**Four meta-methods for the study of qualia**

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**Abstract:**

In this paper, we describe four broad ‘meta-methods’ (as we shall call them) employed in scientific and philosophical research of qualia. These are the theory-centred meta-method, the property-centred meta-method, the argument-centred meta-method, and the event-centred meta-method. Broadly speaking, the theory-centred meta-method is interested in the role of qualia as some theoretical entities picked out by our folk psychological theories; the property-centred meta-method is interested in some metaphysical properties of qualia that we immediately observe through introspection (e.g. intrinsic, non-causal, ineffable); the argument-centred meta-method is interested in the role of qualia in some arguments for non-physicalism; the event-centred meta-method is interested in the role of qualia as some natural events whose nature is hidden and must be uncovered empirically. We will argue that the event-centred meta-method is the most promising route to a comprehensive scientific conception of qualia because of the flexibility of ontological and methodological assumptions it can provide. We also reveal the hidden influences of the different meta-methods and in doing so show why consideration of meta-methods has value for the study of consciousness.

**Keywords:** Qualia; eliminativism; phenomenology; heterophenomenology; consciousness and neuroscience

**1 Introduction**

This paper is interested in what we call ‘meta-methods’, of which we describe four, employed in scientific and philosophical research of qualia. By adopting a meta-method, a researcher intentionally or unintentionally – and explicitly or tacitly – makes a decision about which feature or role of her target of inquiry is the most important explanandum in her research project. In doing so, she also assumes a set of attitudes, background theoretical assumptions, research directions, methodologies, and so on, which correspond to the explanandum. As a result, we argue that a researcher’s choice of meta-method may significantly influence her findings or conclusions. No doubt, our invented term ‘meta-method’ may not be appealing to everybody. Those who dislike it are free to replace it with ‘strategy’, ‘attitude’, ‘perspective’, and the likes – or even Thomas Kuhn’s ‘paradigm’, Imre Lakatos’s ‘research program’, and Larry Laudan’s ‘research tradition’. However, it should be noted that the meaning of those terms will not perfectly capture the subject matter we intend to describe and inquire into in this paper. In particular, those who wish to replace our term with those of other authors should be aware that those terms have prescribed meanings.

Differences in meta-methods can occur in a range of research areas, not only that of qualia. Let us illustrate by example. Consider studies of God by religious believers. In the areas of philosophy of religion and theology, there will always be some difference in findings contingent on whether the religious researcher – who might be a theist philosopher of religion, a theologian or whatever – studies God as ‘the God of the philosopher’ or ‘the God of the believer’. In the former case, God is assumed to be a posit of classical metaphysics and takes the roles of the first cause, a necessary being that everything else grounds on, and so on. In the latter case, God is supposed to be a personal being, which the believer can enter into a personal relationship with. Unsurprisingly, because of these differences, even though these researchers might assume that they are directing their inquiries onto the same target, their research projects will consist of very different sets of attitudes, background theoretical assumptions, research directions, methodologies, and so forth. We adopt the term ‘meta-method’ to describe this phenomenon because it is more general, broader and less precise than any formal research method (e.g. methods of measurements, analyzing data, etc.).

There will always be a lot of overlap between different meta-methods and the dividing lines between them may always be vague. After all, a comprehensive account of a subject has to consider all its possible features and roles, not just the features or roles that particularly interest us. Even when one feature or role is more relevant to us than another it is not always easy to classify things strictly as the features or roles of the target. Consider the study of the God of the philosopher. If some philosopher of religion determines that God is a conscious, omnibenevolent, creator entity because of some metaphysical considerations, it would seem to follow that developing a personal relation with people is the sort of act a conscious, omnibenevolent creator entity would do. Thus, in some sense, the God of the philosopher might have many things in common with the God of the believer. With this in mind, what meta-method a researcher actually adopts is often a relative issue, not anything absolute. Meta-methods are not inconsistent with each other in the sense that if two researchers adopt different meta-methods then they are necessarily in disagreement with each other. A researcher may shift back and forth from one meta-method to another when she works on different research projects, and may even adopt different meta-methods when she is working on different components of the same research project. But she remains wholly consistent. However, differences in meta-methods may still lead researchers to develop very different findings and conclusions. As in the case of God, scholars who believe in the same religion and (supposedly) the same God can have tremendously different conceptions of her because of such differences.

In the rest of this paper, we survey the different meta-methods for the study of qualia and argue that differences in meta-methods can result in substantive differences in the findings of those adopting them. In Section 2, we identify and describe four meta-methods for the study of qualia. Specifically, they are the theory-centred meta-method, the property-centred meta-method, the argument-centred meta-method and the event-centred meta-method. We illustrate each meta-method by providing examples of scientists and philosophers investigating qualia who we feel exemplify these meta-methods. In section 3 and 4, we highlight the influences of each meta-method, and argue that only the event-centred meta-method is well suited to developing a comprehensive scientific conceptualization of qualia. We argue that the theory-centred and the property-centred meta-methods are inflexible and can lead us to a false dilemma between extremist affirmative and eliminative attitudes towards qualia. We consider it a false dilemma because some intermediate – and more scientifically useful and constructive – positions are available if we adopt the event-centred meta-method. To defend such positions, we sympathetically address the views about qualia of some eliminativists, influenced by a Feyerabendian or similar conception of the history of science, such as Patricia Churchland (1988) and neuroscientist Stanislas Dehaene (2014). While they are right to believe that the history of science encourages us to discover seminal theories, not conservatively retain old dogmas, this does not require us to abandon everything we currently have.

In section 5, we argue that the event-centred meta-method is the most promising because it allows us to *revise our ontological commitments* and have a *flexible methodology*. Put simply, the idea is that our initial ontological commitments regarding the nature of qualia should be a base for revisions to build on, as opposed to dogmas to hold or abandon. In addition, we should also not hold any methodological absolutism concerning how we should inquire into the nature of qualia. Instead, we should allow each possible phenomenological method to prove its worth by providing empirical or philosophical findings, not simply by some very abstract *a priori* reasoning that is detached from our findings. With this in mind, we argue from a pragmatic perspective, that the event-centred meta-method has the highest likelihood to bring about the greatest development in science and philosophy.[[1]](#footnote-2) In section 6, we conclude by showing more broadly why considering meta-methods is valuable to the scientific and philosophical study of consciousness.

**2 The four meta-methods**

In this section, we describe four meta-methods and provide examples of researchers who we consider to be motivated by those meta-methods when developing theories about qualia. To narrow down the scope of investigation, we, like many contemporary scientific researchers, assume that physicalism is true and focus only on research programs that assume the same. Of course, some of our proposed meta-methods are not exclusive to physicalist research programs. However, for the purposes of this paper, we shall set aside any further discussion of this matter.

We need to re-emphasize that the meta-methods are general and broad. A meta-method is the set of theoretical and methodological assumptions that are made because of a researcher’s decision about what feature or role of the subject is her target of inquiry. Hence, they have lots of overlap and no clear dividing lines between them. The four meta-methods we describe closely relate to one another and the examples of researchers or research projects we offer up are contestable. However, the main purpose of this paper is not to provide a strict set of categorizations that everyone can fit neatly into, but rather to identify some major research streams of the study of qualia, and reflect on them in the later parts of this paper.

*2.1 The theory-centred meta-method*

Researchers who adopt a theory-centred meta-method are particularly interested in how qualia play the role of a theoretical entity picked out by our folk psychological theories. Accordingly, these researchers then attempt to translate and/or reduce these folk theories into theses that are compatible with their academic traditions (such as neuroscientific theories or functionalist explanations).

One seminal example of this meta-method is David Lewis’s (1995) analytic functionalism. On this view, ‘qualia’ is the name given to the occupants of a particular causal-functional role described in our tacitly held folk psychology. Qualia simply are, then, whatever plays that causal-functional role. If physicalism turns out to be true then there may be no perfect occupants of the role, but there may still be some imperfect ‘next-best deservers’ (140). Lewis identifies part of a quale’s causal-functional role via what he calls the identification thesis. According to the thesis, when one has a quale, one knows all the essences of it (142). Lewis believes that the full version of this thesis is unacceptable to the physicalist but he believes that the physicalist could accept it in ‘some not-so-demanding everyday sense’ (144) – for example, one could know the relations of acquaintance one bears to qualia (for further details, see Lewis 2004 and the so-called ‘ability hypothesis’).

Eliminativists such as Paul Churchland (1985), Patricia Churchland (1988) and Alex Rosenberg (2011) also appear to be examples of researchers who have adopted a theory-centred meta-method. They argue that since our folk psychological theories are shown to be radically inaccurate by science, any theoretical entities posited by such theories, like qualia, probably do not exist. While intuitive conceptions of qualia may one day reduce to some lower-level account (e.g. neurophysiological explanation), there is no guarantee this will occur. This is because being reducible requires a theory to be ‘basically’ correct and since our folk conceptions – including the theories or the so-called immediate introspections – are likely to be radically flawed, they should simply be replaced by future scientific knowledge (1988: 301).

Some researchers are not eliminativists about consciousness but nonetheless hold an eliminative attitude towards qualia. For neuroscientist Stanislas Dehaene (2014), the concept of qualia is a hypothetical one based on our ill-defined intuitions. What qualia refer to is ‘pure mental experience detached from any information processing role’ (262). However, once our intuitions have been improved through advances in neuroscience and computer simulations, the concept will simply vanish and be considered prescientific (e.g. a fate similar to other prescientific concepts such as vitalism).

*2.2 The property-centred meta-method*

Researchers who adopt a property-centred meta-method understand qualia to be bundles, or bearers, of some metaphysical properties observed through introspection (often, by those same researchers). They then focus on how to situate them within the natural world (if possible). This meta-method is very similar to the theory-centred meta-method in the sense that both are based on our intuitions about qualia. However, the property-centred meta-method does not assume any comprehensive folk psychological theory, instead, it takes those metaphysical properties to be knowable by direct, immediate and pretheoretical observation of our experiences through introspection. An analogy can be drawn with the scenario of seeing a turtle in front of oneself along with all its features. Many consider the knowledge about them to be too obvious and immediate that it is unguided by any theoretical reflection. As Galen Strawson (2008) puts it, ‘we have it and know it at every waking moment’ (53), and ‘nothing in this life is more certain’ (21). Different researchers disagree about which set of properties is the right one because of differences in their introspection. Commonly mentioned ones include being non-causal, intrinsic, ineffable, incorrigible, and so on.

JosephLevine’s seminal work, ‘Materialism and Qualia: The Explanatory Gap’ (1983), appears to reflect the property-centred meta-method. On Levine’s view, natural science can only ever tell us about the causal roles of things. For example, the quale of ‘pain’, acting as a sign of bodily damage, may cause us to evade further physical harm. What natural science cannot explain is a ‘qualitative nature’ or the ‘phenomenal properties’ of qualia – that is, why the quale of pain ‘*feels* *the way it does*’ (357, original italics) – since those properties are non-causal. This seems to be heavily based on Levine’s own introspection. As he states, what he describes is an important intuition he finds hard to deny (361). He argues that this difficulty in explaining the mind/body relation leaves us agnostic about it (354).

Bertrand Russell[[2]](#footnote-3), holding that qualia are ‘intrinsic’ and non-causal, proposed the influential view that is known today as Russellian Monism. On this view, physics can only tell us about the causal and spatiotemporal properties of physical entities, not their intrinsic properties (1927a: 384), whereas we can only know of the intrinsic properties of the world in our perception (402). Thus, the mind-body problem can be solved by considering qualia to be the intrinsic properties of the physical (1927b: 154). It is important to note, though, that Russell was a neutral monist and explicitly denied being a materialist (1927a: 382). Despite this, Russellian Monism has attracted many physicalist followers who have attempted to develop physicalist versions of this view, including Daniel Stoljar (2001), Galen Strawson (2008) and Barbara Montero (2015).

In his influential paper, ‘Quining Qualia’ (1993a), Daniel Dennett proposes an eliminativist view of qualiathat exemplifies the property-centred meta-method. Distinct from the Churchlands (who adopt the theory-centred meta-method), Dennett begins with the assumption of property-centred meta-method and considers qualia to be a set of ‘special properties’ (382) that, ‘in one form or another, is “obvious” to most people – to scientists, philosophers, lay people’ (382). The properties he spells out include their being ‘ineffable, intrinsic, private, directly or immediately apprehensible in consciousness’ (385). Then, he argues that these properties are, in fact, inconsistent with our intuitive assumptions about them. Qualia do not exist because those who talk about qualia do not know ‘what on earth they are talking about’ (382).

*2.3 The argument-centred meta-method*

Researchers who adopt the argument-centred meta-method are usually philosophers defending physicalism. They are interested in the role qualia play in the arguments against physicalism that appeal to our first-person experiences (e.g. Jackson 1982; Chalmers 1996). Usually with the intention to defend physicalism, these researchers offer some conceptual analyses that are intended to identify features of qualia that, on their views, lead to the confusion of the non-physicalist.

Of course, the arguments against physicalism these researchers are responding to might also exemplify meta-methods that could be classified as either theory-centred or property-centred. Consider Frank Jackson’s[[3]](#footnote-4) (1982) influential Mary thought experiment. In this thought experiment, we are invited to imagine a scientist, Mary, who has access to all the physical facts relating to the experience of colour but has spent her whole life in a room, only ever experiencing black and white. Once Mary leaves the room and sees something red for the first time, it appears that she has learned something new. However, because Mary had access to all the physical facts about colour experience, this new fact cannot be physical. This led Jackson to conclude that qualia are not physical (130). Jackson’s strategy relies on the intuition that Mary learns something new about the experience of colour. While he does not explicitly tell us the source of this intuition, we might consider the intuition as arising from some tacitly assumed folk psychological theory of qualia or tacit awareness of the metaphysical properties possessed by qualia. Respectively, these lines of thought are congruent with the theory-centred or the property-centred meta-methods.

Researchers who adopt the argument-centred meta-method, however, are not those who are sympathetic to the arguments against physicalism but those who reject them. More specifically, these researchers are merely interested in replying to arguments against physicalism by using conceptual analysis to uncover some features of qualia that, on their views, lead to the confusion of the non-physicalist philosopher.

John Bigelow and Robert Pargetter (1990, 2006) are an example of researchers who have adopted an argument-centred meta-method. Their acquaintance hypothesis is a reply to Jackson’s Mary thought experiment, and aims to explain how Mary can acquire new knowledge without committing to non-physicalism. According to their hypothesis, we can hold different acquaintance relations to the same fact by causally relating to it in different ways. Mary obtains new knowledge not by learning a new fact but instead by developing a new acquaintance relation to a fact she already possesses. They conclude that ‘although qualia are physical, people cannot know all there is to know about them unless they experience them for themselves’ (1990: 147). For them, Jackson is correct that Mary acquires new knowledge but his understanding of what the new knowledge consists of is a mistake.

*2.4 The event-centred meta-method*

Researchers who adopt the event-centred meta-method understand qualia as phenomena that must be explained by scientific and philosophical theories. The term ‘phenomena’ here is meant in a scientific sense, designating events that are susceptible to scientific exploration. What differentiates this meta-method from the theory-centred meta-method and the property-centred meta-method is the notion that the main explananda are the neurological events where qualia are taken to exist, not our folk psychological theory of qualia or some set of metaphysical properties we attribute to qualia through our introspection. In this sense, much like other natural events such as typhoons or biological reproduction, what interests the researcher is not our intuitive or initial concept(s) of the events of concern, but their hidden natures, which we have to uncover empirically.

No doubt, there is an inevitable commitment to either the folk psychological theory or some list of introspected properties at the beginning of the investigation. The event-centred meta-method requires a starting point at which qualia are provided an initial description, thereby allowing researchers to begin their inquiry. Without such a starting point, the inquiry has nowhere to begin. However, the researcher sees the folk psychological theory or the list of introspected properties as what we initially attribute to the explananda, or in other words, initial data and hypotheses about the explananda, not the explananda themselves. Making use of these data and hypotheses to begin the inquiry does not mean the researcher has to consider them to be true. The correct way to describe these events is an empirical matter. Eventual revisions in the form of more advanced theories and refined lists of properties are always possible. While these researchers may make methodological use of other meta-methods, they are not theoretically committed to them. After all, this is much like the case of physics. We must first have some intuitive or initial concepts of matter for inquiries into it to be possible, but then we uncover the events behind our concepts in the empirical world, and revise those concepts in this process.

Philosopher of neuroscience Jakob Hohwy and psychologist Chris Frith (2004) are examples of researchers who we associate with the meta-method. In response to the question ‘Can neuroscience explain consciousness?’, they describe a particular kind of consciousness that they believe neuroscience does provide a successful explanation for. By drawing on a wide body of evidence, including introspective reports, neuroscience and psychiatric studies, they argue that our feeling of being in control can be explained by our predictions for our own actions. No conceptual frameworks of qualia, such as introspective reports or their interpretations are taken to be true until they show their explanatory superiority over others (182). They do not stop at merely drawing correlations between qualia and neural states (i.e. the neural correlates of consciousness [NCC]). That is, they not only aim to tell us when and only when we have a sense of control, but also what that sense *is*. They acknowledge that, at present, their method cannot bridge the explanatory gap completely but argue that the problem is more likely to be solved through many small research steps rather than any single discovery (196). We take this to be an example of the event-centred meta-method since no initial conceptions of qualia are taken to be true. Instead, qualia are considered events whose natures must be discovered bit by bit.

Some researchers appear to have tacitly held attitudes consistent with the event-centred meta-method. Neuroscientists Gerald Edelman and Giulio Tononi (2001) classify qualia as a natural phenomenon and subject worthy of scientific investigation. They warn us about the limitations of philosophical efforts to reveal the nature of qualia. The nature of qualia, much like those of other natural phenomena, is not the kind of thing that is uncovered from the armchair; it requires scientific observations and experiments (6). They also note that ‘no scientific description or explanation can substitute for the real thing’ (12) and that ‘being comes first, describing second’ (15). Put simply, Edelman and Tononi remind us that qualia as events are distinct from theories of qualia. What we can do, such as when we empirically investigate other natural phenomena, is propose scientific explanations drawn from a wide range of methodologies that explain both the phenomenon’s properties and the conditions under which it obtains.

Edelman and Tononi’s research program begins by spelling out the properties of qualia they wish to explain by observing our most general experience: specifically, its privacy, unity and endless variety (20). This starting point is similar to the property-centred meta-method. However, their choice of properties is preceded by their scientific assumption that qualia are physical and evolved (12-16). Our initial understanding is not to be taken for granted and must accommodate other scientific findings in order to be assumed correct. For example, as they develop their theory of qualia, they reject atomism, according to which each quale is an element independent of each other (162-163) – even though atomism is attractive from the perspective of introspection (162). We believe that Edelman and Tononi’s view of qualia as events means that they do not confuse its presumptive set of properties as its ultimate explanandum and, consequently, do not see presumptions as non-negotiable. Rather, they see the set of properties as a useful collection of hypothetical posits that must be carefully selected. It is from this tacit method that they developed their scientific theory of qualia, the dynamic core hypothesis, which has attracted many followers (for more details see Edelman & Tononi 2001).

*2.5 Heterophenomenology*

Some readers may wonder why we have not included Dennett’s (1991, 1993b, 2003) influential heterophenomenology as a distinct meta-method. Heterophenomenology is a method of phenomenology. In this method, the introspective data provided by participants are considered no more than speech acts or texts. These texts are taken as raw experiential data whose contents are not assumed true but fictional (1991: 78). As Dennett writes, ‘The reports *are* the data – they are not reports *of* data’ (1993b: 51). What the researcher then does, from a third-person perspective, is search for causal explanations of the participant’s reports; she never enters a first-person perspective or makes any claim from her own introspections (2003: 21).

Dennett argues that this method applies to reports on qualia (1991: 407). To restate it as a meta-method for the study of qualia, qualia are assumed to be nothing more than a kind of content in reports provided by experimental subjects. They are not considered to be real, and the researcher is only interested in discovering what causes participants to (mistakenly) make such claims. We do not wish to include heterophenomenology as a distinct meta-method, the reasons for which will become clear as the paper progresses.

*2.6 Interrelations between meta-methods*

We have noted that meta-methods are closely interrelated and have lots of overlap between them. This is because: (1) considering one feature or role of qualia to be the most important explanandum does not prevent one from investigating others, (2) one feature or role might be closely related to another, and (3) the dividing line between different features or roles are vague.

For example, those who have adopted the theory-*centred* (not theory-*only*) meta-method do not need to have an exclusive concern forfolk psychology. It is possible to think that many of our folk psychological theories develop from our immediate introspection of the properties of qualia. Those who have adopted the property-centred meta-method do not assume a theory as sophisticated, detailed and comprehensive as the folk psychological theory used by the theory-centred meta-method. Still, those claims of introspected properties could be argued to resemble ‘small theories’ held by the folk. In addition, if the immediateness and theoretical reflectiveness of introspection is a matter of degree, then the dividing line between an immediate introspection and a folk psychological theory might be vague. The arguments against physicalism considered by those with an argument-centred meta-method, as we have already noted, are reliant on folk theories and intuitions about qualia’s properties. Similarly, the event-centred meta-method, as we already have noted, is reliant on folk theories and introspected properties of qualia in order to point out instances of qualia to begin investigating (even though they do not have to be assumed to be true). In this sense, the event-centred meta-method can be considered as an extension of the theory-centred and the property-centred meta-methods.

One can also shift from one meta-method to another across time. For example, Patricia Churchland (1986; 2002) sometimes appears to be adopting the event-centred meta-method rather than the theory-centred meta-method. Aside from suggesting that qualia do not exist, she sometimes appears to be attempting to provide scientific explanations of qualia that replace the folk’s.

**3 An assessment of the theory-centred and the property-centred meta-methods**

In this section, the theory-centred and the property-centred meta-methods are assessed together, as we argue that they share the same major weakness. Other meta-methods are assessed separately in subsequent sections. We argue that both the theory-centred and the property-centred meta-methods are disadvantageous to the development of the study of qualia. Since René Descartes, there are countless researchers who consider (or appear to consider) their current understanding of qualia to be (almost) incorrigible (e.g. Searle 1990; Chalmers 2003; Strawson 2008). However, it should now be common knowledge that many of our initial assumptions about how consciousness operates are mistaken.[[4]](#footnote-5) Accordingly, it is difficult to see why those about qualia should be exceptions. It might be true that our everyday experience appears to convey to us that qualia exist, but it remains difficult to see why our contemporary or intuitive views about qualia should be accurate. Placing our assumptions at the centre of the inquiry prevents flexibility and revisions to research directions if any assumption turns out to be wrong.

In the cases of research programs that adopt the theory-centred meta-method, if folk psychology turns out to be radically false, it is difficult to see how they could go on. The Lewisian methodology does, indeed, consider folk psychology to be false because the qualia role picked out by the theory, according to Lewis, has no perfect occupant. However, if folk psychology turned out to be *radically* false then there may be nothing that even imperfectly fits the qualia role.[[5]](#footnote-6) We do not disagree with Lewis’s approach to the identification thesis, but the qualia role could still be radically false. This is because the identification thesis might not be the only thesis our folk psychology assigns to the qualia role. For example, Dehaene suggests that qualia are believed to be ‘pure mental experience detached from any information processing role’ (2014: 262). These other theses might be radically false. Moreover, Lewis might also be assuming too much when he seems to consider folk psychology to be a consistent theory. It may actually be, as Dennett suggests, inconsistent in some important ways. Furthermore, as Patricia Churchland (1988) argues, if a kind is not a natural kind, it should be eliminated in our scientific ontology; and, indeed, our folk psychology about qualia might commit to non-natural kinds. Her argument will be discussed in detail in the coming paragraphs.

On the other hand, philosophers and scientists who have adopted the property-centred meta-method do not assume a theory as sophisticated as folk psychology, yet the assumption that qualia must possess the particular set of introspected properties seems to, in a similar way, lead the study of qualia into a dead end. More precisely, authors with such persistence are often led to unnecessarily radical conclusions, and, in particular, mysticism about qualia that resists scientific inquires in order to make sense of the introspected properties. For example, Russell is driven to believe that qualia are some kind of intrinsic characters of physical entities that are beyond the reach of physical science. Similarly, Levine, who is a physicalist, is driven to believe in the explanatory gap, according to which it cannot be known which physical explanation of qualia is true.

We have seen that the inflexibility of the theory-centred and the property-centred meta-methods lead to either a (probable) failure or mysticism about qualia; and both are *de facto* dead ends for scientific development. Hence, it is understandable that many authors who understand qualia via the lens of the two meta-methods are drawn to eliminativism about qualia. In fact, when Levine writes his seminal paper on the explanatory gap, what he has left us with is the dilemma that we have to accept either the explanatory gap – which is a version of mysticism about qualia – or eliminativism – which he does not consider to be tenable (1983: 361). Nevertheless, before any judgment concerning the dilemma is made, we should assess the nature of eliminativism carefully and sympathetically. What we are going to argue is as follows. Eliminativists such as the Churchlands, Rosenberg, Dehaene and Dennett may be too quick to deny the existence of qualia due to a lack of flexibility inherent in the theory-centred meta-method they share with Lewis. From the history of science, we can learn that even if an old theory is radically false, this fact should not automatically imply that things of concern in the theory do not exist. This also provides us a way out of the dilemma Levine offers us.

A major argument for eliminativism is offered by Patricia Churchland who adopts the theory-centred meta-method. In her argument, she makes use of resources from Paul Feyerabend’s *incommensurability thesis* in philosophy of science, which is (roughly) the view that translations between old and new theoretical frameworks are improbable if not impossible (P. S. Churchland 1988: 275; see also Feyerabend 1981). On her view, it is possible for there to be a reductive explanation of mental phenomena (including qualia) through neurobiology, in a similar sense to the case that light is reduced to electromagnetic radiation. In this case, there will be an identification of mental phenomena and neurobiological phenomena, and science can preserve the concepts of mental phenomena. However, for this kind of case to happen, the old theories have to be, in her words, ‘pretty much correct’ (301). Such cases, she argues, are atypical in the history of science; and in most cases smooth reductions is impossible because, as the incommensurability thesis tells us, old and new theories are incommensurable. As psychology and neurobiology co-evolve, she concludes, mental phenomena should probably be given up like caloric fluid and vital force.

We are sympathetic to this argument because, despite some philosophers’ contention that eliminativism is simply a naïve and implausible denial of obvious phenomenal facts (e.g. Chalmers 1996; Strawson 2008), what Churchland in fact argues is that she expects some more advanced accounts of those facts, even though those accounts probably would not make use of the concept of the phenomenal. After all, it is difficult to see why replacements of old theories through scientific development should not be expected, unless one holds the strong philosophical notion that our current folk psychology is incorrigible and complete. Nevertheless, we believe that there is a way to understand what the history of science teaches other than Churchland’s. More precisely, there are many more ways to preserve the elements of old theories than she considers, even in cases where new theories have replaced old ones. No doubt, she is correct that eliminations like that of vital force are always possible, but we cannot know *a priori* whether they will actually happen. Hence, she might be too quick to dismiss the elements of our folk psychology.

Let us illustrate. Churchland provides two scenarios in which the incorrectness of the old theories might consist. One is when the theoretical contents are simply false (1988: 287-290) and the other is when the described kinds are not natural kinds but nominal kinds (284-287). However, in the history of science cases of both kinds have often undergone revision without elimination. For example, theoretical entities such as gravity and atoms have been given new meanings as physical theories develop. <Gravity> in Newtonian physics was revised before it developed into its counterparts in string theory or the theory of relativity. Atoms are no longer considered indivisible or like billiard balls, as they have been considered historically. <Planet> and <acid> in older theories have been proven to be non-natural kinds but they were then revised and given newer meanings and newer sets of inclusions in newer theories. This kind of revision provides a basis for new theories to develop upon. It also makes the development of scientific theories easier because the new theory can make use of the rich theoretical resources already present in the old theory.

Scientific practice is pragmatic and realistic; constructing every element of the new theory by itself is not typical. In fact, not only have the theoretical contents and natural kinds found in scientific theories undergone revisions, so too have intuitive and ancient concepts about ordinary physical entities such as water, earth, and fire – which by the light of current physics, have all been shown to be radically false. The early 20th century physicist Arthur Eddington famously and correctly notes that physical objects according to the folk theory have extension, permanence, colour, and substantiality. He then reminds us, that according to current physics they are actually empty spaces with fields of forces (1928: 5-9). Nevertheless, scientists and philosophers (with the exception of mereological nihilists) rarely consider them to be in need of elimination and frequently use them in scientific and philosophical theories. Given all these other cases, it is difficult to see why <qualia> should be an exception whereby the possibility of revision remains unopen. Churchland and Dehaene are correct that an elimination of qualia like that of vital force is always possible, but we cannot know *a priori* whether it will actually happen, and hence the analogy is not conclusive.

This, of course, involves a debate in philosophy of science on the connection between theoretical contents or natural kinds and their revised counterparts. The issue remains controversial. Some consider them to share the same reference through causal theories of reference (e.g. Kitcher 1993) or structural similarities (e.g. Schurz 2009); others consider the revised counterparts to be merely borrowed concepts (e.g. Kuhn 1996). However, we take no stance on this controversy. Our consideration is merely pragmatic, based on how scientific developments actually happened in the history. We have seen how scientists (and philosophers and the folk) revised other concepts with the aim of allowing them to correctly correspond to the event they are tracking, and it is simply difficult to see why the same could not happen for <qualia>.[[6]](#footnote-7) Some readers might consider our position to be eliminativism in disguise, because the old concept of qualia, after having undergone revisions we expect, is nevertheless abandoned. We disagree. It is important to see that revisions have a gradual evolutionary nature, and are thereby not simple abandonments as Churchland has in mind.

Eliminativists who apply the property-centred meta-method fare no differently from those with the theory-centred meta-method. We have seen that Dennett argues that the ‘obvious’ properties of qualia are inconsistent with our intuitive assumptions about them. As a result, he simply concludes that the concept of qualia is a confusion, and qualia therefore do not exist. The quick denial of qualia’s existence, like Churchland’s, is a result of holding inflexible assumptions and neglecting the possibility of revision. Recall that Dennett’s heterophenomenology assumes that there is no phenomenology but only propositional attitudes. This is a result of his eliminativism, which is motivated by a property-centred meta-method. As Dennett explains, ‘There is no such phenomenon as really seeming – over and above the phenomenon of judging in one way or another that something’ (1991: 364), and ‘[speech acts are] sufficient to produce heterophenomenology’ (365).

We have seen why the dilemma between extremist affirmative and eliminative attitudes towards qualia is a false one led by the inflexibility of the theory-centred and the property-centred meta-methods. More precisely, an intermediate position is possible via revision of our concepts. We believe that neglecting this fact is a disadvantage because it blocks the kind of revisions typical in other scientific fields, which is a useful way for researchers to develop new hypotheses other than mysticism. For example, if we take Dehaene’s (2014) advice to wait for the concept of qualia to vanish, then all we can do in the interim is focus our studies on other aspects of consciousness. On the other hand, if we accept Dennett’s heterophenomenology and thereby assume that there is no phenomenology but only propositional attitudes, it seems that we will lose access to many valuable materials and insights important for future studies of consciousness. As a result, we do not consider this the most effective way to expand our scientific (and philosophical) knowledge of consciousness.

**4 An assessment of the argument-centred meta-method**

There is no doubt that the argument-centred meta-method informs our philosophical (and perhaps scientific) knowledge. For example, Bigelow and Pargetter’s research tells us something important about the epistemology of acquaintance. Unfortunately, responding to qualia arguments one by one in the armchair can only tell us about very limited aspects of qualia. It can demonstrate why arguments against physicalism fail (if in fact they do so). In addition, using the example of Bigelow and Pargetter, it can further demonstrate the relevance of other philosophical fields, such as epistemology, to the study of qualia. However, developing a comprehensive understanding of qualia through this meta-method is unlikely.

Notably, this meta-method appears to be angled towards non-physicalist views on qualia. The non-physicalist might continue to formulate new arguments against physicalism or escape objections by pointing to some unexplained features (or rather unexplained assumed features) of qualia. It would be difficult for the physicalist to reply to each argument one by one, unless a relatively comprehensive understanding of qualia is provided or shown to be forthcoming. However, this is not what arguments from the armchair are good at. Simply devising arguments from the armchair cannot tell us, for example, the empirical details about how the brain actually works. Unfortunately, this lack of empirical details about qualia might result in a lack of sufficient resources to reply to some arguments against physicalism. Obtaining such empirical details forces us to go beyond the argument-centred meta-method because philosophical argumentation ceases to be the centre of inquiry.

To be fair, though, the aims of researchers who adopt the argument-centred meta-method were typically not developing a comprehensive theory of qualia. While we believe that there is a need for the study of qualia to move beyond philosophical responses to arguments against physicalism, it is possible this advancement will be partly due to the philosophical knowledge provided by these researchers.

**5 Advocating the event-centred meta-method**

According to the event-centred meta-method, the main explananda for the study of qualia are the neurological events where qualia are taken to exist and our folk theory and introspection are produced as outputs. In this section, we advocate the event-centred meta-method because it allows us to *revise our ontological assumptions* and has a *flexible methodology*. These features of the event-centred meta-method allow us to avoid the inflexible assumptions present in both the theory-centred and the property-centred meta-methods. In addition, it does not commit us to the narrowness of the argument-centred meta-method, as philosophical argumentation is not the only method available to interpret qualia events.

*5.1 Revision of ontological assumptions*

We argue that the event-centred meta-method allows for the revision of ontological assumptions because it holds no strong assumptions about the nature of qualia. As we have commented earlier, the theory-centred or the property-centred meta-method lead to a false dilemma between extremist affirmative and eliminative attitudes towards our assumptions about qualia, which has the potential to bias researchers. The event-centred meta-method, on the other hand, provides us with a way out of the dilemma. Remember, in the event-centred meta-method qualia are observable events, phenomena (scientifically speaking) that are tractable to a wide range of research programs and importantly, their hypotheses are *revisable* in light of discoveries. While assumptions are held, they are not inflexibly held and can be revised without being eliminative. What we believe to be the right choice of meta-method is one that can actually provide our current science with the greatest potential for development. While not without controversy, many scientists (e.g. Hohwy and Frith 2004: 192; Koch 2012: 137; Dehaene 2014: 15) and philosophers of science (e.g. Hempel 1965: 205-206; Lakatos 1970: 135-137; Kuhn 1977: 322; Chalmers 1979: 229; Nolan 1999: 281; Colyvan 2001: 79) consider the potential for development an important theoretical virtue. Given that revised ontological assumptions could be useful grounds for future studies of consciousness to develop upon, we believe that it is one reason why the event-centred meta-method should be advocated.

It is important to note that our preference for the event-centred meta-method is not a claim that eliminativism is false. Even though the two are inconsistent – because the event-centred meta-method presupposes that there is an event, whereas the eliminativism insists that there are no such events – we acknowledge the latter as an open possibility. Following our discussion of revisions of old scientific concepts in section 3, there is no uncontroversial answer to what the connection between old scientific concepts and their newer counterparts is. In scientific practice, whether theoretical contents and natural kinds are revised (like <water>, <gravity>, or <acid>) or eliminated (like <caloric fluid>, <vital force>, or <demonic possession>) is most likely determined by pragmatic considerations of the scientists, and it is difficult to see why <qualia> should be an exception. In the future there may be strong debunking evidence that can show that the seeming appearance of qualia is caused by, say, some neurophysiological processes too irrelevant or unworthy to be called qualia. However, before a criterion distinguishing eliminations from revisions is discovered and becomes uncontroversial among researchers, we believe that whether qualia should be eliminated should be determined by scientists (and philosophers) at that time according to their pragmatic concerns, not our armchair speculation. At present, there is no reason to believe that elimination will occur.

Before progressing, we will address one worry. According to Thomas Kuhn (1996), the revision of ontological assumptions is not typical or welcomed by scientists. The specific worry is this: if we reject or revise paradigms in response to some minor failings, then all our theories would ultimately be rejected, and as a result none of them could ever be substantially developed (146). Instead, it is our persistence in holding onto our paradigms that allows their potential scope and precision to be exploited (152).

We believe that our view is compatible with the Kuhnian framework. Firstly, it is worth noting that Kuhn’s thought, described above, is only meant to apply to what he calls the ‘mature’ and ‘normal’ sciences – those scientific disciplines where working scientists have developed, and are currently using, a shared paradigm. Conversely, for the ‘immature’ or ‘extraordinary’ sciences – those scientific disciplines where no shared paradigm exists, or multiple paradigms compete with each other – Kuhn agrees that revision is an important process (1996: 88-89, 147; 1970: 5-6). We think that the study of qualia reflects such an immature or extraordinary discipline, especially given the variety of meta-methods that appear to exist and are described in this paper. Similar views on the discipline are held by some scientists (e.g. Sutherland 1995: 95).[[7]](#footnote-8)

Secondly, the term paradigm for Kuhn is meant to pick out the theoretical framework (or laws) which shapes a scientific discipline. As a result, Kuhn does not consider every revision of an ontological assumption, such as the revision of a concept that resides in one paradigm, as a paradigm shift. For example, Joseph Priestley continuously revised his concept of the gas released by a heated red oxide of mercury (which is now identified as oxygen). In Kuhn’s view, Priestley’s constant revisions are not a series of paradigm shifts (1996: 79, 89). In fact, Kuhn views Priestley as being conservative about the theory of phlogiston (159). We think that the revision of ontological assumptions regarding qualia might be similar. That is, they might only be revisions that reside *within* some paradigm, such as our neuroscientific practices, and as a result do not trigger a paradigm shift. The event-centred meta-method is useful because it provides better developmental potential within paradigms – something Kuhn identifies as a theoretical virtue as well (1977: 322; 1996: 157-158).[[8]](#footnote-9)

With this in mind, we believe the event-centred meta-method is more attractive than the other meta-methods, which appear to be more theoretically conservative.This is because it can accommodate anomalies – in our case, about the nature of qualia – without triggering a paradigm shift. On the other hand, in Section 3, we saw that the theory-centred and the property-centred meta-method, as a result of lacking ontological flexibility, leads to the adoption of eliminativism or mysticism, which constitutes a radical theoretical shift.

Of course, if we consider those other meta-methods as paradigms, their proponents, according to Kuhn, could be reasonable in holding onto them. However, this fact does not make those meta-methods attractive; and if our assessment in this paper is on point, they are not. For now, we will set aside any further discussion on this point and will return to it at the end of Section 5.2.

*5.2 Flexible methodology*

Recall that the event-centred meta-method, like the other meta-methods, represents a broad direction and attitude towards the study of qualia. Philosophers and scientists who share the same meta-method can utilize very different methodologies. For example, Dennett advocates methodological naturalism and Levine advocates philosophical mysticism regarding qualia even though both adopt the property-centred meta-method. The event-centred meta-method is the same, but we argue that its openness to revisions of our ontological assumptions naturally, though not necessarily, motivates a wide and flexible methodology. The reason is that it, in comparison with other meta-methods, has less methodological commitments we consider unnecessary and, in addition, is theoretically compatible with more kinds of methodologies.We consider this a better foundation for further developments in the study of qualia, both scientific and philosophical, when compared with other contemporary methodological doctrines in the literature such as classical phenomenology and heterophenomenology.

We have seen that the theory-centred, property-centred and argument-centred meta-methods all rely on particular methodological commitments. The theory-centred meta-method requires us to focus on discovering what our folk psychological theories are and how to translate and/or reduce these folk theories into theses compatible with one’s academic traditions. The property-centred meta-method is based on immediate introspection of our experience. The argument-centred meta-method is based on armchair philosophical arguments. We have shown that all these meta-methods have their shortcomings. Contrary to them, the event-centred meta-method makes no such assumptions. It presupposes the existence of qualia but not any one description of them; and our initial theoretical conceptions about them are not simply assumed or required to be true, but rather simply allow us to begin our inquiry and is open to revision. If our theoretical – or ontological – assumptions are open to revision, then methodological assumptions should be the same because the two kinds of assumptions are interrelated. The precise reason is as follows. A methodological doctrine of a discipline is ultimately about how we can epistemically relate to the subject matter appropriately; hence, ontologies with regard to ourselves, the subject matter and how the two can relate to each other always play some important roles in determining (part of) it. Accordingly, no one methodological doctrine can claim privileged or exclusive access to an event before empirical or philosophical evidence exist to support its claim.

The view is not anything novel, but something that is widely accepted in other areas of science, and even by Kuhn, whom we will discuss again shortly. A flexible methodology could be said to reflect a pragmatic scientific attitude towards the choice of methodological methods.[[9]](#footnote-10) With this attitude, all methods are considered hypothetical and experimental and – like the data collection methods in other areas of scientific research – have to be chosen with a pragmatic, permissive, and fallible attitude. As long as supporting evidence can be provided, they are all accepted to help us to fix the target of investigation, to provide findings, and to prepare for the ideal final judgement in some cooperative ways, while every of them is considered fallible and challengeable by incoming evidence.

In the area of phenomenology, this naturally leads to a *flexible phenomenology*, i.e. a flexible methodology applied to phenomenology, reflecting the scientific attitude towards the choice of phenomenological methods. Possible methods that the flexible phenomenology can be open toward might include (not exhaustively) neuroscience, cognitive science, philosophy of mind, first-person reflection, heterophenomenology, and even the Cartesian, German, and Eastern first-person phenomenological traditions. Any evidence that is obvious and any hypothesis or argument that is convincing should be taken seriously by a rational researcher.

Classical phenomenology inspired by the Cartesian tradition sees our current first-person experiences as privileged, incorrigible and indubitable, while the perception of external objects can be mistaken (e.g. Searle 1990; Chalmers 2003; Strawson 2008). For example, when I see a turtle, I might doubt that there really is a turtle and believe instead that I am hallucinating or having a dream. However, the experience of seeing a turtle and its contents are something that I can claim authority over. Some researchers apply this view to qualia. For example, John Searle writes, ‘where consciousness is concerned the existence of the appearance is the reality’ (112). However, it is hard to see how the view can be consistent with what current science tells us about consciousness.

The event-centred meta-method naturally resists the above exclusive methodological assumption. It presupposes the existence of the experiences but not any description of or methodology to study them. Any data obtained from first-person phenomenology is revisable through both scientific investigation and armchair reflection. However, it is also important to note that while this flexible attitude *resists* exclusive assumptions, it does not *reject* them. Privileged or exclusive access is not considered as false, but is considered with an (cautiously) open attitude. It can be vindicated through empirical or philosophical evidence. Current evidence against it should also be considered as fallible. In this case, the incorrigible thesis, for example, can still demonstrate its correctness through showing the mistakes in the current evidence against it.

This resistance to privileged and exclusive access also results in a resistance to heterophenomenology, which claims exclusive access through third-person scientific investigation. Heterophenomenology reflects Dennett’s denial of phenomenological experience and this, we have argued, does not have to be assumed. Researchers adopting an event-centred meta-method do not have to stay in the third-person, and introspections can be taken as more than speech acts. Evidence does not have to be rejected simply because it is found within one’s first-person perspective. What is important is that this evidence is not assumed to be authoritative or reliable, and must be scientifically and philosophically assessed with the possibility of eventually being explained away.

One other interesting comparison that can be drawn is one with psychologist Max Velmans’s (2007) critical phenomenology, which Velmans advocates as an alternative to Dennett’s heterophenomenology. Both the critical phenomenology and the flexible phenomenology assumes neither first-person nor third-person reports of phenomena to be incorrigible or complete. Both advocate an accommodation between first-person introspection and third-person scientific investigation, and are open about the way the accommodation should proceed (227). Nonetheless, even though the critical phenomenology might be relatively similar to the flexible phenomenology in practice, there is a significant difference in their motivations and thus some notable differences in practice caused.

Velmans develops his critical phenomenology from the theoretical assumption that first-person and third-person investigation are ‘mutually irreducible’ and that a complete account of mind requires both (227). On the contrary, the flexible phenomenology makes no such assumptions. As we have noted, rather than being a concrete phenomenological method, the flexible phenomenology is an underlying attitude towards the choice of phenomenological methods. The attitude is a pragmatic, experimental and fallible one, and it does not presuppose the privileged and exclusive access of any phenomenological method. It is important to remember that this attitude is a *resistance to* such dogmas, not a *rejection of* them. Hence, while the critical phenomenology in principle opposes exclusive phenomenological methods such as heterophenomenology and the incorrigibility thesis, the flexible phenomenology allows those methods to be experimentally applied. It is true that the flexible phenomenologist does not consider the results of these experimental applications as all-things-considered judgements, but she can accept them as useful input data in service of her purpose. Moreover, the flexible phenomenology also does not exclude the possibility that an exclusive method, through incoming scientific or philosophical evidence, might eventually demonstrate that it is correct.

Is the flexible phenomenology practical and useful to researchers? We think yes, and we believe that some researchers are already applying it, or (practically) similar strategies such as critical phenomenology, and thereby have findings that are widely recognized as important breakthroughs. Dennett has claimed that ‘the ground rules [of heterophenomenology are] already tacitly endorsed by the leading researchers’ (1993b: 50) and that ‘most of the method is so obvious and uncontroversial that some scientists are baffled that [Dennett himself] would even call it a method’ (2003: 20). While it is true that scientists have typically shunned the inclusion of classical phenomenology, not all have. Recent research from neuroscience has shown a turn or, as neuroscientist Christof Koch notes, a ‘true paradigm shift’ from this tradition (2012: 6). One interesting and explicit example is Masafumi Oizumi, Larissa Albantakis and Giulio Tononi’s recent paper, ‘From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0’ (2014). This group of neuroscientists take classical phenomenology of qualia seriously in order to understand its nature and then attempt to map this onto physical mechanisms. More specifically, they take some axioms in phenomenology to be ‘immediately evident’ and then map them onto their influential integrated theory (2).[[10]](#footnote-11) Despite this scientific research program proceeding in the complete opposite direction to what might typically be found in cognitive neuroscience, it has gained a wide amount of traction and followers.

Finally, it might be objected that the flexible phenomenology seems to be inconsistent with Kuhn’s framework. This is because Kuhn believes that it is beneficial for our ontological and methodological frameworks to be held fixed most of the time. In response, our argument should be seen as consisting of two major components. Firstly, following Kuhn (1996: 44-46), as well as some scientists (e.g. Weinberg 1993: 131), we view science as being constrained by a large set of established practices, and not a few simple rules. This means that more than one methodology is *logically* available. Secondly, our view is not the view that we should be flexible with regard to individual methodological frameworks. Instead, our flexible phenomenology *is* the methodological framework we endorse, for the conceptual reasons and empirical successes we have described in this section. It is important to note that the flexible phenomenology is not arbitrary in its research direction. Its research direction is guided and constrained by established theoretical and ontological frameworks, such as currently successful theories in neuroscience. More specifically, research projects developed by the flexible phenomenology are an extension of these frameworks, and do not simply diverge from them.

**6 Conclusion: The importance of considering meta-methods**

In this paper, we sketched a variety of meta-methods open to philosophers and scientists investigating qualia. Furthermore, we advocated for the event-centred meta-method as it allows for the revision of ontological assumptions and a flexible methodology, which, we argued, are supported by the lessons from the history and practice of science and in addition, have the greatest likelihood to provide our current scientific (and philosophical) knowledge of qualia with the greatest development.

Some eliminativists who favor bottom-up approaches (e.g. Rosenberg 2011) might argue that direct inquiries of the brain sciences without consideration of qualia are good enough. This is because the ideal theory of the brain should tell us everything about consciousness, and if qualia really do exist, they will eventually be uncovered by this approach as well. While it is possible that a purely bottom-up approach is a route to the ideal theory of qualia, our current science is far from reaching the ideal theory and thus require a realistic and pragmatic strategy. As Hohwy and Frith argue, we very rarely attempt to explain things completely from the bottom-up; scientific inquiries are unavoidably driven by what we are interested in (2004: 192). Hence, we advocate that the approach that can actually provide our current science with the greatest development should be preferred.

Having a good meta-method helps us locate our target of interest and prevents us from missing sources of good evidence. Researchers who adopt an event-centred meta-method such as Hohwy, Frith, Edelman, and Tononi provide examples of interesting new research programs possible for qualia. Given the current limitations in neuroscience, these research programs cannot possibly be developed through any methodological dogmatism. It is also noteworthy that the meta-method is not exclusively available to researchers who work in a particular discipline, as can be shown by the diversity of the researchers we mentioned, which consists of neuroscientists, psychologists and philosophers. In sum, taking seriously our meta-methods and their hidden influences could result in significant opportunities for improvements to current scientific and philosophical understandings of qualia.

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1. Here we assume, from the perspective of most working researchers (e.g. P. S. Churchland 1988; Hohwy and Frith 2004; Koch 2012; Dehaene 2014) – and our perspective throughout this paper – that developments are generally positive and beneficial to the research discipline. We set aside the debate in philosophy of science as to whether or not developments constitute progress. [↑](#footnote-ref-2)
2. It is noteworthy that Russell endorses different views at different stages in his life. See Tully (2003) and Wishon (2015) for detailed studies of his different views on qualia. [↑](#footnote-ref-3)
3. Frank Jackson no longer holds this view. [↑](#footnote-ref-4)
4. For an overview of scientific findings that show the inaccuracy of our initial assumptions about consciousness, see P. S. Churchland (1988: 288-290), Dennett (1991: 68-70). We shall not repeat the cases here. [↑](#footnote-ref-5)
5. Certainly, what is meant by a causal role is a bit unclear, and thus what it takes for a causal role to be true (or false) is also a bit unclear. Therefore, it could be asked under what conditions the qualia role could be radically false.

   For example, if a causal role is defined only as whatever it is that causes our beliefs about the role, this would almost guarantee the existence of qualia to be trivially true, since the only way that it could turn out to be false is if our thoughts about qualia are causeless or causally inefficacious. But qualia are not supposed to be so; zombies, if possible, have thoughts about qualia which are not causeless and causally inefficacious, but they do not have qualia.

   A clue might be Lewis’s causal descriptivism, which he proposes elsewhere (1984). On the view, the references of names have to be determined by descriptive fitness while descriptions have to be couched in casual terms. With this in mind, a causal role seems to be a comprehensive description of the properties of its reference in causal terms. In this case, the qualia role could be radically false if some important causal descriptions of it do not correspond to its actual features. [↑](#footnote-ref-6)
6. No doubt, some might worry that *all* radically false old concepts do not track anything. It is impossible to address this worry in detail in this paper because it involves debates in the theory of reference that are far beyond our scope. But, empirically speaking, it seems to be fairly obvious that old theories such as Aristotelian and Newtonian physics are tracking some phenomena, despite the fact that they do not correctly correspond. In particular, to assert that old concepts do not track anything requires us to believe that our ancestors’ worldviews track almost nothing, which is fairly implausible. Hence, it seems that we have good reason to assume that old concepts do track something, but not to assume the radical opposite view. In fact, even in the recent literature on eliminativism, it is more popular among eliminativists to endorse scientific eliminativism – according to which folk concepts should not have any place in our scientific ontology, whereas semantic eliminativism – which is the more radical view that folk concepts do not refer to anything – is less popular. [↑](#footnote-ref-7)
7. We appreciate an anonymous referee for raising the Kuhnian objection, and offering up one possible reply. [↑](#footnote-ref-8)
8. For a more systematic discussion of this point, see Lakatos 1970: 135-137. [↑](#footnote-ref-9)
9. Here we are focusing on the actual practice of science by scientists; and the debates on how to provide *a priori* conceptions of the so-called scientific method and thereby the distinction between science and pseudoscience or non-science are set aside. On our view, most areas of science have already developed their own ontological and methodological frameworks, and most of those frameworks are sufficiently sophisticated and systematic to allow appropriate researches to distant themselves from pseudoscience or non-science. Hence, there is no need to use *a priori* norms to provide such distinction. In fact, in our observation, it is currently more common for contemporary philosophers of science to observe what scientists actually do and offer philosophical regimentations, analyses, and advices. In contrast, it is not obviously an attractive approach for philosophers to develop an *a priori* set of rules that strictly restricts what scientists could do and ought to do. Nevertheless, in any case, we leave the questions of whether the flexible methodology and its applications in different areas can be consistent with the *a priori* conceptions of science as open questions. [↑](#footnote-ref-10)
10. It can be questioned whether this method is associated with the event-centred metamethod because of its similarity to the property-centred metamethod. We think not because of the same line of reasoning we used to interpret Edelman and Tononi (2001), but this is not the concern here. What is important here is that the paper is an obvious case to show some scientists’ turn from the tradition Dennett describes. [↑](#footnote-ref-11)