individual that is in some way or other more than the sum of these objects. Van Inwagen phrases this moderate stance toward the occurrence of composition as follows:

> (…) it is possible for there to be objects that compose something and also possible for there to be objects that compose nothing; or, more exactly, that possible for there to be objects that properly compose something and also possible for there to be disjoint objects that compose nothing.[139]

His own answers entail rather specific and material bonding relations like contact and

[138] I do not discuss one more possible answer to SCQ, namely "Just so" and a position according to which composition is a brute fact and escapes analysis and conceptualization. For this position, called compositional brutalism, see Ned Markosian, "Brutal Composition," *Philosophical Studies 92*, no. 3 (1998): 211–49 and Markosian, "Restricted Composition.", p.352. I omit discussing brutalism because it receives its motivation from a negative argumentation holding that SCQ cannot be satisfactorily answered. Since I am of the opinion that SCQ can be answered also with respect to phenomenal consciousness I think there is no need to consider a position like phenomenal compositional brutalism.

[139] Inwagen, *Material Beings*, p.61. Van Inwagen's own answer to SCQ is moderate since he, as already mentioned above, claims that it is possible for there to be some objects that compose something in case the activity of these objects constitute a life (see section 9 of *Material Beings*).

fastenation which he all rejects resulting in his conditioned nihilism. However, as I mentioned above, mereology is a formal theory and can be applied to whatever entity that is taken the be composed of parts, be it concrete particulars, propositions or abstract objects. So I do not see why the rejection of rather concrete and figurative forms of cohesiveness should entail abandoning restrictive ways of composition and hence moderate answers to SCQ altogether. So I suggest to start searching for solutions to avoid extreme answers like universalism and nihilism at some higher level of generality.

As a general conceptual remark, the notion of moderatism is closely connected to the one of holism and unity. As we will see below, moderatist conceptions in compositional theory predominantly include structure and arrangement as well as forms of dependence among the parts as conditions that restrict composition. Likewise, those conditions are also at play in conceptualizing holistic and unified complex entities in general metaphysics. As this is a thesis predominantly in the metaphysics of mind, I will elaborate on this conceptual conception exclusively regarding the unity and holism of consciousness in part two of the present thesis. To anticipate, in my view, moderatism is the conceptual analog of compositional theory to unity and holism in metaphysics of mind, just that the former are more specific and logically precise, at least in the way I strive to present them here, than the latter. Hence, mainly in part two but also in this first part, I phrase the discussion in compositional terms and hence use moderatist terminology rather than in metaphysical terms of unity and holism.

But before we dwell into moderatist theories, let me discuss another form of monism that, as opposed to the existence version, already belongs to the moderatist answers to SCQ but without reaching its full rigor as posited below.

I.6.a. Compositional Priority Monism

Existence monism is a rather radical position and rarely philosophers feel attracted to it. Yet, monism in general has a longs standing philosophical tradition and some impressive pedigree from figures like Plato, Spinoza, Hegel, and Bradley. Schaffer proposes a kind of monism that is more palatable to the contemporary taste than the existence version and allows an interpretation of traditional monism that does not expulse their authors into the camp of obscure philosophers.[140]

The main reason why priority monism is more adoptable concerns the existence of the parts. Whereas existence monism postulates that there is just the one whole, the one extended simple that absorbs the entirety of reality, priority monism allows for parts of reality, just that the parts are dependent on the whole. Connected to the allowance for the existence of parts in priority monism, as opposed to existence monism, is the role of integrity, a notion that figures prominently in this thesis. As Schaffer mentions, existence monism is incompatible with "(...) the idea of the cosmos as an integrated system."[141] This is easy to see: If there are no parts, then there is nothing to integrate; existence monism denies the existence of parts, hence it is incompatible with integrity.

For integrity entails restriction on composition, by discussing priority monism, we leave the camp of extreme answers to SCQ and enter the moderatist camp. But since priority monism does not state explicit principles of unity and stays fairly unspecific with respect to the interconnection of parts, I rather conceive this position as a transition and introduction to full fledged account of compositional moderatism, which will be of issue hereafter.

As to relate the monisms to SCQ, where existence monism is a version of the "no" answer, since the blobject is simple and hence no composition occurs, priority monism gives a "only once" answer. This is for the parts do exist and compose something, just that they do so only once, namely as to yield the prior whole, the cosmos. This has also implication for the notion of an individual, that is central to the composition debate, particularly at issue in Simons and Inwagen. So priority monism might help with a question asked by Inwagen:

> The word 'monism' comes from a Greek word that means 'alone' or 'single'.

[140] Also, Schaffer's view is well located within the field of mereology as can be exemplarily seen from the fact that he introduces the dispute between monists and pluralists as "The Question of Fundamental Mereology" (Schaffer, "Monism," p.33).

[141] Schaffer, "Monism: The Priority of the Whole," p.69.

> As we have said, Monism is the thesis that there is only one individual thing. But this statement of Monism raises an interesting question. If there is only one individual thing, what is meant by calling it an individual thing? We have seen that an individual thing is a thing that is in some not-too-well-defined sense a separate thing. But if there is only one individual thing, what is it "separate" from? It can't be its own parts it is separate from, for, if it had parts, those parts would themselves be individual things: an individual thing with parts would "automatically" not be the only individual thing. (For example, if the world consisted of a single chair, there would be many individual things. There would be the legs of the chair, the back of the chair, various carbon and oxygen atoms that were parts of the chair, and so on.)[142]

Priority monism offers a way of being separate as to satisfy the definition of an individual without alluding to the questionable separateness of the whole from its parts on the same metaphysical level. This is for surely van Inwagen is right here: if the whole is separate from its parts then there are more individual things than just the whole; but if this is so, then the label "monism" for such view is inappropriate. In contrast, priority monism posits two metaphysical levels, the prior and the posterior. In the light of the prior level, calling the position monism makes sense since on that level the whole is the only entity; there are no more basic things than the cosmos. But also is the whole separate from its parts given that the latter reside on the posterior metaphysical level and the former on the prior one; hence the whole also satisfies the condition of being an individual. So the partition of reality ensures both: the whole's "loneliness" on the prior level and hence its status as a monadic entity, on the one side, and its separateness from its parts and hence its status as an individual, on the other. But now to the actual view.

Basically, Schaffer fans out the mereological debate by appending metaphysical priority theory. He amends the classical mereological question about composition and its monistic answer that there are no parts but only the whole with the metaphysical question about what is fundamental and its answer that there are in fact parts, just that they all are metaphysically and explanatorily dependent on an all-encompassing single concrete object, the cosmos.[143] Mereology and metaphysical priority theory merge in the assumption of a (strict) partial ordering, a principal relation instantiating the formal properties of irreflexivity, asymmetry and transitivity that can be phrased in mereological and metaphysical terms.[144] As we saw above, mereology conceives the world as a partial

[142] Inwagen, *Metaphysics*, p.34.
[143] Schaffer, "Monism," pp.33-38. Cf. Schaffer, "The Internal Relatedness of All Things", p.345.
[144] Ibid, p.37/8. Schaffer, "The Internal Relatedness of All Things", p.346.

ordering in terms of parthood relations; similarly, metaphysical priority theory conceives the world as a partial ordering in terms of dependence relations. Additionally to the formal properties of the partial ordering relation, Schaffer assumes that the structure of the world suchlike conceived is also well-founded. This is to say that the hierarchy of dependence relations bottoms out and hence reaches a fundamental level at which one or more entities exist that are basic.[145]

The combination of mereological and metaphysical issues in Schaffer's priority monism finds its culmination the the question of fundamental mereology about what objects are basic. He formulates his theory as pertaining to actual and concrete objects, but as before, since it is a formal theory it can also be applied to mental entities like phenomenal states. This is especially so, if the latter are conceived as occupying certain locations in an overarching state space. More on this issue follows in the section concerned with such states at the beginning of part two of this thesis.

Basicness is defined in terms of non-dependence as a property of an entity that is located at the bottom of the metaphysical hierarchy. If C denotes the property of concreteness and D the dependence relation, then basicness, B, is defined as follows:

> *Basicness*
>
> $B(x) \equiv C(x) \wedge \neg(\exists y)(C(y) \wedge D(xy))$
>
> An individual is basic if it is concrete and there is not some other individual y such that y is also concrete and x depends on y.

Furthermore, a basic entity has to meet the requirement of “collectively covering the cosmos without overlapping. In a slogan: no gaps, no overlaps.”[146] Roughly, this slogan and the according requirement, labeled “the tiling constraint” by Schaffer, guarantees that the fundamental level is a complete and self-dependent “blueprint for reality.”[147]

The first part of the requirement demands that the basic entity completely covers the cosmos and hence is labeled “covering” in Schaffer's terminology.[148] The fact that all or one basic entity gaplessly encompasses the entirety of reality is expressed mereologically

[145] Ibid, p.37.
[146] Ibid, p.38.
[147] Ibid, pp.38ff.
[148] Ibid, p.39.

in terms of a sum or fusion. Only if the basic entities form a sum, they satisfy the constraint of "covering." Let u signify the property of being the cosmos, then:

Covering

Sum:x(B(x))=u[149]

The cosmos is the sum x such that x is basic.

The second, also mereological, requirement for the basic entity excluding overlap is motivated by two assumptions. Firstly, the fundamental level has to be metaphysically independent. Since overlapping modally constraints two or more basic entities and renders them mutually dependent, it has to be excluded. As a side-note, it is clear to me why the fundamental level has to be unconstrained and hence why overlap is excluded in case there is only one basic object; surely, if there is only one fundamental entity it cannot overlap because that requires at least another fundamental, which is excluded in the premise. However, the no overlap requirement is unclear to me in case there are more than one basic entities. If the requirement demands the metaphysical independence of the fundamental level generally, in my view, this requirement is also met in case the two or more basic entities together, as commonly forming the fundamental level, are metaphysically independent. I do not see why they individually have to be unconstrained from each other. For relations that obtain among them individually, be it modal or other ones, do not affect the metaphysical independence of the fundamental level they collectively form. The fact that relations obtain among two or more fundamental entities does not entail the fact that they therefore depend on something, i.e. are not independent. If I conceive of a truck as consisting of two basic entities, the truck tractor and the trailer, then both collectively constitute the fundamental level for all the other truck parts. Yet, they still are, so to say, modally constrained by being related by the hitch.

In any case, Schaffer provides another reason for the no overlap requirement. It says that the basic entities should be minimally complete and hence cannot contain or include surplus subpluralities that result from two objects that have a common part or one being part of the other. Those entities would be unnecessary as to present a blueprint for reality. Schaffer names this an argument from economy and it can be seen as Occam's Razor as

[149] Ibid, pp.34/39.

applied to fundamental mereology.[150] Schaffer also mentions another reason for economy, namely that the part-whole-relation is redundant. This is to say that being a whole carries with it the properties of its parts and additionally its own, like *having so many parts* etc., and hence unnecessarily populate the fundamental level with subpluralities.[151]

Since parthood implies overlap, this requirement is phrased in terms of no parthood. So, to be precise, the formulation does not say that no basic objects share a common part, which would be no overlap, but:

No Parthood

$\forall(x)\forall(y)\ ((B(x)\wedge B(y)\wedge(x\neq y)) \rightarrow \neg(Pxy)$[152]

For all individuals x and y, if x is basic and y is basic and x and y are not identical, then x is not part of y.

Since parthood is excluded by the tiling constraint and concrete object are parts of the cosmos, it follows from this requirement that if there are more than one basic objects, than it cannot be the cosmos.[153] Based on the principle of the tiling constraint, two positions are possible, monism and pluralism.

Priority monism is the conjunction of two theses. Firstly, the numerical thesis says that the number of basic objects is one. Secondly, the holistic thesis holds that cosmos is basic.[154] In formalism:

Priority Monism

$(\exists!(x))\ (B(x)\wedge B(u))$

There exists exactly one individual x such that x is basic and the cosmos.

According to the tiling constraint, if only one object is basic, then it must be the

[150] Ibid, p.40.
[151] Ibid, p.41.
[152] Ibid, p.40. For the sake of completeness, the formulation for no overlap is $\forall(x)\forall(y)\ ((B(x)\wedge B(y)\wedge(x\neq y))\rightarrow\neg(\exists z)(Pzx\wedge Pzy))$.
[153] Ibid, p.41.
[154] Ibid, p.42.

cosmos, since no other object can function as a completely covering, gapless and metaphysically independent blueprint of the world. And based on the assumption of a well-founded partial ordering, the cosmos figures as the ultimate ground of reality that grounds all of the rest of reality. An equivalent formulation of monism now capturing basicness in terms of dependence relation reads as follows:

Priority Monism

$\forall(x)\ ((P(xu) \wedge (x \neq y)) \rightarrow D(xu)$

For all individuals x, if x is part of the cosmos and not identical to another individual y, then x depends on the cosmos.

In contrast, pluralism is the conjunction of the two opposing theses:

Pluralism

$(\exists(x))(\exists(y))\ (B(x) \wedge (By) \wedge (x \neq y)) \rightarrow \neg(B(u))$

For individuals x and y, if x is basic and y is basic and x and y are not identical, then then the cosmos is not basic.

According to the tiling constraint, if the cosmos is not basic, then a complete covering of reality requires at least two basic objects and if two or more objects are basic, it cannot be the cosmos (since parthood relations are excluded at the basic level). And based on the assumption of a well-founded partial ordering, in pluralism, the parts are such that they are part of the cosmos, not identical to it and the latter depends on the former, in formal phrasing: $(\exists(x))(P(xu) \wedge (x \neq u) \wedge (D(ux))$.[155]

Since the extensionality principle, which equivocates the Composition as Identity Thesis (CAI), figures prominently in this thesis, it is worth noting that one of Schaffer's initial assumption that renders monism and pluralism mutually exclusive concerns that composition is not identity.[156] If the cosmos is identical to all the objects it consists of then monism and pluralism amount to the same metaphysical fact. I think there is an interesting underlying systematic point here. It seems to me that the mutual exclusiveness

[155] Ibid, p.43.
[156] Ibid, pp.35/45.

of monism and pluralism is an implication of the underlying systematic mutual exclusiveness of priority theory and CAI.[157] As has been mentioned above, priority theory amends conceiving reality based on mereological part-whole relations with conceiving it based on metaphysical dependence relations. In purely mereological terms, CAI amounts to the existence of just one entity, hence the claim that regarding objects as mereological sums is ontologically innocent; there is just nothing more to the objects than being a sum. But priority relations leave the other ontological side, so to say, intact. The existence of the sum of parts does not entail the annihilation of the whole, quite the opposite. In order for something to be prior, there has to be something that is derivative and vice versa.[158] Both metaphysical levels exist. Since priority theory presupposes two metaphysical levels and CAI denies them, given that CAI entails the ontological innocence thesis, CAI is incompatible with priority theory. Or in terms of Leibniz law of the Identity of Indiscernibles: Given that, according to priority theory, either the parts, in case pluralism is true, or the whole, in case monism is true, are prior and the other posterior, necessarily, one metaphysical level instantiates the opposite priority-related kind of property of the other. Priority properties are difference-makers: Assuming monism, the fact that the whole instantiates the priority property and that the parts instantiate the posterity property renders both different, to the effect that Leibniz Law is contradicted and CAI falsified. Same with pluralism, just that the parts and the whole instantiate the inverted priority properties.

As the most radical form of pluralism, Schaffer also provides a priority version of atomism, that is worthwhile mentioning as an alternative to the formulation already discussed above. This is for Schaffer's atomism, let's call it priority atomism, adds the partial ordering of dependence relations to the traditional version to the effect that priority atomism simply claims that simples are prior to the whole, not that the only things that exist are atoms. The latter, and hence the kind of atomism already mentioned, then deserves the label existence atomism. Priority atomism is, in contrast, reads as follows:

[157] Cf. Ibid., p.35: “I should note one further controversial assumption I will be making, namely that composition is not identity. In particular, I assume that the cosmos is not identical to the plurality of its planets, pebbles, or particles, or to any other plurality of its many proper parts. If the one literally is the many, then monism and pluralism would no longer be opposing views - indeed both "sides" would turn out to be right.”

[158] Cf. Ibid., p.46. Schaffer, “The Internal Relatedness of All Things”, p.342.

Atomism

$(\exists(x))(\exists(y))\ (B(x)\wedge(By)\wedge(x\neq y))\wedge(\forall(x))(B(x)\ \rightarrow\neg(\exists(y))(P(xy)\wedge(x\neq y))$

For individuals x and y, if x is basic and y is basic and x and y are not identical, and, for all individuals x, if they are basic then there is no other individual y that x is a proper part of and non-identical to.

And it is in fact in terms of atomism, and not so much in terms of pluralism, in which the debate about the opposing versions of dependence ordering is carried out.[159] Atomists hold that it is the whole that is derivative to its parts because the powers and properties of the former depend on the ones of the latter. In contrast, monists hold that the whole is prior to its parts since what the latter are is determined by what the former is. Some set of terminology comes along with this debate, a pair of opposing expressions for the direction of determination and one pair of opposing terms for the derivative entities in monism and atomism respectively. The direction of determination in virtue of which the parts are prior to the whole in atomism is called "bottom up", whereas the reverse determination direction in monism based on which the whole is prior to its parts is "top down". The according derivative entity in atomism is a mere heap, where such entity is characterized by being a whole that is grounded in its parts. In contrast, the derivative entity in monism is a mere fragment such that it is a part that is dependent on the overarching whole.[160]

Schaffer is mainly concerned with metaphysical composition and hence phrases his monistic view in terms of dependence relation between parts and whole. But note that one can also hold a similar view in an explanatory rather than metaphysical fashion. Similarly to expressing the atomistic doctrine by holding that the whole metaphysically depends on the parts, Fine puts it in explanatory terms and views atomism as maintaining that the whole is to be analyzed into its parts and hence is determined explanatorily.[161] Furthermore, he labels the opposing position not monism but holism. So the two views of monism and holism coalesce at the point where the whole depends on its parts,

[159] Cf. Jonathan Schaffer, "Is There a Fundamental Level?," *Noûs* 37, no. 3 (2003): 498–517.

[160] Schaffer, "The Internal Relatedness of All Things", p.347; Koons and Pickavance, *Metaphysics*, p.139. Also Simons, *Parts*, p.334, calls a fragment "something incomplete."

[161] Fine, "Compounds and Aggregates," p.150.

irrespectively of whether the dependence relation is cashed out in metaphysical or explanatory ways. The positions differ, however, in the number of the prior fundamental entities they postulate. Monism holds that there is exactly one of such entity whereas the holist stays silent on this issue. So when we discuss priority and partial orderings, monism entails holism but not vice versa. See Schaffer: "Monism can thus be thought of as the conjunction of the numerical thesis that there is exactly one basic object with the holistic thesis that the cosmos is basic."[162] This difference is important to keep in mind because monists and holists, to anticipate and now with respect to phenomenal consciousness, agree that the total state is prior to and hence depends on or has to be analyzed into its single phenomenal states. Yet, the latter might not be tempted to entertain the prima facie less plausible view that there is only one total phenomenal states in the world, perhaps like a Hegelian *Weltgeist*. More of this is at issue in the second part of this thesis.

Same as I noted regarding traditional, viz. existence, forms of atomism, also priority atomism is inconsistent with a gunky world, even if for slightly different reasons. Existence atomism and gunk are incompatible for atomic entities are essential to the former but straightforwardly rejected by the latter position.[163] Priority atomism is inconsistent with gunky worldview not only for the reason of the plain possibility of gunk, but also because it posits a fundamental level. The latter is excluded by the gunky view for if the parthood relation descend infinitely, a fundamental level is never reached.[164] Schaffer takes this argument in order to argue for monism. If atomism and monism are mutually exclusive and exhaustive views, then either atomism or monism is true. The possibility of gunk provides a good reason to reject atomism to the effect that monism is the only position left to entertain.[165] But it is not that easy. This is because one can reverse the argument from gunk into an argument from junk. As we saw, gunk is a world without atoms. In contrast a junky world is one without an encompasser, where an encompasser is the mereological opposite of an atom, namely an entity that has proper

[162] Schaffer, "Monism," p.42.

[163] For the discussion of atomism versus gunk, see Schaffer, "Is There a Fundamental Level?" here pp.498-502. The remainder of the paper deals with the question whether or not empirical research favors atomism, since, according to Schaffer, "(t)he existence, structure, and number of the levels of nature cannot be intuited from the armchair" (p.502).

[164] And hence also no being, or so argue Schaffer and Fine in a position called ontological foundationalism. Cf. Schaffer, "Monism," footnote 34; Kit Fine, "The Study of Ontology," *Noûs 25*, no. 3 (1991): 263–94; Ross P. Cameron, "Turtles All the Way down: Regress, Priority and Fundamentality," *The Philosophical Quarterly 58*, no. 230 (January 1, 2008): 1–14.

[165] Schaffer, "Monism," sect. 2.4; Koons and Pickavance, *Metaphysics*, pp.142ff.

parts. So now, or so the argument goes, if a world without ultimate parts is a problem, with the result of rejecting atomism, why then is a world without an ultimate encompasser not a problem, with the result of denying monism? Monism posits the cosmos as the fundamental and terminal encompasser but a world without infinitely ascending encompassers is as conceivable and therefore possible as a world with infinitely descending parts. Hence the arguments for resisting atomism and monism are at a par.[166]

Let me add two more general remarks on Schaffer's priority monism that discuss the notion of integrity and hence also feature as a transition to the next section. Also, since one contribution I strive to make in this thesis is to enrich material and mental compositional theory with Simons' account of integrity, the following remarks express the motivation to do so. First, since I partly operate with Schaffer's work, it has to be noted that it is not tailor-made for holistic views, be it on phenomenal consciousness or other entities, since he predominantly argues for priority monism. As opposed to monism, holism is compatible with but not committed to the claim that everything is integrated and hence that there is only one basic entity, the whole cosmos. Holism is very well compatible with pluralism, simply assuming a multiplicity of, say, locally basic wholes.[167] Local basicness captures the intuition that also some finite set of members of a class, or simply some finite number of parts, can be integrated to the effect that the whole formed by this particular number is rendered basic and holistic. Take phenomenal consciousness: I think we want to allow for the intuitive view, pace speculations about cosmopsychism or unrestricted phenomenal composition, that the total phenomenal state of each subject is integrated as well as closed and delineated from others so that there are multitudinous basic entities of this mental kind in the world.[168] This picture combines pluralism with holism: The cosmos consists of a plurality of locally basic total phenomenal states. The advantage of substituting Simons' integrity account for Schaffer's is that the conception of a R-family also includes a closeness principle: The members of a division, or class of parts, are exclusively dependence-related to each other, not to members of another class. That way, Simons R-family theoretically allows for

[166] Koons and Pickavance, *Metaphysics*, pp.142/3.

[167] For Schaffer's notion of priority pluralism, see above in this thesis, for his notion of existence pluralism: Schaffer, "Monism," end of section 2.1. I think nothing turns on this differentiation with respect to the point being made here. Holism is compatible with both forms of pluralism.

[168] See Goff, P. (forthcoming), "The Phenomenal Bonding Solution to the Combination Problem", in: Brüntrup, G./Jaskolla, L., *Panpsychism*, as well as a brief discussion of his position by Dainton, B., "Unity, Synchrony, and Subjects", in: Bennett/Hill, *Sensory Integration and the Unity of Consciousness*, pp.261 and 265.

other integrated divisions, and hence for something that I called a plurality of locally integrated entities. Based on Simons integrity picture, monism and pluralism is just a matter of the extent of the class of interdependent parts. It is comprises everything, we get monism, if not, pluralism. That way we have at hand a suitable way to maintain the clear conceptual difference between, yet compatibility of, holism and monism.

Also, as mentioned, Schaffer considers his priority monism to be the conjunction of the numerical thesis that the number of basic entities is one and the holistic thesis that the cosmos is basic. For the latter thesis he uses several concepts equivocally, like organic unity, holism or integrated system and the like.[169] Yet, he is rather concerned with the priority structure of the world than with explicating what unity and integrity exactly amounts to. He provides examples like causally connectedness and quantum entanglement but a formal account is missing.[170] That changes slightly in his Internal Relatedness-paper but also there, first, the account of integrity in terms of internal relations does not reach full generality and, as will be at issue below, is phrased in terms of a notion of interdependence of the parts as a part-whole relation as opposed to a part-part relation.[171] And, in my view, it is the latter conception of a inter-parts-interdependence as unity and integrity that lies in the background of the debate about restricted composition in terms of structure and order among the parts.[172] So I think that Schaffer's priority monism is a useful addendum to the answers to SCQ because it presents the option of answering “only once” and hence allows to entertain the view of the world as being one in some respect without ending up with some unpalatable position like existence monism. However, as a precise mereological account of a restricted way in which parts, of the world or to a smaller extent of ordinary objects or of phenomenal consciousness, compose a whole as to yield some kind of internal unity, his work does not suffice. Here Simons' approach to integrity presents a welcomed alternative.

169 Schaffer, “Monism: The Priority of the Whole”, p.42; In this paper Schaffer distinguishes integrity from organic unity, at least at the end; see for integrity and related concepts: pp.33, 47, 48, 50, 61, 66-9; for organic unity pp.67-69. In Schaffer, “The Internal Relatedness of All Things” for integrity and related concepts: pp.341-3, 346, 355, 360; see for organic unity pp.342/3, 347/8. Also, for entangled systems that instantiate holistic properties, see Schaffer, “From Nihilism to Monism”, p.184.

170 Schaffer, “The Internal Relatedness of All Things”, pp.362ff (causal connectedness), Schaffer, “Monism: The Priority of the Whole”, pp.50ff (for quantum entanglement).

171 Schaffer, “The Internal Relatedness of All Things”, p.347.

172 Johnston holds that principles of unity at least obtain among the parts. He differentiates between reductive and non-reductive principles of unity, where the former hold exclusively of the parts and the latter pertain to principles of unity that also incorporate the whole (see Johnston, “Parts and Principles” p.134).

These two remarks are just adumbrating. I will discuss this issue further in connection to phenomenal priority monism in the second part. Now, as announced, let us proceed to integrity in metaphysics by starting generally with moderatism and principles of unity.

I.6.b. Principles of Unity

When I introduced compositional moderatism, I suggested the strategy of starting at a higher level of generality for the search of restrictions on composition. To a first approximation, moderate answers to SCQ must satisfy some criteria for restrictions on when composition occurs. When I discussed unrestricted composition, I said that the General Sum Principle (GSP) entails the doctrine of unrestricted composition since GSP does not contain any restriction on the predicate F that the individuals have to satisfy as to form a sum. Any predicate does. By converse argument, restriction of composition based on GSP involves limiting the scope of F such that the set of individuals that satisfy F have to additionally satisfy some other condition.[173] As to stick with the example given above in context of GSP, if we take F to denote the property of *being a single phenomenal state*, inserting a second conjunct in the antecedent of GSP amounts to saying that the set of phenomenal states have to fulfill another condition as to form a further individual, that is, a total phenomenal state.

Still on a quite general level, this condition that restricts occurrences of composition is called a principle of unity. So in contrast to the extreme answer to SCQ, "always" and hence universalism, according to which parts wherever and whenever compose a further individual, the sum of those parts, moderate answers to SCQ additionally require some principle of unity to hold as to postulate composition.[174]

Since unity is a relation among the parts, these principles take a relational form. Whatever it is that restricts composition, it has to do with the way in which the parts are related. Hence, moderate answers to SCQ always "must identify some multigrade relation that is linked in the relevant way with the concept of composition."[175] The obtaining of some relational principle among the parts is an existence condition for the whole.[176] The parts of the table add up to the familiar serviceable table, on this general level, because they enter into a unity relation. According to this view, there is no table unless its parts satisfy the principle of unity such that the board is located on top of the legs; the mere existence of the parts, as opposed to what the doctrine of Unrestricted Composition

[173] Varzi, "Mereology", sect. 4.5.

[174] Johnston, "Parts and Principles" p.131.

[175] Markosian, "Restricted Composition", p.355. See Joshua Hoffman and Gary Rosenkrantz, *Substance: Its Nature and Existence* (Routledge, 1997), p.74 for a causal explication of the principle of unity. At this point it might be interesting to square the composition theory with the debate revolving around structural universals. If we require structural universals in our ontology, is then CEM not utterly deficient, since it allows no structure or, more generally, any relational principle among the parts?

[176] Johnston, "Parts and Principles", p.131.

holds, does not suffice for the whole table to come into existence.

As a qualifying remark, the principle of unity cannot be regarded as another proper part, like the cement that binds together the bricks of a wall. If the principle of unity is conceived this way, then we would just reiterate the problem and have again to ask for another principle of unity among the parts, now including the cement among them. Principles of unity rather express relational conditions the holding of which among parts is necessary for them to compose another individual. As to avoid such reification of principles of unity, philosophers, mainly of neo-aristotelian proclivities, resort to calling the relational condition the form of an object in opposition to what is formed, its matter.[177] According to this hylomorphic approach, the form of a whole provides certain "slots", certain ways in which the matter has to be arranged as to yield an object of a certain kind.[178] In general, principles of unity are conceptualized in terms of structure, order or arrangement of the parts composing a whole.[179] These notions are not always chosen just in order to dodge material implications, but I think it comes in handy that they insinuate the abstract and matter-less nature of the principles.

Also, besides presenting existence conditions, principles of unity are closely connected to identity conditions. The way in which the parts are structured or arranged tell us something about the kind of an object. Or, even stronger, the identity of an entity is said to depend on the structure of its parts.[180] Principles of unity then deserve their place in a real definition of an object.[181] To phrase the connection between the principle of unity to both, existence and identity conditions, in a slogan: what it if for an object to exist and to be of some kind is for the parts to stand in some relation.[182]

Moreover, parts under principles of unity may form hierarchies. A whole on the upper metaphysical level is composed of parts that satisfy a certain principle of unity where each of the parts themselves might be complexes owing their identity to a different principle. So a superordinate whole might be composed of a plurality of parts on a subordinate metaphysical levels generated by various principles of unity until the

177 Kathrin Koslicki, "Towards a Neo-Aristotelian Mereology," *Dialectica 61*, no. 1 (2007): 127–59. Koslicki, *The Structure of Objects*; Fine, "The Non-Identity of a Material Thing and Its Matter"; Fine, "Things and Their Parts"; Sattig, *The Double Lives of Objects.*

178 Sattig, *The Double Lives of Objects*, p.6.Cf. Howard Robinson, "Substance," in *The Stanford Encyclopedia of Philosophy* (Spring 2014 Edition), n.d. section 3.4.

179 Sattig, *The Double Lives of Objects*, p.6.

180 Sattig, *The Double Lives of Objects*, p.7; Johnston, "Parts and Principles", p.132.

181 Johnston, "Parts and Principles", p.132.

182 Inspired by Ibid, p.138.

fundamental level of atoms and simples is reached.[183] That way, a mereology enriched by principles of unity captures the common intuitions concerning composition of ordinary objects. For example, cars are such multilayered items that consist of parts (e.g. clutch, engine) that are themselves complexes generated by principles of unity that are different from the one that governs the composition of the whole car. Mereological sums, in contrast, lack such internal stratification and hence are justifiably accused of not mirroring reality.

Given these provisos, Johnston proposes the following schematic compositional moderatist statement, that is, one that considers a principle of unity:

> What it is for ... (the specific item is specified here) ... to exist is for these parts ... (some parts are specified here) ... to ... (the principle of unity is specified here).[184]

As to mention another proviso, the blank section for the principle of unity has to be filled in by a (multigrade) relation exclusively among the parts. This is at least for the purpose of this thesis. Johnston discusses cases in which the unifying relation can also obtain between the parts and the whole but for the sake of simplicity and due to the extravagant nature of these cases, I stick with principles of unity in the shape of inter-part relations.[185] For example, taking the desk again, a suchlike modified statement would say that what it is for the desk to exist is for this board and these four legs to be arranged such that the board is located on top of the four legs. Or, to anticipate the second part of this thesis, with respect to phenomenal consciousness we can formulate the phenomenal principle of unity by stating that what it is for the total phenomenal state to exist is for a set of single phenomenal states to form a family under some (inter)dependence relation.

Robinson posits two objections against the hylomorphist, one that I reject and one that I also embrace.[186] I am not proposing a specifically hylomorphist version of moderatism in this thesis but Robinson raises worries concerned with the notion of structure and the statement of the principle of unity; and both are of importance for moderatism in general and not only for hylomorphism in particular. The first objection aims at the central notion of structure without which, from the hylomorphist's point of view, no conception of composition gets off the ground. In contrast, Robinson claims that the notion of structure

[183] Sattig, *The Double Lives of Objects*, p.6; Johnston, "Parts and Principles", 132/3.
[184] Johnston, "Parts and Principles", p.133.
[185] Ibid, pp.133/4.
[186] Robinson, *Substance*, section 3.4.

is negligible for an account of the "basic furniture of the world."[187] This is for the notion of structure serves the purpose of mirroring the arrangement of the basic particles of the world, but, or so he argues, this arrangement can be sufficiently described without employing the notion of structure by "specifying the spatio-temporal location of the elements and their causal influence on each other."[188] However, in my view, paraphrasing statements about the existence of the basic denizens of reality and the causal relations that obtain among them without employing the notion of structure is not to say that "structures are not part of the basic furniture of the world."[189] Alluding to causal "influences" instead does not make the structure among the basic particles go away. This is for the plurality or set of the causal influences among them is nothing but the structure they are embedded in. Structure is simply a general or formal term for the set of relations that obtains among entities. This general term can then be further "materialized" by specifying the general notion of a relation by material causal relations among basic physical particles. Still, the notion of structure as a general term for any set of relations remains as being applicable for whatever there really is at the basic level.

The second objection holds that Johnston's schematic moderatist statement is general to such an extent that it becomes vacuous. Robinson launches such criticism by holding that Johnston's statement faces a counterexample to the effect that the hylomorphist is not able anymore to maintain what his theory strives to achieve: to save our common sense conception of composition that involves some kind of arrangement or structure as an integral component of ordinary objects.[190] Robinson's counterexample involves the case of wholes composed of parts that are gravitationally related to each other. This relation allows for wholes in that, on the one hand, satisfy Johnston's principle of moderatist composition, which requires that the parts stand in some relation to each other, without, on the other hand, yielding the desired result of wholes in the common-sensical shape of being in some way compact. For example, a "whole consisting of your eyeglasses and Pluto"[191] is composed of parts that are gravitationally related to some extend without resulting in what the folk might conceive of as an ordinary object; the eyeglass-Pluto object rather resembles some arbitrary sums and hence exactly that kind

187 Ibid.
188 Ibid.
189 Ibid.
190 Ibid., section 3.4.
191 Mark Johnston, "Hylomorphism," *The Journal of Philosophy 103*, no. 12 (2006): 652–98. p.697.

of object that the hylomorphist aims to exclude as proper complex objects.

I agree with this criticism. Johnston's version of moderatism is a decent start but too general as to capture our intuition for the composition of ordinary objects as not being mere sums. The statement is a good start because it emphasizes the principle of unity as an inevitable component of a definition of an object. However, it is insufficient since it allows for counterexamples such as Robinson's.

In order to exclude counterexamples from Johnston's overgeneralized statement I propose to amend it by Simons' conditions for integrated wholes. The rough idea here is to fill in the last blank of Johnston's schematic statement with principles of unity of descending degree of generality as to exclude counterexamples and as to make the statement sharp and precise enough in order to capture our conception of the composition of ordinary objects. The details are fleshed out below since they form the core of a moderatist stance defended in this thesis. But to anticipate, putting the idea in layman's terms already shows how Simon's theory is effective against objections based on the counterexample from gravitational force posited by Robinson.

According to Simons, a central condition for an entity to be an integrated whole as opposed to a mere sum is that the parts form a dependence system. The particular kind of dependence constitutive of the system is to be specified below, but dependence systems generally are characterized by dependence relations among the parts. Yet, a system under a dependence relation has to satisfy another criterion in Simon's conception of an integrated whole and that is being a family of this relation. Again, the special relation the system is a family under will be given below but, roughly, being a family of some relation involves that the system is closed. This in turn involves a relational isolation or discontinuity between the integrated whole and the rest of the world or its ambiance. Closure as a mark of an integrated whole is a useful condition as to capture our intuitions about the difference between ordinary objects and some random plurality. Take as an example the difference between a number of people dispersed over the earth or some city, and a proper crowd. Intuitively, the crowd counts as some whole and further individual whereas the number of dispersed people do not because the crowd exhibits some clear boundary to its surrounding that the random group of people does not. The closure criterion is the formulation and, below as well, formalization of this intuition.

The latter condition is not satisfied by the gravitational relation.[192] Since this relation is ubiquitous and might be extend to any entity in the universe it is incapable of yielding a closed system. Gravitation might be a dependence relation since two gravitationally connected objects are physically dependent on each other to some extent, e.g. for the trajectory of their orbit. But a gravitational dependence relation obtains continuously throughout the universe and does not result in a family of such relation. Hence, referring back to the above mentioned eyeglass-Pluto-object, it might indeed be called a sum, a gravitational sum, that is a sum under the the relation of gravitation. However, it does not deserve the label of a whole for although the eyeglass and Pluto might exert some gravitational force on each other, they do not form a family under such relation.

[192] Cf. Simon's closely related example of three stones being located in different continents that he took from Köhler in Simons, *Parts*, pp. 325/394.

I.6.c. Integrity

The idea of filling in the blank of Johnston's moderatist framework with principles of unity of descending degree of generality is inspired by Rescher and Oppenheim's account of integrity that also serves as a template for Simons exposition.[193] This idea is realized in this thesis as follows. I start fairly formal with presenting Simons' conception of a relation-family according to which only set of parts that are closed and connected can be said to properly compose a further individual or whole. So here we do not discuss some relation or kind of relation specifically but generally the way in which whatever relation obtains in an integrated whole.

Subsequently, I reduce generality by introducing kinds of relations that further specify the characteristics of integrated wholes. Here I begin with the still fairly general notion of dependence relations. So dependence relations represent a further relational specification of integrated wholes. In the domain of dependence relations, various kinds of dependence are to be differentiated. I decide in favor of functional dependence among the parts.

I.6.c.i. Integrity – First Condition: R-Family

In order to state what *being a R-family* amounts to, let me introduce some terminology. First is the notion of division: the class *a* of all parts of an entity is a division iff all parts overlap. That is, all parts completely exhaust the entity:[194]

Division

$a \text{ div } w \equiv \forall x \varepsilon a\ (x<w) \wedge \forall x\ (x<w \rightarrow \exists y \varepsilon a\ (x0y))$

For all individuals x that are elements of the class *a* of parts, all

[193] Nicholas Rescher and Paul Oppenheim, "Logical Analysis of Gestalt Concepts," *The British Journal for the Philosophy of Science 6*, no. 22 (1955): 89–106; Simons, *Parts*, p.334. The notion of integrity stems from Simons but is co-extensional with Rescher/Oppenheim's notion of a whole. I prefer the notion of integrity because it is more specific than the ambivalent notion of a whole.
Also, in this thesis, I will not follow Rescher/Oppenheim and Simons in their tripartite account (Simons, *Parts*, chap.9.7). That means that I do not regard structure as a self-standing third criterion for integrity. This is because they conceptualize structure in perceptual psychologically terms of Gestalt and according to the second Ehrenfels criterion of transposability in terms of invariance: a certain configuration stays the same under transformations. As such psychologically informed notion, in my view, it does not fit my moderatist treatment based on van Inwagen's purely metaphysical SCQ. Also, the notion of structure is already sufficiently involved as an umbrella term in my moderatist position, that is, as a criterion for restricted composition that subsequently is specified by the account of integrity. Hence, I suggest to take structure as the resulting set of relations in a dependence system under a R-family.

[194] Simons, *Parts*, p.327.

x are part of w and for all x, if they are part of w, then for some other individuals y that are also elements of the class *a* of parts, x and y overlap.

A subcategory of a division is a partition, that is a division in which the parts do not overlap:[195]

Partition

a ptn w ≡ a div w ∧ ∀ xyεa ((x0y) → (x=y))

A division and for all individuals x and y that are elements of the class *a* of parts, if x and y overlap, then x and y are identical.

Since only a division allows for the relatedness of the parts this is where we start the characterization of integrity. Simons phrased this condition for integrated wholes as follows:

> Every member of some division of the object stands in a certain relation to every other member, and no member bears this relation to anything other than the members of the division.[196]

In the following, this approximative statement finds its specifications by the definitions of closure and connectedness.[197] Loosely and slightly politically put, closeness pertains to some relational border regulations, whereas connectedness governs interior relational affairs. Let us start with closure.

Closure

There are two ways in which a class of parts that constitute the entity can be closed, on the left and and the right. Let there be a relation R and the class a of parts. The class *a* of parts of an object is closed on the left under a binary R if no relation obtains that is directed from outside the class to inside it:[198]

195 Ibid., p.327.
196 Ibid., p.327.
197 Simons adopts the following notation and terminology for the treatment of relations from Whiteheads and Russell's Principa Mathematica. See Simons, *Parts*, p.327, note 8.
198 Ibid, p.328.

Left Closure

cll R $a \equiv \forall xy (y \varepsilon a \rightarrow xRy \rightarrow x \varepsilon a)$

For all x and y, if y is a member of the class *a* of parts of an object then x is related to y, which entails that x is a member of the class *a* of parts of an object.

For example, take a colony of primates that indulge in the behavior of delousing. The class of members of the colony is closed on the left under the relation of delousing if all members delouse each other but no member of another colony delouses a member of the one in question. Note that for a colony that is suchlike closed on the left it is still possible that one member belonging to the colony delouses a member of another colony. Here the relation does not run from the outside to the inside but from the inside to the outside, which is permissible under the definition given. In order to prevent such disloyal behavior, the chief primate has to drive the understanding into the head of its subordinates that they form a colony that is closed on the right under the relation of delousing. If successful, every member of the colony would delouse the other and no member of the actual colony delouses one of another colony. Formally, a class *a* of parts is closed on the right under R if R is not directed from inside the class to outside it:[199]

Right Closure

clr R $a \equiv \forall xy (x \varepsilon a \rightarrow xRy \rightarrow y \varepsilon a)$

For all x and y, if x is a member of the class *a* of parts of an object then x is related to y which entails that y is a member of the class *a* of parts of an object.

Of course, now the chief primate has the opposed problem, namely that some his fellow primates do not feel obliged to abstain from getting deloused by members of another colony, after all this is not what a colony that is closed on the right under the relation of delousing would condemn because the relation runs from outside to the inside and not vice versa.

[199] Ibid, p.328.

Finally, the chief realizes that his subordinates are smart enough to always find pleasurable loopholes in his fine-grained legislature to the effect that he prescribes a complete delousatory sealing and hence combines left and right closure. That means that the members of the colony delouse each other and no one delouses a member of another group nor do members of other colonies delouse one of the actual one. Formally, the colony forms a class of parts from which neither a R is directed outwards from the inside nor inwards from the outside, it is simply closed under R:[200]

Closure

cl R $a \equiv \forall xy\,(x\varepsilon a \rightarrow xRy \vee yRx \rightarrow y\varepsilon a)$

For all x and y, if x is a member of the class *a* of parts of an object then x is related to y or y is related to x which entails that y is a member of the class *a* of parts of an object.

If we would take a symmetrical relation, all characterization coincide because, for example, if the colony lives under the reciprocal rule of "you scratch my back and I scratch yours", then if one member of another colony scratched the back of a member of the actual one, then the latter is obliged to scratch the back of the former. Symmetry means no difference in directions of relation, so banning one directions results in banning the other.

Connectedness

So far, I accounted for the closure of a class, that is, no relation holds between the member of one class and some member of another class. But the closure definition pertains exclusively to relations at the borders of the class and to relational affairs within the class. But for an integrated whole we do not only need the requirement that no member of a class holds a certain relation to a member of another class and vice versa, but also that the relation in question holds pervasively within the class. The class should not only be relationally closed but also relationally complete. All primates should delouse each other, no one is to be left alone and plagued. In formal terms, the colony should form a class that is also connected under R:[201]

[200] Ibid, p.328.
[201] Ibid, p. 328.

Connectedness

con R a ≡ ∀ xy (xεa → yεa → xRyvyRx)

For all x and y, if x is a member of the class *a* of parts of an object then y is a member of the class *a* of parts of an object which entails that x is related to y or y is related to x.

If we combine closure and connectedness, and hence a class that is closed and connected under a relation, we obtain a closure system, in which all parts of a class are related by a symmetric relation, that is, one that holds in both directions (connectedness) and is not related to any parts of another class (closure):

Closure-System

cs R ≡ con R a ∧ cl R a

The members of the class *a* of parts of an object are connected under a relation and closed under a relation.

When we focus on the definition of connectedness, we see that it simply reverses the order of the implications in the definition for closure. So instead of taking the class membership of one part as basic and then considering the direction of the relation inferring the class membership of the other part in the definition of closure, in the definition of connectedness the class membership of both is basic and from here the relatedness is inferred. If one part is a member of the class and related in both directions to another member, then the latter part is also member of the class, says the closure definition. If both parts are members of the class, then all members are related either in direction, says, roughly, the connectedness definition. So the closure definition defines class membership of the parts based on their relatedness whereas the definition of connectedness defines the relatedness of the parts based on their class membership.

Now we can proceed in the same way not with both directions of relatedness as in the path from closure to connectedness but only with one direction of relatedness, that is, by considering an asymmetric relation. Here we reverse the order of implication not of closure but of either constituents of it, that is we reverse the order of implications in the definitions for closure on the left or closure on the right. The result is the class being

biconnected, that is constituted by relations that hold asymmetrically. So with this reversion of the order we here also go from class membership inferred based on relatedness to relatedness being inferred from class membership, just that the class is constituted not by relations that hold in two direction but only in one:[202]

Biconnectedness

bicon R a ≡ ∀ xy (xεa → yεa → xRy)

For all x and y, if x is a member of the class *a* of parts of an object then y is a member of the class *a* of parts of an object which entails that x is related to y.

Now we can also create a closure system if we combine closure with biconnectedness, resulting in a biclosure system under R:

Biclosure-System

bcs R a ≡ bicon R a ∧ cl R a

The members of the class *a* of parts of an object are biconnected under a relation and closed under a relation.

A biclosure system is a closure system in which all parts of a class are related by a relation that holds in one direction (biconnection) and are not related to any parts of another class (closure).[203] Here we describe the colony as consisting of members where one is delousing the other and the latter the former in turn (and neither of them is busy with some member of another herd).

The last step in schematically characterizing the relatedness that obtains among parts in an integrated whole is to consider the fact that the primary instance of relation itself might not be sufficient to relate all the parts. A primary instance is a relation taken solely in itself. Secondary instances of relation result from considering the disjunction with its converse, R ш𝚛̆, or its ancestral (R ᴗ 𝚛̆)*. Formally, z is related to x under the ancestral (R

[202] Ibid, p.329.

[203] Simons uses the example of the relation of sharing both parents: "If R is the relation of sharing both parents, a biclosure system under this relation is a class of all the full sibling offspring of two particular parents" (Simons, *Parts,* p.329).

∪ ř)* if z instantiates the same relational property that y instantiates in virtue of being R*-related to x. For example, your grandfather is related to you under the relation *fatherhood** because your father is related likewise to you.[204] Note that fatherhood* is not the same relation as fatherhood proper. In the latter case, clearly you would not be related to your grandfather under the relation of fatherhood, simply because your grandfather is your grandfather and not your father. The ancestral of a relation emphasizes the relation purely under the aspect of the property that is inherited, so to say, by one objects from the other all the way down in the order of objects. We can say that the property in question holds indirectly under (R ∪ ř)* whereas under R it holds directly. You are indirectly, by a row of fatherhood relations, related to your grandfather but only directly under this relation to your father.[205]

The first operation (disjunction with the converse) yields secondary instances of R by rendering the relation symmetric, the second one (ancestral) by rendering it reflexive and transitive. The objects, related under various instances of R, primary and secondary, form a R-family:[206]

> *Relation-Family*
>
> fam R a ≡ cs R ∪ ř)* a
>
> The members of the class *a* of parts of an object are a closure system related under the ancestral of the disjunction with the converse of a relation.

Finally, an entity is integrated if it is a division that is a R-family:[207]

> *Integrated Whole*
>
> wh R w ≡ ∃a (a div w ∧ fam R a)
>
> Some class *a* of parts of an object is a division of w and forms a relation-family.

[204] Ibid, p.329.
[205] See also section 4.2 in Zalta's entry "Frege's Theorem and Foundations for Arithmetic" in the *Stanford Encyclopedia of Philosophy* (http://plato.stanford.edu/entries/frege-theorem/#4.2) and Frege's *Begriff-sschrift*, section III, proposition 76.
[206] Simons, *Parts*, p.330.
[207] Ibid., p.330.

So our primate colony forms an integrated whole if all members delouse each other, and themselves, and no member neither is deloused by nor delouses members of another colony. The relation of delousing is called *characteristic* for the colony.[208]

In sum, as to rank as an integrated whole the members of a class of parts have to fulfill the formal requirement of instantiating *being a R-family.*

Now this schematic characterization cannot be all that is said about how a complex object has to be relationally constituted as to be an integrated whole. Some qualifications are appropriate. First, the characterization of a division that forms a relation-family yields not only individuals in a strong sense, but also related entities as collections and masses. Or more precise, the notion of an individual can be extended to such entities as collectives and masses. In the case of masses, if the parts are integrated, we speak of "lumps, chunks, portions, or bits" of matter.[209] In the case of collectives, marking a clear conceptual border between the two notions is difficult. In biology, when it comes to colonies, the distinction between describing it as a single multi-celled individual in the proper sense or a collective, that is an individual in the weaker sense, of single celled individuals in the proper sense is hard to draw. I do not indulge in discussing this semantical issues of the term "individual" here but one thing concerning the difference between individuals and collectives we have to keep in mind. That is, if the parts are integrated, then a collective does represent an integrated whole although no individual in the strict sense results from it. For example, a rugby team forms an integrated whole by being related under the relation of, say, athletic cooperation, and as such yields an individual in the weaker sense, that is, without also forming a "supra-personal individual."[210]

Second, integrity comes in degrees. Not all wholes are internally connected to the same extend of cohesiveness. Take, for example various groups of people. They might all form integrated collectives, that is, being relation-families, but under different relations resulting in different degrees of strength of connectedness. One collective might be constituted by business-relations, others by family ties and again other by friendship. Though they all form integrated collectives of people, the degree to which they are bound together varies.[211]

[208] Ibid., p.330.
[209] Ibid., p.154.
[210] Ibid., p.331.
[211] Ibid., pp.332/3.

Furthermore, the characterization provided so far proceeds purely formal and as such is not apt to define integrity. This is for purely formal characterizations can be given a trivial interpretation if one considers relations like *coexisting with* or *being next to.* Surely under these relations any complex entity forms an integrated whole, to the effect that nothing does, and we are back with Schlick (and Popper) saying that everything in nature is somehow connected so that there is no ontologically substantial difference between mere sums and integrated wholes.[212]

So the formal definition provided has to be further "filled in" with relations that do not trivialize it. The names for such relations come in various forms, like natural, material or substantial relations. The common denominator of them seems to be that they all bear some reference to some metaphysical, physical or organic entities as opposed to logical ones. Examples of such relations are causality taken from the physical domain[213] or the relations that hold among the parts of the human body as the classical paradigmatic integrated whole that is already discussed by Aristotle. On the other hand, it also does not help to discard some relations as candidates for a substantial characteristic relations from the start. This is because some relations might be given both a purely formal as well as more substantial description. For example, take the relation-pair of difference and similarity. Simons on the same page, on the one hand, cites difference as a formal relation that is barely helpful for accounting for an integrated whole as well as mentions its close relational sibling similarity or "likeness of color of the parts of a visual datum" as an example for a natural relation that does turn sets of parts into wholes.[214] The difference here seems to be further specifications for such relations. The difference relation in its purely formal garment does not help whereas the same relation becomes fairly substantial if we specify further properties it might possess.

So far, I complemented the principle of unity in Johnston's schematic moderatist statement by Simons' formal requirement for an integrated whole. For improved clarity, on the next page, I provide an overview of the integrity account. In the next step, I suggest to further specify the relations under which the members of a class of parts form a family as dependence relations.

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212 Ibid., pp.333/4. Simons introduces his moderatist exposition by referring to Schlick who claims that the difference between sums and wholes has no "ontological repercussion" and is of just linguistic or methodological nature.

213 Take Schaffer, "The Internal Relatedness of All Things", as an example of such view.

214 Simons, *Parts*, p.333.

Synopsis II: Integrity – First Condition: Relation-Family

Integrity = A **division** that is a **relation family.**

Division = Members of a class of parts that can overlap.

Relation Family = A **(bi)closure system** under **the ancestral of the disjunction with the converse** of a relation.

The ancestral of the disjunction with the converse of a relation: Yields second instances of the relation that are reflexive and transitive (ancestral) as well as symmetric (disjunction with its converse).

(Bi)Closure System: Members of a division that are **closed** (left and right) and **(bi)connected** under a relation.

Closure: No member of division in question is related to a member of another division (right closure) as well as no member of another division is related to a member of the division in question (left closure).

(Bi)Connectedness: Every member of a division is related to every other member by a symmetric (connectedness) or asymmetric (biconnectedness) relation.

I.6.c.ii. Integrity – Second Condition: Dependence Relations

As to start with some disillusionment, even by discussing dependence relations in this section we still do not reach the level of specification needed for a substantial account of integrity. This if for dependence relations are still formal in the sense that statements like "a depends on b" are incomplete and are in need of some further special way in which the parts depend on each other.[215] The discussion of special dependence relations, though, will have to wait until the second part of this thesis. This is for the reason that I am exclusively concerned with a holistic and moderatist conception of phenomenal consciousness and not with refuting unrestricted composition in every metaphysical domain.

The discussion of dependence relation nevertheless is essential in order to see that they figure as a specification of the moderatists central notion of structure or arrangement. In compositional terms, arbitrary mereological sums and hence unrestricted composition are banned from ontology based on the claim that for some entity to be an individual, over and above the mere existence of the parts and the formal requirement of being an R-family, it has to additionally exhibit some strong internal connectedness that is in turn characterized by the obtaining of dependence relations among the parts.[216] By introducing a R-family in the preceding part I rather discussed a matter of relational topography, that is to say, dealing with the extent and scheme of relations, not their kind. Any relation could serve as forming a R-family, and hence this condition alone does not render complex entities integrated wholes; it does not regard the fact that the parts have to stand in some particular integrative relation to each other. Generally, in order to provide some form of internal cohesiveness the relation R under the family of which a complex entity becomes an integrated whole has to be a dependence relation.

[215] Simons, *Parts*, 293, where Simons provides a list of ways in which the notion of dependence can be understood.

[216] Ibid., pp.290-2. For a general discussion of non-causal dependence relations, see Jaegwon Kim, "Non-causal Connections," *Noûs 8*, no. 1 (1974): 41–52. Also, for ontological dependence generally, cf. Koslicki's contribution in Kathrin Koslicki, "Varieties of Ontological Dependence," in *Metaphysical Grounding: Understanding the Structure of Reality*, ed. Fabrice Correia and Benjamin Schnieder (Cambridge University Press, 2012), p.186; Kathrin Koslicki, "Ontological Dependence: An Opinionated Survey," in *Varieties of Dependence: Ontological Dependence, Grounding, Supervenience, Response-Dependence (Basic Philosophical Concepts)*, ed. Benjamin Schnieder, Miguel Hoeltje, and Alex Steinberg (Philosophia Verlag, 2013), pp.31–64. However, Koslicki is mainly concerned with what I might call vertical ontological dependence, that is to say, dependence between different metaphysical levels, like universals (redness) on their substrates or 'hosts' as well as smiles on a mouth. In contrast, I am here exclusively interested in horizontal ontological dependence, that is, dependence between entities on the same metaphysical level, primarily in-between parts.

A characterization of dependence relation in general reads as follows, and it will be the task in this section to specify this general formulation by certain subclasses of dependence:

General Dependence

$\Box (F(a) \rightarrow G(b))$

Necessarily, if a is F then b is G.[217]

Note that Simons operates with modal mereology in his discussion of ontological dependence. An array of further notions is connected to modal treatments of subject matters, like substance, essentiality and doctrines like essentialism. However, where possible, I avoid to excursions into these fields and keep modal terminology limited.

Candidates for special dependence relations are rigid or generic ontological dependence, also discussed by Simons.[218] I also put strong emphasis on a third candidate which is functional dependence relation, describing an integrated whole in terms of a functional dependence system.

I.6.c.ii.a. Rigid and Generic Ontological Dependence

Rigid Ontological Dependence

Rigid ontological dependence is the strongest form of dependence relations among the subclasses of general ontological dependence. Roughly, an individual *a* is rigidly ontologically dependent on an individual *b* if *a* exists only if *b* exists. A preliminary formalization of rigid ontological dependence makes use of the concept of singular existence and, based on the general formulation above, reads as follows: $\Box(E!(a) \rightarrow E!(b))$. Now, this formalization is overly weak for including two cases. First, it allows self-dependence and surely, trivially, every individual is ontologically dependent on itself.[219]

[217] Simons, *Parts*, p.294.

[218] Ibid. chap.8 and 9.4. Simons discusses ontological dependence relations based on Husserl, where the latter is mainly concerned with such relations in the context of substances where they hold between particulars, bare or not, and their accidents, or among tropes or bundles of tropes. This is just to say that discussing ontological dependence relations in the context of non-overlapping, numerically distinct particulars goes not without saying. See also Peter Simons, "Particulars in Particular Clothing: Three Trope Theories of Substance," *Philosophy and Phenomenological Research 54*, no. 3 (1994): 553–75; Kevin Mulligan, "Relations: Through Thick and Thin," *Erkenntnis 48*, no. 2/3 (1998): 325–53, here p.334.

[219] Simons, *Parts*, p.295.

The second unwanted implication is that it alows that as soon as one individual exists, every other ontologically depends on it. But this seems false, since, for example if we accept the existence of abstract objects, not everything is necessarily ontologically dependent on the existence of the number 42. So a proper formalization has to exclude self-dependence and the necessary existence of individual *b*. Simons states the according definition of weak rigid ontological dependence as follows:

> *Weak Rigid Ontological Dependence*
>
> $\Box E!(x) \rightarrow E!(y)) \wedge (x \neq y) \wedge \neg \Box (E!(y)$
>
> Necessarily, the existence of exactly one x entails the existence of exactly one y and x is non-identical to y and y does not exist necessarily.

The corresponding kind of integrity is defined as follows:

> *Rigid Ontological Integrity*
>
> A division that forms a family under weak rigid dependence relation.

Simons distinguishes weak rigid ontological dependence from the strong version. I omit the latter here since strong ontological dependence concerns cases where the existence of an object depends on it being a part of another, which is regarded as stronger form of dependence by Simons.[220] The strong version hence involves part-whole relations whereas my specification of integrity solely pertains to part-part relations.

Still, even weak rigid ontological dependence seem overly strong for a general conception of integrity, as Esfeld points out.[221] This is because objects might be regarded as integrated even if its parts are removed or replaced, which is barred by weak ontological dependence. Take groups or teams of people, like a rugby team. The team stays intact as a whole even in case some players have to be substituted. A more suitable candidate is generic ontological dependence.

[220] Ibid, pp.302/3 and p.340.
[221] Michael Esfeld, "Holism and Analytic Philosophy," *Mind 107*, pp365–80, here p.368.

Generic Ontological Dependence

The slightly weaker form of dependence, generic ontological dependence, alludes to kinds. Here the idea is not anymore that the existence of some particular individual is necessary for the existence of another particular individual, but rather that, roughly, that the existence of an individual of a certain kind is necessary for the existence of another individual of a certain kind.[222] For example, most living creatures depend on the consumption of water. However, for them not to die the consumption of some arbitrary portion of water is sufficient, it does not have to be some particular portion, say, from a special source. As is the case with rigid ontological dependence, the definition for the generic version has to exclude some trivializing cases. First, vacuous cases have to be ruled out in which no individual exists that is of a certain kind resulting in the definition including the conjunct that it is possible that there is something that if F. Second, similarly to the preliminary version of rigid ontological dependence, we also want to prevent that the definition allows for interpretations according to which something that is not G necessarily depends on some other thing that is G simply in virtue of the fact that something exists that is G.[223] The resulting formalization of generic ontological dependence reads as follows:

> *Generic Ontological Dependence*
>
> $\Box\forall(x)((F(x) \rightarrow \exists(y)(G(y)\wedge(x\neq y))\wedge\Diamond\exists(x)F(x)\wedge\neg\Box(\exists(x)G(x))$
>
> Necessarily, the existence of something that is F entails the existence of some other thing that is G and it is possible that there is something that is F and it is not necessary that there is something that is G.
>
> *Generic Ontological Integrity*
>
> A division that forms a family under generic dependence relation.

I am using here the slightly mitigated version of generic ontological dependence proposed by Esfeld. This version is mitigated in that it excludes forms of essentialism,

[222] Ibid, p.368.
[223] Ibid, pp.368/9. Cf. Simons, *Parts,* p.297.

according to which individuals instantiate their properties necessarily. So this definition stays neutral with respect to the question whether or not the individual ceases to exist without the instantiation of the relational property of being generically dependent on some other individual of a certain kind.[224] The point here is the dependence of the kind of some individual, not its existence, on another individual. For example, me instantiating the property of being a brother is generically ontologically dependent on there being another man in my family who has the same parents; without him I would not be a brother. But that does not imply that I would not exist at all without him. The only thing that I would lose in this case is the property of being a brother, not my existence.

Having said this, in my view, the label ontological dependence might be inappropriate for the version of Esfeld. This is because ontological dependence is commonly understood as the dependence of an object or individual for its existence on another object or individual. Since Esfeld proposes to modify Simons' account of ontological dependence in the direction of subtracting from it the existential aspect to the effect that an object is dependent on another not for its existence but for its kind or quality, i.e. with respect to the instantiation of certain properties, I think it should rather be called generic dependence proper, without the 'ontological' part of the name. Yet, this is rather a terminological point and does not change anything in the plausibility and aptness of the account itself.

Some further qualifications of the definition of generic ontological dependence are in place here. First, regarding the formal properties of the dependence relation, generic ontological dependence is symmetric and transitive. Regarding the first, the ontological dependence does not just run one way from object x having the property F being ontologically dependent on another object y having the property G, but also from y having the property G being ontologically dependent on x having the property F. This fact does justice to the doctrine of integrity mentioned above, namely, that every member of some division of the object stands in a certain relation to every other member, or, more specifically, to the connectedness principle. Transitivity is another extension of this principle: If John is dependent on Jill because he owes her money, and Jill is dependent on Jeff for the same reason, then John is also connected to Jeff by the (ancestral of) being-in-debt-relation.[225]

[224] Esfeld, "Holism and Analytic Philosophy," pp.369-71.
[225] Ibid, p.369.

Second, F and G may be the same property. So in this case, if there is one object x instantiating the property F in the system, there is at least one other object y also having the same property F. Third, properties F and G can be replaced by Kripkean rigid designators that designate natural kinds.[226]

Even if generic ontological dependence is weaker than its rigid sibling, its aptness for integrity is questionable. This is because the resulting ontological integrity still remains fairly general for it invokes the exclusively formal dependence relations. This criticism applies to Simons versions of rigid and generic dependence, who in turn is inspired by Husserl, in whose analysis of foundation we also find no specified material relation that could render the resulting form of integrity more substantial, since "where objects cannot exist without each other, it is nonsense to look for chains to link them together."[227] Whether this criticism also applies to Esfeld's version of generic ontological dependence that does without necessity of property instantiation and that I use here shall be decided in the next part, for, as already mentioned, I am not concerned with the suitability of integrity conceptions for objects and individuals in general but with specific respect to phenomenal consciousness.

Next, I present another kind of dependence relation that yields integrity. Functional dependence invokes material relations and hence is one that is, at least for Simons, a stronger candidate for a holistic and moderatist conception of composition.

I.6.c.ii.b. Functional Dependence

For introducing functional dependence, let me start with an illustrative example. Imagine you and your three children wander through a zoo until you spot a chameleon. Having heard about the amazing capability of this animal to change color, your children rush towards it. What they are also aware of is that chameleons do not change color accidentally but according to their moods in combination with the slightly problematic fact that usually their mood is quite composed. So convincing it to change color won't come easy. Luckily, the paths of the zoo are covered with gravel and the unlucky animal is located at manageable distance as to help it along with exhibiting its colorful talents by some precise pebble throws. Now, Bob, your youngest, is still a bit clumsy, so his throws are not well aimed and not too strong. The according impact on the chameleon is rather

[226] Ibid, p.369.
[227] Simons, *Parts*, p.342.

weak and stimulates it to change its color minimally to some green caused by some pleasurable feeling of getting slightly tickled. This in turn changes Bob's mood into serious disappointment and makes him cry. Your second, Peter, is a bit older and already capable of performing some good hits. The animal gets considerably annoyed and accordingly bright yellow, its stress-color. Peter is quite pleased and starts to smile. Justus, your oldest, basketball professional to be, ambitious and slightly mean due to his puberty turbulences, throws strongly and deadly accurate. Now the animal is seething with rage and pitch black. On the other side, schadenfreude runs out of Justus' nose and ears.

If we abstract a little, you, the chameleon, Justus, Peter, and Bob, are entities or objects of some kind. These objects instantiate certain properties. You possess the property of *being father*, the chameleon the one of *being of a certain skin color*, Justus, Peter and Bob instantiate the same property of *being children* and each of them also different ones like Bob *being clumsy*, Peter *being of mediocre strength*, and Justus of *being mean*. Now I like to conceive of properties as spaces or continua. General properties like strength, color or meanness come in degrees. These degrees take various forms. Some properties, like strength, or more physically, force, come in magnitudes like Newton. But not all properties possess graduations in the form of magnitudes or scales. Colors, for example, do not. Red, green and blue are all colors but one is not greater that the other. They are not magnitudes but rather size-neutral values. So each property can be understood as a space or continuum of its specific values. Following Johnson, let us call properties like force, mass, color and the like *determinables*, since they can be further specified, determined, by certain values.[228] The suchlike specified values of the general properties we call *determinates*, since they take the specified and determined form. Apart from determinates of some general properties, the objects that figure in our little story also instantiate relations. Here it is mainly a matter of causality: Justus causes the chameleon to change its color to pitch black and in turn this fact causes Justus to be quite delighted. But as we will see below, causality is by far not the only relation that might figure in integrated wholes.

As to bring together the points about the determinates and the relations that the

[228] Simons, *Parts*, chap.9.5; W. E. Johnson, *Logic: Part 1* (Cambridge University Press, 2014), pp. 173ff; Simons, "Gestalt and Functional Dependence", in: *Foundations of Gestalt Theory*, Ed. Barry Smith, p.169.

objects possess, two crucial points are important to realize. First, the relations obtain precisely between the determinates and only indirectly between the objects that instantiate them. Colloquially we may say that Justus causes the chameleon to become pitch black. Here the relation between Justus and the chameleon seems to be a matter of a relation that holds between the objects Justus and the chameleon. But if we want to be more precise what we have to say is that the property of Justus *being able to throw hard and accurately* to a certain degree causes the chameleon to instantiate the color-property black to a certain degree. So the obtaining of the relation is rather a matter of determinates of the determinable property of objects rather than of the objects themselves.

Second, the values of some determinable properties that the objects instantiate are related by causality not randomly or accidentally. It is no pure coincidence that the chameleon gets pitch black if Justus throws the pebbles and only pleasantly greenish if Bob does. The value of the color of the chameleon depends on the value of the force of Justus' or Bob's throw. What determinate of the color-determinable the chameleon instantiates depends upon what determinate of the force-determinable Justus or Bob instantiate. If we focus on the various strengths of the throws and the according color of the poor animal, we may say that there is a law-like connection between the respective determinates: a certain throw-strength corresponds to a certain chameleon-color.

The idea that leads to holism and integrity is this: the state of the participants in our narrative, say, the chameleon, Justus and Bob is fixed by the determinates of their determinates, i.e. the values of the determinable properties they instantiate. These determinates, in turn, depend on each other in virtue of being related in a certain way. So in virtue of the relations that obtain among the determinates the state of one participant depends on the state of another. Together they form a dependence system.[229] One mark of such dependence system is the interdependence of its parts, a notion that will be of importance later on.

As we have seen in the introduction, the idea behind dependence systems as logical conceptualizations of integrated wholes is fairly intuitive: Certain characteristics that determine the state of an object depend upon certain characteristics that determine the state of another object.[230] The color-state of the chameleon depends on the more or less skillful and motivational state of the pebble-throwing children. In order to clarify the

[229] Simons, *Parts*, chap.9.5.

conception of functional dependence for integrated wholes, I proceed by gradually specifying and formalizing definitions. I start with the still colloquial way of putting integrated wholes determined by functional dependence relations put forward by Simons, based on Rescher/Oppenheim's account. I slightly modify the formulation just as to streamline it with Simons usage of the term "division" used so far. Simons and Rescher/Oppenheim differentiate between the characterization of a dependence system that pertains to wholes instantiating quantitative properties, that is, determinables whose determinates come in quantitative values, and those that instantiate non-quantitative determinates. It is only in the definition of dependence systems that instantiate quantitative magnitudes of properties that also the determinates and values are mentioned. In contrast, the definition for the latter is slightly more general, just considering the determinables and not the determinates:

> *Dependence System*
> A dependence system is a collection of objects, a division, which form a R-family, to which a class of determinables apply, such that each member of the family has some determinable from the class which is functionally dependent upon some or all of the determinables of some or all of the remaining members.[231]

I think this is an unjustified simplification of the definition of non-quantitative dependence system because also non-quantitative dependence systems consist of objects that instantiate determinates and values. For example, the phenomenal quality spaces that will be discussed below consist of determinable properties, phenomenal colors, that come in certain determinates and values, like the specific colors blue, red, and the like, which also have to be included in the definition. Accordingly, I suggest the following definition for a dependence system, operating with a liberal notion of determinates and values, that is one that does not exclusively refer to quantified magnitudes:

[230] See also Rescher/Oppenheim, "Logical Analysis of Gestalt Concepts", p.98. Also Grelling/Oppenheim, "Logical Analysis of 'Gestalt' as 'Functional Whole'", p.213.
[231] Simons, Parts, p.345 and Rescher/Oppenheim, "Logical Analysis of Gestalt Concepts", p.98.

> A dependence system is a collection of objects, a division, which form a R-family, to which a class of determinables apply, such that each member of the family has some determinable from the class the value of which is functionally dependent upon some or all values of the determinables of some or all of the remaining members.

This might be only a slight modification but, in my view, it is important to point out in the definition of a dependence system that the dependence relation obtains specifically among the determinates, that is, the values of the instantiated determinable properties, and not among the determinables generally.[232]

Following this characterization, a first adumbrated version of the dependence relation R can be formalized as follows, where d is the determinate that depends on a class of determinates ϕ for the argument or object x: $R(d,\phi)_x$. Surely this definition is quite general; it just says that a determinate depends in some way on a class of determinates. To specify what this way is, we have to give this definition a certain meaning and formulate a precise statement as to what this general dependence relation amounts to. Grelling provided the following meaning:

> If, for some argument x_1, every determinate belonging to ϕ, i.e. every determinate upon which d depends, takes the same values as for the argument x_2, then d itself must take equal values for x_1 and x_2 as well.[233]

This definition formalized, in a slightly modified contemporary version, partly using Thalos' way of putting it, where R is the dependence relation, d the determinate that depends, ϕ the class of determinates that d depends upon, g some specific determinate out of ϕ, and x the argument for the determinates, reads as follows:

[232] This is a difference to generic ontological dependence where the point for some objects to be constituent of a holistic or, in Simons terminology, integrated system "is not the specific, determinate way in which it has (...) properties, but simply its having the properties which belong to (...) a family of properties in the generic, determinable way" (Esfeld, "Holism and Analytic Philosophy", p.374).

[233] Grelling's formulations reads as follows: "If, for some argument x1, every function belonging to ϕ, i.e. every function upon which f depends, takes the same values as for the argument x2, then f itself must take equal values for x1 and x2 as well." Grelling, A Logical Theory of Dependence, p.218.

Functional Dependence

$R(d,\phi)_x =_{df} \forall x_1 \forall x_2 \{\forall g[g \in \phi \rightarrow g(x_1)=g(x_2)] \rightarrow d(x_1)=d(x_2)\}$[234]

A determinate property d functionally depends upon a class of determinates ϕ for the common argument x is defined as if the determinate property g out of ϕ stays invariant for some argument x_1 and x_2, then also the determinate property d stays invariant for x_1 and x_2.[235]

Accordingly, the respective integrity, for which I replace the notion of Grelling's and Oppenheim's dependence system with the more precise notion of a R-family, amounts to the following formulation:

Functional Integrity

A division that forms a family under functional dependence relation.

For example, and I take this example from Grelling, the above definition formalizes the colloquial statement that the price of an article depends on its demand and supply by holding that the price (d) of an article (x) functionally depends (R) upon demand and supply (ϕ) is defined as if the demand and supply for the article at time t_1 stays invariant to the supply and demand of the article at time t_2, then also the price of the article stays invariant from t_1 to t_2.[236]

[234] Cf. Thalos, *Without Hierarchy: The Scale Freedom of the Universe*, p.196. Also with respect to what we are talking about when we mention f, the determinate (she calls it a quantity that depends on a class of determinates) her way of phrasing it is instructive: "Definition 1. A quantity X is always a concrete, spacetime localizable feature of some portion of the world, and of a specific System σ in particular. A quantity takes on magnitudes in time, and these may vary over time. (p.195)" And: "A quantity is a characteristic of the universe that may vary in magnitude with time, taking on no more than a single magnitude at a single moment in time. A quantity is a concretum, metaphysically speaking, which possesses an identity through time; it is not an abstract object like the mathematician's variable. Unlike mathematical objects, or concepts, or even general notions such as for instance that of temperature, the temperature of the liquid now boiling in the pot upon my stove—the quantity T —is closely linked teawater with the object (the tea water) to which it belongs. This connection makes the quantity a concretum.(pp.195/6)"

[235] Cf. Thalos, M. (2013), *Without Hierarchy: The Scale Freedom of the Universe*, p.196.

[236] Kurt Grelling, "A Logical Theory of Dependence," *Journal of Symbolic Logic* 4, no. 4 (1939): 169–169, here pp.117/8.

In the example from Grelling, we consider the determinate properties of one argument, viz. one object. Note, and this is the way I conceive of functional dependence primarily, that the same can be said about the dependence of determinate properties of two or more objects. Köhler and Simons discuss functional dependence with respect to physical systems in which, for example, the gravitational force exerted by body one on body two functionally depends on the masses of the two bodies, their distance from each other and their direction on another.[237] So if the latter determinate properties of the bodies stay invariant from t_1 to t_1, then so does the determinate property of gravitational force. And functional dependence also holds in various ways, that is, also mutually and symmetrically as interdependence, among certain determinates of determinable properties of the bodies like velocity, position, attractive forces and acceleration. This is to the effect that a class of objects subject to these forces form a relation-family under functional dependence, and as such are integrated.

Now for this way of putting the dependence relation it cannot be said whether the relation uniformly instantiates the logical properties of symmetry or asymmetry. This is for functional dependence comes in two forms, one in which only one term is dependent on the other, I.e. $R(d,g)_x \rightarrow \neg R(g,d)_x$, and one in which both terms are reciprocally or mutually dependent on each other, i.e. $R(d,g)_x \rightarrow R(g,d)_x$. The former is the asymmetrical, the latter the symmetrical form a functional dependence relation.[238]

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[237] Cf. W. Köhler, *Die physischen Gestalten in Ruhe und im stationären Zustand* (Braunschweig: Vieweg&Sohn, 1920); Simons, *Parts*, pp.344/5.

[238] Cf. Thalos, *Without Hierarchy: The Scale Freedom of the Universe*, p.196. The question of the functional dependence relation being symmetrical or asymmetrical also cannot be settled if we consider the relation of covariation, a logical derivate of functional dependence. Covariation is the relation under which d depends on the class of determinates that d depends upon with respect to one and only one member of ϕ. Grelling and Thalos agree that functional dependence and covariation are both branches of one common genus of relation, that is logical dependence (from Thalos, *Without Hierarchy: The Scale Freedom of the Universe*, p.196, Grellings work not cited). Since we leave the domain of functional dependence with the consideration of covariation and logical dependence, I think following further this thread would just unnecessarily complicate matters. Therefore I obviate doing so. Also, it seems to me that a dependence relation that obtains between only two terms, that is covariation, is of minor use for a holistic conception of whatever domain, since holistic relations are rather many-to-one or many-to-many and not one-to-one relations. Furthermore, the question that is of issue here according to Thalos, namely whether functional dependence is symmetrical or asymmetrical, also seems not to be pressing because, according to my considerations of an integrated whole as a R-family based on Simons, for being such it is enough for a complex entity to instantiate some of the various instances of a relation. So if we have complex entity under an asymmetric relation only, for passing as an integrated whole, we might consider the disjunction with the converse of the relation, which gets us a symmetric relation and an integrated whole in turn (Simons, *Parts*, 329). Hence, if we take functional dependence as the mark of an integrated whole we simply have to consider its reciprocal and mutual kind of the form of $R(d,g)x \rightarrow R(g,d)x$ and ignore the asymmetrical one of the form $R(d,g)x \rightarrow \neg R(g,d)x$ for the conceptualization of an integrated whole.

This conception of a functional whole is considerably different from the psychological gestaltist notion of a whole based on Ehrenfels, for it is rather logical than psychological in nature.[239] With respect to the relation that figures in the integrated whole understood as a family under the functional dependence relation based on Simons, Grelling and Oppenheim, accounts vary with respect to whether the relations are exclusively causal or just logical, which is to say not determined with respect to special and material relations like causality. In Grelling's "A Logical Theory of Dependence" and in Thalos *Without Hierarchies* the latter seems to be the case, as the title of Grelling's paper suggests. Also in Grelling's and Oppenheim's "Logical Analysis of 'Gestalt' as 'Functional Whole" and "The Concept of Gestalt in the Light of Modem Logic" papers where they start off with Ehrenfels' notion and use physical and causal systems as examples only. So, *pace* Chrudzimski, according to whom functional integrity serves as the logical analysis of specifically causally organized wholes, I assume here that functional integrity first and foremost is a logical construct that can be substituted with a wide range of material or special relations.[240]

Thalos proceeds by leaving the path of Grelling and by considering physical relations out of all the relations that are possible to consider based on Grelling's general characterization of functional dependence.[241] I shall do the same in the second part and discuss phenomenal relations as a special kind of functional dependence relations.

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239 Chrudzimski, "Gestalt, Equivalency, and Functional Dependency: Kurt Grelling's Formal Ontology", p.256, in: chap 12 of Milkov, N./ Peckhaus, V (Eds.), *The Berlin Group and the Philosophy of Logical Empiricism* , Vol.273 of Boston Studies in the Philosophy and History of Science, Dordrecht: Springer.

240 Chrudzimski, "Gestalt, Equivalency, and Functional Dependency: Kurt Grelling's Formal Ontology", pp.256/7. For a set of entities under functional dependence, Chrudzimski does use the notion of integrity but the one of a dependence system that I replaced by the former for my purposes. See Simons, "Gestalt and Functional Dependence", p.174 for a substantiation of my point.

241 Based on her project in the philosophy of science to develop a non-hierarchical theory of scientific explanations based on Grelling's functional dependence relations, she writes: "However there will be further species of dependence relation that quantities can enter into but which variables cannot. (As will become clear, this fact is partly due to the fact that variables are abstract while quantities are concrete.) These further dependence relations are not formal, mathematical, or logical relations; in other words, they are not relations having to do simply with how magnitudes—marks on a given scale, which can be compared only as to which is greater—vary over time. Rather, they are relations of dependence due to imperatives of Physics or Biology or Sociology, or what have you" (Thalos, *Without Hierarchy: The Scale Freedom of the Universe*, p.200). Also, see: "My counter-causal proposal is that scientific explanation is illumination of a dependence relation of some sort, but that causal dependence is only one species of dependence relation among many – and a marginal one at that, when it comes to the family tree of dependence relations. To make a strong case, I shall of course have to produce a taxonomy of dependence relations, and argue forcefully that different sciences trade in different dependence relations, with causal dependence being among the poorest cousins of the robust relations in which mathematics, physics, psychology, biology and their close relatives, trade." Thalos, "Explanation is a Genius: An Essay on the Varieties of Scientific Explanation", *Synthese 130*: 317–354, 2002, here p.320.

I.6.d. Spoiler-Alert: Vagueness

As we have seen, a central motivation for accepting unrestricted composition comes from rejecting restricted composition. And a major argument against restricted composition is the one from vagueness. So as to defend restricted composition and avoid the unrestricted one, I am better able to defend my moderatist answer to the SCQ against vagueness.[242]

To reiterate, the argument from vagueness proceeds in three steps.[243] The first premise holds that if composition is restricted, then there must be cases in which composition occurs and cases in which it does not, where these two cases are connected in a sorites-like manner by a finite series of extremely similar adjacent cases, in the middle, so to say, of which we find a pair of adjacent cases such that in one composition occurs but not in the other. The second premise denies such sudden cut-offs of composition. The third premise holds that there is also no gradual, that is, vague, transition in stating that, in any case of composition, it definitely does occur or definitely does not occur. But then, or so is the conclusion, if there is neither a sudden, nor a gradual, transition from occurring to non-occurring composition, then there also cannot be both cases, in which it does and does not occur. Hence, restricted composition if false, hence unrestricted composition is true. It should be noted here that the argument from vagueness is actually an argument from composition-sorites consisting of two sub-claims, only one of which concerns vagueness and gradual shifts from composition to non-composition. The other one pertains to a sudden shift between these cases, that is also denied.

Koslicki attacks the third premise using linguistic and semantical arguments. This strategy stems from the fact that Sider as well as Lewis, who started this argument, though in a somewhat imprecise manner, argue against restricted composition by holding that composition is phrased in a determinate logical and mereological language using vocabulary that cannot be vague.[244] Hence, the subject of that language, composition, likewise cannot be vague. Koslicki rejects the third premise arguing that "one cannot take for granted that mereological vocabulary is never vague", and eventually denies unrestricted composition based on the plausibility of restricted composition.[245]

In contrast, I side with Lewis and Sider here with reference to Simons by holding that,

[242] See, again, also Varzi, "Mereology", section, 4.5.
[243] From Koslicki, *The Structure of Objects*, pp.30ff on Sider, *Four Dimensionalism*, chap.4.
[244] Lewis, *On the Plurality of Worlds*, chapter 4, pp.221ff. Koslicki, *The Structure of Objects*, p.31.
[245] Koslicki, *The Structure of Objects*, p.37.

generally and with respect to the account of integrity that is meant to restrict composition, mereology is a precise and neat corpus of propositions that does not contain vague vocabulary. Hence, I support the third premise according to which composition cannot be vague. But that, in my view, does not justify the conclusion that composition has to be unrestricted. For there is also the second premise to attack, which seem to me to be more plausible and feasible than attacking the third. Accordingly, I think the claim that a sudden cut off occurs in the composition-sorites is less problematic than it seems. So in order to defend restricted composition, as mentioned, we should conceive the argument against it not as solely an argument from vagueness, but as one from sorites, including the denial of vagueness and the denial of sharp cut-offs, and then accept the denial of vagueness and reject the denial of sudden shifts.

In order to see how a sharp cut-off looses its bite, we have to regard the fact that integrity comes in degrees:

> Where relations are susceptible of differences of degree, as for instance friendship, or strength of gravitational attraction, the integrity of wholes bound together in such relationships will also come in degrees; we have here an objective warrant for speaking of something's being more integrated than another in a certain respect: one group of people may be more closely knit by friendship than another, for example.[246]

So, given the differences in degree of integrity, where integrity grounds the occurrence of composition, even the scope within the composition-sorites where composition definitely occurs is a sorites of a finite series of extremely similar adjacent cases. On the one end, close to cases in which composition does definitely not occur, the degree of integrity is maximally low so that composition occurs definitely, but barely. At the other end, composition also occurs definitely, but also due to maximally tight integrity. We ought not confuse definiteness of composition with the mode of composition like differing degree of integrity. Even in cases where integrity is maximally weak composition does definitely occur. Similarly, I take it that the scope within the composition-sorites where composition definitely does not occur is characterized by differences in degree, reaching from cases where parts are maximally dispersed and scattered to the effect that composition does definitely not occur with maximal certainty to cases in which parts are somewhat connected but not yet integrated. The latter cases might be located close to composition cases but are not such for they do not trespass the integrity threshold yet.

[246] Simons, *Parts*, pp.332/3.

So, first, the difference between a case of almost but still not quite and yet integrity and a case of integrity, but just by the skin of one's teeth, is very meager. There is a sharp cut off, but one that puts a infinitesimal amount of difference between a case and no case of composition. Second, the degree of this difference between cases on composition and cases of non-composition is as high, or low, as the degree of difference between two adjacent cases of composition or two adjacent cases of no composition. The entire composition-sorites is characterized by the same amount of difference between all cases it comprises, be it cases of composition or not. For illustration, in the color continuum I assume a clear cut off between yellow and orange, just that (assuming that each color ranges from shade 1 to 100, where the shade 100 of one color is adjacent to shade 1 of the next) the difference between yellow 99 and orange 1 has the same extent as the difference between yellow 45 and yellow 46 or orange 12 and orange 13. Given this picture, I cannot see why the sharp cut off poses a problem. Accepting the denial of vagueness in the argument from sorites of composition against restricted composition still allows for rejecting the denial of sudden shifts of composition cases and hence leaves restricted composition intact.

Part II

Introduction: Phenomenal Consciousness

Phenomenal consciousness is the totality of phenomenal properties of various experiences that our sensory modalities give rise to. Phenomenal consciousness as a whole, the total phenomenal state, consists of various parts, the single phenomenal states. Phenomenal states are mental states that instantiate phenomenal properties. Classically, perceptual experiences serve as the paradigmatic mental states that instantiate phenomenal properties or that have, as to mention a different vernacular that is often adopted, a subjective or qualitative character. For example, if a subject undergoes an experience of some pungent taste of a French Epoisses cheese, the subject is in a mental state that instantiates a phenomenal property where the phenomenal property reflects what it is like for that subject to be in that mental state of undergoing the experience. In other words, the phenomenal property is what is going on in your mind when the cheese hits your tongue, and what the cheeses tastes like for you.[247]

Although perceptual experiences might be the states most comprehensively studied, I think we should also include some less discussed states that are equally characteristic for genuine human mental life. If you want an opulent list to choose from, take a look at Haugeland's "Artificial Intelligence" book.[248] For the my purpose it suffices to simply amend the list comprising of phenomenally relevant mental states (that Haugeland names feelings) by adding, besides perception like tasting Cabernet, also proprioception like sensing the box of wine bottles pulling my arm, bodily sensations like dizziness when having too much of it, emotions like feeling uplifted that evening, and moods like feeling grumpy next morning ("algedonic phenomenology"[249]). Having said this, I am not too liberal about the range of relevant experiences and still entertain what one might call a thin view about phenomenal properties.[250] According to this view, exclusively sensory

247 Cf. Alex Byrne, *Sensory Qualities, Sensible Qualities, Sensational Qualities* and Rosenthal, *Consciousness and Mind*, p.139. See there, 141: "Does this mean that we can simply dispense with our common-sense conception of physical color when it comes to comparing those properties with the mental properties of visual states? Those comparisons rely on similarities and differences in the two families of properties; mental color properties resemble and differ from one another in ways homomorphic to the similarities and differences among physical color properties."

248 Haugeland, J. (1985), *Artificial Intelligence – The Very Idea*, MIT Press, pp.232.

249 Cf. Uriah Kriegel, *The Varieties of Consciousness* (Oxford University Press, 2015), p.3.

250 Cf. Robert Van Gulick, "Consciousness," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Spring 2014, 2014, http://plato.stanford.edu/archives/spr2014/entries/consciousness/. Sect.4.3.

experiences and the mentioned proprioceptions and moods are accompanied by qualia. In contrast, I exclude cognitive phenomenology like what it is like to think or believe a proposition from this exquisite class.

As to add another notion to the conceptual crowd, I assume that all phenomenal states are conscious states. This position is not uncontroversial. Particularly Clark strongly disagrees and claims that "these [phenomenal, H.T.] properties have been and must be firmly dissociated from any ties to consciousness."[251] Also Rosenthal and Lycan view sensory states and conscious states as independent of one another.[252] Nevertheless, since this is a debate that exceeds the limits if this thesis, I assume that mental states that instantiate phenomenal properties are identical to conscious states.

Hence, a phenomenal property is a property of an experience, of a mental or internal state of which a phenomenal state is a subclass. These mental properties are to be distinguished from those of the external objects that we undergo sensory experiences of. One reason for the difference is that the subjective experience of an external object intersubjectively varies to a high degree despite the fact that the very object instantiates the same set of properties. One subject might turn away from the Epoisses cheese in disgust calling it a palatal impertinence because her sensory experience shows properties that resemble that of excremental odors inside the mouth. For the next subject this cheese represents the highest achievement of French dairy production because the experience thereof tells the story of a rich and versatile taste that titillates the palate from intense herbal to exciting bitter nuances. All the same, regardless of these multitudinous properties that subjects might instantiate by being in a phenomenal state when experiencing this cheesy external object, the object itself possesses properties that are invariant and entirely different from the phenomenal ones, perhaps consisting just in some mixture of fungus and spices.

A note on terminology is advisable here because properties of phenomenal states change their names frequently. In the debates revolving around phenomenal consciousness it is common to use the etiquette phenomenal properties for properties of

[251] Clark (2008), "Phenomenal Properties: Some Models from Psychology and Philosophy," in: *Philosophical Issues 18*, Interdisciplinary Core Philosophy, pp.406-425, here p.406.

[252] Rosenthal, *Consciousness and Mind*, see esp. section 5.I. Finally he argues that being conscious involves having an higher-order thought (HOT), also pp.172f. So sensory states are conscious if they are accompanied by a higher order thought of the subject that is in such state, see p.145. See also Rosenthal, D. 1991. "The Independence of Consciousness and Sensory Quality," in *Philosophical Issues 1: Consciousness*, ed. E. Villanueva (Atascadero, CA: Ridgeview Publishing) and Lycn, W.G. 1996. *Consciousness and Experience* (Cambridge, MA: Bradford Books/MIT Press).

experiences and mental or phenomenal states. In contrast, Byrne labels the properties of external objects sensible properties and the properties of the experience thereof sensory properties.[253] So sensory and sensible properties form a pair of opposed notions. In calling properties of phenomenal states sensory properties, he is in line with Clark in his book „Sensory Properties“. Unfortunately, Clark changes his terminology from his book „Sensory Qualities“ to his recent one „A Theory of Sentience“, where he names sensory qualities 'qualitative properties' and sensible properties 'phenomenal'. This juggling with terminology is unfortunate because in the latter book Clark now names the properties of the external objects in the same way as I label the properties of the sensory experiences of the objects - phenomenal. Be it as it may, I stick to the convention in debates about phenomenal consciousness and reserve the label phenomenal or sensory for properties of sensory experiences and sensible or perceptible for the properties of external objects.

Finally, however one might be inclined to call them, phenomenal properties are not uncontroversially taken to exist. Byrne, for example, remains fairly skeptical.[254] The intuition lying behind this claim is that sensory experiences or some phenomenal states do not carry the properties they are said to instantiate like tastes or colors themselves; the sensation itself is not yellow or sweet, rather the sensation is of some external sweet and yellow external object like a pot of rapeseed honey. According to the skeptics about sensory properties, to claim that sensory experiences instantiate them is to confuse properties of the experience with the properties of the external objects experienced, in other words to mistake sensible properties for sensory ones. Byrne claims that „[i]f there are particular “sense experiences”, then their features do not include colors, tastes, and sounds.“[255] So the question about whether phenomenal or sensory properties exist leads to the status of properties like tastes, colors and smells. If they are in fact rather sensible than sensory properties, then it is not clear anymore what sensory properties exactly are and they become a myth. Accordingly, skeptics like Byrne take tastes and colors to be

[253] Byrne, *Sensory Qualities, Sensible Qualities, Sensational Qualities*, p.7. In the sections beforehand he explicitly discusses Clark's notion of a sensory quality. Byrne also mentions sensational properties, which are properties of sense data. But since my account is not even getting close to entities like sense data, I do not take sensational properties into consideration.

[254] Byrne, *Sensory Qualities, Sensible Qualities, Sensational Qualities*, p.22. Here he also claims that the hard problem of consciousness vanishes as soon as sensory qualities also do. For a detailed defense of that thesis, see Byrne, (2006), “Color and the Mind-Body Problem”, in: *Dialectica* 60, pp.223–244. This claim is of mild importance for this essay also because the hard problem is a head problem due to the assumed existence of phenomenal consciousness, the very kind of consciousness the structure of which the present essay attempts to clarify.

[255] Byrne, *Basic Sensible Qualities and the Structure of Appearance*, p.389.

external affairs, namely sensible properties, not internal or mental matters, i.e. sensory properties.

In opposition, other theorists claim that the qualities in question like colors and tastes are not properties of the external objects, are not sensible properties, because on the side of the external objects rather mathematically describable physical entities like wavelengths and complexes of chemicals or molecules obtain and nothing that would resemble our common sense understanding of what colors and the like are. Those physical entities are sensible properties but they are not the colors and tastes that we experience. Rather they function as stimuli triggering what we know to be tastes and colors. A stimulus „is best considered an occasion, a particular episode of irritation of transducer surfaces" and sensory qualities „are not stimuli, but rather the qualities that stimuli present.[256] Take also Hayek as a proponent of this view:

> For the purposes of this discussion we shall employ the term sensory 'qualities' to refer to all the different attributes or dimensions with regard to which we differentiate in our responses to different stimuli.[257]

So if sensible properties are identified with physical entities that function as triggers of smells and colors, then smells and colors themselves cannot be identified with sensible properties and there is a place for them inside the mind as sensory or phenomenal properties of sensory experience. And as such I treat them in this thesis.

Finally I have to mitigate the valid point that it is counterintuitive to assume that the sensory experience instantiates properties like a certain smell and taste to the effect that the experience itself is in fact red and bitter.[258] As mentioned above, this argumentation is used to doubt the existence of sensory properties. I think this claim is often connected to

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256 Clark, *A Theory of Sentience*, p.10. See also Clark's "Sensory Qualities" for a more extensive characterization of a stimulus, for example: "A given thing can be encountered on multiple occasions, and during them can present distinct appearances. Different presentations of a given thing are distinguished temporally; each occurs but once. The notion of a stimulus is allied to (but not quite the same as) that of a presentation of a thing. First, stimuli require some causal impact on one or another sensory transducer. If on a given occasion an object did not affect any of the sensory systems of a subject, then no presentation of the thing occurred, and consequently no stimulus was to be had. Furthermore, 'thing' in this context is applied quite broadly; it is not restricted to medium-sized dry goods, but can include any physical phenomenon one likes—the luminous flux from an instrument, a diffraction grating, virtual image, or whatever. With these provisos, our initial understanding of a stimulus is: a presentation of some thing to a subject that affects some sensory transducer of the subject" (p.46).
Here he also distinguishes between a distal and a proximal stimulus where the latter is characterized as "whatever events occur at sensory transducer" triggered by the former, i.e. thing that causes those events (p.46).

257 Hayek, *The Sensory Order*, p.2.

258 Also se Clark, *Sensory Qualities*, p. 78 for a discussion of this objection.

a view according to which, like in the Aristotelian tradition of philosophy of perception, „in sense perception the relevant sensory faculty becomes like the object it perceives.“[259] If I drink a good mouthful of Campari the experience I undergo is, according to this argumentation, characterized by the same properties of bitterness and dryness as the properties that the Campari in itself instantiates. But this seems to be queer, since clearly the sensory state is not dark red and bitter in the same way as the Campari is. On this rather coarse view, surely one better opts for eliminating sensory qualities from the ontology of consciousness, for the mental states do not instantiate the same kind of property as worldly states of affairs do. But why assume that sensory qualities are of the same kind as sensible properties? I think it is more plausible to assume that the properties are different in the same way as the states are that instantiate them. Mental states are different in kind from external physical objects and so are the properties that are instantiated by the objects and states. If we acknowledge that redness is a different kind of property in the mental realm than in the physical realm, by whatever account, then we are not forced to entertain the queer view that sensory states instantiate the same properties as the external objects and hence there is no need to dispense of sensory qualities.[260]

In what follows, I abstain from using the strict formal formulations of axioms and positions given in the first part. This is because, as mentioned, they are general and hence do not differ as applied to phenomenal consciousness. My task of this second part is to explicate what those general and formal characterizations mean and amount to in the phenomenal domain.

Quality Space: Phenomenal Consciousness as State Space

In the introduction to this second part I described phenomenal consciousness in terms of phenomenal states, i.e. mental states that instantiate phenomenal properties.[261] Additionally, since this is a mereological thesis, a further essential differentiation lies

[259] Shields, Christopher. "Aristotle's Psychology", *The Stanford Encyclopedia of Philosophy*, ed Zalta, http://plato.stanford.edu/entries/aristotle-psychology/suppl3.html

[260] See also Rosenthal, *Consciousness and Mind*, p.118 and 196ff for a discussion of this point.

[261] States might also be regarded as properties themselves, so that total phenomenal sates are “complex properties (sometimes called “structural universals”), e.g. (...) the state of experiencing a complex visual scene in a particular way” (Jeff Yoshimi, “Phenomenology and Connectionism,” *Front. Psychol 2*, no. 288 (2010): 1–13, here p.2.)
For the monistic representation of material physical systems via state space approaches, see Schaffer, “Monism”, pp.59/60.

between single phenomenal states and a total phenomenal state that is composed of the single ones. In order to fruitfully apply SCQ and the mereological apparatus that framed the answers to SCQ to phenomenal consciousness I further deepen this state approach in this section. In a nutshell, I conceive of the actual total phenomenal state as being composed of two or more single phenomenal states out of the set of all possible states where the set of all possible states is represented by what is called a quality space.

Preliminarily and for clarification, let us differentiate between three forms or conditions that a set of single phenomenal states can assume. First, the phenomenal world, cosmos or universe is the entirety or totality of actual single phenomenal states.[262] This total set includes all and every actual single phenomenal states, be it instantiated by you, your parrot or some other organism capable of possessing consciousness. Second, quality or state spaces are the sets of all possible single phenomenal states that are ordered or structured in some broad sense. Common-sensically, quality spaces are conceived of being subjective and individual, that is to say, one such space per organism endowed with consciousness. Yet, the notion of spaces I operate with in this section stays neutral on any compositional view. In addition to individual quality space we might also at least theoretically conceive of you and your parrot sharing one such space. For example, on some views of consciousness, there is only one all organisms encompassing consciousness. Adding the state space approach to such a view amounts to assuming a space of all possible single phenomenal states out of which the all organisms encompassing total state is the actual instantiation. Finally, a total state is the set of single phenomenal states that yields another phenomenal individual. In this introductory section, again, I stay neutral on any compositional view regarding the total state, be it, for example, universalism according to which under any circumstances all actual single phenomenal states compose a total one, or the more intuitive moderatist stance according to which only the set of actual single phenomenal states instantiated by a subject at a time do so. It is only later in this thesis that I suggest my account of phenomenal integrity. According to this moderatist stance on phenomenal composition, a total state is a phenomenal individual only under the condition of being composed of a set of single phenomenal states that are closed under a dependence relation.

In discussing quality space as state space, I choose a mathematical approach to

[262] I am not sure whether the phenomenal universe also might comprise of all possible single phenomenal states.

phenomenal consciousness. As such, quality spaces are frequently used, though in a less formally and mathematically elaborated way, as a tool to illustrate the structure of phenomenal consciousness.[263] Yet, the ways in which authors conceive of quality spaces vary. In the view of some philosophers, the denizens of this space are phenomenal properties or qualities - qualia - rather than the states that instantiate them.[264] Also, the conceptions of quality spaces, mathematical or not, differ from conceptions of how to arrive at such. For example, Carnap and Goodman devote large parts of their studies to developing a machinery to draft interpersonal quality spaces (as the starting point for the whole system of common and scientific concepts) based on an auto-psychological basis.[265,266] In contrast to this classical view, more contemporary approaches informed by empirical research, for example in neurophenomenology, let the phenomenal quality space iso- or homomorphically supervene on neuronal firing patterns and activity spaces of the brain or, another example, in integrated information theory (IIT), on informational

263 Ole Koksvik, "Three Models of Phenomenal Unity," *Journal of Consciousness Studies 21*, no. 7–8 (2014): 105–31, here p.112; Geoffrey Lee, "Unity and Essence in Chalmers' Theory of Consciousness," *Philosophical Studies 167*, no. 3 (February 2014): 763–73, here p.767; Fiona Macpherson, "The Space of Sensory Modalities," in *Perception and Its Modalities*, ed. Dustin Stokes, Mohan Matthen, and Stephen Biggs (Oxford University Press, 2014). pp.437/8 generally, p.453 for color space, also Fiona Macpherson, "Individuating the Senses," in *The Senses: Classic and Contemporary Philosophical Perspectives*, ed. Fiona Macpherson (Oxford University Press, 2011). p.37/8; Paul M. Churchland, "Some Reductive Strategies in Cognitive Neurobiology," *Mind 95*, no. July (1986): 279–309, here pp. 300/301; David M. Rosenthal, *Consciousness and Mind* (Oxford: Clarendon Press, 2005), pp.201ff; W. V. Quine, *Word and Object* (The MIT Press, 1960), p.82/83; Willard V. Quine, "Natural Kinds," in *Ontological Relativity and Other Essays*, ed. Jaegwon Kim and Ernest Sosa (Columbia University Press, 1969), 114–38, pp.125ff; Clyde L. Hardin, *Color for Philosophers: Unweaving the Rainbow* (Hackett, 1988), pp.113ff.

264 See Austen Clark, *A Theory of Sentience* (New York: Oxford University Press, 2000), chap.1 and Austen Clark, *Sensory Qualities* (Oxford University Press Uk, 1996), chap.4, specifically, for example, p.79: "A space is just a multi-dimensional order, and so for each sensory modality we will have a distinct quality space. A phenomenal property is a location within such a space."

265 Rudolf Carnap, *Der Logische Aufbau Der Welt* (Meiner Verlag, 1928); Nelson Goodman, *The Structure of Appearance* (Harvard University Press, 1951); Clark, *Sensory Qualities*, chap.4; Austen Clark, "Phenomenal Properties: Some Models From Psychology and Philosophy," *Philosophical Issues 18*, no. 1 (2008): 406–25, here p.416.

266 Universalism in this camp means that no restriction obtains on the composition of equivalence classes and (similarity-) relations between them of various orders that constitute our conceptions of properties and objects: whatever parts are present in the auto-psychological basis, they extensionally determine a further object, like properties and relations.
For the present thesis, it is almost ironic that Goodman's position remains in a footnote, since it his The *Structure Of Appearance* where the calculus of individuals, what Simons and I introduce as CEM, comes to full development, and this particular with respect to the phenomenal domain. Yet, as has been mentioned, universalism in the sense of no restriction obtaining in the grouping of qualia or Elementarerlebnisse into equivalence classes and eventually quality spaces as to ground the development of concepts is not the universalism at issue in this thesis. This is for, first, I am not discussing any phenomenal-conceptual link, as well as, second, Goodman's and Carnap's autopsychological basis would not even count as universalism in the sense entertained in this thesis because they restrict composition to a subject at a time.

relationships between probability distributions of neuronal activity states.[267] In this thesis, I stay neutral on the latter topic and, regarding the former, take phenomenal states to constitute the quality space.

To begin with, understanding the state approach to phenomenal consciousness involves moving from mere actual states to possible ones. As opposed to the actual and momentary phenomenal state that you are in, say in reading these lines and feeling irritated, the space of phenomenal states embraces all possible states your mind might adopt. In terms of change, state spaces lay out the limits of change, they are a mathematically precise way to portray and order all states that your current one might change into. Accordingly, the majority of state space approaches view phenomenal consciousness as a dynamical system and the state space itself as representing the totality of possible states inherent to conscious systems.[268] The orderly succession of certain actual total states (or configurations, as Fekete and Edelman have it) in time might then be conceived as a trajectory of phenomenal consciousness through its state space.[269] In an illustrative way, phenomenal consciousness can accordingly be mathematically viewed as a complex plane or concatenated row of vectors (see below) swaying in time along the multiplicity of dimensions that represent the various modalities of sensory experience.

So the actual total phenomenal state you are in is just one among very many that your mind, under some other circumstances, might have assumed; and a mathematical way to formalize the set of all possible states is to devise a topological space, or map, in which all of them find their place. Up to the third dimension, one can easily imagine such spaces where possible states are plotted; beyond that it gets abstract.[270] Talking of abstraction,

[267] Yoshimi, "Phenomenology and Connectionism"; Paul M. Churchland, "Some Reductive Strategies in Cognitive Neurobiology"; Giulio Tononi, "Integrated Information Theory of Consciousness: An Updated Account," *Arch Ital Biol 150*, no. 2–3 (2012): 56–90; Tomer Fekete, "Representational Systems," *Minds and Machines 20*, no. 1 (2010): 69–101. Kristjan Loorits, "Structural Qualia: A Solution to the Hard Problem of Consciousness," *Frontiers in Psychology 5* (March 18, 2014), here p.1; Wanja Wiese and Thomas Metzinger, "Desiderata for a Mereotopological Theory of Consciousness," in *Being in Time: Dynamical Models of Phenomenal Experience*, ed. Shimon Edelman, Tomer Fekete, and Neta Zach (John Benjamins Pub. Co., 2012), pp.185–209, here p.194. Juergen Fell, "Identifying Neural Correlates of Consciousness: The State Space Approach," *Consciousness and Cognition 13*, no. 4 (December 2004): 709–29.

[268] Fekete, "Representational Systems" here p.75. See also Yoshimi, "Phenomenology and Connectionism.", pp.4-8.

[269] Tomer Fekete and Shimon Edelman, "Towards a Computational Theory of Experience," *Consciousness and Cognition 20*, no. 3 (2011): 807–27. here pp.815/6. Also see Fell, "Identifying Neural Correlates of Consciousness", p.714.

[270] Cf. Richard P. Stanley, "Qualia Space," *Journal of Consciousness Studies 6*, no. 1 (1999): 49–60; Yoshimi, "Phenomenology and Connectionism"; David Balduzzi and Giulio Tononi, "Qualia: The Geom-

state space approaches are admittedly highly idealized so that it remains at least questionable whether they in fact appropriately represent the nature of phenomenal consciousness.[271] On the other hand, they offer explanatory merits primarily with respect to conceptualizing and precisifying the structure of phenomenal consciousness. This is even more the case regarding its mereological structure, as this thesis is attempting to show and as will become clearer below.

For illustration of state space approaches to subject matters, take not the mental domain, with which I am dealing in this thesis, but the material and physical domain. The physical state space that consists of four dimensions is simply a matrix against the background of which we can locate the position of a piece of matter. And if we are able to specify where and when a piece of matter exists within this space, we describe the state of that piece. For example, the physical state of your doughnut is mathematically precisely characterized by some position along some axes of the state space, that is, a certain position in each dimension: at a certain time, the doughnut on your desk is located at this degree of longitude and latitude and a certain height above the ground. In our example, the positions that your doughnut could be in varies to a certain finite degree, since it could be a bit more left or right or high: these are the possible states the doughnut can assume. The number of possible states is limited because, at least taking our physical world as the universe in question, the number of dimensions is also limited: our physical word extends only to a certain degree in a certain way and the doughnut cannot be in a position external to those dimension and their limits.

Now a state space for phenomenal consciousness works in the exact same way, just that the domain we consider is not the material but the mental one. Technically, this means that we restrict the universal and existential quantifiers of CEM to the mental domain, that is, phenomenally conscious states. Hence, the entities the position of which we are interested in are not physical objects like doughnuts or dachshunds, but states that phenomenal consciousness can assume. And these states include what it is like for you to eat a doughnut or, and this point is of importance, also the conscious states of your dachshund if he spots a sausage. The scope of the domain of conscious states

etry of Integrated Information," ed. Karl J. Friston, *PLoS Computational Biology 5*, no. 8 (August 14, 2009): e1000462; Fekete, "Representational Systems."

271 Stanley, "Qualia Space", p.49. See also Yoshimi who remains doubtful that such mathematical structures apply to phenomenal consciousness to their full extent, resulting in the view that it "could be that C has some form of semi-ordered structure" (Yoshimi, "Phenomenology and Connectionism", p.4).

comprises emphatically of all possible conscious states, and human are not the only creatures the mind of which assumes such states.[272] Bear in mind what Nagel has to say about the extent of occurrence of consciousness:

> Conscious experience is a widespread phenomenon. It occurs at many levels of animal life, though we cannot be sure of its presence in the simpler organisms, and it is very difficult to say in general what provides evidence of it. (Some extremists have been prepared to deny it even of mammals other than man.) No doubt it occurs in countless forms totally unimaginable to us, on other planets in other solar systems throughout the universe. But no matter how the form may vary, the fact that an organism has conscious experience at all means, basically, that there is something it is like to be that organism. There may be further implications about the form of the experience; there may even (though I doubt it) be implications about the behavior of the organism. But fundamentally an organism has conscious mental states if and only if there is something that it is like to be that organism- something it is like for the organism.[273]

As to relate Nagel's quote to the state space approach to phenomenal consciousness, Bayne and Chalmers characterize the synchronic total phenomenal state as what it is like to be a subject at a time.[274] So we can understand Nagel as saying, and I side with this view, that the scope of the domain of possible phenomenally conscious states comprises of the total phenomenal states and theirs constituent single states possibly occurrent in humans as well as of, as to modify the quote, "countless forms of subjects at a time totally unimaginable to us".

As to say a bit more on possibility, the set of possible phenomenal states that humans or dachshunds, or bats, instantiate varies in dependence to the different kind and set up

[272] Mathematical approaches to quality spaces differ in this respect. Yoshimi restricts his discussion to all possible human states by imposing constraints of the way a system can change (Yoshimi, "Phenomenology and Connectionism.", pp.3/4, 6/7). In contrast, Stanley discusses "the space of conscious experience of all possible brains, and not of any single brain. Thus we are considering not just all human and animal brains, but all brains that in principle might exist, however alien they might seem to us." (Stanley, "Qualia Space.", p.49). I am not in the position to assess which of these positions is stronger or more plausible. From the mereological perspective, however, every constraint, or restriction, of the domain to which it applies seems at lest questionable for mereology applies evenhandedly to all entities in a domain. Since I am discussing the set of all phenomenally conscious states in the mental domain, and since the class of creatures that are capable of assuming these states exceeds the class of humanoid creatures, arbitrarily restricting the domain to human phenomenally conscious states seems problematic, at least without further justification. Since Yoshimi does not provide such justification, I support Stanley position and consider the unrestricted set of phenomenally conscious states in the mental domain.

[273] Thomas Nagel, "What Is It Like to Be a Bat?," *Philosophical Review 83*, no. October (1974): 435–50, here p.436.

[274] "One can think of a total phenomenal state as capturing what it is like to be a subject at a time. If a subject has a total phenomenal state, there is a clear sense in which all of a subject's phenomenal states are unified within it" (Bayne and Chalmers, "What Is the Unity of Consciousness?", pp.32/3).

of the dimensions that these creatures possess. For example, the nose of a dachshund is far more capable of detecting sausages than the one of humans, and both lack the sonar sensory modality of bats. Nevertheless, the set of all possible conscious states consists of all states that all creatures principally capable of being in such states might assume. One might further specify the notion of possibility in question here, that is, whether we are talking of logical or metaphysical possibility or what have you. This, however, extends the scope of this thesis, so that I simply presuppose metaphysical possibility and hence the set of all metaphysically possible phenomenal states. And all metaphysically possible phenomenal states just comprise of all states that conscious creatures are principally capable of possessing.

Sticking to examples of human consciousness, if you are enjoying a doughnut and experience what it is like to taste exorbitant sweetness, the mental state you assume instantiates one particular phenomenal property out of finitely many in this one dimension, that is, the dimension of phenomenal taste properties; at least, you could also experience bitterness or sourness when eating rocket or lemon. Yet, since our sensory experience is capable of giving rise to far more possible sensory mental states than the mentioned taste properties, tentatively depending on the number and kind of sensory modalities, the according space of such states contains a multiplicity of dimensions. The result is what philosophers call a multi-dimensional quality space. In the course of the following discussion of SCQ with respect to phenomenal consciousness, the according state space will be successively specified by considerations pertaining to its relational constitution. Before that, let me make some more remarks on its mathematical structure.

Generally, as mentioned, a state space consists of the set of all possible states for a system, "set of ways a system could be."[275] More formally, a space in the mathematical sense is a set of points under some structure. And each point in this space represents one possible state that the system can assume. For example, if you imagine a pitiable simple creature that is only conscious of shades of red, the corresponding quality space is one axis consisting of points each of which represent one possible state of the creature instantiating a phenomenal property of what it is like to experience a certain shade of red.

To delve a bit deeper into the mathematical structure of state spaces, various ways are open to conceive of the kind of structure under which the points are ordered. If we view state spaces as metric spaces, each point is associated with a number. The advantage of

[275] Yoshimi, "Phenomenology and Connectionism", p.2. See also Stanley, "Qualia Space.", p.49.

this conception is that such structure reveals the proportion of the points in a dimension, for example how distant they are to each other.[276] To see that, just consider pairs of points that correspond to numbers. Imagine that the various shades of phenomenal red correspond to numbers, beginning with bright shades being denoted by lower numbers and dark shades by higher numbers. Now if you consider a pair of numbers the exact distance between two shades become apparent: point 3 and point 46 are distant to each other to some exact degree, 43, and so are the two shades of phenomenal red. The distance between two phenomenal properties is predominately captured by similarity relations to the effect that the quality space represents more or less similar possible states of a conscious system.[277] Be this as it may, the point here is that state space are often held to be metric spaces.[278]

Also, vector spaces are a common candidate.[279] The main advantage of a vector space, for the purpose of mapping states, is that vectors facilitate dimensions. So the quality space of some less sensorily handicapped creature includes not only shades of phenomenal red but also allows for tastes or echolocation-phenomenality. Formally, in multi-dimensional vector spaces, R^n, every vector is located within a dimension as a space. So a R^3 vector space is constituted by three dimensions each of which encompasses the spatial scope of one vector. For example, if the conscious state space

[276] See Stanley, "Qualia Space" who introduces metric spaces as a subcategory of topological spaces. He later specifies that qualia space is a metric/topological space that is separable, that is, contains a countable dense set. This means that if we have a list of possible states, whatever further state we imagine, "is as close as we want" to one of the given states (Ibid, p.57). Fekete specifies that the kind of metric topological structure that facilitates the determination of distance between two points on line or curved space of this structure as geodesic (Fekete, "Representational Systems", p.72). Also, see Clark, *A Theory of Sentience* p.4; Goodman, *The Structure of Appearance*, p. 194, 212; Daniel Cohnitz and Marcus Rossberg, "Nelson Goodman," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Spring 2016, 2016, http://plato.stanford.edu/archives/spr2016/entries/goodman/, p.119.

[277] This picture is mostly based on a relational understanding of the similarity relation. See for example, Clark: "A quality space is an ordering of the qualities presented by a sensory modality in which relative similarities among those qualities are represented by their relative distances. Qualities that are relatively similar to one another are closer to one another than are qualities that are relatively less similar. (…) The root relations that define this structure are not causal ones; they are relations of qualitative similarity. (…) [Q]ualitative character is a relational affair. Qualitative properties seem to be intrinsic properties, but they are not. When one sees a patch of orange, the experience seems to involve an intrinsic monadic quale: the quale orange. But this experience is an illusion. The facts in virtue of which that experience is an experience of orange, and not of some other quality, are all relational facts." *Clark, A Theory of Sentience,* p.4. See also Loorits, "Structural Qualia", p.4: "[I]individual qualia are defined by their location in the complex multidimensional qualia space (or simply, by their similarity and dissimilarity relations with other qualia)."

[278] Yoshimi, "Phenomenology and Connectionism", p.2. Fekete, "Representational Systems", specifies the metric structure of the quality space and its neural correlates it is structurally isomorphic to as Riemannian (pp.72, 75-77, 83, 89). Stanley, "Qualia Space", p.50.

[279] Among others mentioned below, see Fell, "Identifying Neural Correlates of Consciousness.", p.714.

of our enhanced creature is viewed as a R^3 vector space, it might include states that instantiate phenomenal properties of the shades of red, taste and echolocation dimension.

Another advantage of vector spaces is that its constituents, the vectors, can be added.[280] This is to the effect that the addition of the vectors representing a possible state in each dimension yields a complex possible state, the product, and "we can think of the represented possibilities as being "built up" from constituents in lower dimensional spaces."[281] For an actual total conscious state of our creature this means that the latter is a combination of more elementary states. Generally, for the reason of the combination of elementary states into total states, state spaces as vector spaces also allow for hierarchies of states where the total state is composed of more elementary states that might be themselves combinations of even more lower level states.[282] For its combinational and compositional nature, to anticipate, vector spaces are a natural fit for a connection with a mereological approach to phenomenal consciousness and the according SCQ. One further feature of vector spaces pertains to the scalar multiplication where we can imagine to multiply the intensity or amplitude of a phenomenal state by a real number.[283] This way, the vector quantifies the intensity of each possible phenomenal state, say, from what it it is like to feel slight to excruciating pain.

Conceiving of state spaces as a combination of metric and vector spaces reveals full descriptive potentiality. Here the numbers in a metric spaces correspond to what in a vector space is called a scalar to the effect that each vector represents an exact magnitude associated with a number. Now also consider that single vectors can be added to form a complex multidimensional vector. Combined with the metric form this space gives rise to the set of all possible n-tuples of numbers that stand for the vectors in each dimension, that is, to all possible total states with precise magnitude.[284] For

280 Stanley, "Qualia Space", p.52-54.

281 Yoshimi, "Phenomenology and Connectionism.", p.2.

282 Ibid, p.10. Fekete and Edelman, "Towards a Computational Theory of Experience." p.812 for hierarchies in conceptual structure that is based on an according structure in neural activity space.

283 See Stanley, "Qualia Space", p.54/5, for a discussion.

284 Stanley holds that the quality space has infinite dimensions. This is for, if we consider not only the actual human but all possible consciousnesses (or brains, as Stanley has it, since he argue based on neural correlates of consciousness) we can consider all sort of modalities and their set up resulting in an infinite number of dimensions. For example, as opposed to human visual experience consisting of three color receptors and hence three dimensions in quality space, it is also at least conceivable that some creature possesses receptors for a multiplicity of wavelength, resulting in an according multiplicity of dimensions; and this is only considering one subspace of one modality (for a discussion, see Ibid., p.56. Fekete also bases the dimensions of the qualia space in an isomorphic way on the neural corre-

example, our R^3 case is a three dimensional metric vector space consisting of all possible states that our creature can assume. Each possible total state can be represented by an added (or connected) vector that is a triple composed of the single possible vectors in each dimension, here seeing red, taste and echolocation. In other words, in this vector space we can precisely mathematically plot all possible total states.[285]

Also, the metric aspect of this metric vector state space facilitates to determine the exact distance between any two possible states: "If a set of possibilities is represented by R^3, this implies that we can say how similar any two possibilities are, and that we can think of any possibility as a combination of three constituents, each of which can itself be represented by a point in a line."[286] And if we further combine scalar multiplication with this addition of vectors, viewing quality space as a metric vector state allows for determining similarity relations between sets or additions of single possible spaces of various amplitudes or intensities. For example, if you simultaneously experience an intense scotch and loud blues music, this set will be more similar to a set of states where you drink a less intense scotch and are listening to moderate volumed blues than to a set of states that you assume if you drink cherry coke and enjoy Britney Spears.[287]

Mereology and Phenomenal Consciousness

As was mentioned above, SCQ in its general metaphysical form is intended by Inwagen to discuss the occurrence of composition with respect to our concrete and medium-sized dry objects. Nevertheless, the question is phrased in such a general way that there are no reasons to restrict its domain to our familiar concreta. Abstract objects like numbers and propositions, in the opinion of most, are also complex entities with respect to which the question is justified about the way, and if at all, they are composed of parts. Likewise, the answers to SCQ are commonly exemplified by ordinary objects as tables and tennis balls, but also here there are no reasons to restrict the domain to which these answers apply. For example, according to the majority view, CEM and hence universalism, any set of individuals compose a further individual where the ontological

lates, yet stays neutral with respect to the dimensional number or infiniteness (Fekete, "Representational Systems.", pp.88, 98).

285 Stanley is more specific and regards qualia space as a "closed pointed cone in an infinite dimensional separable real topological vector space" (Stanley, "Qualia Space." pp.49, 52-55). Since elaborating the specifics extends the scope of this thesis, however, simply conceiving of phenomenal consciousness as a vector space is sufficient.

286 Yoshimi, "Phenomenology and Connectionism",p.2.

287 Stanley, "Qualia Space.", p.55.

status of what counts as an individual is not specified. Hence, any set of material parts composes a further concrete object in the same way as any set of numbers compose another number. Likewise regarding the entire logical space of answers to SCQ. Now, generally, the aim of the second part of this thesis is simply to apply SCQ and its answers not to the material or abstract domain but to the mental one, specifically to phenomenal consciousness as specified in the introduction of this section. In that way, van Inwagen's Special Composition Question (SCQ) becomes, as will be specified below, the Special Phenomenal Composition Question (SPCQ).[288]

Based on this specification, the domain of SPCQ and its answers is the set of all possible phenomenal states in the world. I mentioned the scope of the domain of SPCQ already in the part about the state space approach to phenomenal consciousness but let me emphasize this fact further with respect to possible answers to SPCQ. Depending on the answer one entertains the results of the applying SCQ to the mental domain yields far reaching results. For illustration, assume that universalism about phenomenal consciousness is true. As will be elaborated below, this means that you are of the opinion that any set of single phenomenal states compose a total phenomenal state. And "any" phenomenal state includes Cesar's fear of getting killed by Brutus and yours of what it is like to eat a doughnut. This is to the effect that both together compose another total phenomenal state. One might very well hold that, this is just to say that one should be clear about the fact that the set of phenomenal states that SPCQ and its answers apply to actually include all formerly, currently and future phenomenal states. And only few authors are aware of this fact. For example, it seems dubious and comes close to cheating that Bayne and Chalmers restrict the domain of phenomenal states to which their Unity Thesis applies from the outset to a subject at a time. This is because the actual challenge is to give an account of how your current total phenomenal state is composed of the set of single phenomenal states it is in fact actually composed of instead of being composed of some other set out of all other possible ones, that is the set of phenomenal states of whatever subject at whatever time. More on this below.

Before we delve into the logical space of answers to SPCQ, one might doubt that mereological considerations generally are fruitful for consciousness studies or that it

[288] For a very simply analogy, compare mereology to math: Same as one and one equals two irrespectively of adding pan cakes, propositions, or phenomenal states, also mereological principles that govern parthood relations apply to all metaphysical domains.

makes sense at all to apply the mereological machinery to phenomenal consciousness. What theoretical advantages accrue from such an approach and does it yield any substantial theoretical contribution to our understanding of and tells us something new about phenomenal consciousness? At least, or so one might argue, knowledge of the conditions under which the various parts compose my motorbike does not help me to understand two-wheeled locomotion or to learn how to drive.

However, the important the understanding of functional aspects and properties of entities might be, another essential feature of any given object is its structure. And here mereological approaches are of help in specifying and providing logically precise conceptualizations of the structure of phenomenal consciousness. The various answers to SPCQ to follow below vary considerably in positing what it is to be phenomenally conscious and which predications should be part of a real definition of phenomenal consciousness. For example, if we conceive of conscious experience as being identical to integrated information, as Tononi and others do, then the conception of consciousness essentially involves, generally, being a complex entity, that is, consisting of parts, and specifically that these parts are functionally differentiated as well as informationally integrated.[289] Or take theories according to which a structural homeomorphism obtains between neural activity state space and phenomenal state space that results in a structure of phenomenal consciousness that is constituted by phenomenal relative similarity relations.[290] Understanding consciousness to be mereologically structured in these ways is a substantial contribution to consciousness studies since such approach dissents with an array of other theories, for example, to invoke a rather extreme case, like Tye's "one-experience view" according to which conscious experiences does not even consist of parts.

The positions that evolve in the following sections as answers to SPCQ relate to a certain degree to views present in the literature of philosophy of mind. Hence, where possible, I discuss existing views in the light of SPCQ. These views have all in common that they concern the composition or constitution of phenomenal consciousness and hence are all mereological or compositional in a broad understanding of the terms. However, they do not relate to each other. This is to say, that they neither, or only exceptionally, operate with the same notion of composition and mereology; they all more

[289] Cf. Wiese and Metzinger, "Desiderata for a Mereotopological Theory of Consciousness.", here p.193/4.
[290] Cf. Ibid, 194.

or less entertain varying as well as sometimes loose understandings of what it is for a total state or individual consciousness at a time to be unified or composed of single phenomenal states. Nor, or also only in exceptional cases, are these views interconnected; they all develop or defend their compositional views largely independently of each other. The present thesis attempts to meet both predicaments. Answering SPCQ can be viewed as opening up a new systematic. By way of the following views all being answers to SPCQ they are all embedded into one logical space of positions and hence are put into relation to each other. Furthermore, for answering SCQ and the corresponding SPCQ, I employ one common logical and precise mereological methodology. The resulting advantage is, on the one hand, the precisification of the debate; as opposed to operating with rather loose understandings of the notions of part and whole, both concepts are neatly defined and operated with based on CEM as an axiomatic system. On the other hand, the common basic mereological apparatus results in a streamlined terminology for compositional theories in the study of consciousness; besides being interrelated by participating in the same systematics as answers to SPCQ, the subsequently mentioned views can also be brought to bear on and to enter into discourse with each other based on one common axiomatic mereological system.

II.1. The Special Phenomenal Composition Question

With respect SPCQ, we can proceed in the same way as with respect to the conventional SCQ. That is to say that, for the reason mentioned above, I omit to discuss something like the general phenomenal composition question. Moreover, a phenomenological way of putting the general composition question is a non-starter, since the general composition question solely concerns the general nature of composition in itself, intensionally, so to say, to the effect that specifying conditions for particularly phenomenal composition, in an extensional fashion, misses the point of conceptualizing compositions general nature.

The special composition question, in contrast, can very well be brought to bear on the phenomenal domain since it asks for circumstances under which, if at all, single phenomenal states compose a total phenomenal state. In accordance to the traditional SCQ we thus can put the SPCQ as follows:[291]

> *The Special Phenomenal Composition Question (SPCQ)*
> When is it true that there is some total phenomenal state such that the single phenomenal states compose it?
> or more formally, where $[T]^{Ph}$ is the total phenomenal state and $[x]^{Ph}$ the single phenomenal state:
> When is it true that $\exists$[T] such that the $[x]^{Ph}$s compose $[T]^{Ph}$?

The same logical space of positions as answers to SPCQ come into consideration. Compositional extremists about phenomenal consciousness likewise divide into phenomenal nihilists and phenomenal universalists. The compositional nihilist about phenomenal consciousness holds that it is never true that there is a total phenomenal state such that a set of single phenomenal states composes it whereas the universalist holds the diametrical opposite, namely that it is always true and no restriction on phenomenal composition obtains.

In contrast, the compositional moderatists about phenomenal consciousness impose some restriction on phenomenal composition by positing principles of phenomenal unity.

[291] Cf. Goff for a less formal discussion of this question in the debate revolving around panpsychism. Philip Goff, "The Phenomenal Bonding Solution to the Combination Problem," in *Panpsychism*, ed. G. Brun-trup L. Jaskolla (Oxford University Press, forthcoming), sect.VII.

With its two versions, monism cross-matches the camps. Phenomenal existence monism rejects composition and hence is part of the extreme nihilist camp whereas phenomenal priority monism involves a considerable holistic aspect that places it amongst the moderatists.

II.2. Phenomenal Universalism

Basically, Phenomenal Universalism (PU) and hence the answer "always" to the expounded SPCQ means to apply the entire apparatus of CEM exposed in the first part of this thesis to the domain of phenomenally conscious states. Otherwise, this label is not legitimate. In the course of the following discussion we will see that viewing phenomenal consciousness in the light of CEM has quite some indigestive consequences and, probably based on that fact, some positions called PU appear in an acceptable garment only based on the fact that they peculated some parts of CEM in the application to the phenomenal domain, and hence do not actually deserve to be called PU. To anticipate, with respect to positions other than PU I differentiate between strict and loose versions of these positions where the loose ones are characterized by an incomplete application of the mereological apparatus.

In what follows, and based on my exposition in part I.2.b., I partition CEM in its two major principles, that is, the Principles of Unrestricted Composition (UC) based on the General Sum Principle (GSP) as well as the the principle of Uniqueness of Composition (UqC) based on the the extensionality principle (E) and discuss its according phenomenal versions.[292] So if we apply CEM to phenomenal consciousness the resulting position PU entails the principle of Unrestricted Phenomenal Composition (UPC) as well as the principle of Uniqueness of Phenomenal Composition (UqPC). I also said in the first part, roughly, that UC guides the existence conditions of sums whereas UqC is concerned with its identity conditions. In the same vein, the following discussion focuses on the condition of existence as well as identity of what we might call a phenomenal sum.[293]

But before we do that let us state PU, UPC and UqPC in precise way. To start with, PU amounts to the following:

> *Phenomenal Compositional Universalism (PU)*
> It it always true that there is a total state such that a set of single phenomenal states composes it.
> Let $[x_1]^{Ph}$, …. $[x_n]^{Ph}$ be a set of single phenomenal states. Also, let [T] be the total state. Then $[x_1]^{Ph}$, …., $[x_n]^{Ph}$ always compose

[292] Again, UC and UqC are Lewis' formulations that equal Simons' GSP and E.

[293] For the sake of brevity I exclude the equivalently used notion of fusion and hence the concept of phenomenal fusion in the subsequent discussion.

[T].

In terms of mereological sums: It is always true that $\exists[T]^{Ph}$ the x^{Ph}s compose [T].

As was remarked in the first part, universalism as an answer to SCQ is not unconditionally conceptually connected to CEM and its GSP. This if for summing but not composition allows for the overlap of parts. This difference will be of minor importance for the discussion of the (im)plausibility of UPC below, but for the sake of precision I differentiate PU as the overall position that results if CEM is generally, that is, including its two core principles UC and UqC, applied to the phenomenal domain from UPC specifically concerned with the existence conditions for sums and as the resulting pendant to UC. So the precise statement of UPC specifies UP by adding the condition of non-overlap:

Unrestricted Phenomenal Composition (UPC):
Necessarily, for any non-overlapping set of single phenomenal states, there is a total state such that it is composed of the set of single phenomenal states.

As mentioned, UPC is just Lewis' colloquial formulation of Simon's axiomatic E in CEM. In what follows, I treat E, UC (and CAI) as well as their phenomenal equivalents interchangeably.

UqPC is the phenomenal sibling of UqC and reads as follows:

Uniqueness of Phenomenal Composition (UqPC):
If the set of single phenomenal states composes total state X and total state Y, then total state X and total state Y are identical.

In more colloquial terms, the principle holds that total states with any shared set of single states are identical. Since this principle concerns the identity conditions for phenomenal sums, I will return to this topic below.

Let me pose a remark on the dialectics. In the first part we have seen that, although many authors regard CEM as implausible for not being applicable to ordinary objects in the physical domain, universalism still is the majority view. Sure, for example focusing on UC, sums have extremely undemanding existence conditions: whenever and wherever parts exist, they form a further individual. But according to the universalist, even if we do not regard entities the parts of which are temporally and spatially extremely scattered as individuals, given the most precise and cohesive mereological theory at hand, we have to accept their existence. And here lies exactly the main asset of CEM: first, it is just too good as a theory, and second, the theories that pay tribute to our common sensical intuitions are just too bad. So, it seems to me, a large part of support for CEM stems *ex negativo* from the fact that its opposing theories do not get off the ground or are beset with problems like the beforehand mentioned vagueness objection. As a result, despite its anti-intuitional aspect, for its theoretical virtue of neatness and precision, CEM is preferable over its rivals. But this dialectical situation also means that CEM would stand on weaker footing if a theory reaches a similar level of theoretical virtue and at the same time satisfies our intuitions that composition obtains in the case of our familiar ordinary objects and does not obtain when parts are highly spatially or temporally scattered.

The dialects are the same with respect to the phenomenal domain. As it stands, if CEM is applied to phenomenal consciousness, we should accept its result even if utterly demanding for our pre-philosophical intuition. This is for we have to respect its theoretical virtues. However, in case there would be a rival that is similarly precise and vagueness-free, this rival is to be favored over CEM for its combination of theoretical virtue and plausibility. In what follows below under the section “Moderatism”, I shall propose such theory. Yet, in what follows in this section, I shall simply lay out the implications of PU based on UPC and UqPC which suggest its implausibility. But given the nature of the implications PU's implausibility almost comes for free and hence pointing them out resembles argumentational cheating. Also, as I have said, the implausibility alone is no reason the reject PU.

Before I illustrate the full extent of PU and how the few current approaches that entertain this position fail to realize its ramifications, let me criticize PU, as in the first part of this thesis, based on two more specific aspects of the nature of phenomenal sums concerning their existence and identity conditions that stem the two respective principles

of PU, namely UPC and UqPC. I start with existence conditions and UPC followed by identity conditions based on UqPC.

II.2.a. Unrestricted Phenomenal Composition (UPC) and Existence Conditions for Phenomenal Sums: Structure

As I mentioned in the first part when I discussed the criticism launched against UC, I said that this principle is intimately conceptually connected to existence conditions. This is because the principle guides the conditions under which parts compose and yield another individual and essentially postulates that there are almost none of such: under almost all conditions and unrestrictedly do the parts compose another individual, the notorious sums. Furthermore, in the part about moderatism, the position that results from the criticism of UC, I showed that principles of unity are a proposal to constrain the conditions under which composition occurs. And one specification of principles of unity are structures. To cut the long story about restrictions of composition, existence conditions, and structure short: compositional universalism for a domain is to hold that the individuals in this domain are subject to unrestricted composition such that no substantial restriction obtains for the coming about of further complex individuals. Since restrictions of composition include structure, we can also say that being an universalist about a domain is to hold that complex individuals of that domain are devoid of any structure. As to put it a bit more careful, complex individuals might exhibit some structures, or realize them, but the structure is in no way a condition for the existence of that individual, but rather accidental or coincidental. Like if scattered pebbles that you throw on the ground just coincidentally form a smiley: it was not your intention to restrict the formation deliberately such that the smiley came about, it just happened to be that way.

In the same vein, now focusing on the mental domain, PU entails holding that phenomenal consciousness has no structure (besides the negligible accidental one). This is for structure is a case of principles of unity and restricts composition, which in turn contradicts PU. In the light of the fact that, according to PU, phenomenal consciousness has no structure, how plausible is this position? Given the picture of a structure-less phenomenal consciousness, it seems to me that the implications of PU and UPC are hard to swallow and hence that universalism is implausible and to be rejected in the

phenomenal domain. Let me elaborate.

When we consider phenomenal consciousness as quality space, the implausibility of it lacking any structure becomes even more apparent. In mathematics, a structure-less space is called a discrete space where a discrete space consists of isolated points. So considering the state space approach, how do we have to conceive of phenomenal consciousness as a discrete space? The absence of order in the quality space might be at least slightly conceivable with respect to the order of dimensions that represent the various sense modalities. Here establishing any order in quality space seems a difficult undertaking since there are no reasons to assume that, for example, taste is located closer to vision than to echolocation. However, if we focus on single sense modalities the corresponding dimensions in quality space clearly exhibit some structure. Take vision as a quality space, where the dimensions are ordered along axes of hue, saturation and brightness resulting in the well-known color-space. Also incorporating the metric form of the state space, which allows us to determine the relative similarity and differences of various spaces based on quantitative measurements, this universalist picture amount to the non-obtaining of any difference between states from any two dimensions. For example, we could not hold that dark blue is more similar to, that is, metrically closer in the colors space to, dark red than bright yellow. The same situation results one-dimensionally with the metric order of points on a line or space associated with only one sensory spectrum, say, certain shades of red. Here also the universalist picture amounts to the impossibility of determining any similarities or differences between certain shades resulting in saying that dark red is as similar or not to light red and medium light red.[294] Putting it all together, holding that, in the absence of any structure or order such as distance between states in the space, dark blue is not more similar to dark red than to the taste of a doughnut, seems an overly costly implication of PU.

Moreover, consider that, according to the state space approach, your current total phenomenal state is a complex "snapshot", represented as a complex added vector, composed of a set of certain actual single phenomenal states, associated with one vector in each dimension, out of the set of all possible phenomenal states in quality space. Hence, if the quality space is devoid of any structure, say the set of spatial or similarity relation, so would be your actual total phenomenally conscious state resulting in "various thoughts are buzzing around with some kind of togetherness, but without any sort of

[294] Cf. Stanley, "Qualia Space", p.50.

'betweenness', nearness, or any other spatial relation to each other."[295] Note that "togetherness" here is to be understood in a thin meaning of phenomenal summation as discussed below, that is, not involving any substantial relations among the single states. The notion of togetherness can also be conceived under some thick conception as to posit the spatial relation of colocation or proximity. However, this understanding is not meant in the quote because nearness and the like is excluded. Let us now turn to objections against PU based on its principle UqPC.

II.2.b. Uniqueness of Phenomenal Composition (UqPC) and Identity Conditions for Phenomenal Sums: Kind Properties

As mentioned before, UqPC holds, colloquially put, that it is never the case that the same set of single phenomenal states yields two different phenomenal sums. In the first part, we have seen that UPC and E are problematic in the light of what we called difference-makers, viz. properties that render two individuals non-identical despite the fact that they are composed of the same set of parts. As mentioned, one candidate for such difference-maker are kind or sortal properties. We can launch the same objection in the phenomenal domain: if two total phenomenal states that are composed of the same set of single phenomenal states are non-identical based on such properties, then PU and one of its core principles UqPC are in trouble. In order to discuss this objection, I invoke the central kind property of *being phenomenal.* As I mentioned in the first part of this thesis, the point in this section is not so much that two total states are non-identical because they instantiate different sortal properties but based on the fact that sums, phenomenal or not, are kind obliterating and hence do not instantiate any sortal or kind properties at all that would be constitutive for their identity. Since in the view of almost all philosophers total states are themselves phenomenal, viewing those states as phenomenal sums based on E and UqPC is highly implausible since the latter omit the core identity condition of those states. For example, listening to blues, drinking scotch and smoking tobacco yields a total state in its own right exactly because experiencing all these pleasurable things together results in a conjoint phenomenality on its own, over and above the disjoint phenomenalities of the composing single phenomenal states. However,

[295] C.J.S. Clarke, "The Nonlocality of Mind," Journal of Consciousness Studies 2, no. 3 (March 1, 1995): 231–40, here 233. This quote is taken from Yoshimi, "Phenomenology and Connectionism", pp.6/7, where he also discusses ramifications of a structure-less conscious experience based on Husserl.

E and UqPC do not account for such kind property that is constitutive of the total state for being itself phenomenal.

In order to be clear about the role kind properties play or do not play as identity conditions for phenomenal sums in PU based on UqPC, let us differentiate sums from other possible individuals. For doing that, I first briefly return to general mereological metaphysics. The following list of individuals or totalities is a suggestion to differentiate between modes of composition with respect to the resulting totalities. That also means that I do not argue much for it, and hence do not include this list in the first part of the thesis where it systematically would belong. The following list is just a heuristic tool for a better understanding of which identity conditions phenomenal sums do or do not possess. Let us start with general metaphysics and possible totalities in response to various answers to SCQ. We can differentiate between four kinds of totalities that correspond to different modes of compositions and hence positions in response to SCQ:[296]

Simple Total State

A totality that is not composite and does not consist of single parts. Since this entity is an (extended) simple, no composition obtains. So this totality results from an extreme and monistic stance towards SCQ. Since no composition obtains, also no question arises as to whether the totality instantiates some upper level property that renders it non-identical to the set of parts and therefore would violate CAI or UqPC. Simple totalities just instantiate the properties they do independently of any mode of composition.

Complex Total State

A totality that is composite and does consist of parts. Complex totalities involve composition, but just being a complex totality stays neutral on the question about whether some additional condition for composition has to be satisfied. Hence, universalists and moderatists are still on board and the validity of CAI and UqPC remains undecided.

[296] The notion of a whole, that is close in meaning to the one of a totality, I reserve for properly integrated and/or unified entities that instantiate an upper or top level property.

Mere Conjunctive Total State

A complex totality that itself does not instantiate some upper or top level property, but is a sum of its single parts. This kind of totality is genuine to the universalist answer to the SCQ, since, additional to being a complex, no condition restricts composition. Therefore, mere conjunctive totalities are the ones that follow from CAI and UqPC as essential ingredients of compositional universalism.

Kind Total State

A complex totality that is of a certain kind, that is, one that itself instantiates some upper or top level property. This kind of total state is genuine to the moderatist answer to the SCQ, since, additional to being a complex, composition obtains only under some condition resulting in the instantiation of some upper level property. Kind totalities violate CAI and UqPC for the resulting individuals instantiate a property that can render non-identical two of them that are composed of the same set of parts.

Now, analogous to totalities in general mereological metaphysics, let us differentiate between four kinds of total states in the phenomenal domain that correspond to different modes of compositions and hence positions in response to SPCQ.

Simple Total State

A total state that is not composite and does not consist of single states as parts. Since this state is a (extended) simple, no composition obtains. So this total state results from a extreme and monistic stance towards SPCQ.[297] Usually, this total state is said to instantiate the higher order or upper level kind property of *being phenomenal*. We find candidates for such total states in Tye's one-experience view and Carnap's Elementarerlebnisse. Yet, CAI and UqPC are not of issue here since phenomenality as a total state kind property is instantiated independently of composition.

Complex Total State

A total state that is composite and does consist of single states as parts. Being a

[297] I exclude the total state that would result from nihilism proper, that is, a total state that consists, but is not composed, of single ones that are arranged in a certain way as to, in our case, result in a total state that instantiates the phenomenal kind. This position seems to me to be rather obscure with respect to phenomenal consciousness.

complex total state just means this, consisting of parts and involving composition, no more, no less. So positing it stays neutral on the questions about whether some additional condition for composition has to be satisfied or not and whether total-state-phenomenality is instantiated. Hence, universalists and moderatists are still on board and the validity of CAI and UqPC remains undecided. Except the monistic views, all accounts of phenomenal composition, more or less explicitly, involve complex total states.

Conjunctive Total State

A complex total state that does not instantiate the higher order kind property of phenomenality, for being a sum of its single parts.[298] Note that the mere conjunctive state, analogous to sums in mereology, is an individual or totality in its own right and hence to be differentiated from the set or series of single phenomenal states. In the mental domain, I introduced the label phenomenal sum for this individual. This kind of total state is genuine to the universalist answer to the SPCQ, since, additional to being a complex, no condition restricts composition and also results in no instantiation of some upper level property.[299] Therefore, mere conjunctive totalities are the ones that follow from CAI and UqC as essential ingredients of compositional universalism.

In the context of these conjunctive total states or phenomenal sums, let me further elaborate on the operation of summing or adding that yield such mental individuals. According to CEM in general mereological metaphysics, the operation of summing does not amount to some substantial or material relation. And substantial or material relation here means excluding trivial relations like *being part of the same sum or superordinate entity*. We can see that based on the existence conditions for sums: the existence of the parts fully suffices to bring about sum-individuals and nothing more is required, including

[298] Cf. the section "Sortal Properties" in this thesis and the quote from Sattig in part one of this thesis. Also cf. Koksvik and his "No-Context-Dependence View", where the character of overall or global experience results from simple 'addition' of the characters of individual experiences" (Koksvik, "Three Models of Phenomenal Unity", p.112).

[299] Probably I would have to more careful here and claim that mere conjunctive states do not instantiate any upper level property connected to consciousness. This is because in the debate about group minds, where group minds or group mental states are such that they are composed of sets of mental states or whole minds as proper parts, for example, Rupert holds that the collective state does not instantiate the property of being conscious but might very well possess some other representational property over and above the one of the constitutive single mental states or minds (Robert D. Rupert, "Minding One's Cognitive Systems: When Does a Group of Minds Constitute a Single Cognitive Unit?," *Episteme 1*, no. 3 (2005): 177–88, here p.178).

any kind of relation. If we would add relations to the existence conditions, we would impose restrictions on composition and hence leave the universalist camp towards moderatism. In the same way we should view the operation of summing or addition in the mental domain. That is to say that among the existence conditions of phenomenal sums nothing more is to be found than the existence of the single phenomenal states, hence, also no relations at all. The notions of summing and adding is nothing more than the linguistic means to denote an operation of combining a set of subordinate entities under a common superordinate entity resulting in a strict partial ordering; and this operation is independent of any relation that obtains among the members of the set.

To be specific, the sets of phenomenal states composing into a phenomenal sum are not related *phenomenally*. That is to say that they might be very well related by some other "binding that causes both sensations to be apprehended by a single mind."[300] But this relation between two single phenomenal states, perhaps a relation amounting to what Bayne and Chalmers call subject unity, is independent of forms of relations that obtain in the phenomenal domain.[301]

On the other hand, we should not reject phenomenal summing and addition altogether, even if it is hard to grasp what these operations amount to. As an example of such premature rejection of unrestricted phenomenal composition, see Tononi:

> If two people experience each a different conscious state in two different rooms, the information to which each person gains access depends only on the repertoire of conscious states available to that person. A superordinate consciousness associated with the joint states of two different people considered together is an absurd notion, because the states of the two people are not integrated."

Well, that might be so, but only on the assumption of the truth of Integrated Information theory (IIT). But IIT is a too narrow of a foundation as to assess the scope of phenomenal composition. As we have seen, in the light of mereology and the according phenomenal composition, we should at least initially be open to consider modes of composition that involve mere summing and addition. This is particularly so since phenomenal sums, as obscure they might seem, are the majority position if we apply CEM consequently to the phenomenal domain, given that unrestricted composition is the predominant view in general metaphysics and CEM. So a total state composed by

[300] Stanley, "Qualia Space", p.53.
[301] Bayne and Chalmers, "What Is the Unity of Consciousness?", p.26.

summing or addition of two joint states of different subjects is far from absurd according to PU; we have to anticipate its existence, even if we subsequently reject this option as implausible.

Stanley shows how far we have to go in conceiving what unrestricted phenomenal composition and summing or adding single phenomenal states amounts to. As opposed to Tononi, who already rejects the summing of two conscious states of two independent human subjects, Stanley rightly does not even hesitate to consider the addition of two states of two creatures even more diverging:

> For instance, suppose that p is the visual experience of a human enjoying a beautiful mountain sunset. Let q be the visual experience of a frog who is about to catch a fly on his or her tongue. What should be the sum p + q?[302]

The answer to the final question, according to Stanley, depends on whether or not the two experiences appear in the same visual field. If they do, then we might be able to imagine a more intuitive relation among the two states associated with the experience like the two phenomenal colors red and yellow merge resulting in phenomenal orange. But this is not the point here. The point is to admit way less common-sensical totalities into our phenomenal ontology. In case the two experiences, like the ones of the human and the frog in the quote above, belong to two totally different and independent visual fields or minds, then we should be ready to conceive of the resulting sum as nothing over and above a mental individual "p in the human consciousness and q in the frogs consciousness." That is to say, a total state resulting from, as the "and" already indicates, an operation of mere summation. And this is exactly what PU as an answer to the SPQC amounts to.

Yet, often the relation-less nature of summation and addition involved in the conception of phenomenal sums is not explicitly stated, or possibly not even apprehended. In the attempt to illustrate such operation in the phenomenal domains, some authors resort to notions of simultaneity, contemporaneousness, jointness or colocation within one phenomenal field.[303] Those notions appear to denote substantial

[302] Stanley, "Qualia Space", p.54.

[303] For example Bayne and Chalmers "quasi-mereological" approach to the unity of consciousness (Bayne and Chalmers, "What Is the Unity of Consciousness?"). Or, in phenomenal consciousness conceived as a quality space Q, see Stanley: "Let us consider addition first. If p and q are two points in Q, then we define p + q to be the phenomenal state obtained by experiencing p and q simultaneously" (Stanley, "Qualia Space."). For jointness, see Tononi, "Consciousness Differentiated and Integrated," in The Unity of Consciousness, ed. Axel Cleeremans. Oxford University Press, 2003, p.254.

temporal or spatial relations among the single phenomenal states. But this is a conflation for, mereologically speaking, simply summing or adding single phenomenal states primarily means to subordinate them under some "umbrella-entity", the total state. In order not to confuse these understanding of conjunction, summation, addition and the like, we might tentatively differentiate between two understandings of these notions. Furthermore, based on the first part of this thesis, we additionally can connect these notions with answers to SPCQ (henceforth, I use the nothing of summation as including conjunction and addition). So we get a thin and a thick notion of phenomenal summation:

Thin Notion of Phenomenal Summation

An operation of subordination of a set of single phenomenal states under the superordinate total state that does not involve any substantial relation among the set. Hence, this operation does not restrict composition and is associated with PU. Accordingly, the resulting superordinate total state does not instantiate any property itself.

Thick Notion Phenomenal Summation

An operation of subordination of a set of single phenomenal states under the superordinate total state that does involve some substantial relation among the set. Hence, this operation does restrict composition and is associated with phenomenal compositional moderatism (to be specified below). Accordingly, the resulting superordinate total state does instantiate some property itself.

Reaching the thick notion of summation is a perfect transition to the fourth kind of total state, since this is exactly the superordinate individual that results from such operation.

Total Phenomenal State

A complex total state of the phenomenal kind, that is, one that itself instantiates the upper or top level property of phenomenality. In its complex form, this kind of total state is genuine to the moderatist answer to the SCPQ, since composition obtains only under some condition resulting in the instantiation of some upper level property. Kind total states violate CAI and UqPC for the resulting total states instantiate a property that can

render non-identical two of them that are composed of the same set of single phenomenal states.

Coming back to categorizing phenomenal sums based on the differentiations carried out above, as the result of composition based on PU they follow the respective principles of CAI and UqPC and hence do not instantiate any upper level property. They are simply the sums of the mental domain, with maximally undemanding existence conditions at the cost of minimally sparse identity conditions: This is in the sense that the identity conditions of the individual do not exceed the one of the set of the parts; they are simply identical. For the purpose of this thesis, for highlighting the implications of the identity condition for phenomenal sums, we do not even have to point towards structural (let alone modal or temporal) properties that figure prominently in the general metaphysical theory from criticizing CAI and UqC in the first part of this thesis. Reference to sortal properties suffices for phenomenal sums are not in fact phenomenal. This is to say that if the sum does not facilitate the instantiation of any sortal or kind properties, then it a fortiori does not instantiate properties of the phenomenal kind.

In sum, phenomenal sums, though being composed of single phenomenal states, are not in fact phenomenal themselves for being compositionally incapable, so to say, of instantiating phenomenal properties. Based on the fact that almost all accounts that discuss phenomenal composition, or unity, do so in terms of a total state that is itself conscious or phenomenal, PU and its principles of CAI and UqPC seem highly implausible. This is for they are far away from accommodating what those accounts strive to analyze or conceptualize, that is, a total state that is itself phenomenally conscious.[304]

II.2.c. The Full Extent of PU

In this section, and based on the preceding considerations of the core principles UPC and UqPC, I further illustrate what PU and the according phenomenal sums amount to against the background of the few instances where authors in fact consider these position. I have the impression from the literature that PU and its siblings are mainly held to be rather obscure and implausible. Yet, in places we can find adumbrations and brief discussions of this position, even if as a theoretical bugbear. Also, in the wake of his

[304] An exception is Watzl, cf. Sebastian Watzl, "Attentional Organization and the Unity of Consciousness," *Journal of Consciousness Studies* 21, no. 7–8 (2014): 56–87.

discussion of panpsychism, Goff entertains some related form of PU and even calls it that way. The latter, however, as I mentioned in the introduction of this section, seem not be aware of the full extent of this position.

As we have seen in the first part, according to UC, the existence conditions for sums are extremely liberal. Basically, as soon as the parts exist, the superordinate individual does. And this holds irrespectively of spatial and temporal scattering. Accordingly, UPC maintains that sets of single phenomenal states form another individual phenomenal state, or total phenomenal state, where this total phenomenal state has extremely undemanding existence conditions. In his discussion of phenomenal unity based on Bayne and Chalmers mereological account of unity by subsumption, Dainton contemplates in passing on such results of UPC:

> A *purely* mereological account of phenomenal unity would be a quite radical beast indeed. In the standard system of mereological logic, unrestricted composition applies, i.e. every collection of parts constitute a whole. If this is applied to the experiential realm, then *every* collection of momentary (…) experiences would constitute a genuinely unified conscious state, irrespectively of when or where they occur, or to whom they belong.[305]

As to start with a brief critique, Dainton's inference from UPC to unity of the suchlike summed single phenomenal states is false. This if for, based of CEM, the collection of single phenomenal states form another totality, total state or phenomenal sum, if you like; but this total state resulting from unrestricted composition has nothing to do with any unity among the states.[306] To the contrary, it is rather a point of criticism, as we have seen in the first part, that such sums, be it material or mental, do not exhibit any unity of the parts whatsoever and might be composed of widely spatially or temporally scatters single states, as Dainton himself anticipates. Unity comes into play if we transfer the criticism of phenomenal sums into another genuine position that is opposed to UPC and the direct application of CEM to the phenomenal domain, and that is something like phenomenal moderatism, a view that I shall introduce and defend below. Apart from this moderatist position of phenomenal composition, unity plays no conceptual or metaphysical role in

[305] Dainton, "Unity, Synchrony, and Subjects," in *Sensory Integration and the Unity of Consciousness*, ed. David J. Bennett and Christopher S. Hill (The MIT Press, 2014), 255–86, here p.261.

[306] According to another interpretation of the quote cited, brought forward by Howard Robinson in personal correspondence, Dainton means by unity here simply that the summed states form "a thing" in the sense of a kind of totality irrespectively of any substantial unity among the states. If this is the case, then Dainton rightly infers a phenomenal totality from UPC but misapplies the notion of unity here because in the context of mereology the notion of unity is emphatically not a paraphrase for a totality.

CEM and likewise not in PU. Summing single states based on PU and its principle UPC involves what I labeled the thin notion of phenomenal summation above and yields another total state, but based on the phenomenal versions of CEM, this total state does in no way exhibit any unity.

Also, as a second point of criticism that follows from the first, and as was elaborated before when I discussed identity conditions and UqPC, these totalities called phenomenal sums do not even themselves instantiate any kind property. And that includes being of the phenomenal or conscious kind. Hence, Dainton is not only wrong in connecting UPC with the unity of the resulting total state, he also misapprehends UqPC in stating that the latter is conscious states.

Having said this, he is clearly right in what concerns the existence conditions of phenomenal sums: Virtually any set of single phenomenally conscious states will do, according to UPC, as to form another total state. We can unfold the consequences of unrestricted phenomenal composition step by step, increasing the degree of intellectual imposition. If we start with just spatial scattering, UPC leads to total states that are composed of your pain in your left toe and my state of enjoying strawberry ice-cream. In a next step, we add temporal scattering yielding total states comprised of Brutus intention to kill Caesar, your current state of being annoyed by student's introduction to philosophy-papers and my prospective possible fear of getting prostate cancer at the age of 68. Finally, also bear in mind the cross-kind scope of conscious experiences: A consistent application of CEM and compositional universalism to the phenomenal domain renders real such total states that are composed of Cleopatra's cat feeling pleasurably pampered, my dachshund longing for sausage and your future headache the morning after wine reception.

In contrast, these consequences are exactly those that Goff seems not to anticipate when he discusses the SPCQ and makes use of the label of PU.[307] That might be due to his panpsychist stance according to which all physical or material micro-particles also possess some sort of consciousness that renders them micro-subjects. It is in this framework that Goff introduces universalism as a solution to a notorious problem for panpsychist, that is, the combination problem. The combination problem holds that

[307] Goff, "The Phenomenal Bonding Solution to the Combination Problem", sect. VII. and his "There is No Combination Problem," in: Michael Blamauer, *The Mental as Fundamental: New Perspectives on Panpsychism* (Walter de Gruyter, 2011), pp.139/40.

panpsychism cannot make sense of the way in which the micro-subjects form the familiar macro-subject, i.e., the sort of consciousness genuine to human beings. Goff then argues that universalism is "the default position" as to counter the combination problem.[308] He himself does not elaborate much on his universalist approach to the combination problem but the ramifications of such are highlighted by Dainton. Dainton holds that, if Goff would be right, "then at any given time, each and every combination of experiences forms a unified co-consciousness ensemble no matter how spatially distant their physical subjects may be."[309]

Again, some implications went wild here, since, as I have already noticed, nothing even close to unity and (co-)consciousness follows from single phenomenal states or experiences are composed based on PU. Also, as has been discussed in part one of this thesis, PU does not involve any relations except the trivial one of *being part of the same sum*. That also follows from the extremely undemanding existence conditions for sums. The existence of the parts, here single phenomenal states or experiences, completely suffices to form the higher order phenomenal totality - nothing is further required, including structure or relations, be it co-consciousness or the original phenomenal bonding relation posited by Goff, the former being Dainton's paraphrase of the latter.[310] In brief, according to PU, all we get is a phenomenal sum and this entity is completely different - because devoid of any relations or unity - from any "ensembles" or the like. But clearly these are not Dainton's views, he just inherits and thereby highlights the wrong implications involved in Goff's position.

As a side-note, the fact that phenomenal sums do not allow for relations at all also renders Goff's discussion of a further specification of the phenomenal bonding relation as a spatial relation pointless.[311] If there are no relations in sums, a fortiori there are no bonding or spatial ones. This is for any relation amounts to restriction of composition and hence stands diametrically opposed to what PU and UPC based on the standard mereological picture entail.

Furthermore, when I mentioned that Goff seems not to be aware of the full ramifications of his adoption of PU, I also meant that he does not consider the fact that,

308 Goff, "The Phenomenal Bonding Solution to the Combination Problem", sect. VII.
309 Dainton, "Unity, Synchrony, and Subjects", p.265. For the co-consciousness relation, cf. Barry F. Dainton, *Stream of Consciousness: Unity and Continuity in Conscious Experience* (Routledge, 2000).
310 Goff, "The Phenomenal Bonding Solution to the Combination Problem", sect. VII.
311 Ibid.

according to PU and UPC, also temporally scattered conscious micro-particles would form macro-subjects. So not only all possible combinations of micro-subjects yield a macro-subject synchronically, at a time, but also all combinations conceived diachronically, over time. It might to most be already hard to imagine macro-subjects being composed of any synchronic combination of micro-particles, because, for example, our familiar brain would be just a lucky compositional coincidence yielding the well-known human macro-consciousness as opposed to less imaginable macro-consciousnesses generated by far less coherent combinations of physical micro-subjects. Some might completely loose grasp of what it is to be a macro-consciousness if it involves the composition of also temporally distant parts, that is, conscious physical micro-particles of the past, present and future.

All this is to the effect that I do not claim that Goff's panpsychist position is false, I just hold that it does not qualify for the label phenomenal universalism. Or, in case Goff prefers to keep that label for some argumentational purposes, I would encourage him to elaborate more and to make transparent the full set of consequences entailed by this position.

II.3. Phenomenal Atomism

Introductory Remark

As in the first part of this thesis, also in this section the discussion of atomism comes out fairly short for here I discuss atomism only in the strict mereological sense. And this sense pertains to atomism understood as the postulate of atomicity and not the way it is conceived of in almost the entire literature on the structure of phenomenal consciousness. Before I discuss atomism in this strict mereological sense, let me make a remark on the notion of atomism in both fields.

Atomism in mereology takes the form of the postulate of atomicity and is opposed to the one of atomlessness. The former, as will be explained below, claims that there are non-divisible entities, the latter denies this. In contrast, atomism in philosophy of mind presents an opposition to holism. Here atomism, very roughly, holds that, for example, single phenomenal states independently of each others existence and identity form a complex total state that is, adding Schaffer's priority theory, also derivative to the series of single states.[312] In contrast, holism claims that the single states are interdependent resulting in an integrated total state that is prior to the set of the single ones. So the notions of atomism in both fields are logically disconnected from each other. Atomism in mereology pertains to non-divisibility whereas atomism in philosophy of mind is mainly concerned with non-relatedness, given that independence and interdependence are opposing theses about the obtaining of dependence relations among the parts.

At the beginning of this thesis, I stated that one general motivation is to make strict mereology fertile for the study of consciousness. The fact that the notion of atomism diverges to such great extend in both fields serves as an indication that these fields are still largely systematically independent of each other. This thesis attempts to make a contribution to bridging these debates. Also, I take this systematic gap as some surprise in the light of the recently increasing number of publications revolving around the mereology of (phenomenal) consciousness. But now back to the application of atomism in the strict mereological sense to phenomenal consciousness.

[312] Or, the other way round, according to atomism in the philosophy of mind, the single states are basic and the total state depends in the one or other way on the series of single ones. In contrast, according to holism, the total state is basic and the single states derivative. More on this below.

Phenomenal Atomicity and Phenomenal Atomlessness

As has been pointed out in the first part of this thesis, mereology as a strict logical theory stays neutral on the question about atomism. The postulates of atomicity, atomlessness and non-atomicity can simply be added to standard mereology (in what follows, also as in the first part, non-Atomicity is excluded as a serious alternative). Of course, they are mutually incompatible, but each of them is compatible with the main corpus of CEM. To decide between these options is not part of mereology proper – in theory both paths are logically viable – but rather involves the question "whether the atomistic or the atomless mereology is in some sense the 'correct' one in application to the physical world."[313] Accordingly, for our purposes, we have to decide whether an atomistic or atomless mereology seems to be the correct one in application to the mental domain, which is phenomenal consciousness in this thesis.

In a bit more detail, standard mereology is a thesis about the parthood relation and about modes of composition. But these issues are independent from any (non)atomistic claims about whether the parthood relation, however defined and logically formalized, terminates at some point. That is to say, whether or not the parts are infinitely divisible or not. For example, you might think that restriction obtains on the composition of your car, or you might not think that way; but this stance towards composition is independent of whether you hold that the tiniest parts of your car are composed, restrictedly or not, of even tinier parts, ad infinitum, or whether you think that they are non-divisible, that is, a-toms (a-temno in ancient greek) in the classical etymological sense.

In this same vein, theoretically, at least, whatever stance towards the phenomenal parthood relation or phenomenal composition, that is, whether it obtains conditionally or not, is compatible with postulates that we might call phenomenal atomicity and phenomenal atomlessness. Roughly, phenomenal atomicity holds that at some level phenomenal divisibility bottoms out, or, in other words, that the phenomenal domain is well-founded in there being a fundamental level. In contrast, the existence of such fundamental level - where whatever we assume phenomenal entities to be, states or properties, is not divisible anymore - is denied by the postulate of phenomenal atomlessness. In more formal phrasing here put in terms of states phenomenal atomicity reads as foliows:

[313] Simons, Parts, p.42.

Phenomenal Atomicity

For every single phenomenal state x there is some single phenomenal state y such that y is an atom and y is a part of or equal to x.

A side issue in connection to atomicity, as discussed in the first part of this thesis, concerns the conceptual link from atomicity to simples, this link being that atoms and simples are regarded as non-divisible. Moreover, I mentioned two views on simples: the pointy view, according to which simples are extensionless and the opposing view according to which they occupy some region in time or space. In the phenomenal domain, if we regard single phenomenal states as phenomenal atoms, I regard the pointy view as no option. This is for, if we take states to be events, surely phenomenal states occupy some temporal region. That leaves the view according to which phenomenal atoms are indivisible and as well extend in time.[314] But, as I also mentioned in the first part, at his systematic point atomism shades off into monism because if the stream of consciousness is regarded as one indivisible and temporally extended entity, that is, a phenomenal extended simple, we reach something that I will below call phenomenal existence monism. So I postpone the discussion of this variation of atomism to later and proceed with the direct opponent of the atomicity postulate, viz. phenomenal atomlessness.

Phenomenal Atomlessness

For every single phenomenal state x there is some single phenomenal state y such that y is a proper part of x.

So now, since we have these two alternatives at hand, as to reiterate, which one is the more plausible one in application to phenomenal consciousness?

To start with, to my knowledge, almost the entire literature about (the structure of)

[314] With respect to space, I have difficulties to image something like a spatially pointy single phenomenal state. In vision, for example, what we consciously see always seems to be extended to some degree. So I also tentatively reject the pointy view with respect to phenomenal space. A spatially extended single phenomenal state might appear in discussions about homogeneity, where, for example, seeing red fills out the entire phenomenal field (cf. Oliver Massin and Marion Hämmerli, "Brentano On Compound Colors," 2015, https://www.academia.edu/13041769/Brentano_On_Compound_Colors. p.4). But also here, the issue is phenomenal existence monism and hence does not belong to this section about atomicity.

phenomenal consciousness presupposes mereological atomicity. Usually, the smallest entity is taken to be the single phenomenal state, or single phenomenal properties, qualia.[315] Still, it is conceivable that these are further divisible. For example, in the vicinity of panpsychism, or more specific panprotopsychism, according to which properties that are not themselves phenomenal are metaphysically fundamental and form the basis for phenomenal properties, Nagasawa and Wager claim that "it might be the case that phenomenal properties are infinitely decomposable into more and more primitive forms of protophenomenal properties and that the chain of decomposition or supervenience continues infinitely."[316] However, I do not see this. This is for the reason that panprotopsychism is meant to be a fundamental theory, positing protophenomenal properties as the well-founded termination of decomposition; and this excludes infinite phenomenal division, or in other words, phenomenal gunk, by definition.[317] Moreover, pure speculation about infinite protophenomenal division does not help the debate for the problem of phenomenal gunk is not its lacking logical possibility or conceivability but its implausibility.

Another route to phenomenal gunk might be to hold that the phenomenal state of what it is like to see red further is composed of states of phenomenal hue and saturation. Or, similarly, that phenomenal properties consist of further accidental or second order properties. But still, even if one assumes that, it just shifts the fundamental level one step further down the metaphysical ordering. That is to say, even if one postulates the existence of second order states or properties, these entities themselves then are not divisible anymore to the effect that the ordering of phenomenal states is well-founded and phenomenal atomicity is taken to be true.

And this holds, just to briefly throw a glance at the other understanding of atomism as opposed to holism in the philosophy of mind, for either of these positions. This is to say that even the denial of atomism, viz. holism, presupposes atomicity in the mereological

315 For qualia as phenomenal atoms, or, more precise, as representationally atomic, see Thomas Metzinger, *Being No One: The Self-Model Theory of Subjectivity*, New Ed (Cambridge, Mass.: The Mit Press, 2004), sect.2.4 and p.610.

316 For the introduction of panprotopsychism, see David J. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory*, Revised ed. edition (New York: Oxford University Press, 1997), pp.126/7. For the response, see Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism," in *Panpsychism*, ed. Brüntrup, G. (Oxford University Press, forthcoming), p.120.

317 This is because a well-founded partial ordering means that division terminates, which is the opposite of what phenomenal gunk understood as infinite divisibility holds. Of course, my objection fails if pan(proto)psychism is not taken to be a theory that posits a fundamental and well-founded mental metaphysics.

sense. Holistic approaches might claim that more or less strong relations obtain among the single phenomenal states such as to result in the priority of the complex total state; but all these holistic approaches entertain the view that the single states are not further divisible, hence are atomistic in the mereological sense of atomicity. So here we have another way to put the conceptual and logical independence of the two notions of atomism: if one understanding is taken to be true also with respect to the denial of the second, the two cannot have much in common.

Another indication that atomicity is the stance to opt for with respect to phenomenal consciousness is the finitude of cardinality in combination with the antisymmetry of the parthood relation entailed by this position.[318] In general mereology, the finitude of cardinality means that the number of entities engaged in the partial ordering is limited. There is just the cake and the ten slices. And the antisymmetry of the parthood relation involves that the slice of the cake is part of the cake but the cake not part of the slice. And both imply atomicity about the cake because if the slices would be further infinitely divisible there also would be an infinite number of smaller and smaller slices. I take it that based on this route of argumentation, atomicity about phenomenal consciousness is likewise almost unanimously entertained. For neither can I think of authors who deny the antisymmetry of phenomenal parthood, nor, based on what I said before about the divisibility of phenomenal states or properties, hold that the phenomenal domain is occupied by infinite number of states. Note that the number of states with respect to divisibility is independent of the number of states regarding, to quote Nagel again, "conscious experience" that "[n]o doubt occurs in countless forms totally unimaginable to us." There might exist countless forms of kinds of phenomenal states but this fact concerns the scope or breadth, so to say, of the phenomenal domain, whereas, if we take those states of whatever form to be phenomenal atoms, the number of those states is finite with respect to the downward partial ordering or the depth, so to say, of the this domain.

However clear the truth of phenomenal atomicity might be based on these considerations, the truth of infinite phenomenal divisibility is also a logical option on the

[318] For the point about finitude of cardinality and antisymmetry of the parthood relation with respect to atomicity in general mereology, again see, cf. Achille Varzi, "Mereology," *The Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/archives/win2015/entries/mereology/>, sect.3.4, where he also admits the possibility of atomistic theories for infinite domains. However I regard the latter case as rather exotic and not applicable to the phenomenal domain.

table. Corresponding to the material domain where the postulation of atomlessness renders a world gunky, positing phenomenal atomlessness in the mental domain result in phenomenal gunk. When phenomenal gunk appears in the literature then as a theoretical possibility in opposition to a position authors actually defend rather than as one they in fact are able to imagine and to illustrate, let alone adopt.[319]

In discussing Brentano on compound colors, Massimo and Hämmerli consider two ways to account for homogeneous colors.[320] The first one is phenomenal gunk, where they define phenomenal gunk as, first, each part of a visual extent appears as having the same color and, second, this visual extent also appears as having proper parts. The second way to account for homogeneity is by alluding to extended simples, where such is defined as, first, also each part of a visual extent appears as having the same color and, second, this visual extent also appears as not having proper parts. The point is simply that homogeneity can be explained by either referring to infinite divisibility of the visual extent of the same color in question or by that extent being a single one partless entity. So here we meet again the mentioned opposition of the atomicity-postulate, in the shape of an extended simple, and the atomlessness-postulate, in the shape of phenomenal gunk. Whereas Massin and Hämmerli claim that the former is entertained by Brentano and hence proceed in regarding this option, they stop discussing phenomenal gunk as something that Brentano suggests. Like I said, phenomenal gunk is not argued for but serves as a position in opposition to which another one is favored.

Similarly, now with respect to a temporal perspective on phenomenal consciousness and not from a spatial one like Massin and Hämmerli, in discussing temporal succession of our conscious experience, Pelczar simply presupposes that diachronic consciousness is a well-founded phenomenon by either being diachronically simple or entirely consisting of diachronically simple experiences as parts. He does not even bother to define or describe diachronic phenomenal gunk but simply states that denying „that human experience is a well-founded phenomenon is to say that it consists of phenomenal

[319] This is at least with respect to synchronic phenomenal consciousness with which I am concerned here. For a discussion of atomic and atomless diachronic phenomenal consciousness, see Dainton, B., "The Phenomenal Continuum", in: Valtteri Arstila and Dan Lloyd, *Subjective Time: The Philosophy, Psychology, and Neuroscience of Temporality* (The MIT Press, 2014), sect.6.5. Cf. Carlos Montemayor, *Minding Time: A Philosophical and Theoretical Approach to the Psychology of Time* (Leiden ; Boston: Brill Academic Pub, 2012).

[320] Massin and Hämmerli, "Brentano On Compound Colors", p.4.

"gunk.""[321] So also here we see the extended simple view as being favored over the gunky view and the latter simply being an untenable background against which the former is adopted.

Even worse, apart from not even defining, let alone arguing for, phenomenal gunk, in Roberts on Berkeley's view on experience the gunky view is used contradictorily. Roberts holds that, according to Berkeley, experience consists of no individuals and hence has clearly in mind, again, the extended-simple view on experience. This becomes clear when he describes experience in Berkeley's view as some sensory plenum.[322] But subsequently he also mentions phenomenal gunk as some possible illustration of Berkeley's view, but then, in a footnote, writes that "of course, this kind of gunk is not infinitely divisible, for a start."[323] Since infinitely divisible is exactly what phenomenal gunk essentially is, Roberts clearly does not mean phenomenal gunk when we writes phenomenal gunk.

In sum, although being a legitimate position by being derived from a core mereological principles, phenomenal gunk and hence the postulate of atomlessness as applied to phenomenal consciousness is rarely mentioned and never argued for. Since I also do not dare to indulge in the latter venture, I take phenomenal atomicity as the view to hold.

[321] Michael Pelczar, *Sensorama: A Phenomenalist Analysis of Spacetime and Its Contents* (OUP Oxford, 2015), p.59. Similarly in Michael Pelczar (2014), „Physical Time, Phenomenal Time, and the Symmetry of Nature", in: L. Nathan Oaklander, *Debates in the Metaphysics of Time* (A&C Black, 2014), pp. 131-148, here p. 135, where he, in discussing Dainton's view on the stream of consciousness, simply assumes "that human experience has a logically atomic structure."

[322] John Russell Roberts, *A Metaphysics for the Mob: The Philosophy of George Berkeley* (Oxford University Press, 2007), p.34.

[323] Ibid., p.151.

II.4. Phenomenal Nihilism

As we have seen in the first part, compositional nihilism amounts to holding that no composite objects exist. Hence, in the phenomenal domain, we can translate this claim into holding that no complex total phenomenal state exists.

As a preliminary remark in order to disambiguate the notion of phenomenal nihilism, in the present context at least, this position is the thesis that no phenomenal composition occurs and not that not phenomenal quality or properties exist. In the way discussed here, nihilism is a compositional thesis and not an existence claim. So the phenomenal nihilist in the mereological sense as an answer to SPCQ might very well hold that qualia and phenomenal states or properties exist, but he denies that phenomenal atoms like this compose some further complex individual like a total phenomenal state or human subjectivity. Hence, the precise label for this position is phenomenal compositional nihilism and formally phrased as follows:

> *Phenomenal Nihilism (PN)*
> It is never true that there is a total state such that a set of single phenomenal states composes it.
> Let $[x_1]^{Ph}$, …. $[x_n]^{Ph}$ be a set of single phenomenal states of a subject S at time t. Also, let [T] be the total state. Then $[x_1]^{Ph}$, …., $[x_n]^{Ph}$ never compose [T].

At first glance, as was noted in the first part, the position also in the phenomenal domain that no complex entity like our familiar phenomenal consciousness exists sounds crazy to most. Or, given the extend of the literature on such position, I simply assume that authors regard nihilism in the phenomenal domain as absurd - for there is almost no literature.

The only quasi-discussion I know of is to be found in Goff. I say quasi-discussion because phenomenal nihilism is merely mentioned and subsequently straightforwardly rejected as "a non-starter on the grounds that the subjects we are pre-theoretically committed to are composite objects of some sort."[324] I agree on the pre-theoretical

[324] Philip Goff, "The Phenomenal Bonding Solution to the Combination Problem," in *Panpsychism*, ed. G. Bruntrup, L. Jaskolla (Oxford University Press, forthcoming), sect VII.

inclinations that Goff ventilates here. But still, I think a bit more can be done as to do justice to this position as to any other in philosophy. This involves that we should reject a position as false or absurd only if all argumentational means are exploited as to defend it. And as we have seen in the first part, the nihilist has a idiosyncratic strategy up her sleeve to mitigate the sense of absurdity that surrounds phenomenal nihilism.[325]

With respect to ordinary objects, this strategy amounts to holding that, although no tables exist, the microparticles that are usually said to compose tables are arranged table wise. In other words, the arrangement, not the composition, of the micro-parts is responsible for the instantiation the sortal property of *being of the table kind*. Likewise, in the phenomenal domain, the phenomenal compositional nihilist claims that the arrangement, not the composition, of the single phenomenal states is responsible for the instantiation of the sortal property of *being of the phenomenality kind*. Or, in short, although phenomenal consciousness as a complex entity does not exist, according to the proponent of PN, our common sense intuition is accounted for by saying that single phenomenal states exist that are arranged phenomenality-wise.

The main asset of this view is its parsimoniousness. If it were true that the nihilist in fact is able to account for all the causal, material or mental properties in the world by doing without composite material and mental individuals, indeed we should dispense of them. However, as I will argue below, this possibility is highly questionable. Furthermore, PN is a viable option if one accepts the argument from vagueness. If composition cannot be vague, then it either always or never occurs. If you opt for the first scenario, you become an universalist, in case you favor the second, a nihilist.

In contrast, the liabilities of this view are manifold. To start with a rather common point, PN is incompatible with the possibility of gunk. If phenomenal entities like single states are infinitely divisible, the nihilist does not get what he needs for his paraphrase of k-wise arrangement, that is, some fundamental level of mental microparticles that are, in our case, phenomenality-wise arranged. Before we came to the conclusion that phenomenal gunk is to be rather rejected than supported. But be this as it may, one cannot exclude phenomenal gunk as metaphysically possible and facing the choice between two equally unpalatable views, phenomenal gunk or the non-existence of composite phenomenal

[325] Another defense of nihilism involves its parsimoniousness. But since this argument can be launched in favor of other positions, too, I stick to the k-wise locution in the following section as a line of defense particular to compositional nihilism.

totalities, one might even opt for phenomenal gunk.

Apart from these common starting points for discussing phenomenal nihilism, let me remark on two further ones. In the first part we have seen, mereologically speaking and very roughly, that composition and the parthood relation can be conceptualized in terms of part-part relations: according to the universalist, parts compose a further individual even in case no inter-part-relations obtain, whereas, on the other side of the spectrum, the moderatist holds that a further individual only results from rather strong relatedness among the parts. Also, if we compare the universalists with the nihilists stance, we can say that universalist sums are individuals without arrangement and nihilist entities are arrangements without individuality. By way of criticism in terms of the part-part relation, the opponent to universalism, the moderatist, say, holds that individuality and composition is highly dubious in the absence of some kind of inter-part-relation. I think we can say something similar to the nihilist: It is highly dubious that there is no composition and individuality in the presence of part-part-relations. And arrangement is nothing other than a part-part-relation. In short, there is no such thing, or at least I do not understand this conception, of composition-obliterating arrangement. This is for arrangement is a part-part-relation that in turn necessitates composition and individuality. If even, according to the universalist, entities without such relations result in a composite individual, then a fortiori the obtaining of such inter-part-relations does.

Coming to phenomenal consciousness, this point holds true also with respect to the phenomenal nihilist who posits something like non-composite phenomenal arrangement. For being an inter-part-relatedness, phenomenal arrangement is not conceivable without necessitating composition. If I undergo three phenomenal states that are arranged in a certain way, it seems inconceivable that they do not result in some total state, or some visual field. Recall, for example Watzl's position according to which, in a moderatist manner, the attentional arrangement results in some sort of holism. And holistic entities in the least are conceivable as non-composite entities. Note that I do not hold that it is inconceivable that three phenomenal states do not form a total state. Phenomenal atomists claim exactly that. The point here is holding that it is inconceivable to deny the existence of a composite total state given the obtaining of arrangement of the three single states.

Of course, this has to be elaborated further. The next step in substantiating the

position that non-composite phenomenal arrangement is inconceivable could be to develop and argue in favor of a principle that we might call the arrangement-principle. That principle would state that arrangement necessitates composition. I think such principle is an essential part of phenomenal composition but I do not have the space her to argue for it.

Another skeptical point pertains to the instantiation of upper level properties, or to be more exact, upper level kind properties. The shortcut argumentation would be to hold that only composite and complex individuals, and not the arrangement itself, instantiate upper level kind properties. Since nihilism holds that such composite individuals do not exist, no upper level kind properties are instantiated and nihilism is to be rejected because it is not being able to account for properties like being a table or being phenomenal. But this is a bit quick, so here is the more detailed version.

Recall that we differentiated before between four kinds of totalities: complex, non-complex, conjunctive states/sums and kind totalities. Only the latter instantiates kind properties like *being a table* or, in the phenomenal domain, *being phenomenal*. Now the nihilists entity is one that cross-qualifies for the first and the last. This is for, if no composition occurs, necessarily, the entity is also non-complex. Furthermore, arrangements are also totalities that instantiate kind properties. We can see this by focusing on the alleged main argumentational merit, at least in the eye of the nihilist, of his position. And this is that his ontology is more parsimonious than others, by doing away with all those complex and composite entities, while at the same time being able to account for, by way of the being k-wise arranged paraphrase, the entire causal efficacy of what us folk regards as common composites. And without the instantiation of upper level kind properties, the nihilist would not be able to account for causal efficacy. The totality of the car-arrangement has to be of a certain color as to reflect sun light of some particular wavelength – the parts alone are not causally efficacious in that way.

However, it seem dubious to me that any non-composite or non-complex entity would facilitate the instantiation of some upper level kind property. It is the car as a whole, or some individual, that facilitates that. For illustration, take all the parts of your car with their respective color-properties. You can arrange them in any way you like, they simply remain to have the color they do, regardless whether the yellow thing is arranged next to the red and blue or to the orange and black part. It is only that the parts facilitate the reflection of

light of a certain wave length if they come together as some complex composite and whole thing. That is also to say that arrangement does not help here. Arrangement or not, without composition there is no totality and it is the totality that instantiates upper level properties. To say it even more simple: kind properties are instantiated by the complex totality and not by the arrangement itself.

Similarly with respect to phenomenal consciousness: I might experience noise coming from behind, a red ball in front of me and a helicopter above me. On the PN's picture, in order to be able to claim that his phenomenal ontology is more parsimonious than the one allowing phenomenal complexities while at the time being explanatorily adequate to the same extend, she also has to hold that her non-composite entities also instantiate the kind property of being phenomenal. For this is what all approaches to phenomenal consciousness strive to account for: the phenomenality of the phenomenal totality, or, what it is like to be a subject at a time, as opposed to the phenomenality of the single phenomenal states that the total state consist of. Also here I cannot see how such total state phenomenality is instantiated solely based on the phenomenality of the single states, that is, without them forming a further phenomenal individual. You might swap the mentioned states around, hearing the helicopter from behind, seeing a red ball on the side and experiencing noise ahead. They simply remain to have the phenomenality they do. It is only that the single phenomenal states generate a genuine phenomenality on their own if they come together as some complex total state. Arrangement or not, without composition there is no total state and it is this total state that instantiates phenomenality. To say it even more simple: total-state-phenomenality is instantiated by the complex totality that is the total state and not by the arrangement itself. What we are searching to explain in phenomenal consciousness is the total-state-phenomenality and not arrangement-phenomenality.

As I remarked at the beginning of this section, almost nothing has been written about PN. For good reason, one might hold, for this position is obviously hard to swallow. Nevertheless, it is an option in logical space and hence deserves some thoughts. The discussion in this section is just a starting point and clearly in need of elaboration. However, PN in this thesis is just a side product, so to say, of the application of SCQ to phenomenal domain. The main focus here is the moderatist answer to SPCQ, not the nihilist one. So I leave PN behind as a project for further research.

II.5. Phenomenal Monisms

With respect to composition, as we have seen in the first part, monism is an interesting hybrid position since it cuts across the main camps of answers to SCQ: Existence monism denies composition and hence belongs to the extreme camp whereas priority monism not only involves composition but also poses restrictions upon the latter and therefore resides in the moderatist camp. In the same way, I will discuss the respective phenomenal versions of monism: Phenomenal existence monism is still part of the extreme answers to SPCQ as opposed to phenomenal priority monism that will present the way into phenomenal moderatism.[326]

II.5.a. Phenomenal Existence Monism

As has been discussed above, existence monism and nihilism are close metaphysical siblings: both eliminate parts and composition from their ontology, the difference simply being that the remaining denizens of the world are multiple for the nihilist and single for the monist. The same systematic proximity holds in the phenomenal domain: the phenomenal nihilist denies the existence of the parthood relation and the occurrence of composition to the effect that all there is are multiple phenomenal states, arguably arranged phenomenality-wise. Similarly, the phenomenal existence monist shares the view regarding the parthood-relation and the occurrence of composition, just that she arrives at a different conclusion: All there is is one single state, arguably phenomenal. In one statement:

> *Phenomenal Existence Monism (PEM)*
> It it always true that there is a total state such that a set of single phenomenal states does not composes it.
> Let $[x_1]^{Ph}$, …. $[x_n]^{Ph}$ be a set of single phenomenal states. Also, let [T] be the total state. Then $[x_1]^{Ph}$, …., $[x_n]^{Ph}$ does not compose [T].

In the discussion to follow, I differentiate between strict PEM (sPEM) and loose PEM (lPEM). SPEM is the position that follows from directly applying existence monism from

[326] Cf. Kriegel who sees the same parallel between monism in general and mind-metaphysics: Uriah Kriegel, *The Varieties of Consciousness* (Oxford University Press, 2015), p.8.

general metaphysics to the phenomenal domain. The correct application implies considering the full scope of the SCQ, and SPCQ, respectively. That is to say, as has already been mentioned with respect to compositional universalism, that mereology and hence the according composition questions consider the totality or entirety of material or phenomenal states, that is, the material or phenomenal world.[327] With respect to existence monism this means that the correct application to the phenomenal domain, and that is sPEM, involves the blobject of all phenomenal states. For the reason that only answers that consider the full scope of the respective domain are correct answers, in my view, sPEM is the only correct existence monist answer to SPCQ, even if almost untenable (and in that perhaps the appropriate phenomenal sibling to general existence monism).

In contrast, lPEM results from an unjustifiably simplified application of existence monism to the phenomenal domain. That is to say, the scope of the phenomenal domain is restricted to the set of phenomenal states of a subject (diachronically or synchronically) and does not involve the set of all phenomenal states. So the resulting phenomenal existence monist single object becomes the one single total conscious state of a subject. Surely, in comparison to sPEM, lPEM is more palatable, but I emphasize that lPEM does not count as a correct answer to SPCQ. I simply discuss this position here because it involves some phenomenal single partless entity of some sort and hence is connectable to SPCQ in some loose way.

At the end of this section, I consider an objection to PEM in general, that is, one that attacks the strict as well as loose version of PEM. This objection denies the claim that qualitative multiplicity can be instantiated by a numerical single entity. Since both versions of PEM posit such entity, even if to a different ontological extent, the objection also aims evenhandedly at sPEM and lPEM.

As to start with sPEM, as indicated, this position entails the consideration of the entire set of actual phenomenal states.[328] Or, to be precise, since according to sPEM there are no separate phenomenal states, hence also no set, this position involves one single

[327] David J. Chalmers, *The Character of Consciousness* (New York: Oxford University Press, 2010), p.538 uses the notion of a phenomenal world for the entirety of phenomenal states, or so I understand it in the context of the metaphysics of consciousness that he is concerned with here.

[328] One might hold here that even sPEM is restricted and hence not strict in the sense I introduced because it excludes past or future states, as opposed to PU. That might be so. However, a phenomenal blobject including past and future states is hardly conceivable so that I commit some looseness in order to render sPEM suitable for discussion.

seamless and partless phenomenal totality that has as aspects or modification what common-sensically would be regarded as single phenomenal states. According to sPEM, the mental domain consists of one mind, or one consciousness. We can also connect this picture to the notion of a cosmos. Same as in the material domain existence monism results in viewing the cosmos as one one single entity, sPEM in the mental domain results in viewing the phenomenal cosmos as one single entity, something that has been called by Nagasawa and Wager the "cosmic consciousness."[329] In opposition to their view labeled "priority cosmopsychism", which is the phenomenal version of Schaffer's priority monism that also is at issue in this thesis in the subsequent section, they directly refer to existence monism and call the view that posits such single partless cosmic consciousness "existence cosmopsychism".[330] However untenable this position might seem or be, I think it is important to put it on the logical map of answers in response to SPCQ for being derived from a genuine mereological view. So let us take a brief look at the only paper I found that actually defends this position.

Mathews calls her position "Cosmological Panpsychism" and holds that it is "a holistic or cosmological version of panpsychism, according to which the universe as a whole is the ultimate locus of mind, or of mind-like properties."[331] It is not fully clear to me, and here already start the problematic aspects of her exposition of the view, to what extent her position is a full-fledged version of sPEM since she, on the one hand, speaks of reality as being an "unbounded, indivisible substantival plenum"[332], which sounds like the extended simple of the classical existence monist. On the other hand, she conceptualizes this plenum "as space considered geometrodynamically, (...) intrinsically internally structured in accordance with a principle of perfect point to point connectivity and hence perfect continuity."[333] And where are structures there are also disjoint parts to be structured. I stick to the sPEM interpretation because, for illustration of her view, she alludes to pictures of the ocean and waves, same as Horgan and Potrč do. But at this point the problems of elusive exposition continue. The mental One is conceptualized "as a geometrically dynamic space, (that, H.T.) is experienced from within as a field of subjectivity, a great, internally differentiated field of impulse, of intrinsic activity, of felt

329 Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism." p.117.
330 Ibid, pp.117/8.
331 Freya Mathews, "Panpsychism as Paradigm," in *The Mental as Fundamental*, ed. Michael Blamauer (Ontos Verlag, 2011), http://www.freyamathews.net/downloads/PanpsychismParadigm.pdf, p.1.
332 Ibid, p.5.
333 Ibid, p.8.

expansions, swellings, dwindlings, contractions, surges, urges and so forth" and the way in which our macro-selves evolve from or can exist within this cosmic mind as "[s]elves (that, H.T.) then enjoy a real though relative individuality even though they exist in the context of an undivided whole. Since they proactively seek from their environment the resources they need to actualize and maintain their structure while at the same time resisting causal inroads into their integrity, they count, ontologically, as individuals, even though they are not separate substances, but disturbances within a global substance."[334] The problem I see with this elusive way of explicating the view is that by no means it becomes clear whether the mental cosmic One is in fact an extended simple ("undivided whole") or still structured in some way ("internally differentiated field of impulse"), or what kind of ontological status the macro-subjects within this whole maintain (no separate substances and still individuals?). But within the context of monist views, these matters are exactly the ones that have to be clarified in order to, to begin with, categorize the view in question as s- or lPEM, and furthermore to scrutinize its consistency, let alone plausibility.

With respect to assessing the plausibility of sPEM, few arguments in favor of it come to mind.[335] Surely, similarly to its sibling in general metaphysics, it is extremely parsimonious. However, the cost of this asset are overwhelming. Apart from its obvious counter-intuitivity, one might wonder how the numerical single cosmic consciousness is capable of exhibiting the qualitative multiplicity that we usually connect with myriads of human and other's creatures phenomenal states. At least Mathews does no good job to mitigate these worries. Also, as mentioned, this problem also pertains to lPEM and hence is discussed at the end of this section. Although lPEM is the less strict version of PEM, I proceed by discussing this position now because it is also the clearer and slightly more palatable view among the existence monist family.

As opposed to sPEM, lPEM enjoys some support, historically as well as contemporarily. However, some support in this context just means that philosophers in fact seriously entertain this position but not that this support is in any way broad; the positions mentioned here are clearly minority views still. Before discussing Searle and Tye as contemporary proponents of lPEM in some more detail, let me mention James and

334 Ibid, p.5/6.

335 Cf. Itay Shani, "Cosmopsychism: A Holistic Approach to the Metaphysics of Experience," *Philosophical Papers* 44, no. 3 (2015): 389–437, pp.409/410 for a discussion of existence monism in a framework of philosophy of mind.

Carnap as historical precursors of this position.[336]

Regarding Carnap, before I already mentioned that he constructs the entirety of common and scientific concepts based on an autopsychological basis.[337] This is to say that he is a phenomenalist in the sense that, in his view, our conceptual apparatus is not based on the apprehension of worldly objects directly but on the experiences we undergo when we perceive those objects. At the most fundamental level, Carnap calls these experiences Elementarerlebnisse or, in English, elementary experiences, and basically all concepts derive from these experiences by abstraction or what he call quasi-analysis.[338] The reason why he calls the process by which concepts evolve from the elementary experiences quasi-analysis is that, according to Carnap, these experiences are in fact indecomposable so that they cannot be subject to an analysis proper. The entire stream of consciousness of a subject is regarded by Carnap as one indivisible total experience. In other words, this experience, diachronically at least, is one single and simple temporally extended entity and does not consist of single states of experiences as parts.[339] And by posting experience as such Carnap clearly qualifies as a phenomenal compositional existence monist.

James differentiates between the object or content of the experience and the experiential or phenomenal states themselves, and holds that the former but not the latter can be composed, or as he has it, "mixed."[340] Regarding parthood, this picture amounts to saying that single objects of experience are regarded as parts, but not the corresponding state of what it is like to experience those objects. In whatever way the objects of experience are arranged or shuffled around, the resulting phenomenality is a

[336] Also Strawson might be considered as a proponent of this view, although I do not have the means to argue in detail for that claim here. For a start to do so on another occasion, one might refer to the following quote: "But it [the total experiential field, H.T.] is, for all that, a unity, and essentially so. It is fundamentally unified, utterly indivisible as the particular concrete phenomenon it is, simply in being, indeed, a total experiential field; (...)" (Galen Strawson, *Selves: An Essay in Revisionary Metaphysics*, Revised (Oxford: Oxford University Press, USA, 2011), pp.377/8).

[337] Alan W. Richardson, *Carnap's Construction of the World: The Aufbau and the Emergence of Logical Empiricism*, 1 edition (Cambridge, U.K.; New York, NY, USA: Cambridge University Press, 2008), pp.34ff. Also Michael Friedman, *Reconsidering Logical Positivism* (Cambridge University Press, 1999), p.91.

[338] Rudolf Carnap, *Der Logische Aufbau Der Welt* (Meiner Verlag, 1928), §67. See the footnote on the same page for some further contemporary supporters of this view like Schlick and Schuppe. Cf. Daniel Cohnitz and Marcus Rossberg, *Nelson Goodman* (Chesham, Bucks: Acumen Publishing, 2006). p.106/7.

[339] Carnap, *Der Logische Aufbau Der Welt*, §68.

[340] William James, *The Principles of Psychology* (Dover Publications, 1890), p.157. Cf. Andrew Brook and Paul Raymont, "The Unity of Consciousness," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Winter 2014, 2014, http://plato.stanford.edu/archives/win2014/entries/consciousness-unity/, sect.6.2.

"tertium quid" that corresponds to the experienced "simply and totally".[341] In the latter phrase we see nicely the existence monistic thrust of James' view: The state of diachronic consciousness is a total as well as simple one. This simple conscious totality results from the experience of various single objects by a process of "fusing" that is to be understood as the resulting total state not subsuming or being composed of, but as replacing experiences of the single objects. In terms of sums and wholes, we can say that, according to James, the encompassing totality is like a whole in that it is more than the sum of objects we experience and not, as phenomenal sums are, the same as and identical to the set. Yet, if various objects get combined or fused into one single experience thereof, we might ask how this single experiential total state is capable of representing and reflecting the complexity of this variety of objects. This is to say, how to retain the qualitative or structural complexity of the objects in the transition from the numerical multiplicity to simplicity in experience? And here the link to the first part of the present thesis shows because this problem for James is the same as for the contemporary supporters of existence monism, for example Horgan and Potrč. In both domains, be it material or mental, it seems a hard task to explain how numerical simplicity, like the single simple material "blobject" or one total phenomenally conscious state, is compatible with positing the instantiation and manifestation of a multiplicity of qualitative or structural properties. We will return to this issue below in this section.

Coming to Tye, and in passing Searle, we can notice striking similarities to James' account. Also Tye, in what he calls *The One Experience View*, differentiates between the object, or content, of experience and the experiential level itself, just that he conceptualizes the objectual level as physical events that happen in the brain.[342] According to Tye, the qualities of the objects are represented in separate locations in the brain; at this objectual level single entities, viz. parts, exist in the shape of physical neural processes.[343] But these processes occurring at various places in the brain are not to be confused with experiences. On the experiential level, there are no parts like single experiences, but all there is is one seamless macro-experience that encompasses, or is

341 James, *The Principles of Psychology,* pp.156/7.

342 Michael Tye, *Consciousness and Persons: Unity and Identity*, Representation and Mind (Cambridge, Mass: MIT Press, 2003). sect.1.3/4. Cf. Tim Bayne, "Divided Brains and Unified Phenomenology: A Review Essay on Michael Tye's Consciousness and Persons," *Philosophical Psychology* 18, no. 4 (August 2005): 495–512, p.496.

343 Tye, *Consciousness and Persons*. pp.28/9, 36.

constituted by, the physical micro-events in the brain.[344] Hence, there are, on the experiential level, also no genuine visual or auditory experiences.[345] Although qualities of objects are processes in separate auditory or visual cortices, the resulting experience comprises of these qualities without being separate experiential or, in my vernacular, single phenomenally conscious states.

With respect to the last two points, the partlessness of experience and its non-modal nature, Searle joins in: Instead of single experiences from various sense modalities composing a total cross-modal one, Searle speaks of the total state of consciousness as not consisting of parts and being a "single, unified, conscious field" containing visual and auditory "aspects."[346] According to him, like Tye, a separate visual or auditory consciousness does not exist, but only one total all modalities encompassing seamless total conscious state.[347]

The relation of constitution that holds between the separate and physical micro-processes in the brain and the resulting seamless single macro-experience is also an element that resembles James' account. Where James posits a process of fusing that renders one whole experiences from various separate objects, Tye holds that the single experience is "constituted by a combination of largely independent physical events going on in separate regions of the brain."[348] I interpreted James in terms of sums and wholes as holding that the one experience is more than the sum of objects it is fused from. Now Tye makes this way of phrasing the relation between his single experiences and the various separate micro-processes in the brain explicit by referring to classical examples used in the debate revolving around the identity of the whole with the sum of its parts.[349] By invoking different modal and actual properties of the lump of clay and the statue, or water droplets and the whole cloud, he claims that by Leibniz law the totality is different from the set of parts it is constituted by. Similarly, or so he eventually argues, also the one single seamless experience instantiates different properties from the set of physical

344 Ibid, p.40.

345 Michael Tye, Consciousness and Persons: Unity and Identity, Representation and Mind (Cambridge, Mass: MIT Press, 2003), pp.27/8.

346 John R. Searle, *Consciousness and Language* (Cambridge: Cambridge University Press, 2002), p.56.

347 Metzinger speculates about a similar account with respect to embodiment and „human self-awareness on the proprioceptive level" (Metzinger, *Being No One*, p.611). This what he also calls "phenomenal embodiment" (ibid.) is, on his proposal, holistic in such a way that no simple and single sensations or first order phenomenal properties can be ascribed to it. Kriegel (in Kriegel, *The Varieties of Consciousness,* p.8) also uses the notion holistic for existence monistic views.

348 Tye, *Consciousness and Persons*., p.31.

349 Ibid, pp.29-31.

micro-processes in the brain and hence is non-identical to the set: for example, the whole experience would survive the loss of one qualitative aspect, whereas the set of representations of the brain would not survive the loss of one of them. So, in a nutshell, according to Tye, the one experience is constituted by but is not composed of the various physical events.

In a similar vein, although not as fine-grained as Tye, Searle thinks of the above mentioned single conscious fields as "a feature of the brain emerging from the activities of large masses of neurons."[350] Accordingly, the aspects of this fields that reflect the various qualities of objects perceived by the sense modalities, but are emphatically not conscious discrete bits or parts, are conceived by Searle as "modifications, as forms that the underlying basal conscious field takes after my peripheral nerve endings have been assaulted by the various external stimuli."[351] In their talk of aspects and modification of the single conscious state Tye and Searle indulge in the same vernacular as their general metaphysical existence monist colleagues who try to illustrate changes in the world by speaking of modifications of the blobject and alluding to metaphors like dents in a car or waves of the ocean.

Criticizing PEM

As I said at the beginning of this section, the following criticism pertains to both versions of PEM. This is because the objection questions the possibility for a numerical single entity to exhibit qualitative complexity and multiplicity, and sPEM as well as lPEM posit such possebility. However, I conduct the criticism in terms of lPEM because I want to maintain connection to actual occurring discussions in philosophy of mind. And as I said before, sPEM is no serious part of the latter.

lPEM has launched some caveats and I do not reiterate those objection here.[352] I rather want to focus on one line of critique that I already mentioned in the first part with respect to existence monism in general metaphysics, that is, internal structure or qualitative complexity within the one single totality. Regarding lPEM, it has only briefly mentioned by Kriegel and Bayne that the one single total state of consciousness only mysteriously can

350 Searle, *Consciousness and Language,* p.56.
351 Ibid.
352 Cf. for criticism Bayne, "Divided Brains and Unified Phenomenology" and Tim Bayne, *The Unity of Consciousness* (Oxford University Press Uk, 2012), pp.22ff.

be said to maintain structural or qualitative complexity.[353] The fact that this point is only mentioned in passing and is not further discussed by supporters and opposers of PEM comes as a surprise, given that in general metaphysics, as we have seen in the first part, supporters of existence monism make considerable effort to mitigate these objections by deploying elaborate semantic apparatuses.

The general picture according to IPEM, as to reduce the positions introduced above to their common argumentational denominator, seems to be the following: some kind of multiplicity exists at the extra-conscious level, where the various authors differently conceptualize the ontological status of those items, be it representational content, perceptual objects or neurons firing in the visual or auditory cortex of the brain. In the next step this objectual multiplicity enters into an unifying and substituting constitutional or fusing process. This process results in a conscious singularity, for example called a single total conscious state or field. Now it remains mysterious how the one single phenomenal entity is capable of maintaining the same qualitative and structural complexity as the set of initial objects that the subject is conscious of. I regard the fact that phenomenal consciousness is qualitatively structured and multifold as a given: I am aware of various different auditory or visual qualities in several locations in my visual or auditory field at the same time. So the question is about how to make sense of this qualitative complexity, that also strikingly corresponds to the qualitative multiplicity of the set of objects I am phenomenally conscious of, by way of a phenomenal entity that lacks substantial or numerical complexity.

The supporters of IPEM might resort to the strategy followed by their colleagues in general metaphysics and develop a semantic machinery to the end of holding that in fact the structural complexity is a merely linguistic matter and hence that "nothing in the world answers directly to these posits."[354] So the one single entity might exhibit qualitative complexity but this does not to correspond to any structural or numerical complexity. Even if doubtful, this strategy of "indirect language-world correspondence"[355] might work in the material domain in the light of the fundamental human situation in which we do not have direct epistemic access to the worldly and material domain making it at least conceivable that we merely perceive and speak of the world as being structurally

[353] Kriegel, *The Varieties of Consciousness*, p.8. Bayne, *The Unity of Consciousness,* p.23.
[354] Jonathan Schaffer, "Monism," in *Stanford Encyclopedia of Philosophy*, ed. Jonathan Schaffer, 2008, sect.2.
[355] Ibid, sect.2.

complex whereas in fact it is a single entity. However, if we have direct access to something then it is our own mental life, so in the mental domain the fundamental human situation is also fundamentally different. Since the direct epistemic access to our mental live reveals rock solid structural complexity, it is implausible to hold that we merely speak of it as being such whereas in fact it is not.

Since this strategy does not work, the phenomenal existence monist has to answer the initial question and to explain how qualitative complexity is compatible with numerical singularity of the one phenomenal totality without such semantic maneuver. With regards to those strategies, I like to make a general point: In my view, it is in principle impossible that any singularity, be it material or mental, simultaneously instantiates a multiplicity of determinate properties. Let me unfold this statement step by step. First, the "in principle" part. The principle I have in mind derives from a differentiation of classes of properties that I already mentioned before, namely the fundamental difference between the determinable class and determinate class of properties. Recall that determinable properties are general ones, like color and shapes, that can further be specified into their determinate properties, that is, the specific color, like red, or shape, like square. The according principle is nicely phrased by Simons:

> The properties an object may have fall into natural groups or spaces of contraries. For bodies, for example, we have the precise (fully determinate) mass, volume, shape, color, temperature, velocity, and so on. Provided we speak only of fully exact properties, in each of these spaces no object can simultaneously have more than one property-it cannot have two masses, temperature, etc (…).[356]

Let us call this principle the Determinates-Exclusion Principle. It holds that no object simultaneously instantiates two determinate properties that belong to the same determinable. As to clarify, let me briefly consider one objection: One might hold that the principle is falsified by objects that are cold, or red, at one end and hot, or yellow, at the other end, that is, by objects that do instantiate two colors and temperatures simultaneously, like a spoon that is located with one end in a hot soup and the other end in your hand where the latter is colder than the former, or some fruit that is more ripe and red at one side and less ripe and yellow on the other. However, these objects are not

[356] Simons, *Parts,* p.343. Also, for the determinate and determinable terminology, see Johnson, *Logic*, pp.173ff.

made up of one partless whole entity but of a multiplicity of micro-particles or -parts.[357] And it is due to the different temperature or color that changes from one micro-particle to the other that the macro-object seems to have two colors or temperatures simultaneously. I take it that Simons has in mind here single and numerically singular objects. So the objection misses the point for alluding to entities the principle does not apply to.

The second part of my statement says that this principle holds true across the material-mental divide and hence also can be applied to the phenomenal domain. Generally, I see no reason to treat the Determinates-Exclusion Principle in any way different from the other metaphysical principles mentioned to far. Same as mereology does apply evenhandedly to the material and the mental domain, so does the Determinates-Exclusion Principle. Of course, more work has to be done here. For example, mereology is applicable to the phenomenal realm only provided that we take single phenomenal states to be occurents and not continuants.[358] So I stipulate here that the principle holds true in the phenomenal domain premised upon phenomenal objects or states being occurants and leave the elaboration of this stipulation for another occasion.

Finally, in my statement, I hold that the impossibility of instantiation pertains only to a certain class of properties. Here we come back to the differentiation between determinable and determinate properties. The Determinates-Exclusion Principle hence is specified by holding that two determinable properties can be simultaneously instantiated by a numerically singular entity, like being of a certain color and shape. What is excluded by the principle is the simultaneous instantiation of two determinate properties like red and yellow.

So the general point I like to make is that in the light of the Determinates-Exclusion Principle no numerically single phenomenally conscious state simultaneously instantiates

[357] One might ask here, as Howard Robinson did in personal correspondence, why this needs to be true in the phenomenal domain, that is to say, why cannot there be experiential states that simultaneously instantiate two determinates of the same determinable without consisting of micro-states. First, note that this objection simply takes us back to the initial question about structural diversity of n numerically and metaphysically simple entity in response to which I posited this principle. Second, as all metaphysical principles discussed in this thesis, I take them to hold generally, that is to say, in any domain. So if the Determinates Exclusion Principle holds generally, then I see no principled reasons to assume that the principle fails to hold particularly in the phenomenal domain. Hence, I think the burden of proof here is at the objectors side who claims that such structurally diverse but simple phenomenal entities exist. As far as I am concerned, I have difficulties conceiving of one experience that is, say, blue and orange simultaneously.

[358] As opposed to entities called occurants, entities labeled continuants do not possess temporal parts. Cf. Simons, *Parts*, p.118.

two determinate phenomenal properties. But since the latter is exactly what total phenomenal states (or fields, in Searle's words, or experiences, as Carnap, James and Tye have it) do, for example when we simultaneously are aware of a red apple next to a yellow banana, the total phenomenal state (or field) cannot be numerically simple as the phenomenal existence monist holds. Hence IPEM is false. Before I summarized the phenomenal existence monist position such that some extra-conscious multiplicity, by some process of unification or fusion, results in a conscious singularity. My point based on the Determinates-Exclusion Principle is simply that this process remains a myth because, to modify my initial statement, it is in principle impossible that any phenomenal singularity simultaneously instantiates a multiplicity of determinate phenomenal properties. Clearly, the main argumentational work is done here by the Determinate-Exclusion Principle. So in order to resist my point one has to object to that principle, or to its application to the phenomenal domain. The discussion of these and other objections I also postpone to another occasion.

II.6. Phenomenal Moderatism

The answers to SPCQ considered so far all belong to the extreme camp. And as such, I assume, they do not satisfy the intuitions that most of us entertain with respect to the composition of phenomenal consciousness. If we follow the application of CEM to the phenomenal domain up to this point, we have the choice between holding that single phenomenal states always and unrestrictedly form a total conscious state, viz. universalism, or never, as the nihilist, atomist and monist claim each resulting in their own special phenomenality-wise arranged, atomic, gunky or blobjective ontology. Similarly to general mereology, the extreme answers seem not to accommodate the intuition that there is some compositional middle ground according to which sometimes single states compose a total one and sometimes not; roughly, for example, they do in case of all of your single states at a time and separately in case of all of mine at a time, but not in case of simultaneously some of yours and some of mine together at a time. But also similarly to the general discussion of CEM in the first part, this lacking support of common sense is not the fault of the mereological theory. Phenomenal universalism, for example, is a concise and logically precise theory and our intuitional discomfort with its result does not pose a sufficiently strong overrider for it. An apt competitor for the extreme answers given so far would be a theory that reaches the logical rigor of phenomenal universalism as well as satisfies moderate attitudes towards phenomenal composition. This final section of the second part attempts to provide exactly that. In order to do so, I apply the moderatist template developed in the first part as accurate as possible to phenomenal consciousness.

To start with at the most general level, a moderatist answer to SPCQ involves some conditions under which it is true that there is a total phenomenal state such that a set of single phenomenal states composes it.[359] Hence:

> *Phenomenal Moderatism (PM)*
> It is conditionally true that there is a total state such that a set of single phenomenal states composes it.
> Let $[x_1]^{Ph}$, …. $[x_n]^{Ph}$ be a set of single phenomenal states of a

[359] I am concerned here with synchronic phenomenal consciousness, but note that even the condition of contemporaneousness and togetherness suffice as a condition of composition since they exclude that single phenomenal states at different times compose another phenomenal individual as phenomenal universalism allows.

subject S at time t. Also, let [T] be the total state. Then $[x_1]^{Ph}$, …., $[x_n]^{Ph}$ conditionally compose [T].

As an introduction to moderatist conceptions of phenomenal consciousness, I first consider phenomenal priority monism. This position is part of the moderatist camp because it involves conditions and hence restrictions on composition, that is roughly, some relation of dependence among the parts. On the other hand, it lacks conceptual precision as well as certain axiomatic ingredients that I regard as essential for a full moderatist conception of phenomenal composition. For example, phenomenal priority monism is still monistic to the extent that it cannot account for the intuitive datum of a plurality of total phenomenally conscious states, that is, states of what it is like to be a subject at a time for each of us and also disjoint from each other. In short, it lacks a closure axiom for phenomenal composition.

II.6.a. Phenomenal Priority Monism

Within the monist family, phenomenal existence monism is a fairly extreme member in the already extreme camp of answers to SPCQ. In contrast, phenomenal priority monism is less extreme in two ways. Firstly, we leave the extreme answers to SPCQ and enter the moderatist one in that, as opposed to the positions ranging from phenomenal universalism to phenomenal existence monism, according to which composition always or never occurs, single phenomenal states are held to compose some further phenomenal totality only under some condition.[360] And secondly, regarding the monist family itself, for the same reason of restricting composition, phenomenal priority monism is more palatable than its existence sibling. The general definition of phenomenal compositional priority monism reads as follows:

> *Phenomenal Priority Monism (PPM)*
> It it always true that there is a total state such that it is basic and the set of single phenomenal states composes it.
> Let $[x_1]^{Ph}$, …. $[x_n]^{Ph}$ be a set of single phenomenal states. Also, let [T] be the total state. Then [T] is basic and $[x_1]^{Ph}$, …., $[x_n]^{Ph}$ compose [T].

[360] I present phenomenal priority monism as a position that opposes CEM by restricting composition and hence denies CEM's core axiom, for example, the General Sum Principle. In contrast, Buck and Jaskolla claim that their monism that involves, in my view, a version of phenomenal priority monism, keeps this principle and CEM intact by holding that there is just one subject: "Thus, we are able to maintain the assertion that the general summing principle of CEM holds in the actual world, but there is nothing to sum because there is just this one subject" (Ludwig Jaskolla and Alexander J. Buck, "Does Panexperiential Holism Solve the Combination Problem?," *Journal of Consciousness Studies* 19, no. 9–10 (2012): pp.190-199, here p.195). However, I cannot see how monism in this garment is compatible with CEM. This is because, if there is only one subject such that there is noting to sum, then there are also no parts. But the existence of parts is an essential axiomatic ingredient of CEM. So if there are no parts, in the form of subjects or single experiences in the phenomenal domain, then also CEM does not hold in the first place, not even starting to consider its core axioms like the GSP. This criticism includes another, namely the one that they misconstrue priority monism. This is simply because priority monism implies the existence of parts which they deny on their rather existential monist sounding "one Subject-view."
As a consequence, also the motivation for their positions is weakened. They claim support for their pan-experiential holism based on the fact that, if the extreme positions like universalism and nihilism are unpalatable, as well as Simon's account of restricting composition regarded as arbitrary, then their monistic positions suggests itself for being compatible with CEM. However, as we have seen, since their position is not compatible with CEM, also part of its motivation vanishes (Ibid.). As a side-note in comparison to Buck and Jaskolla, my approach includes claiming that Simons' criteria are not arbitrary so that an account suggests itself that entertains a moderatist rather than monist, of whatever kind, stance towards the composition of subjective phenomenal consciousness.

Same as with PEM, also regarding PPM we find a strict (sPPM) and a loose (lPPM) version of it. And also similarly to PEM, I treat sPPM as the correct one in opposition to lPPM because the former but not the latter considers the entire phenomenal domain, that is, the phenomenal cosmos or world, as the scope of SPCQ. I start with sPPM.

Strict Phenomenal Priority Monism (sPPM)

On the most general systematic level, sPPM results from combining priority monism in general metaphysics with the metaphysics of mind: There is only one basic phenomenal totality such that it is prior to its parts. Also, by being the correct version, the fact that sPPM involves the entire phenomenal world or cosmos as the phenomenal totality nicely finds its manifestation in what sPPM is mainly called in the literature, that is "(priority) cosmopsychism".[361]

In a bit more detail, sPPM holds that "exactly one basic consciousness, the cosmic consciousness, exists."[362] Since sPPM is construed in direct reference to general priority monism and as such is opposed to existence monism, the one and only basic consciousness is compatible with the existence of parts, that is, individual consciousnesses such that "[t]he cosmic consciousness is more basic than other consciousnesses in the sense that it is ontologically prior to or ontologically more fundamental than other consciousnesses."[363] At this point already the maximum level of a detailed exposition of sPPM is reached. It seems to me that the authors, rather than applying Schaffer's priority monism to the phenomenal domain in a fine-grained and precise way, are rather concerned with attempts to illustrate what sPPM amounts to and with fending off objections. Since this is not the place to improve on this position, I proceed likewise.

One major problem for sPPM is how the derivative individual consciousnesses relate to the basic cosmic one. Some authors resolve this predicament with direct reference to Schaffer's priority monism and the ways he meets worries about how our familiar objects derive from the one basic concrete cosmos, for example, by alluding to distributional or

361 Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism"; Philip Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation," in *Routledge Panpsychism Handbook*, ed. William Seager (Routledge, forthcoming), http://philpapers.org/archive/GOFCMA.pdf; Shani, "Cosmopsychism."

362 Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", p.116.

363 Ibid, p.117, 121. Shani, "Cosmopsychism", p.390/, 408, calls the „omnipresent cosmic consciousness" the „single ontological ultimate" and also gets slightly absolute idealistic by also labeling it the Absolute (p.408).

regionalized properties of the whole.[364] Goff, on the other hand, alludes to Bayne and Chalmers' subsumption theory and holds, calling individual consciousnesses "organic consciousnesses", that "facts about organic consciousness are subsumed within the fundamental facts about the conscious universe, and this accounts for the fact that facts about organic consciousness are nothing over and above the fundamental facts about the conscious universe."[365] Other suggestions include structural approaches such that "diachronic equivalence-relations" obtain between "an experientially heterogeneous universe" and the "persisting self of humans" as "quasi-abstract" entities.[366] At this point, where the cosmic consciousness is illustrated as "an inner expanse constantly teeming with a spontaneous buzz of qualitative feel" and humans are understood as "vortices" or "relatively stable experiential patterns within the big experiential subject", sPPM fades out into a less helpful picturesque and illustrative exposition that renders the discussion of this objection too interpretative and does not further contribute to this section.[367]

One other major problem for sPPM is that the nature of the basic one consciousness is hard to imagine and illustrate, or is plainly counter-intuitive.[368] The main strategy of mitigation here is to allude to other hardly imaginable entities like conscious micro particles that reside in the panpsychist world or four-dimensional objects.[369] However, I am not sure whether reference to one counter-intuitive object helps to diffuse the counter-intuitiveness of another. Be this as it may, I think the interesting point here is that not only the reaction towards objections is rather weak but also the argumentation surrounding sPPM in general. It seems to me that this in turn has to do with its systematic locations within the logical space of positions. That is to say that usually sPPM is constructed in opposition or as an alternative to other views that are likewise not quite

364 For discussion, see Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism" pp.121-3. For the respective discussion in Schaffer, see Schaffer, "Monism," sect.2.3.

365 For discussion, see Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation", pp.11-13.

366 Ludwig Jaskolla and Alexander J. Buck, "Does Panexperiential Holism Solve the Combination Problem?," *Journal of Consciousness Studies 19*, no. 9–10 (2012): 9–10, p.198.

367 Shani, "Cosmopsychism", p.412, 414 and Jaskolla and Buck, "Does Panexperiential Holism Solve the Combination Problem?", p.198. The further interested reader might refer to T. L. S. Sprigge, *The God of Metaphysics* (Clarendon Press, 2006), pp.486-90, for example p.489: "The universe is supposed to be what may loosely (rather than mathematically) be called an infinitely comprehensive experience which includes all finite states of consciousness in something like the same sense as one of our states of consciousness includes individual sensations." It does not get more concrete than that. For vortices and the like, see Mathews, "Panpsychism as Paradigm", p.5.

368 Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism." p.124 and Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation", pp.11/12.

369 Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", pp.124-6 and Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation", p.11.

palatable to common sense, like panpsychism.[370] Since sPPM, located within this systematic vicinity, already left the intuitive camp, so to say, argumentation gets very modest, that is, authors do not even attempt to generate intuitive support for sPPM but rather hold that the entities posited by it are at least not more queer than other queer entities posited by related views. Or, in a systematic way, regarding an argument that shows the counter-intuitiveness of sPPM, this argument is not itself objected to but it is rather taken to be a support of sPPM that "[w]hile this might be a good argument to show that priority cosmopsychism is counterintuitive it is not a good argument to show that priority cosmopsychism is more counterintuitive than panpsychism."[371] However, same as I think that reference to one counter-intuitive object does not help to diffuse the counter-intuitiveness of another, I also hold that alluding to one hardly tenable position does not easy the worry regarding another.

Loose Phenomenal Priority Monism (lPPM)

LPPM results from combining priority monism in general metaphysics with the metaphysics of mind: There is only one basic phenomenal totality such that it is prior to its parts. Yet, the fact that the set of phenomenal entities that exhibits such partial priority ordering does not involve the entire phenomenal world or cosmos but is restricted to a subject (at a time) renders this version of PPM loose or incorrect. This is, as mentioned before, because mereology itself does not include such restrictions and unjustifiably imposing the latter impairs mereological methodology.

Having said this, sPPM and lPPM clearly are systematical siblings because their metaphysics structurally resemble. According to sPPM, the partial priority ordering obtains between the cosmic and the individual conscious level, that is, between the conscious absolute or cosmos and the individual subject-level consciousness. The contrast to lPPM merely concerns the respective metaphysical levels in between which the priority ordering occurs: According to lPPM, the one basic phenomenal totality is the individual consciousness that is prior to the set of single or partial phenomenal states.[372]

[370] Or as to solve problems that positions like panpsychism attract, like the combination problem. Cf. Jaskolla and Buck, "Does Panexperiential Holism Solve the Combination Problem?" Also, Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", sect. 4.4.2.

[371] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", p.125.

[372] Kriegel, *The Varieties of Consciousness,* p.8; also, for example, in Elijah Chudnoff, "Gurwitsch's Phenomenal Holism," *Phenomenology and the Cognitive Sciences* 12, no. 3 (September 2013): 559–78, p.561: „I stipulate that our target is all experiences of a subject at a time." Cf. Barry Dainton, "Unity, Synchrony, and Subjects," in *Sensory Integration and the Unity of Consciousness*, ed. David J. Bennett and

And the similarities between the PPM's reach even further because in both versions authors allude to Bayne and Chalmer's theory of subsumption in order to account for the relation between the basic and derivative phenomenal entities: whereas Goff speculates that the cosmic consciousness subsumes the individual ones in sPPM, Bayne's view in lPPM is "that the total phenomenal state is prior to and more fundamental than the experiential parts that it subsumes."[373]

Now coming to the actual view, and even here the PPM siblings unfortunately resemble, it almost cannot be said more about it than I already did. In the locations cited, the exposition of lPPM in most cases does not exceed the reference to Schaffer's priority monism and the general positing of the total conscious state of a subject at a time as basic and prior to the partial experiential states.[374] Differences show in rather slight metaphysical conceptions of the ordered phenomenal levels: Bayne, inspired by Searle, likes "the thought that the multiplicity in consciousness might involve the modification of an underlying basal field" whereas Chudnoff couches the metaphysical dependence relation in terms of partial and total phenomenal states.[375] But in general almost the entire subtlety of the original view by Schaffer gets lost on the way to philosophy of mind. For example, it would be interesting what the tiling constraint amounts to here. What does it mean that there cannot obtain any gaps or overlaps within the set of single or partial

Christopher S. Hill (The MIT Press, 2014), 255–86, here pp.262-4. Also, see Sebastian Watzl, "Attentional Organization and the Unity of Consciousness," *Journal of Consciousness Studies 21*, no. 7–8 (2014): 56–87, here p.61.

373 Bayne, *The Unity of Consciousness,* p.36. Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation," p.7.

374 Cf. Chalmers, *The Character of Consciousness,* p.502 footnote 1 and p.538, footnote 6. These footnotes are not mentioned in the actual "What is the Unity of Consciousness?" paper by Bayne and Chalmers publishes in other places. Lee refers to Bayne and Chalmers theory of subsumption in context of phenomenal holism, so it is lPPM in spirit, but without explicitly mentioning Schaffer's priority monism, (Geoffrey Lee, "Unity and Essence in Chalmers' Theory of Consciousness," *Philosophical Studies* 167, no. 3 (February 2014): 763–73, here pp.766/7. Also cf. Geoffrey Lee, "Experiences and Their Parts," in *Sensory Integration and the Unity of Consciousness* (MIT Press, 2014), pp.287–322, here sect.3, though Lee seems to shift the level of the whole to the neural or physical domain and hence leaves the debate resolving around strict phenomenal holism.
Connected to the idea of the total conscious state as being basic is the according methodology in the study of consciousness, that is the top-down view. Here the holistic metaphysics correspond to a methodology in which the focus primarily lies on the total field of consciousness that then secondarily is decomposed in its parts. In contrast, the atomist methodology corresponds to a view on consciousness according to which the parts or single phenomenal states can be studies independently of them being imbedded in the total conscious field. Cf. Bayne, *The Unity of Consciousness*, p.226. The same holds for sPPM, see Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", pp.121/2.

375 Bayne, *The Unity of Consciousness,* p.36, and p.244. Chudnoff, "Gurwitsch's Phenomenal Holism", p.562. However, Chudnoff seems to misconceive holism as the view according to which an entity is basic when he writes on 562 that phenomenal holism is compatible with the claim "that the total phenomenal state also metaphysically depends on its parts."

phenomenally conscious states (or individual consciousnesses in the case of sPPM)?[376] Unfortunately, this is not the place to conduct this discussion so that I mention this as a point for further research.

Besides discussing PPM and differentiating two versions of it, this section functions as an introduction and transition to one main topic of this thesis, that is, phenomenal compositional moderatism (PM). In order to serve that purpose, I discuss two rather systematic and conceptual points. The systematic point pertains to the separation of the holistic from the monistic aspect of PPM, and how the two versions of PPM relate to the holistic one. This is because, first, the holistic view is predominant in the phenomenal application of Schaffer's priority monism anyway, and because PM relates only to PPM's holistic thesis and not to the monistic one. With my conceptual point I motivate my strategy of not operating with the notion of holism in this thesis but with the more specific notions of unity and integrity.

The Holism in the Monisms

I think monism reveals an interesting systematic situation that calls for some remarks. As I mentioned, the monistic family cross-qualifies for two radically opposed camps of answers to SPCQ. Existence monism belongs to the extreme camp whereas priority monism resides on the moderatist side. But how can it be that the same systematic family breaks up into full opposition when considered from the compositional angle? I think this has to do with the occurrence of holism. Since holism is what, in my view, also essentially determines PM, which will be discussed in the final section of this thesis, the following considerations can also be read as a transition to phenomenal compositional moderatism.

Schaffer summarizes priority monism "as the conjunction of the numerical thesis that there is exactly one basic object with the holistic thesis that the cosmos is basic."[377] If we drop the second conjunct, we are back at existence monism that posits an entity like the one and only object from which all other things are derived as being aspects or

[376] For example, if we assume that the set of single phenomenal states compose a total one according to PPM, in a diachronical understanding, the No-Gap-Principle might be taken to hold that there are no stretches of time in-between two single phenomenal states. Understood this way, the principle would cause some problems for PPM given that intuitively we take diachronic phenomenal consciousness to be a unified totality despite the fact that there are various phenomenally unconscious stretches of time, for example, when we sleep.

[377] Schaffer, "Monism," p.42.

modifications. On the other hand, if we drop the first conjunct we arrive at the view that conceptualizes holism within the framework of priority theory resulting in an account of basicness. And this view stays neutral on the kind or number of entities claimed to be basic. Yet, as we saw in the first part, Schaffer is mainly concerned with considering basicness from the perspective of the cosmos. According to him, monism is true if the basicness principle, according to which the basic entity does not depend on anything, and the tiling constraint along with the covering principle, according to which the basic entity completely covers entire reality, are satisfied with respect to the cosmos. That is why the holistic thesis constituent of monism turns into the particularistic thesis essential to pluralism in case the cosmos is not basic.[378]

But note that we can extract holism in terms of basicness from the monistic numerical thesis that there is only the cosmos as the one basic entity. In that case we can hold that a certain fraction or division of reality forms a whole, that is, is basic with respect to the parts the division is composed of. So we would be holists with respect to that fraction. Furthermore, we can hold that the cosmos consists of various of those holistic divisions. So we would be particularists with respect to the cosmos. Note that here I do not say anything about monism or pluralism since the numerical thesis that decides between these positions is excluded by solely considering the holistic thesis in terms of basicness.

If we focus on the holistic thesis rather than on the numerical one, and try to find out what basicness on Schaffer's account means generally and independently of solely concentrating on the cosmos as the one basic entity, we find only less formal and precise treatment. At least, in part two of his *Priority*-paper, where he discusses various arguments that favor the monistic worldview, we can find some adumbrations on what renders a set of parts, be it the entire cosmos, or just some division of it, basic. A conceptual dichotomy that figures prominently in these considerations is the one between integrated wholes and mere aggregates. For example, in his first argument in favor of monism based on common sense, he starts by exclusively discussing what the latter holds regarding integrated wholes. And Schaffer does so, as I do here, by not yet considering any numerical stance, that is, whether the integrated whole in question is some random set of parts or the entire cosmos.[379] With the help of examples like the pebbles that are prior to the heap and the syllable that is basic and prior to its letters, he

[378] Ibid, pp.42/43.
[379] Ibid, p.48.

then concludes that "[c]ommon sense probably does endorse the priority of the parts in cases of mere aggregation, such as with the heap. Yet common sense probably endorses the priority of the whole in cases of integrated wholes, such as with the syllable."[380] In a nutshell, integrity necessitates basicness and priority, whereas mere aggregation grounds derivativeness and posteriority. So if I interpret Schaffer rightly, one way in which he conceptualizes the holistic thesis that some entity is basic is in terms of integrity and the according entity of integrated wholes: A set of parts, be it the entire cosmos, as he has it, or just some division of it, by my general interpretation, is basic if integrity obtains among it.

But even if this is so, why would we allocate Schaffer's priority monism to the moderatist camp, as I do. Here we just have to recall what I discussed in the first part. On the most general level, integrity is some principle of unity that restricts composition. If a set of parts or series of states is integrated, than some interrelatedness obtains among them to the effect that not any set of parts at any time composes a further individual. So holism is inextricably conceptually connected to compositional moderatism by the notion of integrity. Systematically this connection shows based on the fact that holism is part of Schaffer's priority monism in the shape of its constitutive holistic thesis and the talk of integrated wholes, on the one side, as well as in the prominent featuring of integrity and integrated wholes in Simons exposition of compositional moderatism on the other.

In sum, given that Schaffer conceptualizes holism in the framework of priority theory in terms of basicness, and basicness entails integrity as restrictions of composition, we can now see why two positions belonging to the same metaphysical family, viz. monism, are diametrically opposed with respect to composition: priority monism combines the numerical thesis that there is only one basic entity, which renders it a monistic view same as existence monism, with the holistic thesis that the whole is basic, which links it to compositional moderatism by involving integrity as restrictions of composition. So the underlying reason why the metaphysically alike monisms are compositionally opposed is the mutual entailment of holism and moderatism which determines the priority but not the existence version. And as per the transition to the final section of this thesis, PM, the aim of the latter is to precisify and sharpen the conception of integrity as to account for a moderatist and holist stance towards the composition of phenomenal consciousness.

[380] Ibid.

Holism and Compositional Theory

Now that we separated the monistic from the holistic aspects of PPM, let me make another remark on holism itself. In both versions of PPM, basically, holism is the view according to which an entity is basic. In sPPM this entity is the phenomenal world or cosmos, in lPPM it is the individual consciousness. Also, these accounts are elaborate when it comes to discussing what it means for an entity to be basic, for example in terms of metaphysical dependence and priority.[381] In contrast, it seems to me that these accounts remain fairly vague about what it specifically is that renders an entity holistic and hence basic. That is to say that whole-part relations are well discussed but not part-part relations, although the latter are what is responsible, as we have seen in the first part of this thesis, for the resulting whole to be basic. Here various suggestions are on the table, but a specific account is missing. In both phenomenal versions, for example, the subsumption account is prominent. So here it seems that if the set of phenomenal parts is unified by subsumption, then there is a whole that is basic and prior to its parts. But also other forms of unity seem to qualify, like contemporaneousness or co-consciousness.[382] Also, in sPPM, the cosmic consciousness is taken to be unified by being integrated, a theme that this position directly inherits from the original priority monism.[383] And this assessment does not only apply to the PPM's but also to the original priority monism in general metaphysics. As we saw in the discussion of Schaffer, he is very precise when it comes to the constraints of the answers to fundamental ontology, that is, the tiling constraint to the question about which objects are fundamental. Yet, when he reaches the second part and the substantiation of the monistic answer and specifically its holistic thesis that the cosmos is basic, notions of unity, integration, entanglement and organic wholes are used interchangeably. Also here we see various suggestions for what kind of interrelatedness of the parts have to obtain in order to render the whole basic, but no unitary account. In sum, in general and phenomenal priority monism, holism is an umbrella term for a set of parts being unified, cohere or are strongly related as to result in a whole that is basic and prior to the set of parts.

If we now take a look at compositional theory and specifically moderatism, the topic of the first part of this thesis, we see that there the same notions are operated with. Here

[381] We can add explanatory priority here such that the whole is not only metaphysically but also explanatorily prior to the set of its parts, though I lack the respective literature here.

[382] Cf. Chudnoff, "Gurwitsch's Phenomenal Holism" p.562 and Dainton, *Stream of Consciousness*.

[383] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", p.122.

also the way parts are interrelated is conceptualized in terms of unity, integrity, wholes and the like. However, two differences are apparent in my view. First, the notion of holism is far less present in compositional theory and particularly moderatism than in the philosophy of mind and particularly the PPM's.[384] Second, the notions of unity and integrity that unsystematically surround the notion of holism in the PPM's are used in a nuanced and systematic way in compositional theory. As we saw, here they appear in an descending degree of generality towards a precise account of moderatism: At a fairly high level we have principles of unity that restrict composition generally up to the point where we reach Simon's logically precise account of integrity.

Again, two points come to my mind here. First, debates in the philosophy of mind revolving around phenomenal holism or the unity of consciousness and the debates in compositional moderatism seem to have the same subject matter: roughly, the way parts are more or less strongly interrelated as to account for the unity of consciousness in the philosophy of mind on the one side and as to account for an alternative to CEM on the other.[385] Second, one could use the notion of holism as to denote the common denominator of both debates, since holism is the view according to which, again very roughly, parts are more or less strongly interrelated. However, as we have seen, holism as a conceptual tool is far too vague and used in too many different ways in the two debates as to establish a systematic link between them. For that reason, since I am attempting to do exactly that in this thesis, I choose to circumvent the notion of holism and to operate directly with the notions that holism is paraphrased with, particularly the one of unity and integrity. This is because they appear in both debates and present an apt starting point for inquiry. Furthermore, I approach the composition of phenomenal consciousness in the systematic way as presented in the first part. That means that I also take over the precise way in which the notions of unity and integrity are used there for my purposes of discussing PM. This is for the reason that, in my view, they enable a more precise account of PM than would be possible with the conceptual apparatus used in the

384 For example, Johnston discusses fundamental ontology in his prominent moderatist account in a similar way as Schaffer does, but without mentioning holism (see Mark Johnston, “Parts and Principles,” *Philosophical Topics* 30, no. 1 (2002): 129–66, here pp.132/3. For an explicit holistic version of sPPM, cf. Sprigge, *The God of Metaphysics,* p.488; Shani, “Cosmopsychism”, pp. 390, 410 and Jaskolla and Buck, “Does Panexperiential Holism Solve the Combination Problem?”, though they confuse holism with monism and hence do not, as Schaffer does and as I emphasize in this section, separate the monistic from the holistic thesis, as can be seen from this quote on p.196: “The fact that there is exactly one entity suffices to classify our approach as some kind of holism.“

385 Clearly more work has to be done here in order to substantiate this thesis.

philosophy of mind that does not disambiguate between the notions of holism, unity and integrity.

The mentioning of holism in this section is meant just to do justice to the way in which the unifying interrelatedness of phenomenal parts is discussed in the philosophy of mind. But, as I said, although I circumvent the notion of holism, compositional theory and priority monism partially share the same subject matter so that one may also read my following expositions of PM as a specification of Schaffer's question of fundamental ontology in the phenomenal domain. That is, a set of single phenomenal parts or states are holistic and hence basic if integrated. This reading is based on my view according to which moderatism with its core notions of principles of unity and integrity is the compositional term for holism.

Finally, as to lead over to PM, as mentioned, in what follows I will be mainly concerned with an exposition and discussion of the conditions that restrict the composition of phenomenal entities in compositional terms. In a nutshell, according to PM, a set of single phenomenal states composes a further phenomenal individual, that is the total phenomenal state, under the condition that the set is integrated.

II.6.b Principles of Phenomenal Unity

The aim of this section is twofold. Firstly, I introduce principles of unity for the phenomenal domain. Secondly, I contrast the dialectical role of unity in phenomenal compositional theory with the dialectical role of unity as apparent in the debate that revolves around the unity of consciousness in philosophy of mind.

As to the first point, before I suggested to start at a general level so as to search for a moderatist answer to SPCQ and hence restrictions of phenomenal composition. That is to say that, in my view, we should not primarily consider, as van Inwagen does in the material domain, rather special relations among the parts, like fastening or contact, but rather look for more general restriction principles in the shape of more comprehensive (class of) relations. This is for, as Simons put it, "[t]he problem facing the proponent of a distinction between arbitrary sums and non-arbitrary unified wholes is to give an account of the latter which is neither too vague and unspecific to be of use (…), nor too specific to cover all cases (…)."[386] And I think van Inwagen's strategy is a case of the latter problem.

Talking of decreasing levels of generality in the quest for moderatist restrictions of phenomenal composition - as to differentiate between arbitrary phenomenal sums, as posited by the phenomenal universalist, and non-arbitrary unified phenomenal wholes, as posed by the moderatist - principles of unity form the most general level. This is because demanding such principles does not yet amount to specifying certain special relations among single phenomenal states but, as a start, so to say, simply entails that there must be "some multigrade relation"[387] as a unifying principle over and above the mere existence of the parts as to justify the occurrence of composition and hence the existence of a proper phenomenal individual like a total phenomenal state or what it is like to be you or me. This is to say that there is no such thing as phenomenal consciousness without the obtaining of such principle.

As a proviso, note that, for now, such principle stays neutral on what we called the numerical thesis in the context of priority monism. Possible positions are connected to a strict application of principles of unity to the phenomenal domain. Since a strict application involves the consideration of the entire phenomenal cosmos or the entirety of actual single phenomenal states, one might hold that a principle of unity holds

386 Simons, *Parts,* p.291.

387 Ned Markosian, "Restricted Composition," in *Contemporary Debates in Metaphysics*, ed. Theodore Sider, John Hawthorne, and Dean W. Zimmerman (Blackwell Pub., 2008), 341–63, here p.355.

ubiquitously. In this case she is a monist since she supports the numerical thesis that there is only one unified phenomenal whole, which is the phenomenal cosmos. In contrast, she also might hold that a multiplicity of fractions or devisions of the phenomenal world are subject to such principle, resulting in the thesis that the number of integrated phenomenal wholes is larger than one, which renders her a phenomenal pluralist. Furthermore, given the fact discussed in the first part that principles of unity also form hierarchies, one might also speculate that the phenomenal cosmos is subject to one principle whereas its parts, for example the individual consciousnesses, are unified by some other principle.

Also, principles of phenomenal unity function as existence as well as identity conditions. They are existence conditions because without those principles, according to the moderatist, no such thing as phenomenal consciousness, be it cosmic for the monist or individual for the pluralist, exists. Yet, principles of unity also present identity conditions. Same as in the material domain the identity of a table depends on the way its parts are arranged or structured, where structure or arrangements are subcategories of principles of unity, also in the mental domain the identity of a total state as being phenomenally conscious depends on the arrangement of the single phenomenal states as parts. Compare here the position entertained by Watzl who claims that the attentional organization of the phenomenal field is responsible for the entire field instantiating the property of being conscious. We will return to this position below.

Based on Johnston's version regarding the material domain, a moderatist statement in the phenomenal at a high level of generality, that is, under consideration of the principle of unity reads as follows:

> *Principle of Phenomenal Unity*
> What it is for the total phenomenal state to exist is for the single phenomenal states to (the principle of unity is specified here).

The last part of the statement left unspecified is the subject matter of the following sections. In what follows the principle of unity will be further sharpened by invoking integrity. But before I do that, let me make a remark on the different dialectical role of the

notion of unity in compositional theory and philosophy of mind. Furthermore, in the exceptional case in which this difference does not show and even the unity of consciousness debate takes compositional form, I argue that this is in the somewhat deficient loose and not the strict form.

Unity in Compositional Theory and Philosophy of Mind

This thesis is concerned with the application of the SCQ to the phenomenal domain, so systematically it is a combination of mereological metaphysics and philosophy of mind. The notion of unity is present in both and it is interesting to note that the notion of phenomenal unity as it results from the application of compositional theory inhabits another dialectical role than the same notion as present in the debate revolving around the unity of consciousness.

The notion of unity in the discussion surrounding the unity of consciousness is mainly used in connection with conceptual analysis, that is, what we understand by unity (e.g. subject, access or phenomenal unity) itself, or what (kind of) special relations account for unity (e.g. co-consciousness, subsumption). Furthermore, the debate reaches out to other levels of the cognitive architecture and discusses whether or not, for example, phenomenal unity is grounded in neural correlates of consciousness or higher order thoughts. Many further approaches to the unity of consciousness can be listed here but the point is that in the discussion in the philosophy of mind unity or the according principles do not inhabit the dialectical role as necessary features or properties of the nature of phenomenal consciousness, that is, as its existence or identity conditions.

In contrast, as we have seen in my general moderatist statement involving the principle of unity above, unity in compositional theory plays the dialectical role of a necessary condition for the existence of phenomenal consciousness, or, taken conceptually as in Watzl, figures in the real definition of it. According to compositional moderatism, the principle of unity is essential to or an existence condition of being of a certain kind. Hence, there is no case in which an entity is of a certain kind if its parts are not unified. Take material kinds, that is, kinds material objects can be. In the material domain, objects can be of various kinds, for example, being solid or being a table. Moderatism holds that material objects cannot be of the solid or table kind if the parts they are composed of are not under some principle of unity. Now take mental kinds, that is, kinds mental states can

be. In the mental domain, states can be of various kinds, for example, being phenomenal. Phenomenal compositional moderatism holds that mental states cannot be of the phenomenal kind if the single states they are composed of are not under some principle of unity.

However, there is one exemption from this contrast between compositional theory and the unity of consciousness debate. Watzl as well as Bayne and Chalmers explicitly hold that unity is an essential and necessary feature of phenomenal consciousness to the effect that, in Bayne and Chalmers words, "there seems to be something inconceivable about phenomenal disunity."[388] And even being explicitly based on Johnston's work, Watzl holds that principles of unity, specified by him as attentional organization, "is a relationship between the phenomenal parts that occurs in the real definition or essence of consciousness."[389]

However, same as with the phenomenal monisms, in Bayne/Chalmers and Watzl we find no strict compositional approach. This is because, based on what I called the loose understanding of mereology, both restrict the scope of their mereology to subject at a time. In Watzl this restricted application of Johnston's principle of unity shows because he regards attentional organization determined by the peripherality relation as this principle where it is clear that what is organized in such a way is the field of consciousness of an individual.[390] Also, Bayne and Chalmers' unity thesis holds that "any set of phenomenal states of a subject at a time" is necessarily unified.[391] Let me elaborate.

Even although we find a clear connection of compositional theory and the debate revolving around the unity of consciousness in the philosophy of mind in the two mentioned approached, still, from the compositional perspective, they are deficient.

388 Timothy J. Bayne and David J. Chalmers, "What Is the Unity of Consciousness?," in *The Unity of Consciousness*, ed. Axel Cleeremans (Oxford University Press, 2003), p.37.

389 Watzl, "Attentional Organization and the Unity of Consciousness," p.57. Also, in Fekete and Edelman we have an example of connecting not the notion of unity but the notion of holism with the essence of experience: "The blurring of the distinction between the possible and the actual has driven some scholars to question the suitability of the computational approach to modeling experience. This concern is, however, unfounded: the now classical analysis by Quine (1951), which revealed linguistic meaning to be holistic, extends naturally to the content of experience. Thus, it is only reasonable that holism should also turn out to be an essential property of any purported computational framework for modeling experience. In fact, anything less than holism on the part of a theory would imply that that it is failing in its job of capturing the essence of experience" (Tomer Fekete and Shimon Edelman, "Towards a Computational Theory of Experience," *Consciousness and Cognition* 20, no. 3 (2011): 807–27, here p.811.

390 Watzl, "Attentional Organization and the Unity of Consciousness," sect.3.

391 Bayne and Chalmers, "What Is the Unity of Consciousness?", p.33.

Surely, just viewed from the perspective of philosophy of mind, the way in which Bayne and Chalmers as well as Watzl approach the unity of consciousness makes perfect sense because mainly philosophy of mind is concerned with the mind of individuals, not worlds. But this is exactly the difference between philosophy of mind and compositional theory, in my view. The latter, not the former, pertains to the entirety and hence cosmos or world of respective entities, be it in the material or mental domain. The fact that a moderatist answer to SPCQ has to consider the phenomenal world and not only the phenomenal consciousness of individuals can be inferred from the way in which moderatism is viewed in the material domain, for example by van Inwagen. Van Inwagen phrases this moderate stance toward the occurrence of composition as follows:

> (…) it is possible for there to be objects that compose something and also possible for there to be objects that compose nothing; or, more exactly, that possible for there to be objects that properly compose something and also possible for there to be disjoint objects that compose nothing.[392]

With respect to principles of unity we can translate this statement into saying that a correct moderatist stance towards composition facilitates a differentiation between objects among which such principle holds and that properly compose something and objects among such principle does not obtain and that do not properly compose something. Accordingly in the moderatist answer to SPCQ involving principles of unity: A correct account has to facilitate a differentiation between a set of single phenomenal states among which a principle of phenomenal unity holds and that properly composes a total phenomenal state and a set of single states among which such principle does not obtain and that do not properly compose a total phenomenal state.

Now, in Bayne and Chalmers as well as Watzl principles of unity feature only in accounts of the occurrence of composition. That is to say, they restrict the scope of the set of single phenomenal states in question to the one of a subject at a time and then, by subsumption or attentional organization respectively as a principle of unity, account for the proper composition of a total phenomenal state, that is, the individual phenomenal consciousness. They do not, though, consider the non-occurrence of composition connected to possible relations of single phenomenal states of individual consciousness A

[392] Inwagen, *Material Beings,* p.61. Van Inwagen's own answer to SCQ is moderate since, he, as already mentioned above, claims that it is possible for there to be some objects that compose something in case the activity of these objects constitute a life (see section 9 of *Material Beings*).

with such states of consciousness B, or, in general, to any other (set of) single states in the rest of the phenomenal world. But, at least intuitively, this is exactly the difference between the occurrence and non-occurrence of phenomenal composition: There seems to obtain a rather strong unifying relation among single phenomenal states within one individual consciousness as opposed to in-between two states of two separate consciousnesses A and B. Restricting the set of single phenomenal states to the ones of a subject at time might be fruitful as it is, and probably particularly when discussing subject unity. However, regarding phenomenal unity such limited account does not facilitate what van Inwagen has in mind for a correct moderatist stance towards composition, that is, the differentiation between occurrences and non-occurrences of composition. Simons even calls this strategy "cheating" (here with respect to Husserl's version of a dependence relation, foundation, that is meant to enable unity and integrity):

> It is notable that Husserl begins his discussion of foundation by explicitly setting aside the relations an object has to others outside it, which is cheating, since only then it is plausible to say that all objects which are foundationally connected form a whole of which they are parts, and the difficult cases are not confronted.[393]

Only with this differentiation between occurrences and non-occurrences of compositions a moderatist stance reveals its full descriptive power for the complete scope of entities in a domain or world. In the material domain, for example, and this is what I regard as the main argumentational advantage of moderatism as became apparent in Simon's quote at the beginning of this section, principles of unity help to satisfy our common sense intuition about the occurrence of composition of ordinary objects. This is by holding that in case of our familiar dry, medium sized objects principles of unity obtain and account for the occurrence of composition whereas in case of a set of parts picked out from scattered locations in time and space those principles do not hold to the effect that this set does not compose another material individual. Hence, moderatism seems to be an apt description of the material world because it differentiates between proper composed and complex objects and mere arbitrary sets or heaps. Simply accounting for occurrences of composition while staying silent on when composition does not occur results in considerably ignoring the implications of moderatism for the entire cosmos of material entities.

[393] Simons, *Parts,* p.340.

Same with respect to the mental domain. Simply accounting for occurrences of phenomenal composition, as Bayne and Chalmers as well as Watzl do, while staying silent on when phenomenal composition does not occur results in considerably ignoring the implications of phenomenal moderatism for the phenomenal world. Their accounts do not facilitate a differentiation between individual consciousnesses in regards to which principles of unity obtain and hence composition occurs and sets of random single phenomenal states picked out from scattered locations in time and the space in regards to which principles of unity do not obtain and hence composition does not occur. In sum, from a compositional perceptive, their accounts are deficient because they do not facilitate a differentiation between occurrences and non-occurrences of phenomenal composition and hence block a full-fledged moderatist phenomenal worldview that includes both.

To anticipate, in order to render a moderatist stance toward phenomenal composition correct and strict, we also need some principles or axioms that clearly mark off cases in which relations by which principles of unity are specified do not hold among members of a set of single phenomenal states and hence do not contribute to composing a total phenomenal state, that is, a individual phenomenal consciousness. Such limiting principles will be now introduced within the above announced specification of principles of unity in terms of integrity.

II.6.c. Phenomenal Integrity

I view integrity as the crucial difference-maker with respect to composition. In other words, integrity delineates cases of composition, as in the case of individual consciousnesses, and cases of non-composition, as in the cases of some arbitrary set of single phenomenal states. Recall what Simons holds with respect to what in van Inwagen's framework of SCQ counts as the moderatist stance:

> Implicit in the criticism of mereological theories which permit the existence of arbitrary sums is the view that something cannot count as an individual, as *one* object, unless it is possessed of a certain degree of integrity or internal connectedness.[394]

However, Simons also reminds us that the universalist stance is not easy to come by because CEM is logically neat and precise to the effect that proponents of moderatism face the challenge of presenting an account that is neither too vague nor too specific. So with respect to phenomenal consciousness, in order to pay tribute to our intuition that individual consciousnesses present cases of phenomenal composition whereas random sets of single phenomenal states do not, we cannot simple dismiss phenomenal universalism on the grounds of counterintuitiveness but have to present an account that is equally precise without being too specific. In order not to be the latter, Simons recommends a formal account that maintains sufficient degree of generality as well as logical precision:

> What is it about an integrated whole in virtue of which it hangs together in the way that an arbitrary sum does not? In schematic outline, it seems as though the explanation must refer to some kind of relation between the *parts* of an integrated whole which they have to one another, while such relations do not obtain between the parts of a mere sum. This notion of hanging together is obviously not a specific one, but should be given a formal characterization.[395]

In a nutshell, I suggest that viewing Simon's account of integrity as a principle of unity provides a precise account of phenomenal moderatism. A formal account of phenomenal integrity facilitates the delineation of cases of phenomenal composition from cases in which such composition does not occur.

Integrity is not a new conceptual kid on the block in consciousness studies. For example, an entire branch of the debate is concerned with sensory integration or

[394] Ibid, p.290, italics by Simons.
[395] Ibid, p.292.

Integrated Information Theory (IIT).[396] These approaches feature in the debate revolving around the unity of consciousness and, as we have seen, the notions of unity and integrity are closely related. However, as I noted, in consciousness studies the specific way in which the notions are connected does not become clear. From the perspective of compositional theory, I suggested to take integrity as a specification of unity. However, for an account of integrity that is also general enough as to serve a moderatist stance of how single phenomenal states "hinge together", as Simons has it, as to form another phenomenal individual, the notion of integrity as used in consciousness studies seems too much entrenched in the particular sub-field and as such too specific and unapt. Neither the notion of integrity as operated within the discussion surrounding sensory integration, nor as used in IIT, is capable of providing an approach to integrity that facilitates the general delineation of the occurrence from the non-occurrence of phenomenal composition.

In what follows, I use the account of integrity developed in the first part and apply it to phenomenal consciousness as an attempt to present a formal characterization of phenomenal integrity. In order to qualify for the generation of integrity and hence phenomenal composition the relations that obtain among single phenomenal states have to fulfill two main conditions. Firstly, still at some fairly high level of generality, the set of single phenomenal states has to form a relation-family. That is to say, to anticipate, that the set is internally connected as well as clearly delineated from other sets of single phenomenal states outside the set in question. Secondly, these inter-part relations are further specified in terms of dependence. Here I append the concept of phenomenal functional dependence to the already mentioned range of phenomenal dependence relations mentioned in the literature. In sum, roughly, phenomenal integrity is conceived as a phenomenal dependence system under a relation-family resulting in the composition of a phenomenal individual in the shape of a total phenomenal state.

Before we reach the actual account of integrity, some further preliminary remarks are in place here, first on the way I use the examples in this section. So far, I used individual consciousness as an example of integrity and construct the phenomenal world as being

[396] For further study, start with David J. Bennett and Christopher S. Hill, eds., *Sensory Integration and the Unity of Consciousness* (MIT Press, 2014); Tononi, "Consciousness Differentiated and Integrated," in *The Unity of Consciousness*, ed. Axel Cleeremans (Oxford University Press, 2003); Giulio Tononi, "Integrated Information Theory of Consciousness: An Updated Account," *Arch Ital Biol* 150, no. 2–3 (2012): 56–90.

composed of disjoint individual integrated consciousnesses. But this is just in order to use intuitive and approachable examples and does not mean that I anticipate the result of this study. Like I said in the preceding paragraph, whether some set of phenomenal states compose a further phenomenal individual or not is decided upon the relation that one thinks holds among the single phenomenal states and not what one intuitively prefers the phenomenal world to look like. As has been mentioned, psychological proclivities do not present an overrider against neat and precise phenomenal universalism. I do favor the view on individual consciousnesses as integrated divisions but I do not attempt to substantiate this view by way of using corresponding examples for the introduction of the involved mereological terminology but, in the course of this section, by arguing that integrity-generating relations obtain among the set of single phenomenal states of one individual consciousness and not in-between the set of states of two consciousnesses.

This argumentational strategy is exemplified by Tononi and his IIT. He first develops his notion of integrity, that is, the multigrade relation of integrated information that plausibly exclusively obtains among the set of single phenomenal states of a subject. Based on this notion of integrity, then, only individual consciousnesses are integrated to the effect that a "superordinate consciousness associated with the joint states of two different people considered together is an absurd notion (…and, H.T.) the notion of a subordinate, partial consciousness is equally misplaced."[397] One can understand my approach as an attempt to reach the same result with a more general and formal characterization of integrity.

Another difference to Tononi's approach pertains to what I called before my state space approach to consciousness. As opposed to Tononi, whose account is closely connected to the neural level as the base for information processing in the integrated way, and hence reductive to some degree, I remain fully phenomenal and exclusively conceive of the way in which phenomenal consciousness is integrated based on phenomenal relations. The state space approach comes in here because such space is the, in my view, on the one hand, maximally precise depiction and formulation of the system of possible and actual phenomenal states conscious creatures can assume and, on the other hand, fully determined by phenomenal relations. As such the state space approach is non-reductive because it exclusively involves a system of phenomenal relations without grounding its structure in the the structure of neural correlates of consciousness or in some higher order thoughts.

[397] Tononi, "Consciousness Differentiated and Integrated," p.254.

Connected to my state space approach, and related to my second account of phenomenal integrity at the end of this part two, I have to flag the fact that large argumentational work for the conclusion that individual phenomenal consciousnesses are integrated divisions, and not the entire phenomenal world, is done by the premise that the quality space and hence also the instantiated total conscious state is subjective and individual. That is to say that, in my view, although the phenomenal world, as mentioned in the introduction to the second part of this thesis, comprises of all actual states of all conscious creatures, spaces of such states are own to each individual creature. There is no such space for the phenomenal cosmos. Based on the premise that only individual creatures possess such state and the one that a total state in such space is integrated, I arrive at the conclusion that integrity corresponds to individuality. Having said this, I take the main contribution of this thesis to lie in the specific account of integrity and not in the elaboration of a particular phenomenal world view. That is to say that fans of cosmic consciousness might as well hold that a cosmic state space exists that comprises of all actual states and that this space is integrated in the way I support to the end of arguing for an integrated phenomenal cosmic consciousness in the shape of cosmic priority monism. [398] However, that does not turn of the account of integrity propagated here.

I.6.c.i. Phenomenal Integrity – First Condition: R-Family

The start for a characterization of integrity marks the notion of a phenomenal division. A phenomenal division is a set of single phenomenal states that can overlap, whereas this is not the case with phenomenal partitions. Using this notion of a division, the doctrine of phenomenal integrity that is to be specified in the following sections reads as follows:

> *Principle of Phenomenal Integrity*
> Every single phenomenal state of some division of the phenomenal world stands in a certain relation to every other single phenomenal state, and no single phenomenal state bears this relation to anything other than the single phenomenal states of this division.

[398] Still there is the problem of differentiating between the phenomenally conscious states of humans and other creatures because I think that even cosmic priority monists do not hold that the conscious One includes phenomenal states of toddlers and dachshunds.

This approximative doctrine finds its specific formulation in the principle of phenomenal closure and connectedness.

Phenomenal Closure

As we saw in the first part of this thesis, the closure principle can be subdivided into closure on the left and on the right. Basically, closure on left guarantees that no relation from the outside of a division reaches into it whereas closure on the right ensures that no relation from inside the division leads to a member external to the division. Of course, this differentiation makes only sense for asymmetrical relations because symmetrical relations function in both directions. If Susie is related to Jane by the sisterhood relation then necessarily Judy is also related to Susie since sisterhood is a symmetric relation. There is no such case of left (or right) closure with the sisterhood relation, that is, a case in which Susie is a member of a family division and related by sisterhood to Jane who is not a member because she is not related to the former. As I showed in the first part of this thesis, asymmetrical relations like delousing allow for such directed closure cases.

In the phenomenal domain, take as an example of an asymmetrical phenomenal relation Watzl's peripherality relation that determines the attentional organization of the conscious field. The left closure requirement for integrity is met if no experience outside the conscious field of subject A is peripheral to one experience inside the conscious field of subject B. Also, for right closure, no experience inside the field of subject A holds the peripherality relation to an experience of subject B. Given that it is plausible to assume that, for example, me feeling pain in my finger is not in any way attentionally peripheral to you tasting lemon, and, more general, the peripherality relation obtains only among the set of single states of a subject, the closure principle is met and Watzl's attentionally structured conscious field counts as an integrated division of single phenomenal states where this division corresponds to an individual phenomenal consciousness. Note that this is only the case based on the closure principle. The principles to follow, for example connected to dependence relations, might render the conscious field á la Watzl disintegrated in case the peripherality relation is not a dependence relation.

In contrast, as an example for cases in which a relation does not guarantee closure to the effect that individual subjective consciousness are not integrated, take the co-consciousness relation. In its basic form, the co-consciousness relation obtains if two

experiences occur together. Surely, togetherness has to be specified here, but if we take it in its rough version, then it is conceivable that one experience of me feeling pain in my finger occurs together with you undergoing the experience of tasting lemon. In this case the two experience are related, or, more precisely, one experience of mine co-consciously reaches into your phenomenal consciousness and vice versa, to the effect that our consciousnesses fail to be closed.[399] Note, first, that here as well we speak only of the closure condition for integrity; if one holds that the co-consciousness relation is a dependence relation within each individual consciousness but not in case it occurs in-between two consciousnesses, then integrity might obtain. Also, secondly, she might very well hold the view that in the case of the co-consciousness relation the closure principle does not account for the a set of single phenomenal states corresponding to individual consciousnesses. Here she is simply conceiving two or more consciousnesses as being integrated, which seems queer but is allowed for by the theory. This is just to say that the closure principle itself is not affected by any view on phenomenal relatedness of single phenomenal states.

We can formulate the full closure principle as follows:

> *Phenomenal Closure*
> For all single phenomenal states $[x]^{Ph}$ and $[y]^{Ph}$, a set of single phenomenal states is closed under a relation R is defined as if $[x]^{Ph}$ is a member of the set then $[x]^{Ph}$ holds R to $[y]^{Ph}$ or $[y]^{Ph}$ holds R to $[x]^{Ph}$ which entails that $[y]^{Ph}$ is a member of the set.

In this case the set A forms an integrated phenomenal division based on the closure principle.

Phenomenal Connectedness

Same as with phenomenal closure, the phenomenal connectedness principle is fairly permissive. It does not involve any requirements regarding the kind of relations but simply

[399] To be precise, I only hold here that the co-consciousness relation does not account for the intuitive view that individual consciousnesses are closed. This is not to say that the view according to which two consciousnesses are not closed from each other is not tenable; it definitely is an option in logical space of answers to SPCQ, yet probably not an intuitive one. More on the co-consciousness relation can be found in the section in which I discuss phenomenal integrity.

guides the way in which the relations hold. That is to say, whereas the closure principle contributes to integrity by limiting the extent of relatedness of a division, the connectedness principle requires the relations to hold ubiquitously within that phenomenal division. Recall what the approximate formulation of integrity involved above says: not only that no single phenomenal states bears a relation to another that is outside the division, but also that every single phenomenal state of the division stands in a certain relation to every other single phenomenal state. So no single phenomenal state remains separate, that is disconnected, within the division.

The fact that this principle is very permissive is proven by the fact that almost all candidates for a phenomenal relation satisfy it. Only relations like conjunction or addition, which are even involved in the existence conditions for sums since they do not posit anything over and above the mere existence of parts, protect this principle from being trivial. So just focusing on connectedness, a division that is ubiquitously internally related by co-consciousness, peripherality, or qualitative similarity qualifies as being integrated. Based on the characterization provided in the first part, a precise formulation of phenomenal connectedness reads follows:

> *Phenomenal Connectedness*
> For all single phenomenal states $[x]^{Ph}$ and $[y]^{Ph}$, a set of single phenomenal states is connected under a relation R is defined as if $[x]^{Ph}$ is a member of the set then $[y]^{Ph}$ is a member of the set which entails that $[x]^{Ph}$ holds R to $[y]^{Ph}$ or $[y]^{Ph}$ holds R to $[x]^{Ph}$.

In this case the set A forms an integrated phenomenal division based on the connectedness principle.[400]

Putting the two principles together, as an interims result, we reach the phenomenal closure system, which is formulated like this:

> *Phenomenal Closure System*
> For all single phenomenal states, a set A of single phenomenal states forms a phenomenal closure system if the set is

[400] For connectedness mathematically conceived with the state space approach, see Ibid, sect.II.

connected and closed under a relation R.

For illustration, pick out any set of single phenomenal states out of the phenomenal world you like, for example, the ones you are undergoing and the ones your dachshund is assuming. Based on the principle of phenomenal closure, the set of your single phenomenal states, or the ones of your dachshund, or the two sets taken together form an integrated phenomenal individual, that is another phenomenal consciousness, dependent on to what extent you think a phenomenal relation holds. If you are of the opinion that exclusively the single phenomenal states of your dachshund are connected and closed under, for example, the co-consciousness relation, then only the set of states of your dachshund forms a singular phenomenal consciousness. However, if you and your dachshund are so intimately familiar to each other after years and years of human-hund-interaction resulting in your impression that even the two sets of yours are co-conscious, then you two compose a joint phenomenal consciousness according to the definition of a closure system.

Coming back to the difference between symmetric and asymmetric phenomenal relations, a derivative phenomenal closure system results from considering a system that is closed under a relation that only holds in one direction. The set of states under such relation is called a biconnected set and the system that results from a suchlike biconnected set is labeled a biclosure system. I regard phenomenal biclosure system as an exotic sibling of general closure system but it is interesting that we already came across such system, that is, again, Watzl's conscious field structured by the peripherality relation. The set of single phenomenal states, be it of one subject, as Watzl has it, or any other set if one thinks it forms a field, yields an integrated phenomenal division, based on being biconnected under peripherality. That is, every single phenomenal field at the fringe of the conscious field is peripheral to any such state that is located further towards the attentional centre of the field. However, and that makes the set being biconnected, the more central states are not related in such way to the more marginal one - naturally, since this is exactly what peripherality amounts to, that is, being located at the margins as opposed towards the centre in relation to other states. Since I regard phenomenal biclosure system as a curiosity, I abstain from their formal characterization as provided in the first part of this thesis.

Now we are only one step away from the formal and precise characterization of the

first condition of phenomenal integrity. We still miss the formulation of what a phenomenal relation-family is. A phenomenal relation-family is a phenomenal closure system that allows for not only the first instance of some phenomenal relation but also for second instances. Second instances of a phenomenal relations are its disjunction with its converse as well as its ancestral. As we saw in the first part of this thesis, the former renders the relation symmetric, that latter additionally transitive and reflexive. As an example for such strategy of broadening the class of permissible relations under which a set of single phenomenal states forms a closure system, take Masrour's connectivity view according to which "the global unity of experience is grounded in local connections among experiences."[401] So, according to Masrour, we experience not only qualities of objects but also the relations that obtain among them. For example, if my hand is on the keyboard, I do not only experience the hand and the keyboard but I also undergo the experience of the relation of adjacency that my hand entertains with the keyboard.[402] If we take this adjacency as a relation under which a set of single phenomenal states forms a phenomenal closure system, then being a relation-family involves this closure system as being also related under the disjunction with the converse and the ancestral of the adjacency relation. For example, the subclass of the two mentioned states might be related by the disjunction of the converse if we say that not only is my hand close to the keyboard but also the keyboard is also experienced as being adjacent to my hand. Similarly, for ancestry, imagine a cup of coffee being located next to the keyboard. In this case we can say that I do not only experience the adjacency relation (and the disjunction with its converse) between the hand and the keyboard and the keyboard and the coffee, but I also experience my hand as being adjacent to the cup. This is because the ancestral of a relation, as I phrased it in the first part of this thesis, considers the relation in question purely under the aspect of what property is "inherited" by the relation. So even if the hand is not directly adjacent to the cup, that would be the first instance of the relation, the hand and the cup are related by the property of adjacency because its ancestral considers each separate adjacency in combination. There is a path of adjacencies among the three objects like a path of fatherhoods among family members through multiple generations.

A phenomenal relation family is then defined as follows:

401 Farid Masrour, "Unity of Consciousness: In Defense of a Leibnizian View.," in *Sensory Integration and the Unity of Consciousness*, ed. Christopher Hill David Bennett (MIT Press, forthcoming), p.328.

402 Cf. Ibid.

Phenomenal Relation-Family

For all single phenomenal states, a set A of single phenomenal states forms a phenomenal relation-family if the set is a closure system related under the ancestral of the disjunction with the converse of a relation R.

Finally, the characterization of phenomenal integrity simply combines the notion of a division and a relation family:

Phenomenal Integrity

For all single phenomenal states, a set A of single phenomenal states is integrated if the set is a division that forms a phenomenal relation-family.

Note, that a division, as opposed to a partition, involves a set of single phenomenal states that overlaps with another set. So an example for phenomenal integrity that considers this aspect of a division is our human-hund-consciousness that is closed and connected under the co-consciousness relation and that overlaps with the single consciousnesses of both. Or, more intuitively, our arguably closed and connected familiar individual total phenomenal state that presents the top level of a phenomenal hierarchies with, say, the otherwise connected and closed set of phenomenal states associated with one sense modality as the middle tier and the single phenomenal states of that modality as the lower tier. Hence, viewing individual consciousnesses as divisions and not partitions pays tribute to the intuition that the structure of phenomenal consciousness involves hierarchies.[403] In contrast, partitions do not allow for overlaps so a conceptualization of phenomenal consciousness as determined by hierarchies is excluded.

In the first part of this thesis I introduced the differentiation between individuals in the strict sense as opposed to collectives. Both represent individuals in the compositional sense, that is, they form another totality, just that the former but not the latter, as in the example of the rugby team, yields another full-fledged individual, say, the "team-individual". This is an interesting case as applied to the phenomenal domain because it

[403] Simons, *Parts,* p.332.

allows a set of single phenomenal states to be integrated and hence to form another phenomenal totality without from there inferring an individual or subjective total consciousness. In other words, for example, in cosmic priority monism, an integrated phenomenal collective that results from the set of connected and closed individual consciousnesses amounts to an integrated phenomenal totality without indulging into the little palatable claim that such one fundamental entity is itself a cosmic subject. Perhaps this view from compositional theory helps the cosmic psychist to render his view a bit more acceptable.[404]

Also as has been mentioned in the first part, integrity comes in degrees. Since this degree is closely connected to the extend of dependence that a relation generates among the single phenomenal states, I postpone this discussion to the second condition for a complete account of integrity, that is, phenomenal dependence relation.[405]

Also by means of a transition to the next section, note that the characterization of integrity provided up to this point is incomplete and tentative because it only considers the first condition for phenomenal integrity of a set of single phenomenal states being a relation-family. The tentativeness of this characterization shows if we realize that nothing has been said so far about the kind or nature of the relations in question that connect and close a division. So the current characterization of phenomenal integrity can be trivialized by filing in relations like conjunction or addition. A division of single phenomenal states that forms a relation-family under mere conjunction surely in not integrated.

Furthermore, recall that the challenge for an account of phenomenal integrity lies not only in being too general, as the danger of triviality indicates, but also in being too specific as to include all cases in which we have the intuition that a set of single phenomenal states in integrated. So one might agree that Watzl's attentionally conscious field is phenomenally integrated but I think it also clear that the peripherality relation alone does not suffice for an account of phenomenal integrity in general. The discussion of phenomenal dependence relation in the next section is meant to find a viable middle way between generality and specificity.

404 This route is blocked if one holds that the integrated total state simply is identical to a super-individual subject.

405 See there the discussion of Koksvik's view.

II.6.c.ii. Phenomenal Integrity – Second Condition: Phenomenal Dependence Relations

As has been noted in the first part of this thesis, even if dependence relations already present some specification of integrity and hence of principles of unity that "bind together" phenomenal parts, they still exhibit a considerable general character and "connote merely a rough schema, a form of connection between objects and kind of objects, which may be variously filled in."[406] As we will see, several kinds of dependence relations are on the table, some too strong and some too weak as to account for phenomenal integrity. Eventually in this section, as a second condition for phenomenal integrity besides being a relation-family, I will single out functional dependence as a promising candidate out of the class of dependence relations.

As to introduce a first rough disambiguation of the notion of phenomenal dependence, I differentiate between horizontal and vertical dependence relation. In general metaphysics and connected to the notion of grounding, the discussion of dependence is mainly concerned with vertical dependence, that is, dependence relations that obtain between entities on different metaphysical or logical levels, like universals on their substrates or hosts as well as conclusions on their premises. In contrast, in phenomenal compositional theory, I am exclusively interested in horizontal dependence, that is, dependence relations that hold in-between phenomenal parts on the same metaphysical level. As I have mentioned already, the rough idea of phenomenal integrity and hence the conditions under which, for example, single phenomenal states present an occurrence of composition and hence compose a total phenomenal state is that some principle of unity that takes relational form obtains among the parts. Surely, one could also discuss vertical dependence by asking in what way (ontologically or causally, say) and if at all the total state depends on its parts. But that too much broadens the discussion here.

As I mentioned, we can differentiate between various members in the family of dependence relations. What they have all in common, though, can be described as general dependence. Based on the first part of this thesis, general phenomenal dependence is defined as follows:

> *General Phenomenal Dependence*
>
> For the single phenomenal states $[x]^{Ph}$ and $[y]^{Ph}$, $[x]^{Ph}$ is generally dependent on $[y]^{Ph}$ is defined as, necessarily, if $[x]^{Ph}$ is

[406] Ibid, p.293.

F then [y]^{Ph} is G.

For illustration, imagine some case of perceptual effect. For example, take the color contrast demonstrated by M.E.Chevreul.[407] If a grey patch is surrounded by blue patches, like in the case of the threads of a Gobelin examined by Chevreul, the grey ones look slightly yellow due to the grey-blue color contrast (nota bene talking about what Clark calls looks, that is, the phenomenal properties instantiated by your mental states and not the sensible quality instantiated by the Gobelin itself). In this case, the color-contrast is a case of phenomenal dependence as per above definition because, necessarily, if the surrounding phenomenal states in your visual field instantiate the property of some patch being blue then the central one instantiates the property of some patch being yellowish. Of course, this needs to be specified, first, with respect to the notion of necessity in play here and also with respect to some borderline constraints, since phenomenal dependence of this kind might cease to obtain based on the size of the perceived patched or the saturation of the color.

In a cross-modal scenario, this general notion of dependence might correspond to what Koksvik calls weak-context-dependence view.[408] On this view, the exact determinate phenomenal property that is instantiated by a phenomenal state depends on there being another instantiated determinate phenomenal property. He cites the example of the volume of a sound a subject hears as having an influence on how crisp potato chips are perceived to be.[409] According to Koksvik, the degree of dependence is still weak in this case because we can also imagine a strong-context-dependence view according to which even the determinable property of one phenomenal state depends on the properties of other states.[410] We will meet this picture again when I discuss functional dependence. Also considering Dainton would be interesting here because he also discusses his co-consciousness relation in terms of phenomenal interdependence and hence proposes what I deny here, namely "that co-consciousness itself generates

[407] Cf. Austen Clark, *Sensory Qualities* (Oxford University Press Uk, 1996), p.13.

[408] Ole Koksvik, "Three Models of Phenomenal Unity," *Journal of Consciousness Studies* 21, no. 7–8 (2014): 105–31, here pp.113/115.

[409] Ibid. pp.115.

[410] Also, the contribution of one single phenomenal state to the overall phenomenality is mediocre in the weak-context-dependence view as opposed to a extreme contribution according to the strong-context-dependence view (Ibid, pp.113/4).

interdependencies between experiences."[411]

Also in accordance to the first part of this thesis, candidates for special dependence relations are rigid and generic ontological dependence. I briefly discuss these in application to the phenomenal domain, for the sake of completeness, but leave the elaboration as an issue for further research. Because it is a good fit for my state space approach to phenomenal consciousness as well as a new and promising approach to phenomenal dependence, instead, I rather subsequently concentrate on another special version, that is, functional dependence as opposed to ontological, be it rigid or generic, dependence.

II.6.c.ii.a. Rigid and Generic Ontological Phenomenal Dependence

Rigid Ontological Phenomenal Dependence

As has been discussed in the first part of this thesis, rigid dependence is the strongest member of the family of dependence relations and hence also in the phenomenal domain amounts to rather implausible results. And this assessment pertains to all three versions of rigid dependence discussed above, that is, the preliminary formulation as well as the strong and the weak one.

The basic formulation of rigid ontological phenomenal dependence operating with singular existence as applied to the phenomenal domain amounts to holding that, necessarily, if there is exactly one phenomenal state $[x]^{Ph}$ then there is exactly one single phenomenal state $[y]^{Ph}$. The two cases that are not excluded by this definition and that renders this formulation either overly weak or implausible are self-dependence and what I might call unrestricted ontological dependence. In the first case the definition includes that a phenomenal state ontologically depends on itself, which is trivially true. In the other case, as soon as exactly one phenomenal state exists, necessarily, every other phenomenal state ontologically depends on it. This scenario seems implausible because it means that as soon as the phenomenal state of your dog of what it is like to chase the mailman in Scotland exists, necessarily, every other phenomenal state depends on it for its existence, be it the one of the very mailman of what it is like to panic (which might be even true) or the one of a cow of what it is like to be worshiped in India.[412] I think this kind

[411] Cf. chapter 8 "Phenomenal Interdependence" and 9 "The Ramifications Co-Consciousness" in his *Stream of Consciousness)*.

[412] And given their behavior, I take it that the cows in India are well aware of being worshiped.

of dependence relation is too strong even for the radical phenomenal monist.

The other two formulations of rigid ontological phenomenal dependence, weak and strong, also operate with the concept of singular existence but add further conjuncts. As has been noted in the first part, the strong formulation pertains to the dependence relation between the parts and the whole. Since I am exclusively concerned with inter-part relations here, I omit discussing strong rigid ontological phenomenal dependence and proceed to the weak version.

Weak Rigid Ontological Phenomenal Dependence

The weaker version of rigid ontological phenomenal dependence excludes the implausible cases of the preliminary formulation and reads as follows:

> *Weak Rigid Ontological Phenomenal Dependence*
> Necessarily, if there is exactly one phenomenal state $[x]^{Ph}$ then it follows that there is exactly one single phenomenal state $[y]^{Ph}$ and $[x]^{Ph}$ is non-identical to $[y]^{Ph}$ and $[y]^{Ph}$ does not exist necessarily.

Since this is the first viable and specific, as opposed to the tentative general version, candidate for a dependence relation, let us see what an interim-account of phenomenal integrity that plugs in weak rigid ontological phenomenal dependence into the first condition for integrity, viz. being a relation family, amounts to:

> *Rigid Phenomenal Integrity*
> A set of single phenomenal states is integrated and hence composes another phenomenal individual if this set forms a relation-family under weak rigid ontological dependence.

Phenomenal integrity based on this version of dependence is weaker, indeed, than it would be based on the preliminary formulation because it does not posit the necessary existence of other single phenomenal states. However, even this kind on integrity seems overly demanding because, if other single phenomenal states happen to exist, then weak

rigid ontological dependence does not allow for change and replacement of single phenomenal states within one integrated set. If exactly this one phenomenal state, say, of what it is like to drink Cabernet necessitates the existence of all other exactly those single phenomenal states, then the entire total phenomenal state of what it is like to be me or you ceases to exist as soon as one of the single states does so. And this is highly implausible since it does not seem to be the case that my phenomenal consciousness collapses if I feel differently or undergo some other experience, that is, if single phenomenal states get replaced or changed, from one moment to another of drinking Cabernet. And this scenario gets even more obscure when applied to integrated sets of phenomenal states that exceed individual consciousnesses as in the dog-cow example for the preliminary version of rigid dependence mentioned above. For example, the cosmic psychist, assuming this kind of dependence, is forced to hold that the One consciousness ceases to exist and relaunches every time one of its partial consciousnesses "changes its mind", so to say.

As we see here, the operation with singular existence posits overly strong dependence. Hence, this concept is dropped in the more palatable version of ontological dependence, the generic version, that is at issue in the next section.

Generic Ontological Phenomenal Dependence

Generic dependence is rather permissible in that it does not allude to existence but identity, more specifically, kinds. As opposed to rigid dependence in which one single phenomenal state depends for its existence on another, in generic dependence, one single phenomenal state of a certain kind depends on another of a certain kind. Phenomenal kinds can be explicated in terms of creatures that are in these states, like human or bovine phenomenal states, or based on the cognitive architecture, like proprioceptive or sensory phenomenal states, or even more fine grained based on sensory modalities, like phenomenal color states in vision or phenomenal sound states in echolocation. But admittedly, this categorization is a stipulation of mine.

Note again here the difference between vertical and horizontal generic phenomenal dependence relation. The latter, with which I am concerned here, pertains without exception to what I call the phenomenal domain or world and what is the subject matter of this thesis, that is, phenomenal states. Hence I take phenomenal states to be the basic

category and the kinds thereof to be certain subcategories. In contrast, vertical dependence relations hold between the parts and the whole. And as we have seen in phenomenal universalism, it is by no means clear that the composition of single states that are phenomenal yields total states that are also itself phenomenal. This is because unrestricted phenomenal composition result in sums, that is, totalities that do not instantiate the total state property of phenomenality. So with respect to vertical dependence relations probably mental states in general are the basic category and the phenomenal ones form a kind or subcategory thereof. Since I am only concerned with the former relation and not the latter, this issue shall not further occupy me here; this note is just meant to keep in mind the difference of the two kinds of dependence relations and a possible implication thereof.

The definition of generic phenomenal dependence involves two provisos. First, corresponding to the formula provided in the first part, as to exclude vacuous cases in which there is no state of a certain kind, the definition has to include the possibility that there are such states. Second, also similar to the preliminary version of rigid ontological phenomenal dependence, the formulation excludes implausible cases in which all phenomenal states that are not of a certain kind would depend on there being one of a certain kind simply in virtue of the latter existing. Otherwise the formulation would hold that my human phenomenal state of being grumpy ontologically depends on the bovine phenomenal state of being hungry, just because there is the very bovine phenomenal state, which is trivial.

We can characterize generic ontological phenomenal dependence like this:

> *Generic Ontological Phenomenal Dependence*
> Necessarily, if there is a phenomenal state $[x]^{Ph}$ that is F then there is another single phenomenal state $[y]^{Ph}$ that is G and it is possible that there is a single phenomenal state that is F and it is not necessary that there is another phenomenal state that is G.

The corresponding integrity is defined as follows:

Generic Phenomenal Integrity

A set of single phenomenal states is integrated and hence composes another phenomenal individual if this set forms a relation family under generic ontological phenomenal dependence.

As an example for such generic integrity, take our Gobelin example from the beginning. I experience the centre patch as being yellowish in dependence on the surrounding patches being experienced as being blue. The generic aspect of this dependence means that in case the surrounding patches are not or not entirely experienced as being blue the centre patch does not cease to exist, as would be the case with rigid dependence, but just that the phenomenal state of what it like to experience the centre patch would be of a different kind, for example, of the grey kind.

Two brief addenda are in place here: First, since generic phenomenal dependence is a transitive and symmetric relation, it accounts for the connectedness principle of phenomenal integrity. For example, take a set of single phenomenal states to be related by a dependence version of relative qualitative similarity. Here, first, a single state instantiating the phenomenal property of being blue is relatively similar to the one of being purple and vice versa, which is symmetry. Also, if there is another phenomenal state that instantiates the property of being red, then not only is blue relatively similar to purple and purple to red but also blue to red, even if to a different extent, or by taking the ancestral of the relative similarity relation, which is transitivity. Symmetry and transitivity of relative qualitative similarity taken together, then, accounts for the fact that every single phenomenal state of the set is connected to every other single phenomenal state, which is the definition of connectedness. As a side note, there is also the possibility to account for biconnectedness if we take the dependence relation to be asymmetric, but I take this to be a rather exotic case.

Second, F and G may be the same property. So, as to take the famous example of infectious yawning, my phenomenal state of what it is like to yawn might be generically dependent on the same kind of phenomenal state of what it is like to yawn that you are in.

Furthermore, in the preceding section I said that integrity comes in degrees. As an example of differing degrees of phenomenal integrity, if we conceive of phenomenal

consciousness as a multidimensional state space, take the claim that the single phenomenal states that are associated with one sense modality are related under stronger dependence than single phenomenal states that belong to different modalities. Another question, of course, is how to account for such difference in dependence of states in-between and within modalities. As yet, I just can think of Integrated Information Theory (IIT) that explains differences in dependence with reference to differences by "more densely tangled" informational relationships between quales.[413]

To sum up, among the dependence relations mentioned, I think the generic version is an apt way to account for phenomenal integrity. As already Esfeld states, generic ontological dependence is precise enough to figure in analytic accounts of holism, and as we have seen, holism and integrity are conceptually closely linked.[414] Also, in my view, as opposed to its stronger siblings, generic dependence, be it in the mental or material domain, is the more plausible option in that it concerns the identity and not the existence conditions of entities in question.

Nevertheless, in what follows, I leave the ontological camp and apply the functional kind of dependence as introduced in the first part of this thesis to phenomenal consciousness. This is for two reasons. The first pertains to an even higher level of precision because, as opposed to kinds of states that figure in generic ontological dependence, with functional dependence we can conceptualize integrity of single phenomenal states down to the level of determinate properties as a subcategory of kinds that are usually taken to be determinable properties. The second reason, perhaps connected to the first by the methodological precision that analytic philosophy claims to entertain, concerns the fact that recently philosophers in the analytic philosophy of mind start to conceive of the total phenomenally conscious state as a function of the single ones it is composed of. I take it as a promising coincidence that Simons is also the first contemporary philosopher in mereological metaphysics who revitalizes and proposes a precise formulation of the notion of functional dependence that was already used in a less precise way in early 20th century German philosophy of mind and psychology. Applying this contemporary version of functional dependence to the likewise contemporary way of conceiving of phenomenal consciousness as a function, in my view, facilitates a precise

413 David Balduzzi and Giulio Tononi, "Qualia: The Geometry of Integrated Information," ed. Karl J. Friston, *PLoS Computational Biology* 5, no. 8 (August 14, 2009), pp.1-24, here pp.7/8.

414 Cf. Esfeld, "Holism and Analytic Philosophy."

way of conceptualizing the way in which single phenomenal states are integrated and as such compose the total phenomenal state.

II.6.c.ii.b. Functional Phenomenal Dependence

As I noted at the end of the preceding section, the notion of function and functional dependence is not a conceptual newcomer. Grelling and Oppenheim used it in early 20th century to logically formulate the dependence relation that in their view obtained in Gestalts. I think it is remarkable that functional dependence as a concept even came into existence in the context of philosophy of mind and psychology as a phenomenal or mental relation and not as a physical or material relation in context of which functional dependence was used afterwards.

Here is not the place to indulge in the history of this concept, but just to provide a taste for the origin of the notion of functional dependence, see how Grelling and Oppenheim tie this notion to what is also the general topic of this thesis, viz. wholes as dependence systems:

> In spite of differences, the two concepts of determination system and of dependence system can, in a less formal language, both be designated by 'functional whole', because both 'determination' and 'dependence' can in a certain sense be considered *as functional* relations. As far as the much discussed term '*whole*' is concerned, we must limit ourselves here to the remark that already Fries speaks of a '*Ganzes der Wechselwirkung*' and Kant uses similar expressions in this connection.[415]

Note that functional dependence is still a rather schematic and formal characterization of a dependence relation. That means that various special relations might fit this label. That also means that the fact that Grelling and Oppenheim used the notion of functional dependence for an exact formulation of Gestalt systems allows no inference to the fact that gestalt relations alone can be filled in as a functional dependence relation.[416]

Simons revitalized the notion of functional dependence based on Grelling and Oppenheim. Since the following quote not only links functional dependence to Grelling but also provides a nice classification of functional as opposed to ontological and other kinds of dependence relations, I shall cite it in (almost) full length:

[415] Kurt Grelling and Paul Oppenheim, "Logical Analysis of 'Gestalt' as 'Functional Whole.,'" *Journal of Symbolic Logic* 4, no. 4 (1939): pp.201-215, here p.214.

[416] Or, vice versa, that Gestalt can be understood as a formal notion. For discussion, see Peter M. Simons, "Gestalt and Functional Dependence," in *Foundations of Gestalt Theory*, ed. Barry Smith (Philosophia, 1988), 158–90, particularly for the latter point p.162.

> We use the epithet 'functional' where Grelling talks simply of dependence, because there are many different kinds of dependence, of which the kind discussed is only one. In particular the kind of dependence has nothing to do with *existential* or *ontological* dependence, the dependence of one object for its existence on another. Nor is it directly connected with *logical* dependence, the relationship between propositions and sets of propositions (there *is* connection, but it is not as simple as might appear at first sight). Finally, there is the notion of *causal* dependence. To the extent that the authors' notion of functional dependence captures the idea of one quantity's depending on another (or several others), it might be claimed that causal dependence turns out to be a special case. But functional dependence is in my view far too weak a relation to capture the causal aspect of causal dependence, which has to do with some things' being in a certain way or acting in a certain way *making* something come about.[417]

One qualifying remark about the relation of functional and ontological dependence might be in place here. Simons understands ontological dependence in terms of existential dependence as the dependence of an object's existence on another. Based on this understanding surely there is a categorical difference between the two kinds of dependence. Yet, as we have seen in the preceding section, ontological dependence might also come in its generic form that does not imply existential dependence but rather one of the objects identity on another. Since also generic ontological dependence can be said to obtain among determinate and determinable properties that also figure prominently in functional dependence systems, we might conceive both forms of dependence relations not as completely separate as suggested by Simons. Whether they are akin on the same conceptual level or one is to be seen as a subcategory of the other is a question to answer at another occasion.

As opposed to the rather extraordinary mental phenomenon of Gestalt, I am here concerned with a functional dependence relation that ubiquitously determines the phenomenal domain. That is to say, a relation the obtaining of which among single phenomenal states can be said to yield another composed complex phenomenal totality like a total phenomenal state of subject at a time or some more extended conscious field, if you like. In the individual case, as mentioned, recently authors like to conceive of the total phenomenally conscious state as a function of the single phenomenal states. Here we have function mentioned, also in a general way and not alluding to specific phenomena like Gestalt. However, also this notion (like the ones of holism and unity

[417] Ibid, p.174.

discussed above) in contemporary literature is rather used intuitively or impressionistic and without further specification. In what follows, I use the notion of functional dependence proposed by Simons and others as to provide a specific formulation of what it means for single phenomenal states to be functionally dependent on another and hence to yield a functional dependence system, a term that I think captures what it is to be a total conscious state in a more precise way.

To begin with, as an example of how the notion of function in connection with the composition of a total phenomenal state is used, see Lee. He does not mention function directly in connection with a phenomenal relation but alludes to the wave-function state as similarly structured:

> In response to these worries, the Holistic primitivist should say that primitive total phenomenal properties belong to a complex high-dimensional property space, whose different dimensions correspond to different ways in which a total experience can vary. An analogy would be with wave-function states in quantum mechanics, which (on most interpretations) apply primitively to a whole physical system. Despite being a primitive state, a wave-function state has a complex internal structure given by its amplitude at each point in configuration space. Similarly, primitive holistic experiential states could be said to be similar or different in various respects in virtue of their locations along the various dimensions of the property space, and in this sense have a complex internal structure.[418]

If we take the analogy posed by Lee a bit further, and it might even be that Lee himself implies this but this is not clear from the quote, we might conceive the total phenomenal state as being structured similarly to the wave function state also with respect to the functional aspect. That is to say that same as the wave state can be conceived of as a function of its constituent single states, the total phenomenal state can be conceived of as a function of its composing single phenomenal states.

In order to explore this idea a bit further, yet still rather figuratively, let me mention Koksvik again who specifies slightly stronger of how to understand an overall experience as a function of its "contributor experiences"[419,420] by differentiating it from other forms of

[418] Lee, "Unity and Essence in Chalmers' Theory of Consciousness", p.767.

[419] Koksvik, "Three Models of Phenomenal Unity", p.114.

[420] At this point it is also possible to continue the discussion of the notion of function in the literature by referring to the debate revolving around multisensory integration. Here the notion of a function is used to conceptualize the cross-modal nature of perceptual processes. For example, see Bayne who states that "the fact that one's awareness of the location of the ventriloquized event is a function of both the visual and the auditory input indicates that the spatial information in question is not modality-specific" (Bayne, T., "The Multisensory Nature of Perceptual Consciousness", in: Bennett and Hill, *Sensory Integration and the Unity of Consciousness,* pp. 15-36, here p.24.

phenomenal relatedness. Same as Lee and myself, also Koksvik entertains a rather mathematical view on phenomenal consciousness and thinks "of the phenomenal characters of overall experiences as a value in a highly complex multidimensional space."[421]

In his models of context dependence, Koksvik, besides the weak and strong version, also includes a no-context-dependence view.[422] As opposed to the two former views, according to which some sort of dependence obtains between two or more single phenomenal states, viz. the dependence of the determinate or determinable property of the states on another, the latter view holds that the single states are not dependent on each other at all. Interestingly for the present thesis, Koksvik then calls the resulting overall or total experience an addition in the case of the no-context view and a function in case of the two dependence views.[423] For the weak-context-dependence view he states the following where the part in bracket refers to the no-context-dependence view in the elaboration of which Koksvik does not speak of addition directly:

> The character of a person's overall experience at a time is on this view a more complex function (than straightforward addition) from the characters of local contributor experiences.[424]

And similarly for the strong-context-dependence view:

> Even on this view, however, the phenomenal character of the overall experience results from a function from the characters of local contributor experiences, albeit an extremely complex one.[425]

So with the no-context-dependence view we are back at our well-known phenomenal sum-totality that results from a mere addition or summation of the single phenomenal states.[426] For the total state the addition of the single states means that every time the total state has one particular single state as its parts the latter stays qualitatively constant. The instantiation of other single phenomenal states every time the overall experience

421 Koksvik, "Three Models of Phenomenal Unity", p.112.

422 For a context-dependence view in IIT, see Balduzzi and Tononi, "Qualia," p.12/13. Whether or not it is possible to also conceptualize this kind of context dependence in terms of functional dependence is an interesting question. Tentatively, I answer this question to the affirmative, but simply because IIT predominantly operates mathematically, for which functional dependence seems to be tailor-made.

423 Koksvik, "Three Models of Phenomenal Unity", pp.113/4.

424 Ibid, p.113.

425 Ibid, p.114.

426 For similar considerations regarding addition within the state space approach to phenomenal consciousness, see Richard P. Stanley, "Qualia Space," *Journal of Consciousness Studies 6*, no. 1 (1999): 49–60, pp.53-5.

changes has no influence on the identity of the particular single state. For example, the particular single phenomenal state might be what it is like for you to listen to Slayer. According to the no-context dependence view, the slayer-state stays qualitatively constant within one total experience in which it is merely added to experiences of you walking the park and watch poodles frolicking around at time t1 as compared to another total experience in which it is merely added to experiences of you hitting a Neo-Nazi-demonstration at time t2. In contrast, according to the two context-dependence views, the phenomenal state of what is is like for you to listen to Slayer at time t1 and t2 varies if it is a part of an overall experience that is a function of set of the single states it is composed of. In the park scene Slayer might be experienced as slightly off or misplaced whereas in the demonstration scene thrash metal might be exactly the right thing to listen to for being the appropriate expression of your emotions in the presence of Neo-Nazis.

Also, the fact that the total state in the no-context-dependence view is just a "copy" of the set of the single states, which is to say that the single states are qualitatively the same if separate or part of the phenomenal sum, might be an explanation of why the total state does not instantiate a phenomenality on its own, as was already mentioned. In contrast, on the context-dependence views, the fact that the total state is seen as a function of the set of the single states, that is to say that a particular state qualitatively changes in dependence on the presence of other single states, might account for a genuine total state phenomenality.

So what is left to do in this section is to precisely capture what it means if single phenomenal states are context-dependent on each other in this way as to yield a phenomenal function, as opposed to be merely added to each other as to form a phenomenal sum.

As to start with conceptual precision, calling the resulting phenomenal totality a function, as Koksvik seemingly does, is not quite right. If we take the primary school understanding of what a function is, namely the "black box" in between an input of arguments and an output of a value, then the function is the relation or kind of dependence relation that holds among the single states and not a label for what results from this relatedness. So, same as addition is the relation that obtains among the set of single phenomenal states yielding the phenomenal totality called a phenomenal sum, we should say that the function or functional dependence is the relation that obtains among

the set of single phenomenal states yielding the phenomenal totality called a phenomenal value, or path in quality space (also as Koksvik does in the quote cited above).[427]

As to be metaphysically more precise, similar to my elaboration of functional dependence in the first part of this thesis, strictly speaking not the states themselves are functionally related but the determinate properties those states instantiate. So also here functional dependence, as with generic ontological dependence mentioned above, Koksvik's weak dependence view seems to be the analogy. This is because, according to this view, only the determinate properties instantiated by single states vary in dependence to each other, as opposed to the strong dependence view, according to which even the determinables of the states depend on each other. As to stick to my Slayer example, according to functional dependence and Koksvik's weak-context-dependence view, listening to Slayer while walking the park as compared to hitting the Neo-Nazi demonstration might change in a finer-grained manner from the determinate property of slightly inappropriately loud and aggressive (in the park) to the determinate property of what is is like to experience the exactly right level of loudness and aggression (at the demonstration). The determinable property of the phenomenal state of enjoyable loudness and aggression remains the same in the two scenarios. In contrasts, on the strong-context-dependence view and some form of dependence that exceeds the functional one in strength, even the determinable property changes such that listening to Slayer in the park might not be enjoyably loud and aggressive at all anymore.

Also, in the precise formulation of functional dependence, the latter is a relation between one determinate property of a phenomenal states to the set of the remaining determinates of states. And not, for example, between one determinate and the next. For example, as in the Gobelin case, functional dependence would mean that the determinate property of yellowish depends on all the other determinate properties of being blue and not only on one of them.[428] At the outset, this might look overly strong, especially if we

[427] However, it might be that here we have to differentiate the total state itself and the total state property that it instantiates. Koksvik might mean the latter with his notion of value cited above.

[428] I take the Gobelin example to be one of phenomenal dependence here, that is, that the grey patch *appears* to be yellowish in the presence of a blue surrounding. However, one might also take the example to be one of physical dependence, that is, that the actual color of the centre grey patch changes in dependence to the blue surrounding. I take the former interpretation of the example to be the more plausible one because, in my view, the physical configuration that is responsible for the emittance or reflectance of light of certain wave lengths and hence for the centre patch to actually be of a certain color, as opposed to merely appear to be of a certain color, is not dependent in any way of there being surrounding patches of a certain color. Nevertheless, this latter interpretation is an option. Thanks to Howard Robinson for bringing up this point.

consider that each and all determinate properties of the set of states are also in turn functionally dependent on all the other sets of the remaining determinates. However, as with the other forms of dependence discussed, this fact just pays tribute to the connectedness principle of phenomenal integrity according to which every state has to be related to all other states. Functional dependence just specifies this principle by holding that the states are connected in virtue of their determinate properties being functionally dependent on each other.

So finally, based on the formalization in the first part of this thesis, functional phenomenal dependence can be characterized as follows:

> *Functional Phenomenal Dependence*
>
> A determinate phenomenal property d functionally depends upon a class of phenomenal determinates ϕ for the common phenomenal state $[x]^{Ph}$ is defined as if the determinate phenomenal property g out of ϕ stays invariant for some argument $[x_1]^{Ph}$ and $[x_2]^{Ph}$, then also the determinate property d stays invariant $[x_1]^{Ph}$ and $[x_2]^{Ph}$.

Note that $[x_1]^{Ph}$ and $[x_2]^{Ph}$ in this definition are not numerically different states but denote the same state at different times. For example, if the determinate properties of the determinables of volume of sound and crisp taste of potato chips are instantiated by the same phenomenal state, then functional dependence of the former upon the latter means that if the experienced volume of sound stays invariant from t1 to t2, so does the experienced crispiness of the potato chip. Or, if the perceived volume raises by some magnitude 15, so does the taste.[429]

However, so far I assumed that each single phenomenal state only instantiates one determinable property, like color or sound and hence only one determinate property also, like red or b-flat.[430] For the sake of simplicity, I will stick to this picture. And as we have

[429] Or, if you prefer, by some other function like if the n+1: if the volume assumes 15 then the taste 16 and so forth.

[430] Yet, it might still be possible to apply the original definition of functional dependence that pertains to phenomenal states that possess more than one determinates to phenomenal states that only instantiate one determinable. This is because one determinable property might assume more than one determinate property. For example, the determinable property of sound might assume the determinate b-flat

seen in the first part of this thesis, the definition does not entail that functional dependence exclusively holds among the determinate properties of just one phenomenal state. Also as mentioned there, I primarily understand functional phenomenal dependence as obtaining among the determinate properties as opposed to determinable properties. Like the example of a closed and hence integrated set of objects under gravitational force in the physical domain mentioned in the first part, also in the phenomenal domain, a set of phenomenal states that simultaneously varies or stagnates in their determinate properties forms a closed and hence integrated set. For example, the crispiness of potato chips is functionally dependent on the perceived volume of sound is defined as if the determinate property of volume of sound instantiated by one phenomenal state stays invariant or changes to a certain degree, the also the determinate property of crispiness instantiated by another phenomenal state stays invariant or changes to certain degree.

Also, as mentioned, the definition above involves the dependence of one determinate property upon a set of others, rather than a one-on-one functional dependence relation. Here I also take it that the various determinates are instantiated by various phenomenal states. In effect this means that one determinate property instantiated by one phenomenal state functionally depends on a set of determinate properties instantiated by various separate single phenomenal states. For illustration we can just extend the former example by assuming that the crispiness does not only depend on the volume but additionally on the mood of the consumer, where, according to the picture propagated here, the mood determinable assumes a certain determinate instantiated by a single phenomenal state that is numerically different from the states that instantiate the determinate of volume and crispiness.

Since I mentioned integrity already before, let us also define functional phenomenal integrity as follows:

> *Functional Phenomenal Integrity*
> A set of single phenomenal states is integrated and hence composes another phenomenal individual if this set forms a relation-family under functional phenomenal dependence.

plus another determinate, say, of intensity or volume of listening to b-flat.

Surely, this cannot be the end of functional dependence. This is because, as seen in the material domain, more fundamental facts ground the facts about functional dependence. That is to say, the fact that, for example, a set of objects form an integrated gravitational dependence system is based on more fundamental natural or physical laws. Hence, also in the phenomenal domain, the fact that, for example, single phenomenal states are integrated under the relation of relative qualitative similarity, or Watzl's peripherality relation, or what have you, is governed by according phenomenal laws. I am thinking of a tradition based on Kant's idea of the conditions on the possibility of experience and Husserl's transcendental-eidetic phenomenology that, as the name indicates, foots on Kant's thought. In a contemporary and analytic setting, Yoshimi is a nice example of making Kant's and Husserl's ideas clear and understandable by holding that they proposed rules, or in Yoshimi's words, constraints, as "governing the way possible experiences must be instantiated if particular types of things are to appear."[431] Since this topic would open a whole new corpus of literature, I leave this debate as an issue for further research.[432]

[431] Jeff Yoshimi, "Two Dynamical Themes in Husserl," in *Being in Time: Dynamical Models of Phenomenal Experience*, ed. Shimon Edelman, Tomer Fekete, and Neta Zach (John Benjamins Pub. Co., 2012), 88–165, here p.166. Cf. also Jeff Yoshimi, "Phenomenology and Connectionism," *Front. Psychol* 2, no. 288 (2010): 1–13, here pp.6/7.

[432] Talking of laws, another interesting historical case of discussing functional relations is as psychophysical laws in Fechner and Mach. As Heidelberger states: "In his Elemente, Fechner (1801–1887) defines psychophysics as an ''exact doctrine on the functional correspondence or interdependence of body and soul'' (Fechner, 1860, p. 8). ''Functional correspondence'' [funktionelle Abhängigkeitsbeziehung] is then characterized as a ''constant or lawful relation between both [the material and the mental] such that we can infer from the existence and the changes of one the existence and changes of the other'' (ibid.). Fechner makes it clear that such a relation is called ''functional'' because it states the dependency of a psychological variable on a physical one (or the other way around) in the same way as a mathematical function describes a dependency relation between x and y" (Michael Heidelberger, "Functional Relations and Causality in Fechner and Mach*," Philosophical Psychology 23,* no. 2 (2010): 163–72, here p.163). Since this kind of functional relation is psychophysical and not purely phenomenal, as I prefer to discuss it, I merely flag this point as in issue for further study.

Also, in the context of neutral monism, Mach discusses functional dependence as the kind of relation that renders the neutral and fundamental elements sensations or physical objects. See Ivanova: "The terms 'elements', understood as the ultimate constituents of all things, and 'sensations' are not identical (some confusion here arises from the fact that Mach frequently refers to 'sensations' as 'elements of experience', for example). This does not mean that sensations are intrinsically different from the elements but rather that the elements become sensations only when 'standing to one another in a certain known relation' (connexion) of functional dependence on each other (Mach 1914, p. 243). 'In another functional relation [the elements] are at the same time physical objects' (Mach 1914, p. 16). Thus, Mach's elements are neither physical nor psychical. It is their ordering in any concrete situation/ configuration (the nature of the connexion) that allows them to be classified as the one or the other" (Maria N. Ivanova, "Hayek, Mach, and the Re-Ordering of Mind," *The European Journal of the History of Economic Thought 23*, no. 5 (September 2, 2016): 693–717, p.695). Also here, carving out Mach's notion of func-

Conclusion

The guiding question of the present thesis was the Special Phenomenal Composition Question (SPCQ): “When is it true that a set of single phenomenal states compose a total phenomenal state?”

In order to address this question, in the first part, I discussed mereology in general metaphysics and chose van Inwagen's Special Composition Question (SCQ) as the theoretical framework. The array of answers that van Inwagen himself provides were complemented by an extensive discussion of a moderatist answer according to which only under some condition it is true that parts compose another total individual. This moderatist position towards composition is an amalgamation of Johnston's Principles of Unity and Simon's account of integrity. In a still formal and schematic fashion, I proposed a way in which moderatist conditions can be satisfied: composition can be restricted if the parts are integrated based on dependence relations and here I specifically suggested functional dependence relations.

In the second part, I operated with this methodological template from general metaphysics as to answer what I labeled the Special Phenomenal Composition Question (SPCQ). Regarding the array of non-moderatist answers to SPCQ, all positions seemed to be more or less counterintuitive. This fact might be held against my endeavor in principle, for example by objecting that SPCQ in itself is questionable if it only yields such hardly tenable positions, or also what one might call strawman-positions. In response I have two points. First, counter-intuitivity does not entail illegitimacy. Positions like phenomenal universalism might stretch ones philosophical acceptability, yet those positions in phenomenal compositional theory are the result of an application of strict mereology and by that exceed most other mereological treatments in the study of consciousness in logical precision. So some answers to SPCQ might be hard to swallow, but based on such foundational theory they are legitimate and deserve their spot on the logical map, especially because some of them are entirely new or in need of stronger consideration. Even more, I take it as a sign of originality of SPCQ that it yields views and positions that allow for new perspective on the structure and composition of phenomenal consciousness.

Second, and I think that this itself is an interesting result of the present thesis, theories

tional dependence and relating it to the discussion of the present thesis would require a thesis on its own so that I leave a further discussion to another occasion.

and positions in phenomenal composition seem to inherit their counter-intuitivity from their origin in general compositional theory. Also in the latter every position but the moderatist minority one seems hard to hold, like compositional universalism or nihilism. So instead of rejecting views on phenomenal composition specifically for their queerness, the question should rather be why mereology in general unearths almost exclusively views that defy our common sense intuition about the composition of things and minds, and why particularly the position that does pay tribute to such intuition, viz. moderatism, is the clear minority view in the material as well as mental domain.

With respect to the moderatist view developed in the present thesis, according to the consideration in the first part, also in the phenomenal domain an option arose for restricting phenomenal composition and hence a more intuitive conception of individual consciousnesses. According to the account of phenomenal integrity it is true that a set of single phenomenal states compose a total phenomenal state under the condition that the single states form a family under functional dependence relations.

Surely, special relations have to be amended in order to advance this rather formal account of how the set of single phenomenal states of a subject at a time are functionally integrated and hence present a case of occurrence of phenomenal composition, whereas the set of single phenomenal states of me and other subjects are not functionally integrated and hence present a case of non-occurrence of composition. With the exposition and discussion of formal criteria for differentiating between occurrences and non-occurrences of phenomenal composition I hope to have prepared the ground for such advancement.

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