The Special Phenomenal Composition Question

by

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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, 18.10.2017 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 it is 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 it is 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
Functional Dependence and Integrity

Generic Ontological Phenomenal 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, phenomenal consciousness is 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 built 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 applying it to the phenomenal domain in the shape of SPCQ and its answers, can be seen as the fundamental question of this thesis.

I consider this fundamental approach as a piece of groundwork research. That means, on the one

[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.

hand, that discussing SPCQ based on SCQ in general metaphysics yields genuine results by relating existing positions to each other as well as developing new ones regarding phenomenal composition. Thereby, I systematise 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 in opening up more questions than answering them, discussing SPCQ brings it about that not every thread of the debate can be followed up in detail. This has 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 have recently been on the rise in the literature, but, on the other hand, do not expend 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 actually 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 aforementioned fundamental aspect of the present thesis: To utilise and make fertile what classical mereological metaphysics has to offer on 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 one of your single phenomenal states and each and only one of mine to compose one total consciousness as opposed to all of our phenomenal states together to do so. In short, these conditions say that the set of single phenomenal states have to be integrated 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, the moderatist stance towards phenomenal consciousness also follows a moderatist answer to SCQ in the 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 considerably differs from his in that it combines

Johnston's Principles of Unity with Simons' 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, 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 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 the one asking 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 propose 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, although 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 of 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 a general, though logically precise, account of a moderate answer for SCQ. He develops integrity as a set of conditions under which composition is restricted, that ubiquitously applies to all possible domains. In the first part, I

introduce Simons' 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 thematises the nature of composition itself and generally asks, "What is composition?" [2] Accordingly, van Inwagen labels it the General Composition Question. I omit to discuss 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 being, according to van Inwagen, "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 $\exists$ 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 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

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

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 of 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 object such that the parts compose it, and sometimes 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 labelled 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's 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 it is always true that some parts compose a whole. Hence, by introducing CEM, I am also already presenting an answer to SCQ, and even the most

[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.

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. At 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 utilised 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, it holds:

Axiom 1 (Asymmetry):

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

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

Axiom 2 (Transitivity):

[11] Ibid., section 1.

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

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

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 because, 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 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

[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 says 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 because 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.

each other. Instead, we want proper cake-parts to be separated and disjoint so 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 symbolise overlap by writing xoy. 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 characterise 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 the case that the whole cake overlaps its proper part-cake, but also vice versa. Also note here the difference from 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 make the two relations diverge: Overlap is intransitive, which means that just because cake one and two overlap, the same as cake two and three, it is not necessarily the case that cake one and three also do. If the three cakes were 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 x¤y for disjointness. Furthermore, the disjointness relation is described by its formal properties.[19] According to the symmetry of disjointness, if an object is disjoint from another, then the latter is also disjoint from the first. Irreflexivity tells us that nothing is disjoint from itself. Lastly, disjointness is intransitive, which is to say that just because one individual and a second are disjoint, the same as individuals two and three, it is not necessarily the case that individuals 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.

[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.

Axiom 3 (Weak Supplementation Principle, WSP):

$(x<<y) \rightarrow (\exists z)(z<<y \wedge z \iota x)$

If x is a proper part of y, then there is some z such that z is a 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 axioms 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 due to 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 its strong sibling, the Strong Supplementation Principle (SSP) which entails WSP and PPP.[21] Here, I will just mention the fact that these principles and others to follow entail each other in certain 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 option one, PPP is formalised 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 y

[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. However, 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 aforementioned 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 thematised.

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

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

also 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):

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

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 yields one individual and not two amounts to the extensionality principle, emphasising the identity of individuals in such a case:

Extensionality (E)

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

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

Vulgo: Individuals with the same parts are identical.[24] This principle is called extensional because we can also paraphrase the doctrine by saying that individuals are the same if they have the same extensions where the extensions can then 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 an 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's axiom of Uniqueness of Composition, Goodman's

[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 and y 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.

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

content principle, and the Composition as Identity (CAI) thesis.[26] Since I will mainly operate with Lewis's 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 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 the 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, the 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

[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, see the unpublished master's 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 misbehaviour 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 axiom, in some others it is derived as a theorem; see Achille C. Varzi, "The Extensionality of Parthood and Composition," Philosophical Quarterly 58, no. 1 (2008): 108–33, especially p.108.

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

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

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 an 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 more strongly 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 what follows in the application of CEM to phenomenal consciousness. I will 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, for which reason 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 stated in just these four axioms.

Axiom 4 of CEM (General Sum Principle, GSP)

$(\exists x)(F(x)) \rightarrow (\exists x)(\forall y)((yox) \leftrightarrow (\exists z)(F(z) \wedge (yoz)))$

If there is an individual x that satisfies a certain predicate, there is a x

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

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

> 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 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 is 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 because 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 permissible 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 these

[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 should be exercised 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.

[32] See Peter van Inwagen, "The Number of Things," *Philosophical Issues 12*, no. 1 (2002): 176–96, especially pp.189-193 for a brief analysis of the sum in terms of the + sign and the stating of intuitive reasons for rejection of 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, especially p.342.

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]

Just 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 are concerned with two main issues: the (im)plausibility of unrestricted composition, and the 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 the application of CEM to phenomenal consciousness: I think that it is implausible to conceive of phenomenal consciousness in universalist and extensionalist terms. To use 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. Criticising 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 the identity and existence conditions of sums: Since the Principle of Unrestricted Composition guides the conditions under which sums come about, criticising 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 by presenting attacks aimed at Unrestricted Composition.

[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 x's" (p.361).

[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's principles to be colloquial phrasings of the axioms of CEM stated by Simons.

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

To start with the criticism aimed at unrestricted composition and sums, the first thing to note is that, although both are crucial ingredients to CEM, denying them does not entail denying CEM in general. This is because 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 individuals 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. It is just that she is disagreeing about the cases in which, 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]

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 existing "just because there is a form of expression which requires a referent."[39] This is because 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 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

[38] Ibid, p.109.
[39] Ibid, p.109.
[40] Examples here are abundant, take for example Lewis's trout-turkey in Lewis, Parts of Classes, p.7.

well motivated by common sense.[41] Yet, that does not mean that we should drop the intuition, just that we should find a 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 reasons for the conviction that there are no such apt mereological theories.

Interestingly enough, many arguments in favour 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, simply because there is no better theory at hand to conceptualise composition. So arguments in favour 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 and, hence, to be rejected.[42] But as we will see, the vagueness argument can also be invoked to entertain compositional positions other 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 other answers to SCQ besides universalism, namely "no" and "once" and, hence, related to positions like nihilism and existence monism. Therefore, 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 it 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

[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, especially p.145.
[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.

different yet extremely similar to each other. Start with the case in which composition definitely does occur and move along the line case by case, until you reach the opposite end where composition definitely does 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 a 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 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 to the discussion of Unrestricted Composition, I mentioned the classical critique that CEM allows for highly counterintuitive objects being composed of widely scattered parts. What is usually in play here is spatial scatteredness. Yet, that is not the only way for CEM-individuals to be scattered, as Fine posits. He criticises 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 theorising existence conditions, I include a temporal aspect in the discussion. This is because the discussion of time-relativised existence conditions actually aims at clarifying the composition of an ordinary individual at a time and hence pertains to the synchronic existence of objects, whereas the debate about time-relativised identity conditions aims at fixing the identity of an

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

[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, especially p.73).

ordinary individual over time, and hence pertains to the 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 characterised by the possibility of temporal scattering and, hence, the lack of temporal structure. Johnston summarises 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]

In a more detailed manner, Fine entertains the same line of objection and follows that CEM fails not only spatially but also temporally to conceptualise 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 calls "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, irrespective of the spatial region the parts are located in. Moreover, the existence conditions of the sum are 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, are the two slices of bread and the ham part of the sandwich whether or not they are spatially close to each other, they also are part of it 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 irrespective 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

[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, especially p.130.
[48] Fine, "Things and Their Parts."
[49] Ibid, p.62.

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 characterised 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 conceptualisation 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 is the ham part of the restricted sum but also any other arbitrary object that the ham is part of to the effect that 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 are assured of the temporal cohabitation of the sum and the whole, the parts still do not spatially cohabit. They could be wherever in order 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 is 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.iii. Uniqueness of Composition (UqC): Identity Conditions For Mereological Sums

The general point of this section is to present objections that mainly aim to identity conditions of sums and affect CEM by way of threatening its crucial extensionality principle and Lewis's 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 thematised as such "difference-makers". Additionally, I find sortal differences illuminating, so I will also include sortal or kind properties as being responsible for 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

[50] See also Koslicki, *The Structure of Objects*, pp.73/47 for a discussion of Fine's argumentation.
[51] Ibid, p.73.
[52] Fine, "Things and Their Parts", p.63. Koslicki, *The Structure of Objects*, p.75.

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 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 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 of structure, order, arrangement, organisation, or generally some relation among the parts. Mereological sums are unstructured wholes.[56] We find

[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 Bohn, "Unrestricted Composition as Identity," pp.14 for an example of the latter.

[55] To follow 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 defence of anti-extensionalism against these arguments 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

the *locus classicus* of such line 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 a start, take a simple example of a set of parts consisting of 20 white, 20 red and 20 blue Lego bricks. A student who 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 rectangles for each colour 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, put them in a more squarish shape and place 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 the same bricks form two different flags, which means mereologically that the same set of parts yields two different individuals. And the non-identity of the flags is based on the different structure of the bricks they are composed of.

What might be of mildly spectacular importance for the scholar drives the mereological metaphysics into deep problems. This is because 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 light of such cases are the Proper Parts Principle (PPP) and the Strong Supplementation Principle (SSP). As

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).

[57] Nicholas Rescher, "Axioms for the Part Relation," *Philosophical Studies 6*, no. 1 (1955): 8–11, especially p.10.

[58] Varzi, "Mereology", section 3.2.

[59] Simons, *Parts*, p.117.

we saw above, both are essential ingredients of the axiomatic system of CEM, particularly because they exclude models in which two individuals consist of the same parts and so 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 formalise 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 because the parts are structured in a different way are also 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 part that is disjoint from the first also needs to be a part of the same whole, so as to capture the appropriate conceptualisation of the parthood relation. Finally, since cases of non-identical and differently structured individuals being composed of the same set of parts constitute 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 in 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.

[60] Varzi, "Mereology", section 3.2.

[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 the 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 be said to have the same parts anymore but are still, at least from a commonsensical standpoint, identical. In order to resist this line of objections, philosophers usually turn to four-dimensionalism (or relativising 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 concern diachronic rather 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", especially pp.345ff.

Regarding the first option to resist the rejection of PPP and SSP and 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 structure the Russian flag at time t1 and subsequently rearrange 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 from an angle altered by 90 degrees one is suddenly looking 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 colours are not in the same order, if one turns around the Russian flag and, hence, it does not turn into the French one, some other vertically oriented flag of another country that matches the colours and structure of the Russian flag is conceivable to the effect that we have two flags with the same parts at the same time, which results in there being two non-identical flags.

In this case, 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 because it remains questionable whether there indeed exist two flags and not just one being looked at from different angles. This case resembles the one of the duck/rabbit drawing, where two people look at the same single drawing but it is just that one person sees a duck and the other one a rabbit. And here also, it seems unreasonable to claim that there are two drawings just because two people see different animals in it.[64] However, I think this example heads in the wrong direction. The point in claiming that two flags that are composed of the same parts are non-identical pertains to states of affairs that are not mind-dependent: The two flags are different because they are actually composed of a different order of colours and not because two subjects see them differently based on their alternating experiences of actually one and the same flag. Finally, the duck/rabbit example misses the point because the fact that the drawing results in two images in case it is viewed from different angles does not allow any inference to the fact that the drawing that yields these two images in the eye of the beholder exhibits any different structures. It is just one drawing and the different potential experiences of it are not based on the structure of the drawing but on the angles it is viewed from.

[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.

In a nutshell, the fact that sums do not instantiate structure directly derives from the axiomatic corpus of CEM: According to the principles of Extensionality and Uniqueness of Composition that guide the identity conditions for sums, two individuals with the same set of parts are identical. Cases in which two individuals that are composed of the same set of parts exhibit different structures are excluded because the latter render the individuals non-identical.

To briefly refer back into the section concerned with existence conditions, note that the structure-obliterating nature of sums also directly follows from the principles of General Sum and Unrestricted Composition that guide the existence conditions for sums.[65] Be it in the general spatial way or the temporal one, as discussed based on Fine, the sum exists as soon as the parts do. Therefore, temporal or spatial structure is eliminated as a condition for the existence of sums.

With respect to our familiar and ordinary medium-sized dry objects, the fact that sums do not exhibit structure, be it based on identity or existence guiding principles of CEM, does not extend to the claim that ordinary objects likewise do not have structure - it just means that ordinary objects cannot be construed as sums. And the latter is exactly the point of criticism launched against compositional universalists: Not only does it require us universalists to accept objects that are spatially and temporally widely scattered into our ontology, but ordinary objects also seem to stubbornly defy universalists' description. This is because construing ordinary objects as sums and hence without invoking structure neglects an essential feature of such objects. And, as we have seen, universalists cannot include structure in their construction of ordinary objects because, in this case, they would contradict essential principles and axioms of CEM.

So, if you take your body as an example for such an ordinary object, surely it is wrong to claim that it does not exhibit structure, because you would hardly be alive if it did not.[66] And also, structure definitely is, based on its enabling you to be alive, a condition for your existence. However, it is wrong to say that the mereological sum that constitutes your body exhibits structure and, hence, enables you to be alive. As we have seen, if universalists construe your body as being constituted by a mereological sum, they cannot invoke structure in the description of your body because structure is exempted by the axioms and principles of CEM, namely the formal system that

[65] Generally, structure affects both, identity as well as existence condition
s for sums. To do justice to both kinds of conditions, here in the first part, I discuss structure in the context of identity guiding principles, namely the Extensionality Principle and Uniqueness of Composition, whereas in the second part, structure is considered in the context of existence guiding principles, namely the General Sum Principle and Unrestricted Phenomenal Composition. The term "structure-obliterating" I borrow from Kit Fine; see Kit Fine, "Compounds and Aggregates," Noûs 28, no. 2 (June 1994), p.137.

[66] This example is taken from Barry Dainton in personal conversation.

renders them the universalists that they are. Likewise, the fact that structure is a condition for your existence is an argument for the claim that universalists fail to construe ordinary objects as mereological sums and that your body is an object constituted by something over and above a mereological sum, that is, structure. However, the former is not an argument for the claim that mereological sums exhibit structure because it strictly follows from CEM that they do not.

To put it in other words, surely your body and other familiar ordinary objects do exhibit structure but if you see those objects as being constituted by mereological sums, it is not based on the latter by which the objects exhibit structure. The objects do not have structure *qua* sums.[67] And the fact that ordinary objects are essentially characterised by something that exceeds the mere sum, namely structure and arrangement, in my eyes, serves as a strong indication for the fact that universalist constructions of ordinary objects fail.

So far, I have considered structure as a reason to deny compositional universalism mainly based on the former violating the Extensionality Principle and, hence, the Uniqueness of Composition doctrine. 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.[68] 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.[69] 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.[70]

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, according to the compositional universalist, such

[67] Thanks to Howard Robinson for this formulation provided in personal conversation.

[68] I will use the notions of sortal and kind properties interchangeably, similarly to Sattig, as discussed below.

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

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

properties do not determine the identity of a complex object. Anti-extensionalist views hold that the identity of a complex individual does not only depend on the existence of the parts but also on the kind of parts and whole; 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 of parts ignores kinds.

To use a related term from Sattig, quoted below, mereological sums have a "kind-independent nature." 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 of the object.[71]

Before I get to explain what, exactly, Sattig means with his terminology, let me briefly detour into existence conditions and at least somewhat informally infer the kind-independent nature of sums directly from the existence guiding principles of CEM. Sattig already adumbrates with his comment in the quote that the "identity of a table depends solely on which material objects are its parts." To start on a critical note, I think that Sattig confused identity and existence conditions here because the existence of parts that is sufficient for the existence of an object is – as the phrasing already suggests - its existence and not its identity condition. Be this as it may, based on GSP and the associated doctrine of Unrestricted Composition (UC) that guide such an existence condition, as has been noted, the object exists as soon as the parts do, no more no less. These extremely permissive existence conditions introduce widely spatially and temporally scattered objects into our ontology. Also, these conditions allow for familiar objects that common-sensically are part of our ontology, like turtles and tables. However, from the point of view of CEM and GSP, there is no difference between arbitrarily scattered and familiar, or what we might call ill-formed and well-formed, sets of parts.[72] Turtles and tables exist based on the same principle as nose-virtues or moon-socks. The simple point to make here is that just as this principle posits exclusively the existence of the parts as an existence condition for a further object in both cases, ill-formed and well-formed set of parts, these principles likewise exclude other conditions in both cases (because the conditions restrict composition). So neither with respect to widely scattered nor with respect to familiar objects is a further condition like being of a certain kind allowed for by GSP and UC of CEM. And since being a compositional universalist just means being an proponent of CEM,

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

[72] Thanks to Barry Dainton for introducing the latter concepts into the debate (in personal conversation).

conditions like being of a certain kind do not enter the universalists' construction of familiar objects.

In order to understand in more detail the kind-independent nature of (ordinary) objects construed as a mereological sum, let us look more closely at the corresponding quote in Sattig's work. Out of the literature that discusses the nature of sums, I choose Sattig because in his discussion, kind-properties, equivocated with sortal properties, play a pivotal role. As a starting point, let us take this quote:

> (…) 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.[73]

I think the challenge to understand the kind-independent nature of mereological sums is that it is wrong to claim that sums simply do not instantiate kinds: as Sattig says, "ordinary mereological sums have properties and relations that realize ordinary kinds." So, instead of holding that sums are devoid of any kinds generally, the kind-obliterating nature of sums is connected specifically to identity conditions: "the identity of a table does not depend on any table-realizers." "Realization" is the key term here that one has to be clear about to understand the difference between the absence of kinds generally and with respect to identity conditions specifically. So what does it mean that sums have properties that realise kinds without the sums' identity being dependent on such realisers?

The concept of kind-realizsation rests on two further notions: qualitative content and grounding.[74] The qualitative content of a kind is the set of properties or qualities that unifies all instances of that kind. All instances of the kind human, for example, are unified by the properties of, say, being conscious and being able to build motorcycles. Grounding is understood in the Finean sense that the holding of one fact or proposition consists in the holding of another fact or proposition or that one holds in virtue of the other. Now, kind-realisation means that an object

[73] Sattig, *The Double Lives of Objects*, pp.4/5.
[74] Sattig, *The Double Lives of Objects*, pp.16ff.

instantiates the qualitative content. As we have seen, the qualitative content is a set of characteristic properties. These properties function as kind-realisers in the sense that the instantiation of the set of properties grounds the instantiation of the qualitative content of the kind. In our example, the set of properties of an object, of being conscious and of being able to build motorcycles, realises the kind human if the instantiation of this set grounds the instantiation of the qualitative content of the kind human. To put it (probably overly) simply, kind-realisers are properties that are responsible for an object falling under a certain kind.

Now, according to Sattig, if ordinary objects like humans are construed as mereological sums, these sums have properties that realise the kinds, whereas the identity of a table or human does not depend on such properties. I think we can interpret this quote in a similar sense to how I also explained the way in which ordinary objects construed as mereological sums do or do not have structure in the preceding section. It is wrong to say that humans construed as mereological sums do not instantiate properties that ground the kind human. However, it is not the sum that instantiates these "human-realisers." Humans construed as mereological sums are of the kind human not in virtue of the sum, not *qua* sum. Similar to what I said with respect to structural properties, and also with respect to sortal properties, in order to characterise an object construed as a sum to be of a certain kind, one has to refer to something that exceeds the sum.

Based on my general point mentioned above, the fact that we cannot refer to kind properties in the determination of the identity of an object construed as a sum is clear: Identity and existence conditions of sums are guided by principles of CEM that simply leave no room for such kind-realising properties. The problem, to refer back to the beginning, is how to understand the claim that objects construed as sums nevertheless somehow instantiate kinds although their identity is not determined by them. If an object is a sum and sums do not instantiate kind-properties, where does this kind of object stem from? I think an apt way to tentatively understand how ordinary objects construed as a sum are of a certain kind is to hold that such construed objects instantiate kind properties as accidental properties. I take accidental properties to be such that the identity of an object dos not depend on them. They are not essential or constitutive of the identity of an object.

In my view, to close this section, the implications of this view are quite implausible. In a general picture, the compositional universalist is forced to claim that kind properties are accidental properties. In more detail, properties that realise a kind are held to not be constitutive of an object and to not determine its identity. However, at least prima facie, I think that an object being of a certain kind is a good candidate for determining its identity and for characterising what this object

essentially is. Being conscious and able to build motorcycles, among others, seem to be exactly those properties that essentially characterise what it means to be of the human kind. The conceiving of kind properties as accidental or non-constitutive and the objects that instantiate them as kind-independent, as Sattig has it, strengthen the impression that I already expressed with respect to structure and arrangement: it serves as a strong indication for the fact that universalist constructions of ordinary objects fail.

Moreover, based on the forgoing considerations, I am not so sure whether I understand what it means that an object is construed as a mere sum. With respect to both, structural and kind/sortal properties, it has been shown that the identity of ordinary objects construed as mereological sums does not depend on their instantiation. Such ordinary objects might instantiate structure and kind properties but these properties are not constitutive of the object and the object instantiates those properties not *qua* the sum. These properties are in some sense external to the sum. Yet, in my view, this also means that objects construed as mere sums are something over and above the sum. This is because if the sum does not instantiate structural or kind properties but the object construed as a sum somehow does, then there must be some metaphysical layer of the object that exceeds the sum and facilitates the instantiation of these properties. Since these properties are merely accidental to the identity of an object and not constitutive of it, perhaps we have to understand those objects as essentially constituted by the sum and accidentally, also by structural and sortal properties. Be this as it may, based on this picture, strictly speaking, it cannot be said that an object is construed as a mere sum because the construction of an object must include some other, perhaps accidental, metaphysical layer that instantiates structural and kind properties and that exceeds the sum.

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.

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 how these axioms reflect material, or in the case of this thesis, mental reality rather 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 until 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.[75] Formally:

Atom

$At(x) \equiv \neg(\exists z)(z << x)$[76]

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 so, 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.

Atomicity

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

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

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 formally, the atomicity axiom requires that every individual is either itself an atom or composed of such.[77]

With atomism, combining the SCQ with CEM becomes slightly intricate. This is because 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 can hardly be found in van Inwagen and his view that only mereological atoms or living things exist is a form of conditioned nihilism.[78] However, in CEM atomism is explicitly included as a (de)composition principle.[79] 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 (…)."[80] 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 can do no harm.

Simples

Another debate connected to atomistic entities is the one revolving around simples. Notions of atoms and simples are equivocated based on both being characterised 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

[77] Cf. Jonathan Schaffer, "Monism: The Priority of the Whole," *Philosophical Review* 119, no. 1 (2010): 31–76, especially pp.61-65 for the possibility of atomless gunk as an argument against pluralism and in favour of monism.
[78] Cf. Theodore Sider, "Van Inwagen and the Possibility of Gunk," *Analysis 53*, no. 4 (1993): 285–89, especially p.285.
[79] Varzi, "Mereology", sect 3.4.
[80] Robert C. Koons and Timothy Pickavance, *Metaphysics: The Fundamentals* (Wiley-Blackwell, 2015), p.139.

such point-sized objects is the "Pointy View of Simples."[81] 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.[82] They postulate extended simples, namely partless and hence atomic entities that occupy "at any time an extended region, called its locus (...)."[83] 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.[84] At this point, atomism shades off into monism, a view that is discussed below. This is because 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.[85] 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.[86] This is because 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 "conceptual parts" and qualities, although those concepts do not really correspond to "metaphysical parts."[87] 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.

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[81] 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 Simons' 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, especially p.138.

[82] 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.

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

[84] McDaniel, "8. Brutal Simples", p.239; Simons, "Extended Simples" p.378.

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

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

[87] 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.

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.[88] A gunky world is one in which all individuals are infinitely divisible.[89] 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.[90] A precursor of this view, Leibniz, has a picturesque way of phrasing it:

> 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.[91]

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

Finally, atomism involves non-atomicity:

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

[88] 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.

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

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

[91] 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.

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.[92] 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, either in formal mereology or in metaphysics, so I lay this issue to rest.[93]

[92] Ibid, p.24.

[93] 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, a view akin 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 in fact does not.

Nihilism entail two theses: first, the lower level entities themselves have no parts and, second, they do not yield a composite object.[94] 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.[95,96] Simples are also called atoms, from the Greek word for "not to be divided."[97] So the thesis that no composition occurs is equivalent to 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 generally, innumerable simple (sub)microscopic particles.[98] But definitely no unified object that sometimes purrs on your lap. Objects like that are not part of the nihilist ontology.[99]

In order to make this view more palatable for you, the nihilist would add that the appearance to you of there being an unified cat-object is understandable because the microparticles, even if they

[94] 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).

[95] 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.

[96] Trenton Merricks, *Objects and Persons* (Oxford University Press, 2001).

[97] Varzi, "Mereology.", section 3.4.

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

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

do not compose your cat, are arranged cat-wise.[100] Accordingly for predication, your sentences that operate with singular terms 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 light of her view on the one side but also to get the sceptic on board by developing expressions that are accessible to commonsense 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 the providing of some semantic or explanatory apparatus to mitigate the apparent irreconcilability with common sense. Yet, in both cases, the success of such a strategy is highly doubtful.[101]

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 answers in 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 assume ordinary objects exist as complexes.[102] The only difference between the nihilists on the one side and the folk ontologists on the other side is that the former deny and the latter accept the claim that the same natured simples compose a complex object.

The consequences 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 comes to be convinced of it. The first reason is fueled by the argument from sorties of decomposition and the well-known argument from vagueness, which we already encountered in connection to universalism.[103] If universalism seems unpalatable, one ends up entertaining nihilism, as van Inwagen himself does,

[100] 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, especially 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 van Inwagen, *Material Beings*, pp.108/109 for the origin of the 'arranged k-wise' locution.

[101] Cf. Markosian, "Restricted Composition", pp.347ff.

[102] Merricks, *Objects and Persons*, p.4.

[103] 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.

with the exception of complex objects like you and me, viz. one that constitutes a life.

Another reason to be convinced by 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 be explained by being caused by their parts only.[104,105] 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 commonsense 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 line here and exempt human beings from their otherwise nihilistic convictions, based on the fact that humans either constitute a life or are conscious.[106] Moreover, nihilism at large faces a powerful objection here, given the additional assumption that no distinct lines can be drawn between living or conscious beings and non-living or non-conscious ones.[107]

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 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.[108] This argument imagines a possible world that is infinitely divisible and in which, therefore, no fundamental atoms or simples

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

[105] Jonathan Schaffer, "From Nihilism to Monism," *Australasian Journal of Philosophy 85*, no. 2 (June 1, 2007): 175–91, especially 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).

[106] See van 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 van 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 favour 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.

[107] Lowe, "How Are Ordinary Objects Possible?", p.512.

[108] David Lewis, *Parts of Classes* (Blackwell, 1991), p.20.

as parts of higher order complex entities exist.[109] Even if one thinks that a gunky world is as counterintuitive as one without any complex objects, and it is not the task of this thesis to settle this dispute, the possibility of atomless gunk renders nihilism false, for the latter posits what the former denies.[110]

Apart from these common starting points for criticising compositional nihilism, let me remark on another. In short, in my view, arrangement is identical to composition. So the debate about whether suitably arranged objects compose a further totality is a verbal one because entities being suitably arranged is what it means for them to compose a further object. Let me elaborate on this point by comparing answers to SCQ. In the first section, we have seen, mereologically speaking and very roughly, that composition and the parthood relation can be conceptualised in terms of structure, or what we here more specifically call arrangement: according to the universalist, parts compose a further individual even in case no structure obtains, 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. Now, the opponent to universalism, the moderatist, holds that individuality and composition are highly dubious in the absence of some kind of structure or arrangement. I think we can say something similar to the nihilist: It is highly doubtful that there is no composition and individuality in the presence of arrangement. In short, there is no such thing, or at least I do not understand this conception, of composition-obliterating arrangement. If even, according to the universalist, entities without structure result in a composite individual, then *a fortiori* the existence of the entities under some structure or arrangement do.

Let me elaborate on the reason for thinking that composition and arrangement are identical by speculating about the reasons to think otherwise. I think the reason that some philosophers take the composite object to be different from suitably arranged entities is some misguided understanding of the metaphysical status of the composite object. Based on this misguided understanding, the composite totality is reified as compared to the suitably arranged entities: it is

[109] Sider, "Van Inwagen and the Possibility of Gunk.", especially p.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).

[110] 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.

assumed that, over and above the suitably arranged objects, there exists a third and numerically different entity, the composite object. But this is not the case. The composite object just is the suchlike arranged entities. This can be seen form the existence conditions of totalities, based here on a moderatist understanding: a further individual exists as soon as the parts under some relation or arrangement exist. Yet, what these existence conditions say is not that the further individual exists additionally to and numerically different from the arranged parts. What the existence conditions express is the case that the former comes into existence not *plus* but *as* being the latter. The whole car is not numerically different from its composing parts. The car simply is its parts arranged in a functionally conducing way.

My argument is a version of what Sider calls "The Deflationary Argument", which holds that it is a conceptual truth that composites exist if subatomic particles do.[111] Yet, I phrase my argument in rather metaphysical than semantic terms so that Sider's rejoinder to the deflationary argument does not apply to mine. Sider objects that even if this conceptual truth holds in ordinary language, it does not do so in fundamental language. However, I think that what I take to be a metaphysical fact, i.e. that suitably arranged entities are identical to the composite object, is not dependent on semantic or linguistic issues.

Talking of Sider, in the section "The Cartesian Argument", he denies what even some nihilistically inclined philosophers would grant, namely, that living and conscious beings are exempted from the otherwise composite-less ontology.[112] With reference to van Inwagen's *Material Beings*, Sider holds, as opposed to what van Inwagen suggests, that mentality is not a reason to set apart thinking organisms from artifacts by claiming that solely the former but not the latter are composite objects. Sider thinks that nothing "is wrong with saying that the correctness (or truth) of 'I think' is a matter of arrangements of particles."[113]

Based on my previously given 'arrangement is composition' argument, I agree with Sider that nothing is wrong with saying that mentality of conscious life is a matter of arrangement. However, as mentioned before, I also think that particles being 'I think'-ly arranged amounts to the same thing as saying that those particles compose a single thinking being. So, based on this assumption, saying, as Sider does, that thinking is a matter of arrangement does not pose an argument against the view that particles compose a thinking composite organism because the latter simply is what

[111] Sider, *Against Parthood*, p.269, section 8, p.269.
[112] Sider, *Against Parthood*, sect.7, pp.268ff.
[113] Sider, *Against Parthood*, p.268.

particles that by their arrangement facilitate metal activity do: they compose a thinking being. Similarly to my preceding considerations, I might speculate that the reason why philosophers like Sider make a difference between particles arranged thinking-wise and a thinking composite is that they assume the latter to be a numerically different entity that is something over and above the arranged particles. But this is not the case. If the existence condition for a thinking organism involves the particles and an arrangement that facilitates mental activity, then the composed entity is identical to the arranged particles. So I agree with Sider''s basic assumption that no difference between thinking organisms and artifacts obtains. However, as opposed to Sider's view according to which there is no difference based on the claim that both are suitably arranged particles and not composites, I agree that there is no difference between thinking beings and artifacts based on the denial of nihilism and the claim that both are composites. This is because being a composite simply is identical to suitably arranged particles.

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.[114] Yet, a monistic conclusion is also possible, that is, one that posits only one entity that is simple and likewise defies composition.[115]

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.[116] 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.[117] Since as such they support also the two core principles of nihilism, these monisms are a variation of the latter.[118]

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 conclusions from it.[119] 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 composition never occurs, there is only one single simple entity, the cosmos.

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

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

[116] 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.

[117] Horgan and Potrč, *Austere Realism*, p.165.

[118] 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).

[119] 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. However, since this debate primarily involves semantic and epistemic as opposed to metaphysical vagueness, I omit this line of discussion.

Schaffer provides a precise formulation of existence monism.[120] If C denotes actual concrete objects, u the cosmos[121] 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 exists exactly one actual concrete individual and it is the cosmos.[122]

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.[123] Besides the standard ingredient of existence monism of positing one simple actual concrete object, 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 being itself complex.[124] To that end, Horgan/Potrč deploy a complicated semantic machinery involving a conception of truth as an indirect world-language correspondence.[125] With this truth conception at hand, they then claim that commonsensical and scientific beliefs that postulate the multiplicity of complex objects inclusive of their parts, properties, and structure are true, "even though nothing in the world answers directly to these posits."[126]

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[120] 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).

[121] 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 emphasises 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.

[122] 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, spatio-temporal points and the like (Ibid).

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

[124] 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.

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

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

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.[127] The paraphrases involve holding that all the changes and differences that the folk perceive in the world are in fact mere modifications of the one single simple entity, like Spinoza does.[128] These modifications are something like dents in a car or waves of the ocean.[129] To the paradigmatic pluralistic truism from Moore, "Here is one hand.. and here is another"[130], 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.[131]

In a bit more detail, in such paraphrases, the compositional existence monist alludes to spatio-temporal local manners of instantiation that are meant to eschew commitment to rock-solid spatio-temporal points or locations as parts that are commonsensically taken to instantiate certain properties or relations.[132] For example, the compositional monist paraphrases the statement that the car has a black tyre in a certain location as a part such that the one single car spatio-temporally is a certain way, namely tyre-ish and blackish. The property of being a tyre and being black is instantiated four times in a spatio-temporal manner by the car-blobject.

A natural objection to this paraphrase strategy is similar to a point that I already briefly mounted in response to Sider with respect to my deflationary argument in the preceding section about nihilism. Generally, this is to doubt that linguistic and conceptual frameworks have a bearing on what seems obvious in many ways, namely that structural complexity is instantiated by a plurality of objects and parts. Schaffer develops this general point by doubting that paraphrases as semantical and linguistic means are apt to mitigate or reverse intuitions about complex objects that are grounded on solid perceptions and intuitions.[133] Specifically, his argumentation contains two claims: First, the one that it is intuitively obvious or perceptually apparent that there is a plurality

[127] Schaffer, "Monism," section 2.
[128] Cf. Benedict Spinoza and Stuart Hampshire, *Ethics*, trans. Edwin Curley, New Ed (London; New York: Penguin Classics, 1996).
[129] Van 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.
[130] G. E. Moore, *G.E. Moore: Selected Writings* (Routledge, 1993), p.166.
[131] Schaffer, "Monism," section 2.
[132] Horgan and Potrč, *Austere Realism*, sect. 7.4.1. and 7.4.2.
[133] Schaffer, "Monism," section 2.

of objects and second, that, based on the first, there are at least prima facie reasons to believe that there is such plurality. In the light of this argumentation, Schaffer holds, it is questionable how the paraphrase strategy of the existence monist is supposed to help. This is because, with respect to the first claim, paraphrases seem not to have the power to mitigate or alter perceptions or intuitions. Similarly, with respect to the second claim, it seems implausible to hold that paraphrases generally make you believe other than what perceptions and intuitions tell you to believe.

In light of the questionable paraphrase strategy, the monistic sceptic might ask for tenable argumentational motivations so as to override her commonsensical pluralistic beliefs. Existence monism inherits such motivation from its metaphysical sibling, nihilism.[134] At a general level, this motivation stems from the claim that existence monism offers the most sufficient and parsimonious ontology.[135] 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, just as any other relation, is abandoned from ontology.

Yet, there is a more sophisticated version of the parsimony argument. Let us call it the argument from explanatory parsimony. Similarly to the nihilist, the existence monist holds that his one partless cosmos is sufficient to tell all the causal stories in the world.[136] If this is so, then any further entities over and above the one concrete object, like proper parts in general, are explanatorily redundant or epiphenomenal. By being as such, proper parts get scythed by Occam's Razor for they unnecessarily proliferate ontology.[137] 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. 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 favours distinct concrete objects.[138] However, simply continuing to think what others thought before is not a good methodological guide and

[134] Schaffer, "Monism," section 2.
[135] Horgan and Potrč, "Existence Monism Trumps Priority Monism", p.74; Schaffer, "Why the World Has Parts", p.85.
[136] 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).
[137] Schaffer, "Monism," section 2.2.2.
[138] Schaffer, "Monism," sect 2.2.2.

hence is clearly worsened by Occam's Razor. A more promising methodological objection involves Schaffer's second point, namely theoretical simplicity.[139] Existence monism is as ontologically parsimonious as it is theoretically exuberant, for its near-crazy implications need to be flanked by folk-soothing explanations.

Let me remark on the first argument that Schaffer launches against the existence monist that involves CAI. As I mentioned before, the nihilist and the existence monist are theoretical siblings in that both deny composition based on a parsimony argument. The nihilist holds that whatever the composite can do and explain, the suitably arranged parts can also do and explain, so let us dispose of the composite. Similarly, the existence monist claims that whatever the parts can do and explain, the simple cosmos can also do and explain, so let us dispose of the parts. Based on this theoretical resemblance, I think we can respond to the existence monist in a similar way as we did to the nihilist. In the preceding section, my deflationary-styled argument was to claim that if suitably arranged particles are identical to composites, then the nihilism debate is a verbal one. As mentioned above, Schaffer objects with his CAI argument to the existence monist in a similar way, holding that, "[i]f the world *is* its proper parts, then positing the former just is positing the latter."[140] However, he rejects this argument, holding that CAI is false based on the claim that the whole and the parts are not identical because the parts can be structured.

I agree that there are good reasons to dismiss CAI but I also think that CAI is unnecessarily strong for arguing against existence monism. Similarly to how I responded to the nihilist, and also with respect to the existence monist, we can invoke an identity claim resulting in the argument that the debate is merely verbal without alluding to the strong CAI doctrine. We just have to allow, as I did, that structured parts are also identical to the composite. That is, the existence conditions for composites involve the existence of the parts plus structure. The resulting composite, as mentioned above, is not some additional entity and numerically different from the structured parts. In contrast, the former simply is the latter. Surely, this conception is a moderatist understanding of composition since it extents the otherwise extremely permissive existence conditions. Hence, an objector might demand to justify and substantiate moderatism. And rightly so. But the truth of moderatism does not depend on the truth of the claim that structured parts are nothing over and above or numerically different from, but identical to, the composite. The former is a stance towards the number and kind of existence conditions, the latter a stance towards what results from these

[139] Ibid. Also, see Schaffer, "Why the World Has Parts", p.86.
[140] Schaffer, "Monism," sect. 2.2.2.

conditions. That can be seen from the fact that in universalism also, the entity that results from the extremely permissive existence condition, the sum, simply is identical to the parts and not some ontologically substantial third entity. Hence, I think Schaffer's CAI-styled argument against existence monism points in the right direction, it is just that we have to deploy a more permissive version of it: if the single cosmos is identical to its structured parts, then positing the former is just positing the latter. As a consequence, the argumentation that favours existence monism based on parsimony is verbal and fails. This is because if the cosmos is identical to its proper parts, then it is trivially, so that whatever the parts can do and explain, the simple cosmos also can do and explain and, hence, there are no parts to dispose of.

Talking of moderation is a good transition to the next section, where more intuitively appealing answers to SCQ are discussed.

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 of nihilism, existence monism and atomism. The monisms are not included in van Inwagen's original list of extreme answers, but I think to maintain, like existence monism does, that the world is one extended simple and hence does not consist of parts can also be considered 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.[141]

To a first approximation, moderate answers are less radical in that they accord with the commonsense 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 a 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 atop the desk, 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.[142]

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

[141] 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 conceptualisation. 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 a discussion of 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 with respect to phenomenal consciousness, I think there is no need to consider a position like phenomenal compositional brutalism.

[142] Van 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 constitutes a life (see section 9 of *Material Beings*).

fastenation, all of which he 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 to 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 starting to search 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 that 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 conceptualising 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 analogue of compositional theory to unity and holism in metaphysics of mind; it is just that the former are more specific and logically precise, at least in the way I strive to present them here, than the latter. Therefore, 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 rigour as posited below.

I.6.a. Compositional Priority Monism

Existence monism is a rather radical position and rarely do philosophers feel attracted to it. Yet, monism in general has a longstanding philosophical tradition and an 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 expel their authors into the camp of obscure philosophers.[143]

[143] 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).

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 but it is 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."[144] 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.

As 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 a fully fledged account of compositional moderatism, which will be of issue hereafter.

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 because the parts do exist and compose something; it is just that they do so only once, namely to yield the prior whole, the cosmos. This also has implications for the notion of an individual, that is central to the composition debate, particularly at issue in Simons and van Inwagen. So priority monism might help with a question asked by van Inwagen:

> The word 'monism' comes from a Greek word that means 'alone' or 'single'. 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.)[145]

Priority monism offers a way of being separate to satisfy the definition of an individual without alluding to the questionable separateness of the whole from its parts on the same metaphysical

[144] Schaffer, "Monism: The Priority of the Whole," p.69.
[145] Van Inwagen, *Metaphysics*, p.34.

level. This is because 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 a 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, at that level the whole is the only entity; there are no more basic things than the cosmos. But also the whole is separate from its parts given that the latter reside at the posterior metaphysical level and the former at 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" at 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.[146] 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.[147] As we saw above, mereology conceives the world as a partial ordering in terms of parthood relations; similarly, metaphysical priority theory conceives the world as a partial ordering in terms of dependence relations. In addition to the formal properties of the partial ordering relation, Schaffer assumes that the structure of the world conceived as such 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.[148]

The combination of mereological and metaphysical issues in Schaffer's priority monism finds its culmination in 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

[146] Schaffer, "Monism," pp.33-38. Cf. Schaffer, "The Internal Relatedness of All Things", p.345.
[147] Ibid, p.37/8. Schaffer, "The Internal Relatedness of All Things", p.346.
[148] Ibid, p.37.

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."[149] Roughly, this slogan and the according requirement, labelled "the tiling constraint" by Schaffer, guarantees that the fundamental level is a complete and self-dependent "blueprint for reality."[150]

The first part of the requirement demands that the basic entity completely covers the cosmos and, hence, is labelled "covering" in Schaffer's terminology.[151] The fact that all or one basic entity gaplessly encompasses the entirety of reality is expressed mereologically in terms of a sum or fusion. Only if the basic entities form a sum do they satisfy the constraint of "covering." Let us signify the property of being the cosmos, then:

Covering

$Sum{:}x(B(x)) = u$[152]

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 constrains 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

[149] Ibid, p.38.
[150] Ibid, pp.38ff.
[151] Ibid, p.39.
[152] Ibid, pp.34/39.

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 is more than one basic entity. 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 they 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 are still, so to say, modally constrained by being related by the hitch.

In any case, Schaffer provides another reason for the no overlap requirement. The latter 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 to present a blueprint for reality. Schaffer names this an argument from economy and it can be seen as Occam's Razor applied to fundamental mereology.[153] 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 populates the fundamental level with subpluralities.[154]

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

$\forall(x)\forall(y)((B(x)\wedge B(y)\wedge(x\neq y))\rightarrow\neg(Pxy)$[155]

[153] Ibid, p.40.

[154] Ibid, p.41.

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

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 objects are parts of the cosmos, it follows from this requirement that if there is more than one basic object, then it cannot be the cosmos.[156] 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 the cosmos is basic.[157] 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 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:

[156] Ibid, p.41.
[157] Ibid, p.42.

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: $(\exists (x))(P(xu) \wedge (x \neq u) \wedge (D(ux))$.[158]

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 assumptions that renders monism and pluralism mutually exclusive is that composition is not identity.[159] 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 of monism and pluralism is an implication of the underlying systematic mutual exclusiveness of priority theory and CAI.[160] As has been mentioned above, priority theory amends conceiving of reality based on mereological part-whole relations by conceiving of 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.[161] Both metaphysical levels exist. Since

[158] Ibid, p.43.

[159] Ibid, pp.35/45.

[160] 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."

[161] Cf. Ibid., p.46. Schaffer, "The Internal Relatedness of All Things", p.342.

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's 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 posteriority property renders both different, to the effect that Leibniz's Law is contradicted and CAI falsified. It is the same with pluralism except 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, which is worthwhile mentioning as an alternative to the formulation already discussed above. This is because 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, in contrast, reads as follows:

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.[162] Atomists hold that it is the whole that is derivative of its parts because the powers and properties of the former depend on those 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

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

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 characterised 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.[163]

Schaffer is mainly concerned with metaphysical composition and, hence, phrases his monistic view in terms of the dependence relation between the parts and the 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 analysed into its parts and, hence, is determined explanatorily.[164] 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, irrespective of whether the dependence relation is cashed out in metaphysical or explanatory ways. The positions differ, however, in the number of prior fundamental entities they postulate. Monism holds that there is exactly one of such an 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."[165] 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 analysed 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 state in the world, perhaps like a Hegelian *Weltgeist*. More of this is at issue in the second part of this thesis.

Just as I noted regarding traditional, viz. existence, forms of atomism, priority atomism, also, 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

[163] 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."
[164] Fine, "Compounds and Aggregates," p.150.
[165] Schaffer, "Monism," p.42.

the latter position.[166] Priority atomism is inconsistent with a 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 descends infinitely, a fundamental level is never reached.[167] 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.[168] 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 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 on a par with each other.[169]

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 for doing 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 they 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

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

[167] 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.

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

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

compatible with pluralism, simply assuming a multiplicity of, say, locally basic wholes.[170] Local basicness captures the intuition that some finite set of members of a class, or simply some finite number of parts, can also 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.[171] 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 an 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 other integrated divisions and, hence, for something that I call 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. If 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.[172] Yet, he is rather more concerned with the priority structure of the world than with explicating what unity and integrity exactly amount to. He provides examples like causal connectedness and quantum entanglement but a formal account is missing.[173] That changes slightly in his Internal Relatedness paper but there also, first, the account of integrity in terms of internal relations does not reach full generality and, as will be at issue below, it is phrased in terms

[170] 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.

[171] 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.

[172] Schaffer, "Monism: The Priority of the Whole", p.42; In this paper, Schaffer distinguishes integrity from organic unity, at least at the end; for integrity and related concepts, see: 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, see: pp.341-3, 346, 355, 360; for organic unity, see: pp.342/3, 347/8. Also, for entangled systems that instantiate holistic properties, see Schaffer, "From Nihilism to Monism", p.184.

[173] Schaffer, "The Internal Relatedness of All Things", pp.362ff (causal connectedness), Schaffer, "Monism: The Priority of the Whole", pp.50ff (for quantum entanglement).

of a notion of interdependence of the parts as a part-whole relation as opposed to a part-part relation.[174] And, in my view, it is the latter conception of an 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.[175] 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 us 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 to yield some kind of internal unity, his work does not suffice. Here, Simons' approach to integrity presents a welcome alternative.

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. At 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 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.[176] To stick with the example given above in the 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 fulfil another condition in order to form a further individual, that is, a total phenomenal state.

Still at a quite general level, this condition that restricts occurrences of composition is called a

[174] Schaffer, "The Internal Relatedness of All Things", p.347.

[175] 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 exclusive of the parts and the latter pertain to principles of unity that also incorporate the whole (see Johnston, "Parts and Principles" p.134).

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

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 in order to postulate composition.[177]

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."[178] The obtaining of some relational principle among the parts is an existence condition for the whole.[179] The parts of the table add up to the familiar serviceable table, at 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 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 was conceived of in this way, then we would just reiterate the problem and have to ask, again, 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. 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.[180] According to this hylomorphic approach, the form of a whole provides certain "slots", certain ways in which the matter has to be arranged so as to yield an object of a certain kind. [181] In general, principles of unity are conceptualised in terms of structure, order or arrangement of the parts composing a whole.[182] These notions are not always chosen just in order

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

[178] 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 CEM not, then, utterly deficient, since it allows no structure or, more generally, no relational principle among the parts?

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

[180] 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.*

[181] 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.

[182] Sattig, *The Double Lives of Objects*, p.6.

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 more strongly, the identity of an entity is said to depend on the structure of its parts.[183] Principles of unity then deserve their place in a real definition of an object.[184] To phrase the connection between the principle of unity to both, existence and identity conditions, in a slogan: what it is for an object to exist and to be of some kind is for the parts to stand in some relation.[185]

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 at a subordinate metaphysical level, generated by various principles of unity until the fundamental level of atoms and simples is reached.[186] That way, a mereology enriched by principles of unity captures the common intuitions concerning the 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).[187]

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 so 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

[183] Sattig, *The Double Lives of Objects*, p.7; Johnston, "Parts and Principles", p.132.
[184] Johnston, "Parts and Principles", p.132.
[185] Inspired by Ibid, p.138.
[186] Sattig, *The Double Lives of Objects*, p.6; Johnston, "Parts and Principles", 132/3.
[187] Johnston, "Parts and Principles", p.133.

principles of unity in the shape of inter-part relations.[188] For example, taking the desk again, a statement modified as such 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 embrace.[189] 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 is negligible for an account of the "basic furniture of the world."[190] This is because 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."[191] 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."[192] Alluding to causal "influences" instead does not make the structure among the basic particles go away. 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 "materialised" 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 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

[188] Ibid, pp.133/4.
[189] Robinson, *Substance*, section 3.4.
[190] Ibid.
[191] Ibid.
[192] Ibid.

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 commonsense conception of composition that involves some kind of arrangement or structure as an integral component of ordinary objects.[193] Robinson's counterexample involves the case of wholes composed of parts that are gravitationally related to each other. This relation allows for wholes 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 commonsensical shape of being in some way compact. For example, a "whole consisting of your eyeglasses and Pluto"[194] is composed of parts that are gravitationally related to some extent 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 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 to capture our intuition for the composition of ordinary objects as not being mere sums. The statement is a good start because it emphasises 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 overgeneralised statement, I propose to amend it through 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, to exclude counterexamples and to make the statement sharp and precise enough 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 Simons' 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 characterised by dependence relations among the parts. Yet, a system under a dependence relation has to satisfy another criterion in Simons' conception of an integrated whole and that is being a

[193] Ibid., section 3.4.
[194] Mark Johnston, "Hylomorphism," *The Journal of Philosophy 103*, no. 12 (2006): 652–98. p.697.

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 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 from its surroundings that the random group of people does not. The closure criterion is the formulation and, below as well, formalisation of this intuition.

The latter condition is not satisfied by the gravitational relation.[195] Since this relation is ubiquitous and might be extended 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 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 a relation.

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.[196] This idea is realised in this thesis as follows. I

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

[196] 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 conceptualise structure in the perceptually psychological 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 a 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

start fairly formally, by presenting Simons' conception of a relation-family according to which only sets 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 favour of functional dependence among the parts.

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

In order to state what *being an 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:[197]

Division

a div w ≡ $\forall$ xεa (x<w) $\wedge$ $\forall$ x (x<w $\rightarrow$ $\exists$ yεa (xoy))

For all individuals x that are elements of the class *a* of parts, all 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:[198]

Partition

a ptn w ≡ a div w $\wedge$ $\forall$ xyεa ((xoy) $\rightarrow$ (x=y))

A division and for all individuals x and y that are elements of the class

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 an R-family.

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

[198] Ibid., p.327.

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 characterisation 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.[199]

In the following, this approximate statement finds its specifications by the definitions of closure and connectedness.[200] 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 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:[201]

> *Left Closure*
>
> cll 〈 R 〉 a ≡ ∀ xy (yεa →xRy→xεa)
>
> 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 behaviour 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 thus closed on the left, it is still possible that one member belonging to the

[199] Ibid., p.327.

[200] Simons adopts the following notation and terminology for the treatment of relations from Whitehead and Russell's *Principia Mathematica*. See Simons, *Parts*, p.327, note 8.

[201] Ibid, p.328.

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 behaviour, 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 would delouse one of another colony. Formally, a class *α* of parts is closed on the right under R if R is not directed from inside the class to outside it:[202]

Right Closure

clr 〈 R 〉 a ≡ ∀ xy (xεa →xRy→yεa)

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

Of course, now the chief primate has the opposite 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.

Finally, the chief realises 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 an R is directed outwards from the inside nor inwards from the outside; it is simply closed under R:[203]

Closure

cl 〈 R 〉 a ≡ ∀ xy (xεa →xRy∨yRx→yεa)

For all x and y, if x is a member of the class *α* of parts of an object then

[202] Ibid, p.328.
[203] Ibid, p.328.

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 take a symmetrical relation, all characterisations 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 would be obliged to scratch the back of the former. Symmetry makes no difference in directions of relation, so banning one direction results in banning the other.

Connectedness

So far, I have 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:[204]

Connectedness

con 〈 R 〉 a ≡ ⩝ xy (xεa →yεa→xRy∨yRx)

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

[204] Ibid, p. 328.

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 constituent 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 also go, here, from class membership inferred based on relatedness to relatedness being inferred from class membership, just with the class constituted not by relations that hold in two direction but only in one:[205]

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

[205] Ibid, p.329.

in a biclosure system under R:

Biclosure-System

bcs 〈 R 〉 a ≡ bicon 〈 R 〉 a ∧ cl 〈 R 〉 a

The members of the class *α* 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).[206] 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 characterising 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 ∪ Ř, or its ancestral (R ∪ Ř)*. Formally, z is related to x under the ancestral (R ∪ 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.[207] 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 emphasises the relation purely under the aspect of the property that is inherited, so to say, by one object 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.[208]

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

[206] 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).

[207] Ibid, p.329.

[208] 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 *Begriffsschrift*, section III, proposition 76.

objects, related under various instances of R, primary and secondary, form an R-family:[209]

> *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 an R-family:[210]

> *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.

So our primate colony forms an integrated whole if all members delouse each other, and themselves, and no member is either deloused by or delouses members of another colony. The relation of delousing is called *characteristic* for the colony.[211]

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

Now this schematic characterisation cannot be all that is said about how a complex object has to be relationally constituted to be an integrated whole. Some qualifications are appropriate. First, the characterisation 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 precisely, 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.[212] 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

[209] Simons, *Parts*, p.330.
[210] Ibid., p.330.
[211] Ibid., p.330.
[212] Ibid., p.154.

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 the semantical issues of the term "individual" here but there is one thing concerning the difference between individuals and collectives that 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."[213]

Second, integrity comes in degrees. Not all wholes are internally connected to the same degree 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 others by friendship. Though they all form integrated collectives of people, the degree to which they are bound together varies.[214]

Furthermore, the characterisation provided so far proceeds purely formally and as such is not apt to define integrity. This is for purely formal characterisations 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.[215]

So the formal definition provided has to be further "filled in" with relations that do not trivialise 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[216] 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 relation from the start. This is because some relations might be given both a purely

[213] Ibid., p.331.
[214] Ibid., pp.332/3.
[215] 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.
[216] Take Schaffer, "The Internal Relatedness of All Things", as an example of such a view.

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 mentioning its close relational sibling similarity or "likeness of color of the parts of a visual datum" as an example of a natural relation that does turn sets of parts into wholes.[217] The difference here seems to be further specifications for such relations. The difference relation in its purely formal guise does not help whereas the same relation becomes fairly substantial if we specify further properties it might possess.

So far, I have complemented the principle of unity in Johnston's schematic moderatist statement with 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 further specifying the relations under which the members of a class of parts form a family as dependence relations.

[217] 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) and also 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

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 is because 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.[218] 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 relations 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 characterised by the obtaining of dependence relations among the parts.[219] By introducing an 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 an 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.

A characterisation of a 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:

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

[219] Ibid., pp.290-2. For a general discussion of non-causal dependence relations, see Jaegwon Kim, "Noncausal 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, here, I am exclusively interested in horizontal ontological dependence, that is, dependence between entities at the same metaphysical level, primarily in-between parts.

General Dependence

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

Necessarily, if a is F then b is G.[220]

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 excursions into these fields and keep modal terminology limited.

Candidates for special dependence relations are rigid or generic ontological dependence, also discussed by Simons.[221] I also put strong emphasis on a third candidate, which is a 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 formalisation 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 formalisation is overly weak because it allowes for two cases. First, it allows self-dependence and surely, trivially, every individual is ontologically dependent on itself.[222] The second unwanted implication is that it allows 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 formalisation has to exclude self-dependence and the necessary existence of individual *b*. Simons states the according definition of weak rigid ontological dependence as follows:

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

[221] 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 does not go 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.

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

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 a 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 a stronger form of dependence by Simons.[223] 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 seems overly strong for a general conception of integrity, as Esfeld points out.[224] This is because an object 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.

Generic Ontological Dependence

The slightly weaker form of dependence, generic ontological dependence, alludes to kinds. Here, the idea is no longer that the existence of some particular individual is necessary for the existence of another particular individual but rather that, roughly, the existence of an individual of a certain kind is necessary for the existence of another individual of a certain kind.[225] 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

[223] Ibid, pp.302/3 and p.340.
[224] Michael Esfeld, "Holism and Analytic Philosophy," *Mind 107*, pp365–80, especially p.368.
[225] Ibid, p.368.

for the generic version has to exclude some trivialising 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 is F. Second, similarly to the preliminary version of rigid ontological dependence, we also want to prevent the definition allowing 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.[226] The resulting formalisation 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 a 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, 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.[227] 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

[226] Ibid, pp.368/9. Cf. Simons, *Parts,* p.297.
[227] Esfeld, "Holism and Analytic Philosophy," pp.369-71.

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) the being-in-debt-relation.[228]

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.[229]

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."[230] 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

[228] Ibid, p.369.
[229] Ibid, p.369.
[230] Simons, *Parts*, p.342.

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

To introduce 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 colour, your children rush towards it. What they are also aware of is that chameleons do not change colour 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 colour won't come easily. Luckily, the paths of the zoo are covered with gravel and the unlucky animal is located at manageable distance to help it along with exhibiting its colourful 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 weak and stimulates it to change its colour minimally to a sort of green caused by some pleasurable feeling of getting slightly tickled. This, in turn, changes Bob's mood to serious disappointment and makes him cry. Your second, Peter, is a bit older and already capable of carrying out some good hits. The animal gets considerably annoyed and, accordingly, turns bright yellow, its stress colour. Peter is quite pleased and starts to smile. Justus, your oldest, basketball professional-to-be, ambitious and slightly mean due to the turbulences of puberty, throws strongly and with deadly accuracy. Now the animal is seething with rage and pitch-black. On the other side, schadenfreude runs out of Justus's 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 colour*, 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, colour 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. Colours, for example, do not. Red, green and blue are all colours but one is not greater than 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, colour and the like *determinables*, since they can be further specified, determined, by certain values.[231] 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 colour 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.

To bring together the points about the determinates and the relations that the objects possess, two crucial points are important to realise. 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 colour-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 becomes pitch-black if Justus throws the pebbles and only pleasantly greenish if Bob does. The value of the colour of the chameleon depends on the value of the force of Justus's or Bob's throw. What determinate of the colour-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 colour 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-colour.

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

[231] 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.

the determinates, the state of one participant depends on the state of another. Together, they form a dependence system.[232] One mark of such a 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 conceptualisations 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.[233] The colour-state of the chameleon depends on the more or less skillful and motivational state of the pebble-throwing children. In order to clarify the conception of functional dependence for integrated wholes, I proceed by gradually specifying and formalising 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 to streamline it with Simons' usage of the term "division" used so far. Simons and Rescher/Oppenheim differentiate between the characterisation 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, but just considering the determinables and not the determinates:

> *Dependence System*
>
> A dependence system is a collection of objects, a division, which form an 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.[234]

I think this is an unjustified simplification of the definition of a non-quantitative dependence system because non-quantitative dependence systems also consist of objects that instantiate determinates and values. For example, the phenomenal quality spaces that will be discussed below consist of determinable properties, phenomenal colours, that come in certain determinates and

[232] Simons, *Parts*, Chap.9.5.

[233] See also Rescher/Oppenheim, "Logical Analysis of Gestalt Concepts", p.98. Also Grelling/Oppenheim, "Logical Analysis of 'Gestalt' as 'Functional Whole'", p.213.

[234] Simons, *Parts*, p.345 and Rescher/Oppenheim, "Logical Analysis of Gestalt Concepts", p.98.

values, like the specific colours 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, which is one that does not exclusively refer to quantified magnitudes:

> A dependence system is a collection of objects, a division, which form an 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.[235]

Following this characterisation, a first adumbrated version of the dependence relation R can be formalised as follows, where d is the determinable that depends on a class of determinables ϕ for the argument or object x: $R(d,\phi)_x$. Surely this definition is quite general; it just says that a determinable depends in some way on a class of determinables, and also it does not involve determinates or values yet.

As to specify what this way is and in order to reach functional dependence, 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 determinable belonging to ϕ, i.e. every determinable 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.[236]

Here we reach a more precise formulation of functional dependence that finally involves values, the determinates, and that says, colloquially put, that the value some determinable takes for

[235] 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).

[236] Grelling's formulation 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.

certain objects is dependent upon the values of other determinables.[237]

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

> *Functional Dependence*
>
> $R(d,\phi)_{x=df} \forall x_1 \forall x_2\{\forall g[g \in \phi \rightarrow g(x_1)=g(x_2)] \rightarrow d(x_1)=d(x_2)\}$[238]
>
> A determinable property d functionally depends upon a class of determinables ϕ for the common argument x is defined as if every argument in ϕ take the same value as for some argument x_1 and x_2, then also the determinable property d must take the same value for x_1 and x_2.[239]

For example, and I take this example from Grelling, the above definition formalises 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 t1 takes the same value as the demand and supply of the article at time t2, then the price of the article must take equal value for t1 to t2.[240]

I think that this example from Grelling is slightly misleading because by using time-relativised arguments it sounds as if the dependence of the price on the demand and supply is a temporal matter or is determined over time. And this is not so, because, in my understanding of the definition, it is meant to express a certain stability of the relation, or correspondence, between the different values of the determinables, i.e. the determinates. This can be shown temporally, as in the example from Grelling, but we might also take two articles at the same time to exemplify functional

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[237] Cf. Simons, *Parts*, p.344.

[238] 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).

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

[240] Kurt Grelling, "A Logical Theory of Dependence", in: Smith, B. (Ed.), *Foundations of Gestalt Theory*, pp.217/8.

dependence: if for one article the supply and the demand takes the same value as for some other article, then the price for one article must also take the same value as for the first article. Thalos expresses the same understanding of the definition by explaining that what the formula is meant to assert is that there is a unique value of the dependent determinable property for every set of values of the determinable properties that the first depends upon.[241] And also Simons seems to use non-time-relativised arguments in his informal exposition of functional dependence. [242]

The advantage of this non-time-relativised understanding of functional dependence is that it does not lead to confusion and misunderstanding when we consider changes of functional dependence relations. That is to say, we do not only want to understand what it means that one determinable property of an object is functionally dependent upon (a class of) other determinable properties at a time, but also how functional dependence plays out if one or more of the determinables out of the class change over time. And here using Thalos non-time-relativised understanding helps: same as there is a unique value of the dependent determinable property (viz. the determinate) for values of (the class of) determinable properties that the first depends upon at a time, there is also such unique value for the dependent determinable property in case one or more of the determinable properties of the class change their value over time. For example, as to stick to the economic example from above, if the demand and supply for the article at time t1 takes a higher value to a certain extent as the supply and demand of the article at time t2, then the price of the article must also take a higher value to a certain extent for t1 to t2. Colloquially put, functional dependence in the case of change means that the price changes in a unique way if demand and supply do.

Furthermore, in the example from Grelling, we consider the determinate properties of one argument, viz. one object. [243] 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 towards another.[244] 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

[241] Thalos, M. (2013), *Without Hierarchy: The Scale Freedom of the Universe*, p.196.
[242] Simons, *Parts*, sect. 9.5.
[243] From now onwards, I stick to the simpler terminology of calling values of determinable properties determinate properties.
[244] Cf. W. Köhler, *Die physischen Gestalten in Ruhe und im stationären Zustand* (Braunschweig: Vieweg&Sohn, 1920); Simons, *Parts*, pp.344/5.

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 because 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 of a functional dependence relation.[245]

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

> *Functional Integrity*
> A division that forms a family under a functional dependence relation.

This conception of a functional whole is considerably different from the psychological gestaltist notion of a whole based on Ehrenfels, for it is logical rather than psychological in nature.[246] With respect to the relation that figures in the integrated whole understood as a family under the

[245] 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 this thread further 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 an R-family based on Simons, to be such it is enough for a complex entity to instantiate some of the various instances of a relation. So if we have a complex entity under an asymmetric relation only, 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 conceptualisation of an integrated whole.

[246] 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.

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. This is also the case 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 organised 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.[247]

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 characterisation of functional dependence.[248] I shall do the same in the second part and discuss phenomenal relations as special kinds of functional dependence relations.

[247] 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 with the former for my purposes. See Simons, "Gestalt and Functional Dependence", p.174 for a substantiation of my point.

[248] 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, especially 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 by defending restricted composition and avoiding the unrestricted one, I am better able to defend my moderatist answer to the SCQ against vagueness.[249]

To reiterate, the argument from vagueness proceeds in three steps.[250] 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 is 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.[251] 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.[252]

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

[249] See, again, also Varzi, "Mereology", section, 4.5.
[250] From Koslicki, *The Structure of Objects*, pp.30ff on Sider, *Four-Dimensionalism*, Chap.4.
[251] Lewis, *On the Plurality of Worlds*, Chapter 4, pp.221ff. Koslicki, *The Structure of Objects*, p.31.
[252] Koslicki, *The Structure of Objects*, p.37.

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 seems 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 of 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 loses 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.[253]

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. At 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 to confuse definiteness of composition with the mode of composition, like differing degrees 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 characterised 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 over the integrity threshold yet.

So, first, the difference between a case of almost but still not quite yet integrity and a case of integrity, but just by the skin of one's teeth, is very meagre. There is a sharp cut-off, but one that puts an infinitesimal amount of difference between a case and no case of composition. Second, the degree of this difference between cases of composition and cases of non-composition is as high, or

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

low, as the degree of difference between two adjacent cases of composition or two adjacent cases of no composition. The entire composition-sorites is characterised by the same amount of difference between all the cases it comprises, be they cases of composition or not. For illustration, in the colour continuum, I assume a clear cut-off between yellow and orange, but that (assuming that each colour ranges from shade 1 to 100, where shade 100 of one colour is adjacent to shade 1 of the next) the difference between yellow 99 and orange 1 has the same degree of difference as that 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, 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.[254]

Although perceptual experiences might be the states most comprehensively studied, I think we should also include some less discussed states that are equally characteristic of genuine human mental life. If you want an opulent list to choose from, take a look at Haugeland's "Artificial Intelligence" book.[255] For my purpose, it suffices to simply amend the list comprising of phenomenally relevant mental states (that Haugeland names feelings) by adding, besides perceptions 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 the next morning ("algedonic phenomenology"[256]). 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.[257] According to this view, exclusively sensory 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.

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[254] Cf. Alex Byrne, *Sensory Qualities, Sensible Qualities, Sensational Qualities* and Rosenthal, *Consciousness and Mind*, p.139. See there, p.141: "Does this mean that we can simply dispense with our commonsense 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."

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

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

[257] 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.

To add another notion to the conceptual crowd, I assume that all phenomenal states are conscious states. This position is not uncontroversial. Clark, in particular, strongly disagrees and claims that "these [phenomenal, H.T.] properties have been and must be firmly dissociated from any ties to consciousness."[258] Rosenthal and Lycan also view sensory states and conscious states as independent of one another.[259] Nevertheless, since this is a debate that exceeds the limits of 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 those of excremental odours 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 label of phenomenal properties for properties of 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.[260] So sensory and sensible properties form a pair of

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

[259] Rosenthal, *Consciousness and Mind*, see esp. section 5.I. In the end, he argues that being conscious involves having a 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).

[260] 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 does not even get close to entities like sense data, I do not take sensational properties into consideration.

opposed notions. In calling properties of phenomenal states sensory properties, he is in line with Clark in his book "Sensory Properties". Unfortunately, Clark changes the terminology from his book "Sensory Qualities" in 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 this 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 sceptical.[261] 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 colours themselves; the sensation itself is not yellow or sweet, rather the sensation is of some external sweet and yellow object like a pot of rapeseed honey. According to the sceptics of 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."[262] So the question about whether phenomenal or sensory properties exist leads to the status of properties like tastes, colours and smells. If they are in fact sensible rather than sensory properties, then it is not clear anymore what sensory properties exactly are and they become a myth. Accordingly, sceptics like Byrne take tastes and colours to be 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 colours 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 commonsense understanding of what colours and the like are, does. Those physical entities are sensible properties but they are not the colours and tastes that we experience. Rather, they function as stimuli triggering what we

[261] 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 do. For a detailed defence of that thesis, see Byrne, (2006), "Color and the Mind-Body Problem", in: *Dialectica* 60, pp.223–244. This claim is also of mild importance for this essay 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.

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

know to be tastes and colours. 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."[263] 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.[264]

So if sensible properties are identified with physical entities that function as triggers of smells and colours, then smells and colours 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 I treat them as such 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.[265] As mentioned above, this argumentation is used to doubt the existence of sensory properties. I think this claim is often connected to 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."[266] If I drink a good mouthful of Campari, the experience I undergo is, according to this argumentation, characterised 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 had better opt 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

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[263] Clark, *A Theory of Sentience*, p.10. See also Clark's "Sensory Qualities" for a more extensive characterisation 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 characterised as "whatever events occur at sensory transducer" triggered by the former, i.e. thing that causes those events (p.46).

[264] Hayek, *The Sensory Order*, p.2.

[265] Also see Clark, *Sensory Qualities*, p. 78 for a discussion of this objection.

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

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.[267]

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 for this second part is to explicate what those general and formal characterisations 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.[268] Additionally, since this is a mereological thesis, a further essential differentiation lies 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.[269] This total set includes each and every actual single phenomenal state, 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 as being subjective and individual, that is to say, one such space per

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

[268] States might also be regarded as properties themselves, so that total phenomenal states 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, especially p.2). For the monistic representation of material physical systems via state space approaches, see Schaffer, "Monism", pp.59/60.

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

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 consciousness that encompasses all organisms. Adding the state space approach to such a view amounts to assuming a space of all possible single phenomenal states out of which this total state that encompasses all organisms is represented as a graph or field. 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 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.[270] 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.[271] 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-

[270] Ole Koksvik, "Three Models of Phenomenal Unity," *Journal of Consciousness Studies 21*, no. 7–8 (2014): 105–31, especially p.112; Geoffrey Lee, "Unity and Essence in Chalmers' Theory of Consciousness," *Philosophical Studies 167*, no. 3 (February 2014): 763–73, especially 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 colour 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, especially 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.

[271] 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."

psychological basis.[272, 273] 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, to take another example, in integrated information theory (IIT), on informational relationships between probability distributions of neuronal activity states.[274] 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.[275] The orderly succession of certain actual total states (or configurations, as Fekete and Edelman have it) in time might then be conceived as

[272] 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, especially p.416.

[273] 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 is his *The Structure Of Appearance* where the calculus of individuals, what Simons and I introduce as CEM, comes to full development, and this particularly 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 so as to ground the development of concepts is not the universalism at issue in this thesis. This is because, first, I am not discussing any phenomenal-conceptual link, and also, 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.

[274] 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), especially 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, especially p.194. Juergen Fell, "Identifying Neural Correlates of Consciousness: The State Space Approach," *Consciousness and Cognition 13*, no. 4 (December 2004): 709–29.

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

a trajectory of phenomenal consciousness through its state space.[276] 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 formalise 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 becomes abstract.[277] Talking of abstraction, state space approaches are admittedly highly idealised, so that it remains at least questionable whether they in fact appropriately represent the nature of phenomenal consciousness.[278] On the other hand, they offer explanatory merits, primarily with respect to conceptualising 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 an 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 characterised 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 to the left or right or a bit higher up: 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

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

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

[278] 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).

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, the conscious states of your dachshund if he spots a sausage. The scope of the domain of conscious states comprises emphatically of all possible conscious states, and humans are not the only creatures the mind of which assumes such states.[279] 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.[280]

Relating Nagel's quote on the state space approach to phenomenal consciousness, Bayne and Chalmers characterise the synchronic total phenomenal state as what it is like to be a subject at a time.[281] So we can understand Nagel as saying, and I side with this view, that the scope of the

[279] Mathematical approaches to quality spaces differ in this respect. Yoshimi restricts his discussion to all possible human states by imposing constraints on 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 a 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's position and consider the unrestricted set of phenomenally conscious states in the mental domain.

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

[281] "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).

domain of possible phenomenally conscious states comprises of the total phenomenal states and their constituent single states possibly occurrent in humans, as well as of, to modify the quote, "countless forms of subjects at a time totally unimaginable to us".

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 of the dimensions that these creatures possess. For example, the nose of a dachshund is far more capable of detecting sausages than that of a human, 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 aforementioned 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."[282] 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

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

certain shade of red.

To delve a bit deeper into the mathematical structure of state spaces, various ways are open to conceiving 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 this conception is that such a structure reveals the proportion of the points in a dimension, for example, how distant they are from each other.[283] 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, 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.[284] Be this as it may, the point here is that state spaces are often held to be metric spaces.[285]

Also, vector spaces are a common candidate.[286] 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 an R^3 vector space is constituted by three dimensions, each of which encompasses the spatial scope of one vector. For example, if the

[283] 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 the kind of metric topological structure that facilitates the determination of distance between two points on a 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.

[284] 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)."

[285] 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 per Riemannian (pp.72, 75-77, 83, 89). Stanley, "Qualia Space", p.50.

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

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

Another advantage of vector spaces is that its constituents, the vectors, can be added.[287] 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."[288] 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.[289] 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 multiplying the intensity or amplitude of a phenomenal state by a real number.[290] This way, the vector quantifies the intensity of each possible phenomenal state, from, say, what 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.[291] For example, our R^3 case is a three-dimensional metric vector space consisting of all

[287] Stanley, "Qualia Space", p.52-54.

[288] Yoshimi, "Phenomenology and Connectionism.", p.2.

[289] 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.

[290] See Stanley, "Qualia Space", p.54/5, for a discussion.

[291] Stanley holds that the quality space has infinite dimensions. This is because, if we consider not only the actual human but all possible consciousnesses (or brains, as Stanley has it, since he argues 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 colour receptors and, hence, three dimensions in quality space, it is also at least conceivable that some creature possesses receptors for a multiplicity of wavelengths, 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 correlates, yet stays neutral with respect to the dimensional number or infiniteness (Fekete, "Representational Systems.", pp.88, 98).

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.[292]

Also, the metric aspect of this metric vector state space facilitates determining 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."[293] 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 moderately volumed blues than to a set of states that you assume if you drink Cherry Coke and enjoy Britney Spears.[294]

Mereology and Phenomenal Consciousness

As was mentioned above, SCQ in its general metaphysical form is intended by van 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 such as tables and tennis balls but here also, 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 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 composes 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

[292] 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.

[293] Yoshimi, "Phenomenology and Connectionism",p.2.

[294] Stanley, "Qualia Space.", p.55.

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).[295]

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 emphasise 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 composes a total phenomenal state. And "any" phenomenal state includes Caesar'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 includes all former, current and future phenomenal states. And only a 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 whether mereological considerations generally are fruitful for consciousness studies or whether it 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 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

[295] For a very simple analogy, compare mereology to maths: Just as one and one equals two irrespectively of adding pancakes, propositions, or phenomenal states, mereological principles that govern parthood relations also apply to all metaphysical domains.

are of help in specifying and providing logically precise conceptualisations 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.[296] 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.[297] Understanding consciousness to be mereologically structured in these ways is a substantial contribution to consciousness studies since such an approach dissents from an array of other theories, for example, to invoke a rather extreme case, like Tye's "one-experience view" according to which a conscious experience 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 all have in common that they concern the composition 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, they neither, or only exceptionally, operate with the same notion of composition and mereology; they all more 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 with 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

[296] Tononi, G., "Consciousness Differentiated and Integrated", in: Cleeremens, *The Unity of Consciousness*, pp.253-265. Cf. Wiese and Metzinger, "Desiderata for a Mereotopological Theory of Consciousness.", especially p.193/4.
[297] Cf. Ibid, 194.

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 conceptualising composition's 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 with the traditional SCQ, we thus can put the SPCQ as follows:[298]

> *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. 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

[298] 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. Bruntrup L. Jaskolla (Oxford University Press, forthcoming), sect.VII.

considerable holistic aspect that places it amongst the moderatists.

The mereological methodology of the SPCQ and its answers renders both independent from but applicable to more general issues in the philosophy of mind, like the mind-body problem. This is because the question about whether or not and if yes how single phenomenal states compose a total one is independent from but applicable to the question about whether or not and if yes how a total phenomenal state comes into existence. Take, for example, dualism and functionalism. The dualist might hold that a total phenomenal state comes into existence if you have a soul that has a set of single phenomenal states whereas the functionalist holds that the former comes into existence if certain functional roles are realised. However, these claims are independent from the SPCQ because metaphysical positions do not answer mereological and compositional questions. Even if it is the case that a total phenomenal state comes into existence based on a soul that has a set of single states, then the question of the compositional way in which this happens is still not settled. Does the total state that the soul has come into existence because the single states, to refer to van Inwagen's SCQ, stand in some kind of contact, or because they are somehow fastened, or, as the present thesis has it, are related in some special way? The metaphysical thesis of dualism has no answers to that mereological question. Yet, in reverse, if the SPCQ is settled, then it may very well be applicable to dualism in that the former posits conditions under which it can be said that the single states that the soul has compose a total one. Likewise with functionalism: Even if it is a metaphysical fact that being a single state depends on the functional role it plays, then the mereological question still remains whether or not these states that are defined in that way have to be in contact, fastened or related in some special way to yield the total experience. Yet, again, if the SPCQ is settled, then it may have a bearing on functionalist theses in that the former posits conditions under which roles in combination yield another superordinate role that phenomenal consciousness as a whole plays. Also, in a broader materialist picture, one might hold that mental states are identical to neural activity, but that metaphysical thesis does not provide an answer to the mereological question of under what conditions these states yield the total one of what it is like to be a subject at a time.[299]

Besides the aforementioned question about whether or not and if yes how a total phenomenal state comes into existence, SPCQ is also independent from and cannot be construed in terms of constitution. That is to say that SPCQ does not ask whether or not and if yes how single

[299] Tononi's IIT connects metaphysical and mereological approaches and holds that, roughly, consciousness arises from integrated neural activity. Still, the two approaches are independent of each other since one might hold that conscious states are neural states without saying anything about whether or not and how the single neural states have to be related to each other to compose a total conscious state.

phenomenal states constitute the total one. This is for two reasons. First, similarly to the existential issue discussed in the preceding paragraph, the constitutional issue also has no bearing on the meteorological approach entertained in this thesis. Constitution is an asymmetrical dependence relation and different from the partial ordering based on the parthood relation with which mereology is concerned. It might very well be that a complex total state is 'made up' of single states in a constitutional sense. Yet, this fact allows no inference to mereological facts, that is, whether being a part of a total state involves, for example, the single states being related under some structure or not (universalism versus moderatism).[300]

[300] Moreover, construing SPCQ in the constitutional way involves problematic background assumptions, because "not everyone agrees that total experiences are constituted of partial experiences" where constitution implies that the constituted state is nothing over and above the constituting states. Thanks to Phillip Goff for mentioning this point in personal correspondence. For more on what Goff means by constitution, see his "The Phenomenal Bonding Solution to the Combination Problem", in: Jaskolla, G. Bruntrup L. *Panpsychism: Contemporary Perspectives*. OUP (2016), pp.295.

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 indigestible consequences and, probably based on that fact, some positions called PU appear in an acceptable manner 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 characterised by an incomplete application of the mereological apparatus.

In what follows, and based on my exposition in Part I.2.b., I partition CEM into its two major principles, that is, the Principles of Unrestricted Composition (UC) based on the General Sum Principle (GSP), as well as the principle of Uniqueness of Composition (UqC) based on the extensionality principle (E), and discuss its according phenomenal versions.[301] So if we apply CEM to phenomenal consciousness, the resulting position of 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 the identity of what we might call a phenomenal sum.[302]

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

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

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

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 is because 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 of 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's colloquial formulation of Simons' 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 make 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 is still 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 commonsensical 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 aforementioned 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 reached a similar level of theoretical virtue and at the same time satisfied 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 because we have to respect its theoretical virtues. However, in case there was a rival that was similarly precise and vagueness-free, this rival would be favoured 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 realise its ramifications, let me criticise 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 from the two respective principles of PU, namely UPC and UqPC. I start with existence conditions and UPC, and follow with identity conditions based on UqPC.

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

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 General Sum Principle of CEM that underlies UC 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 a universalist about a domain is to hold that complex individuals of that domain are devoid of any structure. To put it a bit more carefully, complex individuals might exhibit some structures, or realise them, but the structure is in no way a condition for the existence of that individual, but rather accidental or coincidental. It is 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. This is because structure is a case of principles of unity and restricts composition, which in turn contradicts PU. As discussed in the first part with respect to physical ordinary objects like the human body, holding that, according to PU, phenomenal consciousness has no structure does not allow the inference to the claim that phenomenal consciousness exhibits no structure generally; we scarcely would experience the world and ourselves the way we do if it did not. The former claim rather holds that the phenomenal universalist cannot construe and essentially characterise phenomenal consciousness as exhibiting structure. As I mentioned in the first part, axiomatic principles of CEM that guide identity as well as existence conditions for phenomenal sums are violated if structure enters the construction of phenomenal consciousness as a mereological sum. The Extensionality Principle holds that two objects that are composed of the same set of parts are identical. The according phenomenal doctrine of Uniqueness of Phenomenal Composition mentioned above is violated in case structure enters the construction of

phenomenal consciousness because two total states that are composed of the same set of single phenomenal states can be non-identical based on instantiating different structures. Likewise, the General Sum Principle holds that an object exists as soon as the parts exist. The according doctrine of Unrestricted Phenomenal Composition also mentioned above is violated in case structure enters the construction of phenomenal consciousness because structure serves as an additional existence condition that the principle leaves no room for.

To put it in other words, surely phenomenal consciousness does exhibit structure but if you see it as being constituted by mereological sums, as the phenomenal universalist does, it is not the sum based on which structure is instantiated. Phenomenal consciousness does not have structure *qua* sums. And the fact that phenomenal consciousness is essentially characterised by something that exceeds the mere sum, namely structure and arrangement, in my eyes, serves as a strong indication for the fact that PU-based constructions of phenomenal consciousness fail. Let me elaborate on the implausibility of the PU's structure-obliterating construction of phenomenal consciousness.

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 colour-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 amounts 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 colours 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.[303] 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 'betweenness', nearness, or any other spatial relation to each other."[304] 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 so as to posit the spatial relation of colocation or proximity. However, this understanding is not meant in the quote because nearness and the like are 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: Sortal 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 a 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

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

[304] C.J.S. Clarke, "The Nonlocality of Mind," Journal of Consciousness Studies 2, no. 3 (March 1, 1995): pp.231–40, especially p.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.

different sortal properties but is based on the fact that sums, phenomenal or not, are kind-independent and hence do not instantiate any sortal or kind properties at all that would be constitutive for their identity.

In order to clarify what it means for a phenomenal sum to be kind-independent, like in the first part, let me first detour into existence conditions for phenomenal sums and somewhat informally infer their kind-independence from the principle of Unrestricted Phenomenal Composition (UPC). Subsequently, we will see what this nature means for the construction of phenomenal consciousness as a phenomenal sum. The aforementioned principle, based on GSP of CEM, holds that a phenomenal sum exists as soon as a set of single phenomenal states exist. And this is the one and only existence condition for the coming about of a phenomenal sum. The consequence of this principle that I want to highlight is that, since it posits just this one condition, viz. the existence of the single phenomenal states, the phenomenal universalist cannot differentiate between sums that consist of widely spatially and temporally scattered phenomenal sums and sums that conform with our intuitions of what it is to be a complex total phenomenal state. This is to say that based on the permissive existence conditions for phenomenal sums, PU equates well-formed and ill-formed sets of phenomenal states. Just as your state of tasting lemon, mine of listening to blues and Cleopatra's of being annoyed with Caesar forms a further total state in the shape of a phenomenal sum, the set of all your phenomenal states at a time also do. All other conditions, including those that posit kind properties that would facilitate a differentiation of well and ill-formed sets, are excluded by the UPC axiom. Any other condition restricts composition and hence violates a core principle that is based on CEM, the underlying doctrine of compositional universalists.

Now back to the kind-independent nature of phenomenal consciousness construed as a mere sum. Based on what we learned from Sattig, there is an important difference between holding that phenomenal consciousness construed as a mere sum instantiates the kind property of being phenomenal and holding that this kind property determines the identity of phenomenal consciousness. PU's construction of phenomenal consciousness implies agreeing with the former but disagreeing with the latter claim. This is what it means for phenomenal sums to be kind-independent.

In more detail, to adopt Sattig's terminology laid out in the first part, a kind of a complex total state is realised if the total state instantiates properties that function as kind-realisers. In even more detail: the qualitative content of the kind phenomenal consists in the properties that unify instances of the kind phenomenal, for example, being in the state of what it is like to taste lemon and being annoyed. The instantiation of these properties ground the instantiation of the qualitative

content of the kind phenomenal. Grounding the qualitative content of a kind is the sense in which a set of properties realise a kind. Tasting lemon and being annoyed are kind-realisers because the instantiation of these properties is what makes a total state falling under the kind phenomenal.

Now, as we have seen, to construe phenomenal consciousness as a mere sum means that the former instantiates properties that realise the kind phenomenal, but also that these kind-realisers are not constitutive for phenomenal consciousness so construed; these properties do not determine the identity of a total phenomenal state. PU's phenomenal consciousness is kind-independent in this sense. So it is wrong to say that phenomenal consciousness understood as a mere sum is not phenomenal because it does instantiate properties that realise this kind. However, these phenomenality realising properties do not determine the identity of a total phenomenal state and are not constitutive of it. According to the phenomenal universalist, the state you are in does not qualify as phenomenally conscious *qua* sum. In order to characterise phenomenal consciousness as phenomenal, one has to refer to some metaphysical layer that exceeds the sum. To use another word for what phenomenality becomes in the eye of the phenomenal universalist, if phenomenal consciousness is construed as a mere sum, but the mere sum is not responsible for kind-realising properties, then phenomenality and the grounding kind-realising properties become accidental properties that are not constitutive of the identity of the total phenomenal state.

So, in the light of E of CEM and the according UqPC in the phenomenal domain, the identity and essential constitution of two total phenomenal states is the same if they are composed of the same single states, irrespectively of what kind these properties realise or how they are arranged or structured. I think this picture is quite implausible. This is because properties that realise a kind of a total state seem to me to be promising candidates for determining the identity of that state and for characterising what it essentially is. When philosophers inquire about the nature of phenomenal consciousness, alluding to states of what it is like to taste lemon and to what it is like to be annoyed (and their structure) is the natural strategy. Almost all accounts that discuss phenomenal composition, or unity, do so in terms of a total state that is essentially or constitutively conscious or phenomenal. In contrast, if phenomenal consciousness is merely accidentally phenomenal, I have a hard time understanding what it essentially is. I take the attempt to characterise the essential nature of consciousness without being able to refer to properties and states that realise its phenomenal kind to be a futile endeavour. Hence, similar to my conclusion regarding the structure-obliterating nature, I also disagree with the phenomenal universalists' construction of phenomenal consciousness as a mere sum with respect to its kind-independent nature.

Kinds of Phenomenal Summation and Totalities

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. To do 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:[305]

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 of 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.

Mere Conjunctive[306] Total State

A complex totality that is a sum of its single parts and hence has a kind-independent nature. This kind of totality is true to the universalist answer to the SCQ, since, in addition to being a complex,

[305] 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.

[306] I borrow the expression "conjunctive" from Kit Fine, who connects it with the operation that yields sums or fusions, viz. the operation he calls aggregation: "(…) the aggregate will exist when one of its components exist (…)." See Kit Fine, "Compounds and Aggregates," Noûs 28, no. 2 (June 1994), p.141.

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 whose identity is determined by its kind and the kind of its composing single states. This kind of total state is true to the moderatist answer to the SCQ, since, in addition to being a complex, composition obtains only under some condition resulting in some upper-level property being constitutive of the total state. Kind totalities violate CAI and UqPC, for the resulting individuals essentially 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 an (extended) simple, no composition obtains. So this total state results from an extreme and monistic stance towards SPCQ.[307] 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 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 for the monistic views, all accounts of phenomenal composition, more or less explicitly, involve complex

[307] 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 so 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.

total states.

Conjunctive Total State

A complex total state that is a sum of its single parts and whose higher-order kind property of phenomenality is not constitutive.[308] 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 true to the universalist answer to the SPCQ, since, in addition to being a complex, no condition restricts composition and also results in some upper-level property that does not determine the identity of the total state.[309] 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 yields such mental individuals. According to CEM in general mereological metaphysics, the operation of summing does not amount to some substantial or material relation among the parts. 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 any kind of relation. If we added 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 are nothing more than the linguistic means to denote an operation of combining a set of subordinate entities under a common

[308] 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).

[309] 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, especially p.178).

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 very well be related by some other "binding that causes both sensations to be apprehended by a single mind."[310] 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.[311]

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."[312]

Well, that might be so, but only on the assumption of the truth of Integrated Information theory (IIT). But IIT is a too narrow a foundation to assess the scope of phenomenal composition. As we have seen, in light of mereology and the according phenomenal composition, we should at least initially be open to considering 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 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 even more divergent creatures:

> 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?[313]

[310] Stanley, "Qualia Space", p.53.
[311] Bayne and Chalmers, "What Is the Unity of Consciousness?", p.26.
[312] Tononi, G., "Consciousness Differentiated and Integrated", in: Cleeremens, *The Unity of Consciousness*, pp.253-265, especially p.254.
[313] Stanley, "Qualia Space", p.54.

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 when the two phenomenal colours red and yellow merge, resulting in phenomenal orange. But this is not the point here. The point is to admit way less commonsensical 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 frog's 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 an operation in the phenomenal domains, some authors resort to notions of simultaneity, contemporaneousness, jointness or colocation within one phenomenal field.[314] Those notions appear to denote substantial 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 subordinating 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 can additionally connect these notions with answers to SPCQ (henceforth, I use the nothing of summation to include 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 relations among the set. Hence, this operation does not restrict composition and is associated with PU. Accordingly, the identity of the resulting

[314] 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.

superordinate total state is not determined by any kind properties.

Thick Notion of Phenomenal Summation

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

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 an operation.

Total Phenomenal State

A complex total state of the phenomenal kind where the latter is essential and constitutive of the former. In its complex form, this kind of total state is true 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 essentially that renders total states that are composed of the same set of single phenomenal states non-identical.

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 positions. 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 discussion of panpsychism, Goff entertains some related form of PU and even calls it that. However, as I mentioned in the introduction to this section, he seems to 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 irrespective 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 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 constitutes 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.[315]

To start with a brief critique, Dainton's inference from UPC to unity of the suchlike summed single phenomenal states is false. This if because, based on 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.[316] On the contrary, it is rather a point of criticism, as we have seen in the first part, that such sums, be they material or mental, do not exhibit any unity of the parts whatsoever and might be composed of widely spatially or temporally scattered 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 CEM and likewise not in PU. Summing single states based on PU and its principle UPC involves what I labelled the thin notion of phenomenal summation above and yields another total state, but based on the phenomenal versions of CEM, this total state in no way exhibits any unity.

Having said this, Dainton 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, 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 the pain in your left toe and my state of enjoying strawberry ice-cream. In a next step, we add temporal scattering, yielding total

[315] 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, especially p.261.

[316] 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 irrespective 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.

states comprised of Brutus's intention to kill Caesar, your current state of being annoyed by a student's introduction to a philosophy paper 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 a wine reception.

Notwithstanding these consequences, in the context of panpsychism, Phillip Goff entertains PU.[317] Panpsychism holds that the fundamental micro-physical objects are conscious. They are, hence, regarded as micro-psychical entities or, in short, micro-subject. Yet, panpsychism wrestles with one major problem, called the combination problem. According to the combination problem, it is hard to make sense of the way in which the micro-subjects combine into our familiar individual consciousness. If one just takes a set of micro-subjects, it remains a mystery how the mere existence of these micro-subjects yield the macro-subject. Now, Goff's solution to the combination problem consists in holding that it might be true that the mere existence of the micro-subjects does not yield the macro-subject, but that the existence plus some relation that obtains among them does.[318] And this relation is the phenomenal bonding relation.

Goff then asks when it is the case that micro-subjects are related by phenomenal bonding to yield our macro-consciousness, a question that he labels the special phenomenal composition question: "Under what conditions do subjects combine to produce a further subject?"[319] He first considers a commonsense answer, according to which micro-subjects combine to produce a further subject under the condition that they form an organism. It is based on a version of the previously discussed vagueness argument that Goff rejects the commonsense answer and arrives at PU. If it is vague when an organism is formed, then it is also vague when we have a conscious subject. That is to say that we have borderline cases such that it remains indeterminate whether or not there is a conscious subject. And on a semantic treatment of vagueness, where the indeterminacy does not pertain to reality but to the predicate that denotes reality, the problem of vagueness about consciousness is robust: According to Goff, we have no option to resolve the indeterminacy of the predicate 'conscious' by making it precise.[320] Since he rejects the commonsense answer, Goff is left

[317] 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.

[318] Goff, "The Phenomenal Bonding Solution to the Combination Problem", p.292.

[319] Goff, "The Phenomenal Bonding Solution to the Combination Problem", p.296.

[320] Because that involves either accepting analytic functionalism or rejecting phenomenal transparency according to which we have privileged and clear access to the content of phenomenal concepts. See Goff, "The Phenomenal Bonding Solution to the Combination Problem", p.291 and 299.

with two remaining options: that subjects always combine to produce a further subject or never do. The former option is universalism and the latter nihilism. Under the assumption that nihilism is a non-starter, Goff finally entertains PU.[321]

I have three issues with Goff's position. The first pertains to the rejection of the commonsense answers based on embracing the vagueness argument. Here, I hold that there is no need to give in to the vagueness argument and, hence, that the path to the commonsense answer is not blocked. Second, I think that Goff's universalism is different from the universalism commonly understood based on classical mereology and, hence, that Goff misapplies the label PU to his position. Finally, I briefly argue that Goff neglects the diachronic implications of classical universalism.

With regards to vagueness, as I discussed in section I.6.d. of this thesis, the argument is effective only if one accepts two subclaims. The first pertains to the aforementioned borderline cases: The vagueness argument indeed is effective if it is indeterminate whether or not there is or we can speak of (in a semantic treatment favoured by Goff) a conscious subject. However, the argument also involves another subclaim, namely that sudden cut-offs are rejected. If one assumes a spectrum of extremely similar adjacent cases that range from clearly not conscious subjects to clearly conscious subjects, the vagueness argument implies that, as we have seen, somewhere in the middle, so to say, we find these mentioned borderline cases in which it is indeterminate whether consciousness obtains or not. But the assumption of these borderline cases implies the rejection of sudden cut-offs. Such cut-offs describe the situation in which we have two adjacent cases in the middle of the spectrum where one is a conscious subject and the other is not. So at some point in the spectrum consciousness suddenly starts to obtain without borderline cases. And the second subclaim of the vagueness argument is to deny such a possibility.

However, as I argued in I.6.d., I cannot see why such sudden shifts are rejected. I think they are quite plausible. Just because the adjacent cases are extremely similar, it does not follow that no sudden cut-offs exist. We can imagine that we start from one end of the spectrum where consciousness is maximally clearly instantiated and move further from case to case towards the middle of the spectrum, where it is less clearly instantiated. Then there is a sudden shift from a case where it is minimally clear that consciousness is instantiated to a case where it is minimally clear that it is not instantiated. From there we move on to the other end, where we find a maximally clear case of a non-conscious subject. With regard to the sudden shift in the middle, the fact that the difference between the case of minimally clear instantiation and minimally clear non-instantiation

[321] Goff, "The Phenomenal Bonding Solution to the Combination Problem", p.299.

is extremely small does not allow the inference to the fact that instantiation is indeterminate. Take for illustration the colour spectrum in which orange fades in a sorites-like manner into yellow. Here also, somewhere in the middle of the spectrum, the difference between orange and yellow is extremely small. Nonetheless, somewhere in this middle there is a clear shift from orange to yellow. Hence, in light of the fact that indeterminacy between two adjacent cases does not obtain just because they are extremely similar, sudden shifts are quite plausible.

To sum up this point, based on the acceptance of sudden cut-offs, I think that it is not vague whether conscious subjects exist and hence that the commonsense answer to the special phenomenal composition question still stands. So there is no need to adopt PU.

With regard to the second point, I think that the label universalism is misapplied to the view that Goff entertains. And this is particularly due to the phenomenal bonding relation. PU-based CEM essentially involves the doctrine of unrestricted composition. So far, Goff rightly connects this label with his view because, according to Goff, micro-subjects unrestrictedly combine into macro-subjects. However, if we concentrate on the fact that grounds such unrestricted composition of micro-psychic entities, then calling Goff's view universalism is a misnomer. This is because the fact that grounds the combination of micro-subjects is the phenomenal bonding relation. And any relation is exempted from the existence conditions for phenomenal sums, that is, for the entities that result from unrestricted composition according to universalism. In positing a relation among the micro-psychic entities, Goff's position, rather, contains aspects of moderatism (discussed below). Although this label would also be a misapplication because Goff's view includes unrestricted composition, which moderatism denies. Perhaps 'Panrelationalism' comes closest to what Goff thinks. But be this as it may, the label universalism is a misapplication because it generally excludes relations among the parts, here micro-subjects.[322]

[322] In addition to my criticism, one might worry that, if all phenomenal states are necessarily phenomenally bonded, then the bonding relation becomes "empty" and the difference between Goff's position and universalism purely verbal. Thanks to Howard Robinson for this point mentioned in personal correspondence. Sure, if all phenomenal states are necessarily related by the bonding relation, then there is nothing left anymore from which these related states could be differentiated, that is, phenomenal states that are not related in such a way. However, I cannot see the inference from the fact that a relation necessarily obtains and hence excludes the possibility of the non-obtaining of the relation to the fact that this relation is empty. The first claim is a modal one, the second claim is a metaphysical one and just inferring the one from the other without further ado is too quick. For example, so as to yield the water molecule, a chemical relation necessarily has to hold between the oxygen and the hydrogen atoms but this fact does not render this chemical relation empty. The metaphysical difference between the water molecule composed of related atoms and a water molecule constructed as a sum (universalism) unrestrictedly composed of atoms in isolation is apparent and real. The first water molecule possesses structural and sortal properties that the second doesn't (see the section I.2.b in this thesis about criticizing compositional universalism). And the necessity of the holding of the relation does not change that. Similarly, the necessity of the obtaining of the phenomenal bonding relation has no bearing on the fact that there is a non-empty and real difference between one whole individual or cosmic macro-subject composed of phenomenally bonded micro-subjects (Goff's position) and a macro-subject constructed as a sum and unrestrictedly composed of micro-subjects in isolation

Note that here I do not criticise the plausibility of the view that Goff suggests. It might very well be the case that he rightly answers the special phenomenal composition question by holding that micro-subjects combine to produce a further subject under the condition that the phenomenal bonding relation ubiquitously obtains among them. My point is simply that this answer cannot be called universalism. I take issue with the label of the view, not the content.

Finally, when I mentioned at the beginning of this section that Goff is not aware of the full ramifications of his adoption of PU, I also meant that he seems to only consider the combination of micro-subjects at a time, that is synchronically. Hence, he does not consider the fact that, according to PU and UPC, temporally scattered conscious micro-particles would also form macro-subjects, that is, diachronically. So not only do all synchronically possible combinations of micro-subjects yield a macro-subject but all diachronically possible combinations also do. I think this fact does not help the plausibility of Goff's position. It might, to most, already be hard to imagine macro-subjects being composed of just spatially widely scattered micro-particles. But some might completely lose grasp of what it is to be a macro-consciousness if it involves the composition of also temporally distant parts, that is, conscious micro-particles of the past, present and future.

Now we leave the discussion of the application of CEM and hence universalism to the phenomenal domain and proceed with considering phenomenal atomism.

(universalism). The first macro-subject possesses structural and sortal properties that the second doesn't (see the section II.2.a. and b. in this thesis about criticizing phenomenal universalism).

II.3. Phenomenal Atomism

Introductory Remark

As in the first part of this thesis, in this section too the discussion of atomism ends up 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 other's existence and identity form a complex total state that is, adding Schaffer's priority theory, also derivative of the series of single states.[323] 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 extent 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 consider this systematic gap somewhat surprising in 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.

Phenomenal Atomicity and Phenomenal Atomlessness

As was 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

[323] Or, the other way round: according to atomism in the philosophy of mind, the single states are basic and the total state depends, in one or the 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.

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."[324] 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 formalised, 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 a 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, put here in terms of states' phenomenal atomicity, it reads as follows:

> *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

[324] Simons, *Parts*, p.42.

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 because, 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.[325] But, as I also mentioned in the first part, at its 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 until 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 to hand, to reiterate, which is the more plausible one in application to phenomenal consciousness?

To start with, to my knowledge, almost the entire literature about (the structure of) phenomenal consciousness presupposes mereological atomicity. Usually, the smallest entity is taken to be the single phenomenal state, or single phenomenal properties, qualia.[326] Still, it is conceivable that these are further divisible. For example, in the vicinity of panpsychism, or the 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

[325] With respect to space, I have difficulties picturing 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 here also, the issue is phenomenal existence monism and hence does not belong to this section about atomicity.

[326] For qualia as phenomenal atoms, or, more precisely, 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.

supervenience continues infinitely."[327] 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.[328] 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 is further 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 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 also taken to be true 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.[329] In general mereology, the finitude of cardinality means that the

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[327] 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.

[328] 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.

[329] 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.

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 were further infinitely divisible, there would also 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 I can neither 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, think of any who hold that the phenomenal domain is occupied by an 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 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 table. Corresponding to the material domain where the postulation of atomlessness renders a world gunky, positing phenomenal atomlessness in the mental domain results in phenomenal gunk. When phenomenal gunk appears in the literature, then, it is as a theoretical possibility in opposition to a position authors actually defend, rather than as one they are in fact able to imagine and to illustrate, let alone adopt.[330]

In discussing Brentano on compound colours, Massimo and Hämmerli consider two ways to account for homogeneous colours.[331] The first one is phenomenal gunk, where they define phenomenal gunk as, first, each part of a visual extent appears as having the same colour 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, each part of a visual extent also appears as having the same colour 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

[330] 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).

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

infinite divisibility of the visual extent of the same colour in question or by that extent being a single partless entity. So here, we meet again the previously mentioned opposition to 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 favoured.

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 "gunk.""[332] So here also, we see the extended simple view being favoured 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 clearly has in mind, again, the extended-simple view on experience. This becomes clear when he describes experience in Berkeley's view as some sensory plenum.[333] 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."[334] Since infinitely divisible is exactly what phenomenal gunk essentially is, Roberts clearly does not mean phenomenal gunk when he writes phenomenal gunk.

In sum, although a legitimate position through being derived from 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 indulge in the latter

[332] 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, especially p. 135, where, in discussing Dainton's view on the stream of consciousness, he simply assumes "that human experience has a logically atomic structure."

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

[334] Ibid., p.151.

venture, I take phenomenal atomicity as the view to hold.

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 no phenomenal quality or properties exist. In the way it is 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 what it is like to be a subject at a time. Hence, the precise label for this position is phenomenal compositional nihilism and is 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 that no complex entity like our familiar phenomenal consciousness exists sounds crazy to most. One of the few places where this position is, nevertheless, taken seriously can be found in Goff. Yet, even here, 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."[335] I agree with the pre-theoretical inclinations that Goff ventilates here. But still, I think a bit more can be done to do justice to this position as to any other in philosophy. By this, I mean that we should reject a position as false or absurd only if all argumentational means are exploited to defend it. And as we have seen in the first part, the nihilist has an idiosyncratic strategy up her sleeve to mitigate the sense of absurdity that surrounds phenomenal nihilism.

With respect to ordinary objects, this strategy amounts to holding that, although no tables exist,

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

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 of 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 commonsense intuition is accounted for by saying that single phenomenal states exist that are arranged phenomenality-wise. I will object to this strategy below.

The main asset of PN in general and the k-wise-locution-strategy in particular is parsimoniousness. If it is true that the nihilist in fact is able to account for all the properties of a total phenomenal state without taking it to be a composite mental individual, indeed we should dispense of it. However, I will argue below that such account cannot be achieved. 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 a universalist, in case you favour the second, a nihilist. For my argument against vagueness, please refer to section I.6.d.

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 rejected rather than supported. But be this as it may, one cannot exclude phenomenal gunk from being metaphysically possible and, facing the choice between two equally unpalatable views, phenomenal gunk or the non-existence of composite phenomenal totalities, one might even opt for phenomenal gunk.

Moreover, as mentioned before and similarly to Sider's view that I discussed in the first part, according to which nothing "is wrong with saying that the correctness (or truth) of 'I think' is a matter of arrangements of particles", a defender of PN might hold that nothing is wrong with saying that the correctness (or truth) of 'I am phenomenally conscious' is a matter of the phenomenality-wise arrangement of particles.[336]

However, also in the first part, I objected against compositional nihilism in a deflationary way that suitably arranged entities are identical to the composite object to the effect that the debate is

[336] Sider, *Against Parthood*, p.268.

merely verbal. I think this point also holds true with respect to the phenomenal nihilist, who posits something like a non-composite phenomenal arrangement. Also in the phenomenal domain, or so I claim, positing phenomenality-wise arranged single states is just to posit the composite total phenomenal state. To argue tentatively and systematically, in terms of the possible answers to SPCQ, note that the universalist posits a phenomenal sum, that is, a composite, even on very permissible grounds: If the single states exist, then the sum does. Moreover, the moderatist holds that it is particularly structure and arrangement that yields a composite: If the single phenomenal states exist under some structure, then there is the resulting composite total phenomenal state. In the light of these positions, I think it is implausible to posit both, the single states plus structure, and still claim that no composition obtains. If even, according to the phenomenal universalist, single states without structure result in a phenomenal composite individual, then *a fortiori* the existence of the states under some structure or arrangement does. But, of course, this is a somewhat intuitive argumentation, simply based on the systematics of the answers to SPCQ.

A more solid way to argue is based on the existence conditions for composite phenomenal entities. Based on a moderatist understanding, the total phenomenal state exists as soon as the single phenomenal states do under some structure or arrangement. Yet, what the existence conditions yield is not some total phenomenal state that exists over and above or additional to the set of structured single states, or that is numerically different from the set. What the existence conditions express is the case that the former comes into existence not *plus* but *as being* the latter. Or, simply, if the set of single phenomenal states is (suitably) arranged, then the resulting total state is identical to the set. For illustration, if you undergo the single experiences of seeing Tick playing in the garden, Trick playing in the garden and Track playing in the garden, then, roughly according to the moderatist theory, if these experiences are suitably arranged, then you also undergo the complex experience of seeing the Duck-triplet playing together in the garden. However, the resulting complex experience is not numerically different from the three composing single experiences. It is not the case that, if the three single experiences are suitably arranged, then you undergo a fourth one, the total experience. The set of single experiences of Tick, Trick and Track playing in the garden results in a total experience of the Duck-triplet playing that comes into existence not *plus* the set, as a fourth experience, but *as being* the set, as the same experience. The set is identical to the total experience.

In sum, if I am about right with my deflationary argument against PN and its k-wise- locution-strategy, then positing a set of phenomenality-wise arranged single phenomenal states is just positing the composite total phenomenal state so that the debate is merely verbal.

As I remarked at the beginning of this section, almost nothing has been written about PN.[337] 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 the 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.

[337] Note that also positions that deny the unity of consciousness do not pertain to PN. This is because, if one is skeptical about the unity of consciousness, then the corresponding position is not nihilism but atomism (or some minor positions supporting the possibility of experiential/phenomenal gunk). Denying unity, as the atomist does, does not equal denying composition, as the nihilist does. If one rejects the unity of consciousness, she agrees that the non-unified phenomenal parts do not constitute phenomenal wholes; yet, she still usually thinks that phenomenal consciousness is a composite entity, that is, is composed of these non-unified phenomenal parts just that they do not yield the phenomenal whole. Take our familiar phenomenal consciousness: the holist holds that it is composed of unified single phenomenal states, the atomist thinks that it is composed of non-unified single phenomenal states, and the nihilist maintains that single phenomenal states do not compose anything, including the total phenomenal consciousness.

In more systematic terms: holism and atomism are positions concerned with unity: holism supports the unity of single phenomenal states, atomism denies it. In contrast, nihilism is a position concerned with composition: it denies composition. This differentiation might be regarded as verbal, since 'in practice' it amounts to the same thing with respect to unity: the single phenomenal states are not unified and do not yield a phenomenal whole. Yet, from the perspective of compositional theory, there is still a difference: composition is still in play in the atomist's position such that the non-unified single phenomenal states atomistically compose a phenomenal aggregate (let's say in opposition to the phenomenal whole). The phenomenal nihilist opposes even that and holds that the non-unified single phenomenal states not only do not exhibit unity but also do not exhibit composition. So what the phenomenal nihilist rejects when he denies that consciousness is unified is composition. That he also rejects unity probably follows from his position, but, systematically speaking, unity is not at issue directly in compositional theory and hence nihilism.

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, which will present the way into phenomenal moderatism.[338]

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, but it is 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 is always true that there is a total state such that a set of single phenomenal states does not compose 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 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

[338] 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.

consider the totality or entirety of material or phenomenal states, that is, the material or phenomenal world.[339] 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 emphasise that lPEM does not count as a correct answer to SPCQ. I simply discuss this position here because it involves a 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 an entity, even if to a different ontological extent, the objection also aims even-handedly at sPEM and lPEM.

To start with sPEM, as indicated, this position entails the consideration of the entire set of actual phenomenal states.[340] Or, to be precise, since according to sPEM there are no separate phenomenal states, hence also no set, this position involves one single seamless and partless phenomenal totality that has as aspects or modifications what commonsensically 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. Just as in the material domain existence monism results in viewing the cosmos as 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."[341] In opposition to their view labelled "priority cosmopsychism", which is the phenomenal version of Schaffer's priority monism

[339] 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.

[340] 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 I commit some looseness in order to render sPEM suitable for discussion.

[341] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism." p.117.

that is also 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".[342] 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 as 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 the mind, or of mind-like properties."[343] 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"[344], which sounds like the extended simple of the classical existence monist. On the other hand, she conceptualises this plenum "as space considered geometrodynamically, (…) intrinsically internally structured in accordance with a principle of perfect point to point connectivity and hence perfect continuity."[345] And where there 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, the same as Horgan and Potrč do. But at this point, the problems of elusive exposition continue. The mental One is conceptualised "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 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."[346] The problem I see with this elusive way of explicating the view is that by no means does it become 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

[342] Ibid, pp.117/8.
[343] 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.
[344] Ibid, p.5.
[345] Ibid, p.8.
[346] Ibid, p.5/6.

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, categorise the view in question as s- or lPEM, and, furthermore, to scrutinise its consistency, let alone plausibility.

With respect to assessing the plausibility of sPEM, a few arguments in favour of it come to mind.[347] Surely, similarly to its sibling in general metaphysics, it is extremely parsimonious. However, the costs 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 creatures' phenomenal states. Mathews, at least, does no good job of mitigating these worries. Also, as mentioned, this problem pertains to lPEM as well 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 still minority views. Before discussing Searle and Tye as contemporary proponents of lPEM in some more detail, let me mention James and Carnap as historical precursors of this position.[348]

Regarding Carnap, before, I already mentioned that he constructs the entirety of common and scientific concepts on an autopsychological basis.[349] 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

[347] 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.

[348] Strawson might also be considered as a proponent of this view, although I do not have the means to argue in detail for that claim here. To start with when doing 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).

[349] Alan W. Richardson, *Carnap's Construction of the World: The Aufbau and the Emergence of Logical Empiricism*, 1st 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.

quasi-analysis.[350] 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.[351] And by positing 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."[352] 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 "tertium quid" that corresponds to the experienced "simply and totally".[353] In the latter phrase, we see nicely the existence monistic thrust of James's 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 becomes apparent 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 they 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

[350] 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.

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

[352] 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.

[353] James, *The Principles of Psychology,* pp.156/7.

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's account. Also Tye, in what he calls *The One Experience View*, differentiates between the object, or content, of experience and the experiential level itself, but he just conceptualises the objectual level as physical events that happen in the brain.[354] 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.[355] But these processes occurring at various places in the brain are not to be confused with experiences. At the experiential level, there are no parts like single experiences, but all there is is one seamless macro-experience that encompasses, or is constituted by, the physical micro-events in the brain.[356] Hence, there are, at the experiential level, also no genuine visual or auditory experiences.[357] 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."[358] According to him, like Tye, a separate visual or auditory consciousness does not exist, but only one total, all modalities encompassing, and seamless total conscious state.[359]

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's account. Where James posits a process of fusing that renders one whole experience from various separate objects, Tye holds that the single experience is "constituted by a combination of largely

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[354] 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.

[355] Tye, *Consciousness and Persons*. pp.28/9, 36.

[356] Ibid, p.40.

[357] Michael Tye, *Consciousness and Persons: Unity and Identity, Representation and Mind* (Cambridge, Mass: MIT Press, 2003), pp.27/8.

[358] John R. Searle, *Consciousness and Language* (Cambridge: Cambridge University Press, 2002), p.56.

[359] 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, which he also calls "phenomenal embodiment" (ibid.), is, in 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 holistic notion for existence monistic views.

independent physical events going on in separate regions of the brain."[360] 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.[361] 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's law, the totality is different from the set of parts it is constituted by. Similarly, or so he eventually argues, the one single seamless experience also instantiates different properties from the set of physical 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 in as fine-grained a way 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."[362] Accordingly, the aspects of these 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."[363] 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.

Criticising 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 of a numerical single entity to exhibit qualitative complexity and multiplicity, and sPEM as well as lPEM posit such a possibility. However, I conduct the criticism in terms of lPEM because I want to maintain a connection to actually occurring discussions in philosophy of mind. And as I said before, sPEM is no serious part of the

[360] Tye, *Consciousness and Persons*., p.31.
[361] Ibid, pp.29-31.
[362] Searle, *Consciousness and Language,* p.56.
[363] Ibid.

latter.

IPEM has launched some caveats and I will not reiterate those objections here.[364] I want, rather, 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 been mentioned by Kriegel and Bayne that the one single total state of consciousness can only mysteriously be said to maintain structural or qualitative complexity.[365] The fact that this point is only mentioned in passing and is not discussed further 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 a considerable effort to mitigate these objections by deploying elaborate semantic apparatuses.

The general picture according to lPEM, 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 conceptualise the ontological status of those items, be they 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 a 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 lPEM 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."[366] 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

[364] Cf. for criticism Bayne, "Divided Brains and Unified Phenomenology" and Tim Bayne, *The Unity of Consciousness* (Oxford University Press Uk, 2012), pp.22ff.

[365] Kriegel, *The Varieties of Consciousness*, p.8. Bayne, *The Unity of Consciousness,* p.23.

[366] Jonathan Schaffer, "Monism," in *Stanford Encyclopedia of Philosophy*, ed. Jonathan Schaffer, 2008, sect.2.

language-world correspondence"[367] might work in the material domain, in 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 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 life 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 manoeuvre. With regards to those strategies, I would 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 colour and shape, that can further be specified into their determinate properties, that is, the specific colour, 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 (...).[368]

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. 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 colours 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 riper and red on one side and less ripe and yellow on the other. However, these objects

[367] Ibid, sect.2.

[368] Simons, *Parts,* p.343. Also, for the determinate and determinable terminology, see Johnson, *Logic*, pp.173ff.

are not made up of one partless whole entity but of a multiplicity of micro-particles or -parts.[369] And it is due to the different temperature or colour that changes from one micro-particle to the other that the macro-object seems to have two colours 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, can also be applied to the phenomenal domain. Generally, I see no reason to treat the Determinates-Exclusion Principle in any way differently from the other metaphysical principles mentioned so far. Just as mereology applies even-handedly 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.[370] 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 colour 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 would like to make is that in the light of the Determinates-Exclusion Principle, no numerically single phenomenally conscious state simultaneously instantiates 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 are simultaneously aware of a red apple next to a yellow banana, the total phenomenal state

[369] 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 there cannot 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 a 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 on the objector's 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.

[370] As opposed to entities called occurants, entities labelled continuants do not possess temporal parts. Cf. Simons, *Parts*, p.118.

(or field) cannot be numerically simple as the phenomenal existence monist holds. Hence IPEM is false. Before, I summarised 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 in 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 do, 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 the case of all of your single states at a time and separately in the case of all of mine at a time, but not in the 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 of 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 achieves the logical rigour of phenomenal universalism as well as satisfying 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 accurately 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.[371] 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 subject S at time t. Also, let [T] be the total state. Then $[x_1]^{Ph}$, ..., $[x_n]^{Ph}$ conditionally compose [T].

[371] I am concerned here with synchronic phenomenal consciousness, but note that even the conditions of contemporaneousness and togetherness suffice as a condition of composition, since they exclude single phenomenal states at different times from composing another phenomenal individual as phenomenal universalism allows.

Apart from the moderatist account that is developed in the following sections and fleshes out this general statement, I do not know of any other views that explicitly posit restricted phenomenal composition, at least not in a substantial way. Philip Goff mentions restricted phenomenal composition in the context of the combination problem for panpsychism that I will discuss in the next section. Yet, even Goff does not present a self-standing moderatist position but simply considers restricted phenomenal composition as a competitor for universalism that he rejects. Perhaps the reason for such a lacking of consideration of phenomenal moderatism rests in the fact that it presupposes to previously ask the question to which restricted phenomenal composition is an answer. And nobody, except Phillip Goff, to my knowledge, has so far asked anything like SPCQ.

Having said this, William Jaworski posits a positive account that still is not directly comparable to mine but worth considering because it comes close enough to what I discuss in this thesis. Jaworski attempts to solve the mind-body problem by alluding to hylomorphism.[372] According to classical hylomorphism, very roughly, parts or matter (hule) compose a whole under the condition that the whole is additionally composed of a form or structure (morphe). In contemporary metaphysics, as mentioned in the first part of this thesis, a group of philosophers, like Fine, Sattig and Koslicki, adopt the classical approach and develop it into positions that group together under the label of neo-Aristotelian hylomorphism.[373] Jaworski adds another account and tailors it so as to solve the mind-body problem, by invoking structures "as powers to organize or configure things."[374] According to this picture, matter being structured in some special way, like with humans and other complex organisms with their distinctive mental powers like thinking and wishing, is delineated from the otherwise unstructured "sea of matter" that does not exhibit such abilities.[375]

According to Jaworski, his account is naturalistic and anti-reductive. It is the former because Jaworski takes individuals to be composed of physical components and that mental capacities are naturally based on or embodied in the way these physical components are structured. It is the latter

[372] In the first part, I discussed hylomorphism with respect to principles of unity, since the form can be said to feature as such in hylomorphism. Yet, as I will also mention below in section II.6.b., the notion of unity is used in a certain and definite way in philosophy of mind that differs from the notion of unity connected to compositional theory and, more specifically, to restricting principles in neo-Aristotelian hylomorphism. Hence, here in the second part, in order to keep the different notions of unity apart, I consider Jaworski's position under the heading of moderatism generally. Since moderatism entails restricted composition and his position is suggesting exactly that, I think this procedure is appropriate.

[373] See the first part of this thesis, section I.6.b.; Kit Fine, "Things and Their Parts," *Midwest Studies in Philosophy 23*, no. 1 (1999): 61–74; Sattig, *The Double Lives of Objects;* and Koslicki, *The Structure of Objects*.

[374] Jaworski, W., *Structure and the Metaphysics of Mind: How Hylomorphism Solves the Mind-Body Problem* (OUP, 2016), p.4.

[375] Ibid.,p.1/2.

because structures are different from the things structured and both are a basic principle in hylomorphism. This is anti-reductive in the sense that "[n]othing must explain why the former exists any more than something must explain why the latter does."[376]

Before, I said that Jaworski's account comes close to mine. This is because Jaworski also adopts a moderatist stance towards composition.[377] This is particularly evident based on the fact that Jaworski develops his account with explicit reference to van Inwagen's moderatist answer to SCQ. Very roughly, Jaworski's suggestion that structures are powers to configure physical components in such a way that mental powers emerge[378] can be seen as being closely related to van Inwagen's view that composition obtains under the condition that the fundamental components constitute a life. Jaworski's structures function as an explication of what it means for fundamental components to form a life in van Inwagen's sense, by holding that structures organise the components in such a way that the resulting individual exhibits mental and physical life-constituting properties, like demanding and dancing. Both views are moderatist because, generally, structure or order is imposed on the parts to the effect that composition is restricted.[379]

Yet, Jaworski's view also differs from mine in two essential respects. First, as I mentioned in section II.1 of this thesis, the metaphysical debates revolving around the mind-body problem are independent from but applicable to the mereological debates revolving around SCQ and SPCQ. For sure, van Inwagen and Jaworski have a lot to say about under what conditions parts compose a whole and living individual. But what they present are mainly metaphysical conditions and constraints. For example, according to Jaworski, only under the condition that the physical and fundamental components are likewise fundamentally structured in a thinking-enabling way does some individual result. In contrast, compositional accounts, at least the one suggested in this thesis, proceed with mereological conditions and constraints. For example, a further individual results if the fundamental components are integrated, like being related under some kind of dependence relation. These approaches might very well be applicable to each other, for example, by asking whether or not Jaworski's structures satisfy the mereological constraints in question. Still, there is a basic difference between metaphysical and mereological approaches to mental and phenomenal composition.

Second, talking of metaphysics, Jaworski's account is anti-reductive with respect to the relation

[376] Ibid.,p.2 and 5.
[377] See Chapter 6 for a more detailed discussion of van Inwagen (section 6.2).
[378] Emergence is a point of convergence between Jaworski and van Inwagen; see Ibid., p.5.
[379] Ibid., p.5 and Chapter 6, on p.96 and 104 also, with explicit mentioning of (dynamic) principles of unity with reference to Johnston and van Inwagen.

of body and mind in that he does not reduce mental phenomena to physical phenomena and takes structure to be an "irreducible ontological principle."[380] Yet, in comparison to my account, it is reductive in another sense. That is, Jaworski does not reduce the mental to the physical but he does reduce the mental to something else, that is, structure. This is because he grounds facts about the mental in facts about the way the physical and fundamental components are ordered and structured: "Distinctive powers like yours and mine exist in the natural world because structure exists in the natural world."[381] Even more, as mentioned, he often talks of the individual's mental powers as "essentially embodied in its parts."[382] This is also in contrast to my account that exclusively remains at the mental, resp. phenomenal level. The mereological approach deployed in this thesis is concerned with the way and the conditions under which solely phenomenal parts compose a solely phenomenal whole and not with the way and the conditions under which physical parts plus structure compose a mental or phenomenal whole.

In sum, Jaworski's account bears an interesting resemblance to mine with respect to positing restrictions on composition and, hence, clearly being moderatist in spirit. In contrast, the ways and kinds of restrictions essentially differ in that he is invoking metaphysical restrictions whereas mine are mereological. Also, the metaphysical status of the part-entities that the restrictions apply to are fundamentally different: in Jaworski, the restrictions constrain the composition of physical parts and in this thesis, the restrictions constrain the composition of phenomenal parts.

In light of these differences, it is hard to say which position to favour. For example, if one favours rigorous accounts of restricted composition, that is, clear and precise conditions under which wholes result, both accounts are on a par with one another, in their own special way. The metaphysical restrictions that Jaworski suggests are rigorous in the sense that, for example, structures conceived as metabolic processes that constitute life allow fine-grained differentiations between cases of composition and cases of non-composition.[383] If particular parts, say molecules, break out from the spatial and temporal order of metabolic cycles, then the structure ceases to obtain and with it the composition of the living individual. Likewise, the mereological restrictions I submit in this thesis are precise in that particular axioms and principles are to be satisfied to facilitate composition. For example, if parts do not obey the closeness principle, that is, the restrictions that parts of one collection do not entertain any relations with parts of another collection, and vice versa, then composition does not occur. I think, in the end, preferences depend

[380] Ibid., p.3.
[381] Ibid., p.2.
[382] Ibid. Chapters 8-13.
[383] Ibid., Chapter 8.

on the way one thinks that compositional theory can be supported. Jaworski's account has the advantage of being able to gain empirical support whereas I prefer to carry out and substantiate compositional theories in a more formal and logical way.[384]

In what follows and 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 elaboration as well as the mereological precision that I regard as essential for a fully moderatist conception of 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.[385] 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:

[384] Ibid., p.3.

[385] 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, especially p.195). However, I cannot see how monism in this guise is compatible with CEM. This is because if there is only one subject such that there is nothing 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 CEM does not hold in the first place, before 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 in their rather existential monist-sounding "one Subject-view."
As a consequence, the motivation for their positions is also weakened. They claim support for their pan-experiential holism based on the fact that if the extreme positions like universalism and nihilism are unpalatable, and Simons' account of restricting composition is regarded as arbitrary, then their monistic position suggests itself to be compatible with CEM. However, as we have seen, since their position is not compatible with CEM, part of its motivation also 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 is suggested that entertains a moderatist rather than monist, of whatever kind, stance towards the composition of subjective phenomenal consciousness.

Phenomenal Priority Monism (PPM)

It is 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].

Just as with PEM, with PPM also, 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)

At 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".[386]

In a bit more detail, sPPM holds that "exactly one basic consciousness, the cosmic consciousness, exists."[387] 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."[388] 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 more 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

[386] 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."

[387] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", p.116.

[388] 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 labelling it the Absolute (p.408).

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 regionalised properties of the whole.[389] 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." [390] 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.[391] 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 contribute further to this section.[392]

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.[393] 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.[394] 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 is the reaction towards objections rather weak but the argumentation surrounding sPPM in general is, too. 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 palatable

[389] 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.

[390] For discussion, see Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation", pp.11-13.

[391] 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.

[392] 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.

[393] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism." p.124 and Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation", pp.11/12.

[394] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", pp.124-6 and Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation", p.11.

to common sense, like panpsychism.[395] Since sPPM, located within this systematic vicinity, has already left the intuitive camp, so to say, the argumentation becomes 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 no 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 taken, rather, to be supportive 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."[396] However, just 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 ease the worry regarding another.

Loose Phenomenal Priority Monism (lPPM)

LPPM also 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 one another. 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.[397] And the similarities between the PPMs reach even further because in

[395] Or 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.

[396] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", p.125.

[397] 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 Christopher S. Hill (The MIT Press, 2014), 255–86, especially 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, especially p.61.

both versions, authors allude to Bayne and Chalmers' 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."[398]

Now, coming to the actual view, and even here the PPM siblings unfortunately resemble each other, more can barely be said 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.[399] 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.[400]

In the context of panpsychism, one might think that Seager entertains a view that belongs to

[398] Bayne, *The Unity of Consciousness,* p.36. Goff, "Cosmopsychism, Micropsychism, and the Grounding Relation," p.7.

[399] 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 published in other places. Lee refers to Bayne and Chalmers' theory of subsumption in the 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, especially 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, especially sect.3, though Lee seems to shift the level of the whole to the neural or physical domain and, hence, leaves the debate revolving 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 corresponds 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 studied 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.

[400] Bayne, *The Unity of Consciousness,* p.36, and p.244. Chudnoff, "Gurwitsch's Phenomenal Holism", p.562. To start with, Chudnoff introduces holism misleadingly, as the view according to which an entity is basic, when he writes on p.562 that phenomenal holism is also compatible with the claim "that the total phenomenal state also metaphysically depends on its parts." As I take it, that would be atomism. Also, his discussion of phenomenal monism that shows clear parallels to Schaffer's metaphysical monism is contained in only half a page and terminates with the argument that phenomenal monism ought to be rejected because there might be no basic phenomenal state. This is due to the fact that plausibly phenomenal states depend on non-phenomenal states, like brain states (p.573). On the one hand, I do not quite understand his differentiation between metaphysical dependence and basicness that is involved in the marking off of monism from holism: Chudnoff seems to think that there can be metaphysically dependent states (holism) without there being a basic state (monism, p.562). However, in my view, that fact that one state is metaphysically dependent on another is equivalent to the fact that one state that the other depends upon is basic. On the other hand, besides that, there are not many phenomenal issues to discuss in Chudnoff that relate to monism. I included his view on phenomenal holism, though, in the last chapter of this thesis.

the lPPM camp.[401] This is because, according to his Deferential Emergentist Panpsychism (DEF), some kind of mental composition of microconsciousnesses occurs based on which macroconsciousness evolves. In more detail, DEF is deferential in the sense that it accepts the scientific picture of the world and does not posit the truth of panpsychism based on a denial of physicalism. [402] Moreover, regarding emergence, our familiar consciousness emerges from micropsychic properties of fundamental entities in a similar way and parallel to the way in which macrophysical systems like the H_2O molecule emerge from fundamental entities like the hydrogen and oxygen atoms. So far, this picture indeed resembles lPPM in that there is a level of a multiplicity of single micropsychic entities that mentally compose into our familiar macropsychic consciousness, provided that the latter is taken to be metaphysically basic.

However, there is one essential feature in Seager's DEF that clearly disqualifies it from the lPPM camp. Seager specifies the kind of emergence by the notion of fusion. To illustrate fusion, he alludes to examples of quantum entanglement and classical physics, where the microentities (two particles in quantum mechanics or fundamental physical entities in classical physics) fuse into macroentities (the entangled singlet state or black holes).[403] Implicit in the process of fusion is the fact that the generated macrophysical entity "substitutes" the submergent microphysical entities. [404] This means specifically, as he mentions in the example of the black holes, that "the physical entities that form the black hole (…) have gone out of existence."[405] Hence, also with respect to the phenomenal domain, according to Seager, the single phenomenal entities that compose into the mental macroentity cease to exist, at least in the way they did prior to the process of fusion. However, this is incompatible with lPPM. This is because, according to lPPM, both metaphysical levels exist, that of the single states as well as the resulting phenomenal totality. It is particularly the point and advantage of (phenomenal) priority monism over (phenomenal) existence monism, as mentioned above, that the former, as opposed to the latter, involves the existence of both metaphysical levels that are partially ordered along an asymmetrical dependence relation. This is not to say that Seager is wrong with his DEF, but is just to hold that his position does not belong to the lPPM camp.

If neither the positions that explicitly allude to Schaffer nor Seager's view capture lPPM to a

[401] Seager, W. "Panpsychist Infusion", in: Jaskolla, G. Bruntrup L. *Panpsychism: Contemporary Perspectives*. Oxford University Press, 2016, pp.229-248.

[402] Ibid., p.234.

[403] Ibid., pp.238/9.

[404] Ibid., p.238. Seager's process of fusion is meant to avoid the combination problem for panpsychism. The latter, at least in the initial way raised by James, holds that one cannot make sense of mental combination (p.236). In contrast, Seager thinks that if the micropsychic entities fuse and do not combine into the micropsychic entity, then we have a clear sense in which the latter emerges from the former.

[405] Ibid., pp.239.

satisfying extent, what could lPPM look like in a way that does justice to the initial position developed by Schaffer? Since Schaffer's priority monism yields both positions in the phenomenal domain, sPPM and lPPM, the following remark also applies to sPPM. Yet, because particularly lPPM is underdeveloped in the literature, I phrase the way in which the original view from Schaffer might contribute to the corresponding position in the phenomenal domain in terms of lPPM.

The aspect of priority monism that I have in mind for enhancing lPPM is the tiling constraint. This constraint, discussed in some detail in section I.6.a of this thesis, can be summarised with the slogan "no gaps, no overlaps."[406] Roughly, the constraint says that the fundamental level is complete in the sense that the basic objects collectively cover the cosmos without overlapping or leaving gaps. In the phenomenal domain and in the context of lPPM, this constraint means that whatever is fundamental, the set of single phenomenal states or the total phenomenal state, has to likewise completely cover the individual phenomenal consciousness (or the phenomenal world in sPPM). So potential positions in the lPPM camp could be strengthened by including something like the 'Phenomenal Tiling Constraint' and by clarifying what it means for basic single or total phenomenal states to leave gaps or overlap when covering the individual (or cosmic) phenomenal world. Discussing this phenomenal tiling constraint, for example, would involve the reason for requiring that the basic phenomenal entities do not overlap. And this reason is, in reference to the original view, that overlapping states are not freely recombinable and, hence, are dependent on each other to some extent, which in turn violates the principle that basic entities are metaphysically independent.[407] Also, to give another example, if we assume that the set of single phenomenal states compose a total one according to lPPM in a diachronical understanding, the No-Gap-Principle might be taken to hold that there are no phenomenally unconscious 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 periods, for example, when we sleep.

Note that the preceding remarks are not meant to argue against lPPM. Quite the opposite. I think that at least prima facie and based on the phenomenal tiling constraint, this version of lPPM might very well be compatible with the moderatist position I discuss and favour in the following sections. This is because the tiling constraint does not violate but complements basic principles of phenomenal moderatism. As we will see below, an essential part of modernism is its principles that

[406] Schaffer, "Monism: The Priory of the Whole", p.38.
[407] See section I.6.a. of this thesis or Schaffer, "Monism", p.40.

guide composition. For example, the principles of closeness and connectedness say that the set of single phenomenal states compose the whole only under the condition that all single states of the set are mutually connected and are not related to any single state external to the set. Yet, these principles are purely mereological in that they specify certain kinds and ways in which relations obtain among the single states to facilitate composition. What they do not express are the metaphysical requirements included in priority monism and specified by the tiling constraint. But it is intuitively plausible that single phenomenal states do not only have to be related in some special way so as to satisfy the closeness and connectedness principle but that they also do not overlap and leave no gaps when they compose individual consciousness in a basic way. Hence, it might also be conducive for the moderatist account to posit conditions that guide composition in the metaphysical sense according to the tiling constraint.[408]

To close this section, besides discussing PPM and differentiating two versions of it, this section functions as an introduction and transition to the 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 engage 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

[408] It still remains debatable whether, and in what way, it is possible to discuss the tiling constraint external to questions of fundamentality that are essential to the original priority monism but not to moderatism. For example and as mentioned in the text, the reason for requiring that fundamental entities do not overlap is that they remain metaphysically independent as necessary for basic objects. Yet, this reason might not apply to moderatism because the question of basicness is independent from (but compatible with) moderatism.

compositional moderatism.

Schaffer summarises 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."[409] 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 modifications. On the other hand, if we drop the first conjunct, we arrive at the view that conceptualises 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.[410]

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 a less formal and precise treatment. At least, in Part two of his *Priority*-paper, where he discusses various arguments that favour 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 favour 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

[409] Schaffer, "Monism," p.42.
[410] Ibid, pp.42/43.

the entire cosmos.[411] 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 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."[412] 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 conceptualises 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. At the most general level, integrity is some principle of unity that restricts composition. If a set of parts or series of states is integrated, then some interrelatedness obtains among them to the effect that no 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 becomes apparent 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.

However, one might object that priority monism does not exclusively belong to the moderatist camp because it is simply the view that there is one fundamental entity and does not entail restricted composition and because it is compatible with all other answers to SCQ, resp. SPCQ.[413]

To begin with, I do not hold that priority monism exclusively belongs to the moderatist camp particularly because priority monism entails restricted composition but because holism is essential to both, moderatism and priority monism, and because the latter is incompatible with other answers to the composition questions. Based on three essential quotes from Schaffer's monism paper, I argue that priority monism exclusively belongs to moderatism. The first quote supports the claim that holism is essential to priority monism and the other two quotes the claim that priority monism is incompatible with other answers to the composition questions.

The first quote is the already mentioned one that connects priority monism with holism:

[411] Ibid, p.48.
[412] Ibid.
[413] Thanks to Philip Goff for this worry raised in personal conversation.

"Monism can thus be thought as the conjunction of the numerical thesis that there is exactly one basic object with the holistic thesis that the cosmos is basic."[414] In light of this quote, it is correct to hold that priority monism consists in the claim that there is one fundamental entity. But from holding that priority monism is the view that there is one fundamental entity, it does not follow that holism is not an essential part of priority monism. In contrast, as Schaffer holds, rather than being opposites, the two conjunctive theses of the characterisation of monism entail each other.[415] So priority monism belongs to the moderatist camp because holism is essential to both.[416]

Yet, the fact that priority monism belongs to moderatism based on the fact that holism is essential to both does not entail the fact that it is not also compatible with other answers to the composition questions. However, two other quotes make it clear that priority monism is clearly incompatible with nihilism, existence monism, and universalism. On page 33, Schaffer writes that

> "In particular I will assume that there is a world and that it has proper parts. More precisely, I assume that there is a maximal actual concrete object - the cosmos - of which all actual concrete objects are parts."[417]

Priority monism is incompatible with nihilism because the latter denies the existence of a maximal object.[418] Also, priority monism is incompatible with existence monism because the latter denies the existence of parts. Generally, priority monism implies the existence of both metaphysical levels, the whole and the parts, since it is a thesis about the metaphysical dependence relation that obtains among the two. And this implication renders the position incompatible with nihilism and existence monism because each of the latter denies the existence of one metaphysical level: nihilism rejects the existence of the cosmos and existence monism the existence of proper parts.

[414] "If there is exactly one basic actual concrete object, it must be the whole cosmos since nothing less can cover all of reality. And if the cosmos is basic, there can be no other basic actual concrete object since anything other would be a part of the cosmos." Schaffer, "Monism," p.42.

[415] Ibid.

[416] As Philip Goff remarks in personal correspondence, „logically speaking, it could be the case that a certain feature F belongs to both priority monism and to moderatism without it being the case that priority monism is necessarily a form of moderatism." That it true. However, I think that if it the case that this feature F, in this case holism, belongs *essentially* to both, as I claim in the text, it is the case that priority monism belongs to moderatism. Of course, if this is what Goff has in mind, this case only holds if all other possibilities, i.e. other answers to the composition questions to which priority monism could belong, are excluded.

[417] Schaffer, "Monism," p.33.

[418] On page 34/35, in the defence of his claim "that there is a world", Schaffer even mentions that extreme compositional views do not accept the existence of the cosmos: "It is only the most radical views of composition - views that do not even recognize tables and chairs - that do not recognize the cosmos. Suffice it to say that if the strongest objection to monism is that the world does not exist, then I would think that it is the monist who can claim the mantle of common sense and science."

Finally, based on a third quote, priority monism is also incompatible with universalism.[419] On page 35, Schaffer writes:

> 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."[420]

As I mentioned in my exposition of CEM and hence universalism, the Composition as Identity thesis (CAI) is just another name for what mereology includes among its most essential principles, namely extensionality or the principle of uniqueness of composition. Hence, the principle that if a set of parts compose two individuals then the individuals are identical, which basically says that the whole is identified with its parts, is essential to universalism. And since this is exactly the assumption that Schaffer denies, priority monism is incompatible with universalism. As a side note, since compositional atomism is just an extension of CEM, I take the former to also be incompatible with priority monism.

In sum, priority monism exclusively belongs to the moderatist camp for two reasons. First, holism is an essential ingredient for both. Sesond, priority monism is not compatible with other answers to the composition questions because it entails the existence of the whole and the parts as well as the denial of CAI.

In sum, given that Schaffer conceptualises 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, the 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 so as to account for a moderatist and holist stance towards the composition of phenomenal consciousness.

[419] Again, the fact that priority monism is incompatible with universalism is not definitional for priority monism. Holding that priority monism is incompatible with all other answers to SPCQ, like universalism here, supports my claim that priority monism belongs to moderatism (along with the claim that priority monism and moderatism essentially involve holism).

[420] Schaffer, "Monism," p.35 (italics his).

Holism and Compositional Theory

Now that we separated the monistic from the holistic aspects of PPM, let me make a concluding remark on the holistic aspect. 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.[421] 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 responsible, as we have seen in the first part of this thesis, for the resulting whole being 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.[422] 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.[423] And this assessment does not only apply to the PPMs but also to the original priority monism in general metaphysics. As we saw in the discussion on 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 kinds 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 imprecise umbrella term for a set of parts being unified, coherent or strongly related so 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 also, the way parts are interrelated is conceptualised 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

[421] 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.

[422] Cf. Chudnoff, "Gurwitsch's Phenomenal Holism" p.562 and Dainton, *Stream of Consciousness*.

[423] Nagasawa, Yujin; Wager, Khai, "Panpsychism and Priority Cosmopsychism", p.122.

theory and particularly moderatism than in the philosophy of mind and particularly the PPMs.[424] Second, the notions of unity and integrity that unsystematically surround the notion of holism in the PPMs are used in a nuanced and systematic way in compositional theory. As we saw, here they appear in a 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 Simons' logically precise account of integrity.

So when I predominantly discuss part-part-relations in PM and related holistic positions in the last part of this thesis, I will operate with the more precise compositional terminology (more on this in the next section). 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 is 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.

Transition: Holism in Philosophy of Mind and Phenomenal Moderatism

The final section of this thesis, phenomenal moderatism (PM), clearly corresponds to what in standard philosophy of mind is called phenomenal holism: single experiences or phenomenal states as the parts of phenomenal consciousness, be it individual or cosmic, are holistic or unified "in a deep way."[425] However, as mentioned in the preceding paragraph, in PM these topics will be discussed by using a set of terminology that derives from compositional theory. In order to still relate my compositionally oriented discussion of phenomenal holism in PM to positions of phenomenal holism in philosophy of mind, in this section, I briefly introduce the latter. Subsequently, I justify my choice of operating with compositional terminology in PM for the remaining part of this thesis.

To start with, phenomenal holism in philosophy of mind seems to me to be a loose cluster of related views supporting one kind of "hanging together" or unity of phenomenal consciousness

[424] For example, Johnston discusses fundamental ontology in his prominent moderatist account in a similar way to Schaffer, but without mentioning holism (see Mark Johnston, "Parts and Principles," *Philosophical Topics* 30, no. 1 (2002): 129–66, especially 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 emphasise 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."

[425] Bayne/Chalmers, "What is the Unity of Consciousness?", in: Cleeremans, *The Unity of Consciousness*, p.33.

rather than a clear-cut position.[426] So far in this thesis, I have liked to differentiate between part-part and part-whole accounts and I think this also helps to categorise the various holistic views on the table. Roughly, on the one hand, one might explicate the holistic stance by drawing attention to the way in which single phenomenally conscious experiences are related among each other. For example, one might hold that phenomenal consciousness is determined by what researchers call cross- or inter-modal dependence, according to which, for example, what it is like to taste coffee depends to some degree on what it is like to listen to certain sounds.[427] So the different sense modalities exert some kind of influence on each other. The resulting phenomenal states as parts are then taken to "hang together" and holistically form our phenomenal consciousness as a whole. Gestalts are another example of such part-part dependence.[428] Gestalts are phenomenal objects that appear as wholes, which means, for example, that they stay invariant like a melody at various pitches or form subjective contours like in the Kanizsa triangle.

In contrast, one might take the part-whole route to holistic accounts and claim, as we saw in the accounts inspired by Schaffer's Priority Monism and its holistic component emphasised above, that the parts depend on the whole so that the latter is metaphysically or epistemologically basic to the former.[429] Lee's approach is an example of this stance when he asks the "Priority Question" in the context of his discussion of holistic views of consciousness: "Is a complex experience constructed from its experiential parts, or are they derivative from the whole?"[430] This question is also characteristic of a stance towards the scientific study of consciousness, as we will see in the paragraph after next.

When it comes to reasons to take holism seriously or even to support it, in my opinion and in the context of this thesis, parallels to the metaphysical discussion in the first part and hence to physical objects are apparent. As was discussed above, the main support for moderatism stems from the

[426] See also Lee "Experiences and Their Parts", in Bennett/Hill, *Sensory Integration and the Unity of Consciousness*, p.288 who says in a similar vein that "we lack a detailed account of the different ways this distinction [between holistic and atomistic accounts of consciousness] can be drawn and how they are related."

[427] For a good overview, see Bennett/Hill, *Sensory Integration and the Unity of Consciousness*. Also, more briefly, see Dainton, B. "Phenomenal Holism", in *Royal Institute of Philosophy Supplement 67 (*2010): 113-139, especially pp.121-123.

[428] For a comprehensive discussion of gestalts in terms of phenomenal holism and interdependence, see section 8.5. of Dainton's *The Stream of Consciousness*.

[429] I think this approach is related to forms of essentialism: according to mereological essentialism, the existence of the parts is necessary for the existence of the whole and, in contrast, according to hological essentialism, the existence of the whole is necessary for the existence of the parts. See Dainton, *Stream of Consciousness*, pp.185ff for a comprehensive discussion.

[430] Lee, G., "Experiences and their Parts", in: Bennett/Hill, *Sensory Integration and the Unity of Consciousness,* pp.287-321, especially p.288. Also see Dainton for a similar characterisation of phenomenal holism in the same volume: Dainton, B., "Unity, Synchrony, and Subjects", in: Bennett/Hill, *Sensory Integration and the Unity of Consciousness,* pp.255-285, here p.262. Also Watzl in his "Attentional Organization and the Unity of Consciousness", in: *Journal of Consciousness Studies 21*, No. 7–8, (2014), pp. 56–87, especially p.61.

more or less intuitively solid impression that objects like tables and organisms like turtles are composed of parts that are interconnected or interact in some way. Something seems to be wrong with CEM-approaches, according to which there is no fundamental difference between tables and toe-virtues or other cross-categorical or widely spatially and temporally scattered objects. Likewise, holistically inclined discussions in the philosophy of mind often start with the brute intuitive datum of experiencing one's own consciousness as spatially and temporarily unified.[431] When we are phenomenally conscious of various external stimuli, like simultaneously experiencing the sound of birds, smelling fresh air and enjoying ice cream while walking the park, nothing in this whole experience seems to be fractured or frictional. Accounts of a broken down unity of consciousness are on the table but some go even as far as claiming that "something is *inconceivable* about phenomenal disunity."[432] For sure, this intuitive impression of the unity of material and mental objects might crumble upon logical inquiry or empirical facts and we would have to further differentiate between unity and holism theses, but I think this is where most of holism's plausibility and support stems from.

Whereas the reasons to favour the holistic approach to consciousness that I presented in the preceding paragraph are rather intuitive, adopting such a stance has solid implications for the scientific study of conscious experience. If we take consciousness to be a neuronal phenomenon, like Searle does, and hence search for its neural correlates (the NCCs, the neural correlates of consciousness), a holistic approach involves what Searle calls the conscious field model as opposed to the building block model.[433] According to the former, we have to search for the neural correlates of the conscious field as a whole that is based on all the sense modalities and not only for the separated correlates of just one "micro-consciousness" from one sense modality, like vision, that we then combine with the micro-consciousnesses of the other sense modalities into the conscious field, as the building block model suggests.[434] Bayne phrases these methodological differences in the scientific study of consciousness in terms of "top-down" and "bottom-up": Holists entertain the former and focus on "the mechanisms implicated in the construction of the entire phenomenal field"

[431] For an extant discussion of temporal unity, see Dainton's *Stream of Consciousness.* For spatially oriented accounts, for example, see Bayne's *The Unity of Consciousness*. Also, for recent accounts, Bayne/Chalmers, "What is the Unity of Consciousness?", in: Cleeremans, *The Unity of Consciousness*, pp.23-58; Lee, G., "Experiences and their Parts", in: Bennett/Hill, *Sensory Integration and the Unity of Consciousness,* pp.287-321; Masrour, F. "Unity of Consciousness: Advertisement for a Leibnizian View", in: Bennett/Hill, *Sensory Integration and the Unity of Consciousness*, pp.323-345.

[432] Bayne/Chalmers, "What is the Unity of Consciousness?", p.37 (italics theirs).

[433] John R. Searle, "Consciousness", *Annual Review of Neuroscience 23* (2000): 557-578. See also Tim Bayne, "Conscious States and Conscious Creatures: Explanation in the Scientific Study of Consciousness", *Philosophical Perspectives 21* (2007): 1-22, especially section 3.

[434] Ibid., pp.570-577.

as opposed to the atomists, who support the latter methodology and, rather, attempt to understand "the mechanisms responsible for generating the components of the phenomenal field in a piecemeal manner."[435]

Two points come to 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, to account for the unity of consciousness in the philosophy of mind on the one side and to account for an alternative to CEM on the other. Second, one could use the notion of holism to denote the common denominator in 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 to be able to establish a systematic link between them. For that reason, in what follows, I choose to circumvent the notion of holism and to operate directly with the notions that holism is paraphrased with, particularly that 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 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 philosophy of mind, which 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.

Finally, to lead on 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

[435] Bayne, *The Unity of Consciousness*, p.226.

consciousness in philosophy of mind.

As regards the first point, before, I suggested starting 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 (classes of) relations. This is because, 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 (…)."[436] 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 - 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"[437] as a unifying principle over and above the mere existence of the parts 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, this 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 the 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 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 divisions of the phenomenal world are subject to this 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,

[436] Simons, *Parts*, p.291.

[437] Ned Markosian, "Restricted Composition," in *Contemporary Debates in Metaphysics*, ed. Theodore Sider, John Hawthorne, and Dean W. Zimmerman (Blackwell Pub., 2008), 341–63, especially p.355.

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. Just 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, in the mental domain also, 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 organisation of the phenomenal field is responsible for the entire field instantiating the property of being conscious.[438] 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 roles 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 a 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

[438] Watzl, S., "Attentional Organization and the Unity of Consciousness", in: *Journal of Consciousness Studies 21*, No. 7–8, (2014), pp. 56–87.

results from the application of compositional theory inhabits a dialectical role other 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 could 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.[439] 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."[440] And even explicitly based on Johnston's work, Watzl holds that principles of unity, specified by him as attentional organisation, "is a relationship between the phenomenal parts that occurs in the real

[439] Watzl, S., "Attentional Organization and the Unity of Consciousness", in: *Journal of Consciousness Studies 21*, No. 7–8, (2014), pp. 56–87, especially p.57.

[440] 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. For Watzl, see Watzl, S., "Attentional Organization and the Unity of Consciousness", in: *Journal of Consciousness Studies 21*, No. 7–8, (2014), pp. 56–87, especially p.57.

definition or essence of consciousness."[441]

However, just 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 a subject at a time. In Watzl, this restricted application of Johnston's principle of unity shows because he regards attentional organisation determined by the peripherality relation as this principle where it is clear that what is organised in such a way is the field of consciousness of an individual.[442] Also, Bayne and Chalmers' unity thesis holds that "any set of phenomenal states of a subject at a time" is necessarily unified.[443] Let me elaborate.

Even although we find a clear connection between compositional theory and the debate revolving around the unity of consciousness in the philosophy of mind in the two mentioned approaches, still, from the compositional perspective, they are deficient. For sure, 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 minds 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

[441] 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, especially p.811.

[442] Watzl, "Attentional Organization and the Unity of Consciousness," sect.3.

[443] Bayne and Chalmers, "What Is the Unity of Consciousness?", p.33.

compose nothing.[444]

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 a principle holds and that properly compose something and objects among which such a 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 a 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 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 a 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.[445]

[444] Van 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 constitutes a life (see section 9 of *Material Beings*).

[445] Simons, *Parts,* p.340.

Only with this differentiation between occurrences and non-occurrences of compositions does a moderatist stance reveal 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 Simons' quote at the beginning of this section, principles of unity help to satisfy our commonsense 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.

The same goes 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, they block a fully 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, an 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.[446]

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 simply dismiss phenomenal universalism on the grounds of counter-intuitiveness 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 a 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.[447]

In a nutshell, I suggest that viewing Simons' 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 Integrated Information Theory (IIT).[448] These approaches feature in the debate revolving around the unity of consciousness and,

[446] Ibid, p.290, italics his.
[447] Ibid, p.292.
[448] 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*

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 taking integrity as a specification of unity. However, for an account of integrity that is also general enough to serve a moderatist stance of how single phenomenal states "hinge together", as Simons has it, to form another phenomenal individual, the notion of integrity as used in consciousness studies seems too 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 characterisation 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 fulfil 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 discussed in the literature. In sum, roughly, phenomenal integrity is conceived of 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 order here; first, on the way I use the examples in this section. So far, I have used individual consciousness as an example of integrity and constructed the phenomenal world as being 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 of a neat and precise phenomenal

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):290-326.

universalism. I do favour the view on individual consciousnesses as integrated divisions; however, 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 neural realisers 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."[449] One can understand my approach as an attempt to reach the same result with a more general and formal characterisation 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 structure of neural correlates of consciousness or in some higher-order thoughts.

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 a large amount of argumentational work for the conclusion that individual phenomenal consciousnesses are integrated divisions, and not the entire phenomenal world, is done with 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 unique to each

[449] Tononi, "Consciousness Differentiated and Integrated," p.254.

individual creature. There is no such space for the phenomenal cosmos. Based on the premise that only individual creatures possess such a state and the premise that a total state in such a 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. [450] However, that does not turn on the account of integrity propagated here.

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

The start for a characterisation 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.

This approximate 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 only makes sense for asymmetrical relations because symmetrical relations function in both directions. If Susie is related

[450] There is still 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.

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 for an asymmetrical phenomenal relation Watzl's peripherality relation that determines the attentional organisation of the conscious field.[451] According to Watzl, the field of consciousness is attentionally organised in the sense that some experiences in the centre of the field are more strongly attended to than more peripheral experiences that are localised at the fringe of the field of consciousness. The peripherality relation among experiences satisfies the phenomenal closure principle in the following way: 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 à 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 consciousnesses 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 experiences are related, or, more precisely, one experience of mine co-consciously reaches into your phenomenal consciousness and vice versa, to

[451] Watzl, S., "Attentional Organization and the Unity of Consciousness", in: *Journal of Consciousness Studies 21*, No. 7–8, (2014), pp. 56–87, especially p.66.

the effect that our consciousnesses fail to be closed.[452] 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 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 the 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

Just as with phenomenal closure, the phenomenal connectedness principle is fairly permissive. It does not involve any requirements regarding the kind of relations but simply 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 state 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.

[452] 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 is definitely an option in the 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.

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 characterisation 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.[453]

Putting the two principles together, as an interim 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 connected and closed under a relation R.

For illustration, pick any set of single phenomenal states out of the phenomenal world that 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 the extent to which you think a phenomenal relation holds. If you are of the opinion that the single phenomenal states of your dachshund are

[453] For connectedness mathematically conceived with the state space approach, see Ibid, sect.II.

exclusively 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-hound 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 labelled a biclosure system. I regard the phenomenal biclosure system as an exotic sibling of the 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 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 the phenomenal biclosure system as a curiosity, I abstain from its formal characterisation as provided in the first part of this thesis.

Now we are only one step away from the formal and precise characterisation of the first condition of phenomenal integrity. We are still missing 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 relation 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 of such a 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."[454] 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,

[454] 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.

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.[455] 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 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, which 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:

> *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 characterisation 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-

[455] Cf. Ibid.

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-hound-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 hierarchy 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.[456] In contrast, partitions do not allow for overlaps so a conceptualisation 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 fully fledged individual, say, the "team-individual". This is an interesting case as applied to the phenomenal domain because it 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 in the little palatable claim that this 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.[457]

Also, as has been mentioned in the first part, integrity comes in degrees. Since this degree is closely connected to the extent 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, the phenomenal dependence relation.[458]

Also by means of a transition to the next section, note that the characterisation of integrity provided up to this point is incomplete and tentative because it only considers the first condition

[456] Simons, *Parts,* p.332.
[457] This route is blocked if one holds that the integrated total state simply is identical to a super-individual subject.
[458] See there the discussion of Koksvik's view.

for phenomenal integrity of a set of single phenomenal states being a relation-family. The tentativeness of this characterisation becomes apparent if we realise 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 characterisation of phenomenal integrity can be trivialised by filing in relations like conjunction or addition. A division of single phenomenal states that forms a relation-family under mere conjunction surely is 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 to include all cases in which we have the intuition that a set of single phenomenal states is integrated. So one might agree that Watzl's attentionally conscious field is phenomenally integrated but I think it is also clear that the peripherality relation alone does not suffice for an account of phenomenal integrity in general. The discussion of phenomenal dependence relations in the next section is meant to find a viable middle way between generality and specificity.

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 considerably general character and "connote merely a rough schema, a form of connection between objects and kind of objects, which may be variously filled in."[459] As we will see, several kinds of dependence relations are on the table, some too strong and some too weak 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 from the class of dependence relations.

To introduce a first rough disambiguation of the notion of phenomenal dependence, I differentiate between horizontal and vertical dependence relations. 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 at 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 at the same metaphysical level. As I have mentioned already, the rough idea of phenomenal integrity

[459] Ibid, p.293.

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 a 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 broadens the discussion too much 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 should be understood as follows:

> *General Phenomenal Dependence*
> For the single phenomenal states $[x]^{Ph}$ and $[y]^{Ph}$, $[x]^{Ph}$ is generally dependent on $[y]^{Ph}$ iff, necessarily, $[x]^{Ph}$ cannot be F unless $[y]^{Ph}$ is G.

For illustration, imagine some case of perceptual effect. For example, take the colour contrast demonstrated by M.E.Chevreul.[460] 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 colour contrast (n.b. this is 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 colour-contrast is a case of phenomenal dependence as per the 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 colour.

In a cross-modal scenario, this general notion of dependence might correspond to what Koksvik calls the weak-context-dependence view.[461] 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 crisps are perceived to be.[462] According to Koksvik, the degree

[460] Cf. Austen Clark, *Sensory Qualities* (Oxford University Press UK, 1996), p.13.
[461] Ole Koksvik, "Three Models of Phenomenal Unity," *Journal of Consciousness Studies* 21, no. 7–8 (2014): 105–31, especially pp.113/115.
[462] Ibid. pp.115.

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.[463] We will meet this picture again when I discuss functional dependence.

Also in accordance with 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 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 leads to rather implausible results in the phenomenal domain. 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 render 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 exists, of what it is like to chase the postman in Scotland, necessarily, every other phenomenal state depends on it for its existence, be it the one of the very postman 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.[464] I think this kind of dependence relation is too strong even for the radical phenomenal monist.

[463] Also, the contribution of one single phenomenal state to the overall phenomenality is mediocre in the weak-context-dependence view as opposed to an extreme contribution according to the strong-context-dependence view (Ibid, pp.113/4).

[464] And given their behaviour, I take it that the cows in India are well aware of being worshiped.

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 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 of 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 exactly all those other 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. 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 becomes 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 cognitive architecture, like proprioceptive or sensory phenomenal states, or, to be even more fine-grained, based on sensory modalities, like phenomenal colour states in vision or phenomenal sound states in echolocation. But admittedly, this categorisation is a stipulation of mine.

Note again here the difference between vertical and horizontal generic phenomenal dependence relations. 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 themselves phenomenal. This is because unrestricted phenomenal composition results 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 of 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 between 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, 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 characterise 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, 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. So far, I can just think of Integrated Information Theory (IIT), which explains differences in dependence with reference to differences by "more densely tangled" informational relationships between quales.[465]

To sum up, among the dependence relations mentioned, I think the generic version is an apt way to account for phenomenal integrity. As Esfeld already 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.[466] 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 the entities in question.

[465] 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, especially pp.7/8.

[466] Cf. Esfeld, "Holism and Analytic Philosophy."

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 conceptualise 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 have started 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 revitalises 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 means of conceptualising 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 the 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 the 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.[467]

[467] Kurt Grelling and Paul Oppenheim, "Logical Analysis of 'Gestalt' as 'Functional Whole.,'" *Journal of Symbolic Logic* 4, no. 4 (1939): pp.201-215, especially p.214.

Note that functional dependence is still a rather schematic and formal characterisation 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.[468]

Simons revitalised 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:

> 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.[469]

One qualifying remark about the relation of functional and ontological dependence might be made 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, which does not imply existential dependence but, rather, one of the object's identity on another. Since generic ontological dependence can also be said to obtain among determinate and determinable properties that also figure prominently in functional dependence systems, we might conceive of both forms of dependence relations not as completely separate, as suggested by Simons. Whether they are akin at the same conceptual level or one is to be seen as a subcategory of the other is a question to answer on another occasion.

As opposed to the rather extraordinary mental phenomenon of Gestalt, I am here concerned

[468] 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.

[469] Ibid, p.174.

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 have liked 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, in the contemporary literature, this notion (like those of holism and unity discussed above) is also used rather intuitively or in an impressionistic way and without further specification. In what follows, I use the notion of functional dependence proposed by Simons and others 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.[470]

If we take the analogy posed by Lee a bit further, and it might even be that Lee himself implies this but it is not clear from the quote, we might conceive the total phenomenal state as being structured similarly to the wave function state with respect to the functional aspect also. That is to say, just as the wave state can be conceived of as a function of its constituent single states, so too can the total phenomenal state be conceived of as a function of its composing single phenomenal states.

In order to explore this idea a bit more, yet still rather figuratively, let me mention Koksvik again, who specifies slightly more strongly how to understand an overall experience as a function of its

[470] Lee, "Unity and Essence in Chalmers' Theory of Consciousness", p.767.

"contributor experiences"[471,472] by differentiating it from other forms of phenomenal relatedness. Like Lee and myself, Koksvik also 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."[473]

In his models of context dependence, Koksvik, besides the weak and strong version, also includes a no-context-dependence view.[474] 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.[475] For the weak-context-dependence view he states the following, where the part in brackets 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.[476]

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.[477]

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.[478] For the

[471] Koksvik, "Three Models of Phenomenal Unity", p.114.

[472] 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 conceptualise 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, especially p.24.

[473] Koksvik, "Three Models of Phenomenal Unity", p.112.

[474] For a context-dependence view in IIT, see Balduzzi and Tononi, "Qualia," p.12/13. Whether or not it is possible to also conceptualise this kind of context dependence in terms of functional dependence is an interesting question. Tentatively, I answer this question in the affirmative, but simply because IIT predominantly operates mathematically, for which functional dependence seems to be tailor-made.

[475] Koksvik, "Three Models of Phenomenal Unity", pp.113/4.

[476] Ibid, p.113.

[477] Ibid, p.114.

[478] 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.

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 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 it 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 as 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 whether separate from or part of the phenomenal sum, might be an explanation of why the total state does not instantiate a phenomenality that is constitutive of it, as was already mentioned.[479] 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 to yield a phenomenal function, as opposed to merely being added to each other to form a phenomenal sum.

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, just 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

[479] See section II.2.b.

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).[480]

To be metaphysically more precise, similar to my elaboration of functional dependence in the first part of this thesis, strictly speaking it is not the states themselves that are functionally related but the determinate properties those states instantiate. So with functional dependence also, 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. 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 it 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 and the set of the remaining determinates of states (in the formulation, determinate properties appear as values of determinable properties, see below). 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.[481] At the outset, this might look overly strong, especially if we 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

[480] 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.

[481] 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 colour 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 colour, as opposed to merely appear to be of a certain colour, is not dependent in any way on there being surrounding patches of a certain colour. Nevertheless, this latter interpretation is an option. Thanks to Howard Robinson for bringing up this point.

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 formalisation in the first part of this thesis, functional phenomenal dependence can be characterised as follows:

> *Functional Phenomenal Dependence*
>
> A determinable phenomenal property d functionally depends upon a class of phenomenal determinables ϕ for the common phenomenal state $[x]^{Ph}$ is defined as if every determinable phenomenal property out of ϕ takes the same value for some state $[x_1]^{Ph}$ and $[x_2]^{Ph}$, then also the determinable property d takes the same value for $[x_1]^{Ph}$ and $[x_2]^{Ph}$.

Note that this formulation is still very technical in the sense that the determinate properties appear, corresponding to the definition of functional dependence given in Part I of this thesis, as the values of the determinable properties. In a more informal way and by using Thalos expression of a unique value[482] we can also say that functional phenomenal dependence is defined as if there is a class of unique determinate phenomenal properties ("values of determinable properties") for state $[x_1]^{Ph}$ and $[x_2]^{Ph}$, then there is also another unique determinate property ("value of determinable property d") for $[x_1]^{Ph}$ and $[x_2]^{Ph}$.

In order to exemplify this definition, as mentioned in the first part, we might choose a time-relativized and non-time-relativised way. A time-relativised example says that functional phenomenal dependence is defined as if the same set of values of determinable properties (phenomenal determinates) of sound and mood is instantiated by a state at t1 and t2, then also the dependent determinable property of the perceived crisiness of crisps must take the same value for the state at t1 and t2.

But as I mentioned in the first part, this way of exemplifying the definition might lead to misunderstandings and confusions when we want to consider functional dependence under actual change of phenomenal properties. So here is the non-time relativised way of understaning the

[482] See section I.6.c.ii.b. "Functional Dependence".

definition: functional phenomenal dependence is defined as if the same set of values of determinable properties (phenomenal determinates) of sound and mood is instantiated by state1 and state2, then also the dependent determinable property of the perceived crispiness of crisps must take the same value for the state1 and state2. I think in this way it becomes clearer that the definition asserts that there is a unique value of a determinable phenomenal property, a unique phenomenal determinate property, for a set or class of unique values of other determinable phenomenal properties, that is, a set of unique phenomenal determinate properties. And this is independent of whether we understand the arguements of the formula, the states, in a time-relativised or non-time-relativised way.

So when we now consider how functional phenomenal dependence plays out under actual change of phenomenal properties, we do not have to deal with a temporal component in the definition. In the case of changing phenomenal properties, same as there is a unique value of the dependent phenomenal determinable property (viz. the phenomenal determinate) for the values of (the class of) determinable properties that the first depends upon at a time, there is also such unique value for the dependent determinable property in case one or more of the determinable properties of the class change their value over time. For example, same as the determinable property of perceived crispiness of crisps takes the unique value of, say, 15 if the determinable phenomenal properties of mood take 10 and of sound take 17 at time 1, there is also a different unique value for the dependent crispiness determinable, say 25, if the determinables of mood and sound take different values at time2, say 27 and 11.[483] Colloquially put, functional dependence in the case of change of phenomenal crispiness means that the perceived crispiness does change in an unique (probably law-like) way if mood and sound do.

Since I have already mentioned integrity, 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.

When I introduced functional phenomenal integrity at the beginning of this section, I said that it

[483] The extent of the change of the values might occur according, very roughly, to phenomenal, psychological or physical laws.

holds ubiquitously. Some might hold that we do not have enough reasons to think that.[484] It might seem plausible that some phenomenal parts are interdependent in this way but not the entire phenomenal domain. One might even grant that the entire phenomenal domain is constituted by a rather weak unity relation, or what I called the principle of unity, but still doubt that the stronger functional dependence relation obtains ubiquitously.

From a compositional standpoint, the reason we have to think that phenomenal interdependence in this form is ubiquitous is that otherwise, the single phenomenal states would not compose a total phenomenal state, at least according to phenomenal moderatism. For the set of single states to compose a total state only the principle of unity is not enough; it just represents the first general condition for phenomenal moderatism.[485] Additionally, dependence relations are an additional necessary condition for composition. And among those kinds of dependence I proposed the functional one.

Where this question leads, I think, is to settling the compositional question about whether unity or unity plus dependence is a necessary condition for composition. And here compositional theory seems to have, at least according to what I laid out in the first part, a considerably different stance from the standard debate in the philosophy of mind: Only under the condition of dependence relations does composition occur; unity is just the general precondition. This seems to be in stark contrast to the standard debate, where unity plays such a pivotal role and where it seems to be common ground that unified single states form a total one.

Functional Phenomenal Integrity Contextualized

Functional phenomenal integrity is just one among other suggestions about how phenomenal composition can be restricted. As has been noted above, in the classical philosophy of mind and, more specifically, in the discussions revolving around the unity of consciousness and phenomenal holism, we find other approaches that can be linked to PM. In what follows, I consider some of these and explore whether at all and in what way they relate to functional integrity.

The following discussion will yield and elaborate on three central features of functional phenomenal integrity:

1. Single phenomenal states are related by functional dependence such that the phenomenology of one single state changes in dependence of the phenomenology of another single state.

[484] Thanks to Barry Dainton who mentioned this point in personal correspondence.
[485] See section II.6.b. of this thesis.

2. The phenomenology of the total state depends on the phenomenology of the single states but not vice versa.
3. One single phenomenal state that is part of one total phenomenal state could also exist in another total phenomenal state.

Cross-Modal Dependencies and Gestalts

To start with, functional dependence is a formal account, which is to say that various special or material relations might meet the conditions necessary for functional dependence and functional integrity. Two quick examples show that these conditions are not overly permissive. In the introduction to phenomenal holism in the philosophy of mind, I mentioned cross-model dependencies and gestalts as examples based on which proponents of phenomenal holism defend their positions. Regarding the conditions of dependence, both approaches qualify for functional dependence because in cross-modal dependence as well as gestalts, a set of phenomenal states would not be the way they are if other states were not the way they are. In the former case, for example, what it is like to feel taps on the skin is dependent on what it is like to see flashes: If one flash is accompanied by two taps, subjects tend to see two flashes.[486] In the latter case, seeing the Kanisza triangle depends on seeing three notched circles: if one or two of the circles are removed, so is the triangle. However, cross-modal dependencies and gestalts do not fully qualify for functional integrity because they fail to satisfy conditions different from that of dependence. And this is the phenomenal closure principle. As has been introduced above, the phenomenal closure principle says that particularly all states of a set of single phenomenal states are closed and connected under a relation. For individual consciousness, this means that the functional dependence relation obtains among all phenomenal states that compose a total state at a time. However, this is not the case with dependencies of the cross-modal or gestalt sort. And this is because, as Dainton notes, both phenomena do not characterise phenomenal consciousness as a whole.[487] They definitely occasionally and partially occur in our mental life but fail to hold ubiquitously or completely and hence to include the complete set of phenomenal states. Therefore, although they satisfy the dependence criterion, they cannot be plugged in as special relations in the formal account of functional integrity because they fail to satisfy the phenomenal closure principle.

[486] A. Violentyev, S. Shimojo and L. Shams, "Touch-induced Visual Illusion", *Neuroreport 16,* no.10 (2005): 1107–1110. Taken from Dainton, *Phenomenal Holism*, p.122.

[487] See Dainton, *Stream of Consciousness*, section 8 and his *Phenomenal Holism*, sections 4&5.

Sprigge: Strong Phenomenal Interdependence

In the context of cross-modal dependencies, let me elaborate a bit more on the notion of a function that I am using in this thesis and hence clarify what kind of phenomenal interdependence might be an apt candidate for specifying the formal account of functional integrity. A good example in contrast to which the notion of a function can be clarified is presented by Timothy Sprigge.[488] With explicit reference to Bradley, Sprigge entertains a strong version of phenomenal interdependence and holism.[489] According to Sprigge, phenomenal interdependence obtains among all experiences of a subject at a time such that the phenomenal character of the whole is reflected in, or "suffuses"[490], each and every single experience it is composed of. This is to the effect that the single experiences would not be the way they are if they occurred in a different total experience. In terms of cross-modal dependencies, this position amounts to the view that phenomenal interdependencies obtain ubiquitously and among experiences of all sense modalities in a very strong way. In contrast, one could also imagine a weaker phenomenal interdependence such that the single experiences contribute to the overall total one, but still would not change if they appeared in a different total experience. In this case, the experiential whole does not suffuse the composing single experiential parts.[491] For example, when the experience of what it is like to taste chocolate occurs in an overall experience in which I also listen to blues, the two experiences together contribute to an overall total phenomenality. Yet, the way I feel when I taste chocolate does not change if it occurs in a different overall experience, say while also driving a car.

Now to the notion of a function. As has been already noted in the context of Koksvik's view, above, in this section, the notion of a function can be used as soon as some form of phenomenal interdependence (or context view, as Koksvik has it) is in play. The notion of a function in this general sense is just another way of saying that various experiences contribute to the phenomenal character of a total experience a subject undergoes at a time. We can further specify the particular sense in which the notion of a function is used in this thesis by stating that it involves the weaker forms of phenomenal interdependence only. In terms of phenomenal states, this is to say that I

[488] This brief discussion of Sprigge is grounded on Dainton's far more detailed exposition of his position. For Sprigge's original view see Sprigge, T.L.S., *The Vindication of Absolute Idealism*, Edinburgh University Press (1984), Chapter 5, part 3. For Dainton's discussion of Sprigge, see Dainton, *Phenomenal Holism* and *Stream of Consciousness,* section 8.4.

[489] For his reference to Bradley, see Sprigge, T.L.S., *James & Bradley: American Truth and British Reality*, Illinois: Open Court (1932), p.2. Also Dainton, *Phenomenal Holism,* pp.115/6 and *Dainton, Stream of Consciousness*, p.193.

[490] Sprigge, *The Vindication of Absolute Idealism*, p.219. Also see Dainton, *Stream of Consciousness,* p.192/3.

[491] I think this corresponds to what Dainton calls Shallow in opposition to Deep Interdependence in his *Phenomenal Holism*, p.125.

understand functional dependence such that single phenomenal states that contribute to a total phenomenal state might stay invariant if they occurred in a different total phenomenal state. Single phenomenal states are functionally dependent on each other to the effect that the overall character of the total phenomenal state would be different if one or more single states were altered or replaced. But this fact does not allow the inference to the fact that also the total state is reflected in every single state to an extent to which the latter would not be the way they are if part of another total phenomenal state, like in Sprigge.[492] So phenomenal interdependence of the kind proposed by Sprigge is not the way in which the notion of a function operated with in this thesis can be captured and, hence, does not present an apt candidate for specifying the formal account of functional integrity.

Note that the claim that a single phenomenal state that is part of one total phenomenal state could also appear the same way in another total phenomenal state is not incompatible with my characterization of functional dependence, i.e. that a qualitative interdependence obtains between two single phenomenal states that are part of one integrated total one. For illustration, let us go back to functional dependence in non-phenomenal cases. In part I, we considered the price of an article, let's say a banana. Roughly, the price of the banana is functionally dependent on demand and supply: if there is a demand that takes the value, say, 10 and the supply that takes the value 20, then the price takes the value 5. This is a little integrated market-whole where quantitative interdependence obtains: if the demand raises to 20 and the supply decreases to 10, then the price increases to 7, perhaps according to some economic law (increase of demand and decrease of supply resulting in a higher price). There is a unique value for a set of another unique values, which is the rough meaning of functional dependence. Yet, there is no reason to assume that the banana has not also the same price of the value 7 in a different market-whole, for example in one where there is the same ratio of demand and supply, just with different values. Similarly, we can imagine that the same single phenomenal state appears in two different total phenomenal states under the condition of functional phenomenal dependence obtaining. For example, in one total state qualitative interdependence obtains between the bitterness of chocolate, mood and noise such that the bitterness takes the unique value 10 in case mood takes the value 20 and noise 5. And it is also possible that in another total state the bitterness takes the same unique value 10 in case mood and noise exhibit the same ratio with different values. Or, in yet another phenomenal whole, it is possible that the unique value of bitterness of chocolate takes also 10, but now under the

[492] Also here, compare Dainton, *Phenomenal Holism*, p.125.

qualitative interdependence on unique values for the taste of wine and the lighting of the room. Hence, I can see no reason why functional dependence would not be compatible with the claim that the same single phenomenal state (nota bene its phenomenal character and not numerical identity) can appear in different total phenomenal states.

Bayne&Chalmers: Subsumption

A view that clearly also does not satisfy essential conditions for functional integrity and hence phenomenal moderatism is the one presented by Bayne and Chalmers, according to which unity is generated by subsumption. In their view, the phenomenal consciousness of a subject is unified "in a deep way" in case the subject is in a total state that is itself phenomenal that subsumes every specific or single phenomenal state.[493] If we focus on the part-part relations of the single phenomenal states that are subsumed under the total one, then subsumptive unity is further specified by relations of contemporaneousness and conjunction. For example, the two single phenomenal states of what it like to feel a sting and see a bee are unified in case "there is something it is like for a subject to be in both states simultaneously."[494] In other words, in terms of phenomenology, substantive subsumptive phenomenal unity obtains if the total state is characterised by a conjoint phenomenology that involves the conjunction of the phenomenology of feeling the sting and seeing the bee.[495]

Note that Bayne and Chalmers discuss phenomenal unity and not phenomenal holism. One might very well support mere unity of consciousness and differentiate this from phenomenal holism that might be taken to be a stronger kind of phenomenal cohesion of some sort. However, in the compositional framework, as has been noted repeatedly before, unity and integrity or holism cannot be separated. They cannot be separated in the sense that either both together account for phenomenal moderatism, viz. restricted phenomenal composition, or neither do. Unity is simply the first general principle and condition for PM that needs further specification by conditions for integrity like the phenomenal closure principle and some sort of dependence relation. Unity in separation does not account for anything in compositional theory because phenomenal unity alone is far from sufficient for restricting phenomenal composition to an extent to which it supports PM.

It has also been discussed above that, for a loose understanding of phenomenal composition, it might be not strictly speaking correct but prima facie tolerable to, per definitionem, restrict the

[493] Bayne/Chalmers, "What is the Unity of Consciousness?", p.33.
[494] Ibid., p.32.
[495] Ibid.

scope of composition to a subject at a time and hence to satisfy the phenomenal closure principle: all and only the single phenomenal states of a subject are united by subsumption and, hence, the scope of compositions is restricted to a closed and connected set of states. However, the account of subsumptive unity clearly lacks any dependence component and hence fails to meet conditions for restricted phenomenal composition and PM.

This can be seen clearly if we focus on the part-part-relations of single phenomenal states subsumed under a total one. In case of contemporaneousness, I cannot see how one single state is interdependent in any way on another by the subject having them at the same time.[496] The total state might be dependent in a weak way upon the single ones being related in such a way because if one or more single states were temporally disconnected from the rest, the overall phenomenology would differ. Yet, this is, first, a very weak dependence because in case of almost all relations among single states, had one or more single states been absent, the total state would alter. Also, this dependence is one obtaining between the whole and the parts and not exclusively among the parts, as it has been argued in this thesis is the decisive kind of dependence for unity and holism. To recall: My approach of functional integrity also is committed to the claim that, with respect to the dependence of the total state upon the single states, the total state phenomenology depends on the phenomenology of the single states it is composed of. Yet, in terms of the dependence exclusively among the parts, functional integrity goes further than Bayne and Chalmers' subsumption approach in holding that, for example, what it is like to feel a sting differs in dependence to seeing the bee. And such qualitative interdependence among single states does not hold if they are connected by contemporaneousness.

And this equally holds with respect to the conjunctive relation. Not only does one single phenomenal state not change in any way by being conjunctively experienced with another; also, conjunction yields nothing more than a total state that is a mere sum. Also, a sum can be said to subsume the set of single states and, as has been shown in the course of this thesis, a sum is least an example of any cohesion or dependence among the set, let alone anything resembling holism.

What I said in the preceding paragraph was meant to state that Bayne and Chalmers' view is far from accounting for holism in the sense presented here. But as was noted at the beginning, that is not their intention because they strive to present a view on unity, not holism. So in a way I was barking up the wrong tree. But the fact that conjunction, according to Bayne and Chalmers, plays

[496] Since both accounts invoke simultaneous experiences, it it tempting here to connect Bayne and Chalmers' account of subsumptive unity with Dainton's view on unity based on co-consciousness. The latter follows this line in Dainton, B., "Unity, Synchrony, and Subjects", section 2.

the crucial role of being the part-part relation among the single phenomenal states that are unified by a subsumptive total state allows for even doubting that they are successful in what they aim to account for. This is because totalities whose parts are related by conjunction, in my view, do not exhibit any unity. Take again the example of a sum that is composed of a set of single states related by conjunction. As has been seen in connection to CEM, sums count as totalities and further individuals, but they are also the paradigmatic entities that allow for widely spatially and temporally scattered objects and hence are not unified in any way. Bayne and Chalmers just avoid these consequences, because, as I noted, in the very definition of unity they restrict the scope of the composing set of single states to a subject at a time. But in compositional theory this is a highly questionable manoeuvre because such a restriction should stem from compositional conditions and not from limiting the scope of the set of what the compositional account applies to from the start.

Dainton: Co-Consciousness

Another more promising candidate for a material relation is Dainton's co-consciousness.[497] Roughly, the co-consciousness relation obtains among two experiences if they occur together. If I smell fire and feel alerted, these two experiences are unified in virtue of me undergoing them at the same time.[498] Also, co-consciousness is a primitive relation in the sense that it cannot be reduced to some other relation, like spatiality.[499] Co-consciousness is specified by Dainton as a *sui generis* phenomenal, yet not qualitative, relation.[500] What this means is that, on the one hand, the fact that two experiences are co-conscious does not allow any inference to the fact that the qualitative feature of these experiences change in any way. On the other hand, co-consciousness is a phenomenal feature of its own kind in that it is a relation between experiences that itself is experienced: when two experiences occur together this togetherness is a unique phenomenal fact additional to the two single experiences. Finally, it is a pervasive relation: "no matter how we choose to divide a total conscious state into parts (…) all of these parts are connected to one another by the co-consciousness relationship."[501]

Moreover, to describe the phenomenal holism suggested by Dainton based on the consciousnesses relation, we have to go a bit deeper into the constitution of experiences. According

[497] I take the notion of a material relation to apply not only to physically material but also mentally material relations, like *is brighter than* or *is peripheral to* or *is co-conscious with*.
[498] Dainton, *Phenomenal Holism*, p.134; Dainton, *Stream of Consciousness,* section 9.1.
[499] Dainton, *Stream of Consciousness,* section 3 and 9.1. and 9.3.
[500] Dainton, *Stream of Consciousness,* p.216.
[501] Dainton, *Phenomenal Holism*, p.135.

to Dainton, experiences have a local and global character. The local character is the qualitative features of an experience: what it is like to taste chocolate or listening to Buddy Guy. In contrast, the global character is the features of an experience that are based on it being related to other experiences by being co-conscious with them: if I experience tasting chocolate together with the blues of Buddy Guy, this togetherness constitutes the global character of both experiences.[502] Now, phenomenal holism of the sort which Dainton calls C-holism results in virtue of the global character of experiences. Upon further detailed inspection, co-consciousness is a (still phenomenal yet not qualitative) monadic relational property of experiences.[503] Also for Dainton, holism depends on phenomenal interdependence, so that his C-holism results in case phenomenal interdependence obtains among all phenomenal states of a subject at a time. And in the case of co-consciousness this seems to be quite plausible: If two experiences occur together, then a phenomenological description of each is complete only with reference to their global character, that is, the monadic and relational property of co-consciousness. So phenomenal interdependence and, hence, C-holism obtains in virtue of the fact that a complete characterisation of experiences depends on them being co-conscious with another.[504]

How does co-consciousness fare as a candidate for a functional dependence relation? To start with, as opposed to what I said with regard to cross—modal dependence and gestalts, co-consciousness satisfies well the basic conditions for integrity, that is the phenomenal closure principle, and hence could be inserted as a material relation into the formal account of functional integrity. This is because, as noted above, all parts of a total state of a subject at a time are connected by co-consciousness.

Also Dainton's construction of the co-consciousness relation as pertaining to monadic relational properties of experiences suits functional integrity well. One reason why I favour functional integrity in this thesis is the precision of this approach. And the precision stems from the fact that two or more single phenomenal states that are functionally dependent on each other are as such with respect to their determinate properties as opposed to their determinable ones. This has the advantage of being able to exactly identify the quality of the depending states and the extent to which they change in dependence to each other. For example, on the picture propagated here, if the phenomenal state of what it is like to taste chocolate functionally depends on the one of what it is like to listen to Buddy Guy, it is possible to identify the exact determinate shade of chocolate-

[502] Dainton, *Stream of Consciousness,* p.216.
[503] Dainton, *Stream of Consciousness,* section 9.2, Dainton, *Phenomenal Holism*, p.136ff.
[504] Dainton, *Phenomenal Holism*, p.137/8, Dainton, *Stream of Consciousness,* section 9.2.

taste and listening-state of mind, and the exact degree of change that occurs if one influences the other. Since I take co-consciousness, as a monadic and relational property, to also be a determinate property as opposed to a determinable one, the phenomenal interdependence among these can be phrased in term of functional dependence: If tasting chocolate and listening to Buddy Guy are co-conscious, the functional phenomenal dependence can precisely be identified as obtaining between the determinate relational and monadic property as the global character of these experiences. So with respect to precision, the co-consciousness relation can very well be plugged into the formal account of functional dependence.

However, these advantages in precision of co-consciousness as a determinate monadic and relational property are considerably mitigated by the fact that co-consciousness is also non-qualitative. So to say, con-consciousness is a binary dependence relation: either two or more experiences are co-conscious, and then they are dependent on each other, or they are not co-conscious to the effect that the dependence completely ceases to hold.[505] Or in other words: co-consciousnesses is a phenomenal dimension or determinable property with only one determinate property. An experience cannot be more or less co-conscious with another or in a certain qualitative way like, for example, the experience of chocolate-taste might instantiate a panoply of phenomenal taste properties in dependence on listening to blues. So the advantage of functional integrity, of being able to exactly identify the determinate properties among which phenomenal dependencies obtain and the exact extent to which this happens, almost entirely vanishes if we conceive of co-consciousness in terms of functional dependence. This is not to say that co-consciousness cannot be captured as a functional dependence relation, just that the theoretical benefits of doing so are quite limited.

Independently of inserting co-consciousness as a material relation into the formal account of functional integrity, both accounts share the plausible consequence of being able to account for the holistic constitution of individual consciousnesses.[506] As has been already noted with respect to the position I label Loose Phenomenal Priority Monism lPPM), a plausible version of integrity or holism involves the existence of a multiplicity of basic total phenomenal states as individual consciousnesses as opposed to a single total phenomenal state that yields one cosmic consciousness. Both C-holism as well as functional integrity reach this consequence. Since, in C-holism, the identity of an experience is determined by phenomenal character, time of occurrence

[505]See Dainton, *Stream of Consciousness*, p.89 for a discussion. Dainton says here that co-consciousness is an all-or-nothing relation which I take to be equivalent to me calling it a binary dependence relation.

[506] Thanks to Barry Dainton for mentioning this in personal correspondence.

and physical basis, it is plausible to assume that only the experiences of one individual are co-conscious to one another and hence holistically structured.[507] Also, functional integrity allows for the case in which only the set of single phenomenal states of one individual are functionally dependent on each other so that, in virtue of therefore satisfying the phenomenal closure principle, only this individual set forms a basic total phenomenal state.[508]

In the light of these commonalities between C-holism and functional integrity, it is natural to take the two positions as rivals.[509] However, two points counter this impression. First, as has been already noted, functional integrity is a purely formal account that needs to be further substituted by some material or special relation. Since I reached the conclusion here that co-consciousness (with some limited theoretical benefit) might serve as such special relation, the two accounts are not rivals but rather complementary. Second, the same holistic conclusion can be reached by invoking the constitution of experiences based on C-holism. As has been explained above, according to C-holism, experiences possess a local and global character, where the former are the relational and monadic co-consciousness properties and the latter the intrinsic and qualitative properties. Now, C-holism obtains in virtue of the global character, or more specifically, based on the fact that experiences are related by the properties of being co-conscious to each other. In contrast, functional integrity holds in virtue of the local character, that is, based on the fact that experiences are functionally related by the intrinsic and qualitative properties they possess. Yet, if we take Dainton to be right about the metaphysical constitution of experiences, then nothing prevents us from assuming that holistic relations obtain at both constitutional levels of experiences (even if to a different degree, because I take C-holism to be a weaker kind of dependence than functional integrity): a set of experiences might be functionally dependent on each other based on their local character and phenomenally interdependent based on their global one. Such two-folded holism might be more than what is usually suggested about the extent to which experiences are phenomenally dependent on each other, but it is conceivable and metaphysically possible. So also with respect to the constitution of experiences, rather than being rivals, C-holism and functional integrity metaphysically complement each other.

Besides these commonalities, I have a worry with respect to the notion of dependence in Dainton's C-holism. I think Dainton understands dependence in a very broad sense, perhaps too broad for some. Generally, I have the impression that philosophers understand phenomenal

[507] Dainton, *Stream of Consciousness*, p.186.

[508] Yet, if one assumes that all existing super-individual single phenomenal states are functionally dependent on each other, then functional integrity also allows for a cosmic consciousness.

[509] Also suggested by Dainton in personal correspondence.

dependence as pertaining to intrinsic qualitative properties. The fact that C-holism invokes a form of dependence that does not affect such properties of phenomenal states might make some lose a grip on what the notion of dependence actually means. More specifically, in my view, Dainton achieves co-consciousness yielding dependence by creating the global character of experiences. If such global character exists and the co-consciousness property resides in such character, then, indeed, the description of one experience is incomplete unless it contains the fact that it is co-conscious with another. Yet, this manoeuvre of establishing a global character of experiences, the mentioning without which a description is incomplete, might render experiences dependent on each other with respect to any arbitrary property. For example, usually, internal relations are taken to generate dependencies and external relations less so. This is because external relations are not essential to the nature of an experience and, hence, the description of an experience can do without external but not internal relations. It seems to me that Dainton's global character internalises external relations in the sense that what was an external relation before now, in virtue of inhabiting the global character, is essential to the nature of an experience and becomes an internal relation. Based on that internalisation of external relations based on creating a global character, surely phenomenological descriptions are incomplete without mentioning these global properties. But based on this strategy, almost every property generates dependencies; one has just to include it in the global character of an experience and dependencies arise. For a more specific example, take spatial relations. They are usually taken to be external relations and, hence, not to be essential to experiences or their phenomenological descriptions. Experiences do not change in spatial dependence to each other. But by creating a global character of experiences and inserting spatial properties into it, descriptions of experiences become incomplete without mentioning the spatial relations of experiences to each other. An external relation that way becomes essential and internal(ised), so to say, and creates dependencies among experiences. But because this can be done with almost every property, I think that the notion of dependence that rests on creating a global character becomes overly broad: Experiences become phenomenally interdependent in virtue of properties that are commonly not taken to create dependencies. Still, despite this worry and as has been mentioned, Dainton's C-holism suits functional integrity in certain respects.

Tononi: Integrated Information Theory

Besides the co-consciousness relation, the informational relation in Tononi's Integrated Information Theory (IIT) might also fit functional dependence. Very roughly, according to IIT, consciousness is integrated information. That means that, if we assume in a reductive fashion that

consciousness is based on neural systems, certain brain regions give rise to consciousness because they generate a large amount of integrated information.[510] Integrated information is understood causally and means that brain states make a difference to each other: the way one is influences the way the other is.[511] Tononi invokes the notion of information here because he takes information to be the reduction of uncertainty among a number of alternatives: If one state makes another state be in a certain way, then this influence reduces uncertainty because all the other possible ways the state could be in are ruled out.[512] So if a large set of brain states interact in such a way, from a certain threshold on, consciousness arises. Also, this mechanism generating integrated information among brain states is not only responsible for the quantifying of consciousness but also for its quality:

> According to the IIT, these mechanisms working together generate integrated information by specifying a set of informational relationships that completely and univocally determine the quality of experience."[513]

This fact feeds back nicely into what I said about conceiving of phenomenal consciousness as a quality space. Based on several layers of neural structures in the brain based on which integrated information is generated, it is not only one actual single experience that can be mathematically represented as a point or shape in a quality space that comprises all possible states[514]; an actual complex or total experience composed of various single ones can also be presented as a shape or field in a quality space of an even higher cardinality of dimensions. This is because just as smaller systems of informationally integrated brain states generate single experiences, single experiences also generate integrated information among them that yield complex and total experiences of a subject at a time.[515]

If we combine the qualitative character of experience represented in a quality space based on IIT with the formal account of functional dependence, we arrive at two points that show the descriptive power of the latter. First, a relational point: as I said when I laid out functional dependence, it is not exhausted by causal relations but can also be very well captured in terms of

[510] Tononi, G., "Consciousness Differentiated and Integrated", in: Cleeremans, *The Unity of Consciousness*, pp.253-265, especially p.261.

[511] Tononi, G. "Integrated Information Theory of Consciousness: An Updated Account." *Arch Ital Biol 150*, no. 2–3 (2012): 290,326. especially p.297.

[512] Tononi, G., "Consciousness Differentiated and Integrated", p.254.

[513] Tononi, G., "Consciousness as Integrated Information: a Provisional Manifesto", in: *Biol. Bull.* 215: 216–242 (2008), especially p.224.

[514] Again, in virtue of one region of the brain being in a certain state, a second region of the brain is in one particular actual state out of a vast multiplicity of possible states.

[515] If I interpret Tononi rightly, cf. Tononi, "Integrated Information Theory of Consciousness: An Updated Account", p.304.

causality. Since IIT involves the mechanism of two states that are informationally integrated based on the way one state is causally influencing the way another one is, this form of interdependence can be captured in terms of functional dependence.

Second, if we now consider the exact qualitative character of experience that an informational integration results in and that Tononi likes to be represented in a quality space, the precision of functional dependence based on it obtaining between the determinate properties also becomes clear if we combine it with IIT. According to Tononi, if a certain set of states are informationally integrated, the resulting qualitative character of the experience can be mathematically represented in a quality space as a point along various determinable dimensions. So a certain informationally integrated set of brains states might yield the single experience of light green along the dimension of green or colour generally. Another experience of, say, tasting coffee that arises in the same informationally integrated way might be represented as slightly bitter along the dimension of bitterness or taste generally. And these kinds of exact properties along a determinable dimension are what we called determinate properties. If I understand Tononi rightly, then not only do these single experiences result from informational integration but they themselves are also integrated in this way so as to yield more complex or total experiences. So if we represent these single experiences as being related by an informational integration that obtains among their determinate properties, we can also represent the resulting total experience as a field or shape in a multidimensional quality space. And this is exactly what the theoretical and descriptional precision of functional dependence amounts to: If we plug in informational integration as a causal relation among single experiences as represented in multidimensional quality space, we get a picture that precisely shows in what way and to what degree the determinate properties of a single experience exert functional dependencies on each other. The way one experience is influences the way another one is and hence reduces uncertainty by ruling out all the other ways the experience could possibly be. If we take this mechanism to obtain among a set of single experiences, we get a total experience whose composing experiential parts are functionally integrated in virtue of this informational integration holding among the determinate properties of the single experiences.

Watzl: Attentional Organisation

We can find another interesting discussion of phenomenal holism in Watzl.[516] His basic idea is

[516] Watzl, S. "Attentional Organization and the Unity of Consciousness." *Journal of Consciousness Studies 21*, no. 7–8 (2014): 56–87.

that phenomenal consciousness has attentional structure. That means that the phenomenal sphere is structured in terms of what experiences are more or less strong attended to. The rough resulting structure of consciousness consists of the centre, the field and the fringe of consciousness, where the field specifically marks the location of experiences where they are peripheral to the centre and others, those at the fringe, are peripheral to them.[517] The more fine-grained structure can be explicated in terms of the peripherality relation that determines the entirety of phenomenal consciousness. If I am sitting in a café and enjoy the taste of my Wiener Melange Café, other experiences like people chatting around me move to the background. In this case, the experience of other people chatting is peripheral to the experience of the café and, hence, the former is located in the fringe and the latter in the centre (or field) of consciousness.

With this picture of the attentional organisation of phenomenal consciousness, Watzl discusses two theses. The second thesis that he finally endorses is attentional essence, that is the thesis that "[w]hat it is for conscious experience to be is for a subject's qualitative states or events to form an attention system."[518] In other words, attentional organisation appears in the real definition of phenomenal consciousness and is essentially part of it. And an attention system forms a set of experiences that is attentionally connected by the peripherality relation.[519] But here I am concerned with the first thesis, namely attention system holism.[520] According to this holism, "[t]he fact that an experiential part of an attention system exists is grounded in the fact that this attention system exists."[521] As a consequence of this conception, the experiential parts could not exist or possess the identity they have as independent of the attention system.[522] Watzl then discusses related arguments from Chudnoff and Dainton in this context but since I also consider both here, I will skip Watzl's discussion of them to keep things simple and directly consider Watzl's form of holism.

I think in this general form, Watzl's definition of holism is too strong. By way of the terminology operated with in this thesis, Watzl's holism involves what I called rigid ontological dependence between the whole and its parts: the very existence of the experiential parts depend on being part of an experiential whole. On this conception, the experience of tasting the coffee cannot appear in a different whole with a different attentional organisation or in isolation from a whole. But I cannot see any need to construct that strong a holism. This is because the fact that parts interact and hinge

[517] Ibid., p.67.
[518] Ibid., p..78.
[519] Ibid., 68.
[520] Idib. Sect.5.
[521] Ibid.71.
[522] Ibid. p.73/74.

together in some dependent sense on the part-part-level, and this is how I would tentatively define holism, does not allow the inference to the fact that strong dependencies also obtain on the part-whole-level. Why is it wrong to assume that just because parts are dependent on each other they cannot exist the same way in a differently structured whole or in isolation from it? Take the coffee experience from the example above. The fact that what it is like to taste coffee depends on what it is like to also hear people chatting does not allow the inference to the fact that this experience could not appear in the same way in a different whole or in isolation. If the coffee experience assumes a certain determinate state, say, mildly bitter, the same experience could appear in a whole where the people are not chatting but a waltz band is playing instead. Also, under the assumption that the peripherality property of the experience is not essential to it, the experience could appear the same way in isolation from the whole. If we base the definition of holism on part-part-relations, as I did here in this thesis, rather than on a part-whole relation, more plausible and weaker forms of holism result.

Also, perhaps my disagreement with Watzl also stems from the compositional perspective of this thesis that might result in different stances towards holism. Compare what Watzl calls attentional construction and what he does not to take to be a form of holism:

> Facts concerning experiential wholes are partially grounded in facts concerning their experiential parts and partially grounded in facts concerning the attentional connectedness of those parts."[523]

The reason why attentional construction is incompatible with attention system holism lies in the fact that the parts are, in their existence and identity, partly independent from the existence of the whole. So what it is like to taste coffee does not fully depend on whole-properties, that is, the structure and kind of connectedness, but also on facts about the coffee experiences that obtain independently of how this experience is connected to the one of people chatting or the waltz band playing. However, from the compositional perspective of this thesis, what Watzl calls attentional construction also counts as a version of restricted composition: what it takes for an entity to be integrated and hence to restrict the ways of the composition of the parts are the parts and a dependence relation. In more detail: according to the doctrine of functional dependence, as soon as, additional to the existence of the experiences, a dependence relation obtains, based on which the way one experience is depends on the way another is, the conditions for integrity and hence restricted composition and PM are met. But this picture does not force any assumptions about the

[523] Ibid., p.73.

way in which and the extent to which the parts in their existence or identity depend on the whole. I can see no reason why, according to functional dependence, the coffee experience could not also exist the way it is in a different whole or in isolation. Like I said before, there is a certain and determinate way that it is like to taste coffee in the given scene, like mildly bitter, but even if this experience is functionally dependent on experiences in a different whole, like in case a waltz band is playing, the coffee experience would be exactly the same way. Also, given the assumption that functional dependence relations are not essential for the coffee experience, we could imagine it to possess the same identity in isolation from any experiential whole. Watzl even considers the identity and existence of atoms in a molecule as an analogy to his attentional construction system. Interestingly, such examples of physical dependencies among parts of a whole are the original cases Köhler gives for his functional dependencies. Here also, the existence of the parts, like planets or atoms, plus the dependence relations among them, suffice to form a dependence system, the molecule or solar system. Generally, in compositional theory and as opposed to Watzl's conception of phenomenal holism, facts regarding part-part-dependencies do not allow inference to part-whole dependencies. So Watzl's attentional system counts as integrated and, hence, as holism construed based on compositional theory.

Let me put this point differently in systematic terms. In order to relate my compositional account to debates in standard philosophy of mind and discussions revolving around the unity of consciousness and phenomenal holism, I have, at times, somewhat equated phenomenal holism and phenomenal integrity. But as I also noted in several places, compositional theory also differs from the approach to holism in the standard debate. And in the example of Watzl, we have a case of how this difference shows: Because he is defining phenomenal holism predominantly in term of part-whole dependencies, his conception of attentional construction is incompatible with holism because the former involves partial independence of the parts from the whole. However, in compositional theory, the latter form of dependence is of minor importance so that in the light of compositional theory also, Watzl's attentional construction prima facie suffices to account for PM: If we take the peripherality relation to be a dependence relation, then phenomenal integrity obtains in case of attentional construction and the conditions for restriction of phenomenal composition are satisfied. So I think it is important to keep both approaches apart and that the compositional view yields weaker and more plausible accounts of holism, resp. integrity.

So what from the perspective of the standard debate would not count as holism, if we equivocated holism with integrity, from a compositional perspective, does. And this is because compositional theory does not require part-whole dependencies, that is, for experiential parts to

metaphysically depend on the whole such that they could not appear the same way in a different whole or in isolation. And as was already adumbrated above, the fact that parts could appear in different wholes and in isolation in turn depends on the fact that, for example, peripherality and functional dependence relations are not taken to be essential to the experiential parts.[524]

Chudnoff: Phenomenal Holism

As Watzl already discusses, another phenomenal holistic account that raises some worries with regard to these strong part-whole dependencies and essential structural properties is Chudnoff's view that is based on Gurwitch.[525]

Similarly to Watzl, Chudnoff also takes phenomenal consciousness to be structured along the line of centrality. Based on phenomenological observations and assumptions that are based on Gurwitch and Husserl and that I skip here for the sake of brevity, according to Chudnoff, the total phenomenal state of a subject at a time divides into three areas: theme, thematic field and margin. The theme is located at the centre, the margin at the fringe of the field of consciousness, and the thematic field in between them.[526] The theme experiences are regarded as "cohesive individuals" whereas the thematic field is considered as more indefinite.[527] Yet, the thematic field is somewhat relevant to the theme experiences. As an example, think of the riff of "Smoke on the Water" from Deep Purple as the theme. It has a distinct melodic contour. Also, as the thematic field, imagine you listen to this theme at a concert. This thematic field experience colours the experience of the theme with the atmosphere that is special to live concerts as opposed to, say, listening to the studio album which contains "Smoke on the Water" on headphones, in your armchair. Finally, the margin is characterised as experiences that are irrelevant to the theme and the thematic field experiences. For example, randomly appearing thoughts about phenomenal holism do not colour your experience of Deep Purple performing "Smoke on the Water" live onstage in any way.[528] With respect to the marginal experiences, it is important to note that they are irrelevant for the other two kinds of experiences but that they are still part of the total phenomenal state that is structured by the partial ordering of the comparative centrality relation: Marginal experiences do not influence or colour the central theme in any way but they are still connected to the theme by being

[524] A further question would then be whether relations that are not essential to their relata can still be dependence relations. I take the answer to be in the affirmative but this is, of course, debatable.
[525] Watzl, S. "Attentional Organization and the Unity of Consciousness", pp.74ff. Chudnoff, "Gurwitch's Phenomenal Holism".
[526] Ibid., pp.567ff.
[527] Ibid., p.568.
[528] Ibid., pp.570/1.

comparatively least central as compared to the thematic field experiences.[529]

Phenomenal holism results, roughly, from an argumentation based on the premises that all experiences are connected by the centrality relation, all the experiences possess their phenomenal character partly based on the position within the centrality ordering and all experiences have their phenomenal character essentially.[530] The particularly strong version of holism, including the fact that the parts metaphysically depend on the whole, then, result from the fact that also, the part of the phenomenal character that is based on the position within the centrality ordering is essential to the partial experiences to the effect that they could not appear in a different total phenomenal state or in isolation.

To start with a general point, similarly to the co-consciousness relation, it seems to me that just declaring an otherwise weak or external relation as essential to the partial experiences is a questionable manoeuvre to create the dependencies necessary for holism. In my view and in Chudnoff's too, holism requires some sort of dependency among single experiences: As he himself states, phenomenal holism implies global inter-dependence, according to which "[a]ll experiences in a total phenomenal state are metaphysically inter-dependent."[531] But, in my view, the fact that one experience is more central than others does not suffice to generate such dependencies and simply declaring the centrality relation as essential to the partial experiences does not change that. This fact applies even more strongly to marginal experiences. As Chudnoff himself states, they are irrelevant to the theme and thematic field experiences. To say that something is irrelevant to something else, in my eyes, is equivalent to saying that something does not depend on something else. I cannot see how one experience depends on the other if at the same time it is irrelevant for it. And this lack of dependence is not compensated by positing that the centrality relation is essential to the phenomenal character of marginal experiences.

Furthermore, like Watzl, I have my doubts that relations like peripherality or centrality (or co-consciousness) make a distinctive phenomenal contribution that is essential to the experiential parts.[532] The difference from Watzl and Chudnoff just pertains to the fact that also, I do not think that we need such essential structural phenomenality to account for holism. According to my compositional understanding of holism, called integrity, and to what Watzl phrases in terms of his attentional construction, invoking the existence of the experiential parts plus its dependence-

[529] Ibid., p.571.

[530] Ibid., p.572. Also see Watzl, "Attentional Organization and the Unity of Consciousness", pp.74ff, where he enriches the discussion by considering Dainton's co-consiounsess relation and Schaffer's account of internal constraining relations.

[531] Chudnoff, "Gurwitch's Phenomenal Holism", p.573.

[532] Watzl, "Attentional Organization and the Unity of Consciousness", p.77.

generating relatedness fully suffices to generate holism, resp. integrity. To stick to Chudnoff, the price he pays for arriving at holism is too high. I can very well imagine experiences appearing in the same way in a different whole determined by centrality or in isolation. But this is only possible if the property of a partial experience that is determined by the structure of centrality is not essential. Only if the experience of listening to "Smoke on the Water" is not essentially determined by the fact that it is located at the centre of the experience of listening to it at a live concert or at the centre of the thought about phenomenal holism, could it also appear in the same way in a context of a different context or thought or in complete isolation. And the price of positing essential centrality is also unnecessary for holism. Contrast my view, according to which we get holism based on the functional dependence relation. Here, we do not need to assume that the property of a partial experience that is determined by the position of the experience within the functional structure is essential to it. Single phenomenal states change in dependence to each other but there is no need to assume that functional dependence is essential to the experience. For example, plug in causality for functional dependence such that me being in a bad mood causes the taste of ice cream to diminish. The phenomenal character of the taste of ice cream is not essentially affected by this experience being entangled within the system of functional dependencies. There is no essential phenomenal contribution of causality to the partial experience. The only thing there is the experience in a determinate state of diminished enjoyment caused by another experience in a determinate state of a certain degree of a bad mood. The diminished taste of ice cream could also appear in a context of being annoyed by my little brother or rain outside. Or it could appear in isolation, with me simply undergoing this certain determinate phenomenal state of a diminished enjoyment of ice cream that is not caused by anything. Holism still obtains because the experiences are bound together by functional dependence, here understood as some form of phenomenal causality. So I think, as compared to my position, Chudnoff's holism is too strong because it implies that structural properties are essential to partial experiences to the effect that the latter metaphysically depend on the whole and could not appear in a different whole or in isolation. Also, his holism is unnecessarily strong because holism is sufficiently accounted for without positing such essential structural properties.

Surely, this cannot be the end of the discussion 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, is grounded 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."[533] Since this topic would open a whole new corpus of literature, I leave this debate as an issue for further research.[534]

[533] 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, especially pp.6/7.

[534] 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, especially 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 an 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). Carving out Mach's notion of functional dependence and relating it to the discussion of the present thesis would require a thesis on its own, so I leave a further discussion for another occasion.

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 conditions is it true that parts compose another total individual. This moderatist position towards composition is an amalgamation of Johnston's Principles of Unity and Simons' 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 to answer what I labelled the Special Phenomenal Composition Question (SPCQ). Regarding the array of non-moderatist answers to SPCQ, all positions seemed to be more or less counter-intuitive. This fact might be held against my endeavour 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 straw man positions. In response, I make two points. First, counter-intuitivity does not entail illegitimacy. Positions like phenomenal universalism might stretch one's philosophical acceptability, yet those positions in phenomenal compositional theory are the result of an application of strict mereology and with 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 a 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 the originality of SPCQ that it yields views and positions that allow for a 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 and positions in phenomenal composition seem to inherit their counter-intuitivity from their origin in general compositional theory. In the latter also, 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, an option also arose in the phenomenal domain for restricting phenomenal composition and hence for 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 an advancement.

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