
A Theory of Sense-Data

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Abstract

I develop and defend a sense-datum theory of perception. My theory follows the spirit of classic sense-datum theories: I argue that what it is to have a perceptual experience is to be acquainted with some *sense-data*, where sense-data are private particulars that have all the properties they appear to have, that are common to both perception and hallucination, that constitute the phenomenal characters of perceptual experiences, and that are analogous to pictures inside one's head. But my theory also diverges from conventional sense-datum theories in some key respects: on my view, (1) sense-data are neural states presented first-personally, (2) the sensational qualities of sense-data differ in kind from the sensible qualities of external objects, and (3) sense-data are the vehicles in virtue of which we perceive, rather than the objects that we perceive. I argue that this package of claims is appropriately labeled 'sense-datum theory', and that the resultant view ought to be a live contender in contemporary philosophy of perception.

Introduction

The sense-datum theory is dead. It's not clear when exactly the moment of death occurred, but most agree it was the result of a gradual process that started sometime in the mid-twentieth century. Since then, a few brave theorists have attempted to resurrect the theory.¹ But whatever you might think about the merits of their arguments, it's fair to say that none of those attempts have brought sense-data back to life.²

The situation used to be different. A century ago, sense-data occupied a prominent role in analytic philosophy.³ Back then, there were more debates about the nature of sense-data than about whether sense-data exist in the first place. Since then, the idea of a sense-datum has become an object of philosophical ridicule. Almost no living philosophers choose to identify as sense-datum theorists. Those who favor views within the vicinity often take pains to emphasize why their view doesn't actually count as a version of sense-datum theory. Nowadays, to suggest that a theory is committed to sense-data is to expose an embarrassing consequence of that theory.

The aim of this paper is to develop and defend a version of sense-datum theory. In my opinion, the current unpopularity of the view is more a matter of sociological artifact than philosophical wisdom. I don't think we ought to take the existence of sense-data for granted,⁴ as some did in those

¹ For recent-ish defenses of sense-data, see Jackson [1977], Lowe [1992], Robinson [1994, 2023], García-Carpintero [2001], O'Shaughnessy [2003], Brown [2012, 2016], and Warren [2023]. For some classic defenses of sense-data, see Russell [1912, 1914], Moore [1913-1914], Broad [1923], Price [1932], and Ayer [1940]. For some influential critiques of sense-data, see Hicks [1912], Barnes [1944], Ryle [1954], and Austin [1962].

² In the 2020 PhilPapers Survey, the sense-datum theory was one of the least popular views across the whole survey. See Bourget & Chalmers [2022] for an overview of the results.

³ Price [1932: 18] says that "the admission that there are sense-data is not a very large one; it commits us to very little." Instead, "the term sense-datum is [...] a *neutral* term" that "is meant to stand for [...] something from which all theories of perception ought to start, however much they may diverge later." Similarly, Hatfield [2021] says that Moore "introduced the term 'sense data'" [...] "not in the spirit of arguing that sense data exist but of drawing our attention to their obvious existence."

⁴ Warren [2023] appeals to metaontological and linguistic considerations to argue that we *should* take sense-data for granted. On his view, "the existence of sense-data does not hinge

old days. But I do think the view ought to be taken much more seriously than it is now. There are caricatures of the view that are easy to disparage, and that may well be vulnerable to fatal objections. But once we move past those easy targets, we will see that the sense-datum theory—or at least one version of it—ought to be a live contender in contemporary philosophy of perception.

The theory I'll develop follows the spirit of classic sense-datum theories. I'll argue, alongside all sense-datum theorists, that what it is to have a perceptual experience is to be acquainted with some sense-data, and that the phenomenal character of one's perceptual experience is constituted by the sense-data with which one is acquainted. I'll also accept—given the appropriate precisifications—that sense-data are particulars that are common to both perception and hallucination, that have all the properties they appear to have, that are located in a private mental space, and that are analogous to pictures inside one's head.

At the same time, my theory diverges from classic sense-datum theories in some key respects. On my view, (1) sense-data are first-person presentations of neural states, (2) the sensational qualities of sense-data are categorically different from the sensible qualities of external objects, and (3) sense-data are perceptual vehicles, rather than perceptual objects.

The divergences between my theory and more familiar versions of sense-datum theory will lead some to question whether my theory really ought to count as a sense-datum theory at all. I'll say quite a lot throughout the paper about why I think the best analysis of 'sense-datum theory' includes my view. And those who still resist may reinterpret this paper as an endeavor in conceptual engineering (rather than merely conceptual analysis). There's a picture of perception that I want to paint, and I think it's apt to classify it under the label 'sense-datum theory'. I'll argue for the aptness of the label. But what's most important is the picture itself.

on the success of" substantive theories of perception. Instead, he motivates the sense-data framework "as a background framework that [does] not require substantive defense," and interprets sense-datum theory as "not a substantive theory about the nature of experience." By contrast, I take sense-datum theory to be a substantive first-order theory of perception.

My dialectical aims are ambitious in one way and modest in another. The ambitious aim is to resurrect sense-datum theory: I want to show that those of us who feel tempted by sense-datum theory need no longer resist its seductive allure, that those who have been quick to dismiss sense-datum theory have overlooked the best versions of the view, and that appeals to sense-data need no longer be causes for shame and guilt. But my aim is also modest in that I won't attempt to persuade those already sympathetic to other views in the philosophy of perception. Given the present unpopularity of sense-data, it's already audacious to argue that sense-datum theory is even viable. The task of convincing those already swayed by another theory will have to wait another day.

Here's the plan: §1 defines 'sense-data', articulates a core motivation for sense-datum theory, and defines what I'll call the 'standard sense-datum theory'; §2 presents the core claims of my theory of sense-data; §3 discusses the roles of acquaintance and representation in my theory; §4 explains how my theory answers the standard objections to sense-datum theories; and the [APPENDIX](#) discusses the relationship between sense-datum theory and qualia/inner-state theory.

§1 Sense-Data

A philosophical theory of perceptual experience ought to answer the following two questions:

- Q₁: What is it for a subject to have a perceptual experience at all?
- Q₂: What makes a given perceptual experience feel the way it does?

An answer to Q₁ tells us what the theory says about the *nature* of perceptual experience.⁵ An answer to Q₂ tells us what the theory says about the *character*

⁵ Note that answering Q₁ isn't a matter of providing a solution to the mind-body problem. For example, the intentionalist's answer to Q₁ is 'standing in the experiential representation relation to some contents', and the naïve realist's answer to Q₁ is 'being perceptually acquainted with some external objects'. But both those answers are compatible with a variety of solutions to the mind-body problem.

of perceptual experiences. Here's how sense-datum theories answer these questions:

The Core Claims of Sense-Datum Theory

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| NATURE | What it is to have a perceptual experience is to be acquainted with some sense-data. |
| CHARACTER | What it's like to have a perceptual experience is a matter of the sense-data with which one is acquainted. ⁶ |

A few remarks on terminology. I'll use *perceptual experience* non-factively, and I'll use *perception* to denote veridical perceptual experiences (so hallucinations are perceptual experiences, but not perceptions). I'll often drop 'perceptual' and just speak in terms of 'experiences'. I'll always use *sense-data* to denote particulars, and *sensational qualities* to denote the qualities that characterize sense-data. I'll use *sensible qualities* to denote the qualities referred to by sensible terms such as 'red', 'sweet', and 'loud'. A substantive question is whether sensational qualities just are sensible qualities—I'll discuss that later.

Over the rest of this section, I'll discuss how to define 'sense-data', the core motivation for sense-datum theories, and the commitments of what I'll call the 'standard sense-datum theory'.

'Sense-Data'

Let's start with a basic question: What exactly are sense-data?

This question can be interpreted either as asking for (1) a *definition* of 'sense-data', or (2) a *theory* of sense-data. To answer the first question is to

⁶ Is CHARACTER a claim about partial or whole constitution? Well, consider a sense-datum theorist who thinks that only low-level phenomenal properties are wholly constituted by sense-data, but that perceptual experiences also instantiate high-level phenomenal properties (Siegel 2010). Or, consider a sense-datum theorist who thinks that the qualitative character of perceptual experiences is wholly constituted by sense-data, but that perceptual experiences also have a subjective character (Kriegel 2009). The coherence of these views indicate that it's merely partial constitution that's relevant. But for simplicity, I'll assume for the rest of the paper that the sense-datum theorist takes all phenomenal character to be wholly constituted by sense-data.

specify the meaning of the term 'sense-data'. To answer the second question is to provide an account of the nature of sense-data themselves. Two philosophers might agree on how to use the term 'sense-data' yet disagree on which sense-datum theory is best (or whether any sense-datum theory is viable at all). For now, I'll focus merely on how to define 'sense-data'. This will enable us to identify the core commitments of any sense-datum theory, including my own.

Many characterizations of sense-data fare poorly as general definitions. Sometimes definitions are overly permissive: for example, when 'sense-data' is defined as 'whichever objects one is acquainted with in having an experience'. This definition has the undesirable consequence that even naïve realists count as sense-datum theorists, since naïve realists hold that perception involves acquaintance with external objects. Other definitions are overly restrictive: for example, when 'sense-data' is defined as 'non-physical entities that one cannot have mistaken beliefs about'. This definition has the undesirable consequence of excluding many authors who have explicitly called themselves 'sense-datum theorists', including (as I'll discuss later) some originators of the view.

I'll understand 'sense-data' as any entities that satisfy all the following criteria:⁷

- (a) perceptual experience just is acquaintance with sense-data.
- (b) sense-data are particulars.
- (c) sense-data have all the properties they appear to have.
- (d) sense-data are private.
- (e) sense-data are located in mental spaces.

(a) is simply a paraphrase of NATURE and CHARACTER, and specifies the core theoretical role that sense-data play in a theory of perception. (b), (c), (d), and (e) identify what are arguably essential properties of sense-data. I'll say more later in support of this definition, and I'll explain later how

⁷ I'll treat these criteria as individually necessary and jointly sufficient. An alternative approach would be to treat 'sense-data' as a cluster term (whereby none of the individual criteria is necessary, but where enough are jointly sufficient).

exactly I wish to substantiate notions such as ‘acquaintance’, ‘appear’, and ‘private’.

I’ll use ‘sense-datum theory’ to denote the class of theories that endorse the existence of sense-data (in the sense specified above). This definition enables us to include nearly all authors who have explicitly labeled themselves a ‘sense-datum theorist’, and to exclude nearly all authors who have explicitly rejected that label.⁸

There’s a subtle question, for sense-datum theorists, of whether phenomenal character is to be identified with sense-data themselves or with one’s acquaintance with sense-data. For simplicity, I’ll freely move back and forth between ascribing properties to sense-data and ascribing properties to experiences (where sense-data, on certain views, are constituents of experiences, rather than themselves experiences). I’ll also make the following linguistic assumption: if a sense-datum is *F*, and if that sense-datum is a constituent of experience *x*, then there’s a true reading of the sentence ‘experience *x* is *F*’.

Sense-datum theories are often contrasted with *intentionalism*, according to which perceptual experience is a matter of standing in the experiential representation relation to certain representational contents, and *naïve realism*, according to which perceptual experience is a matter of acquaintance with external objects. There are also “qualia theory” and “inner-state theory,” whose definitions are murkier. It’s easy to demarcate my view from naïve realism. In §3, I discuss the relationship between my view and intentionalism. And in the [APPENDIX](#), I discuss the relationship between my view and qualia and inner-state theory.⁹

⁸ Two odd cases are Bermudez [2000] and Forrest [2005], who both adopt the label ‘sense-datum theory’ (though who both also contrast their view with traditional sense-datum theories). Bermudez identifies sense-data with the facing surfaces of external objects, and Forrest identifies sense-data with universals. Both these authors are using ‘sense-data’ in a more permissive way than I am, and neither author aims to preserve mutual exclusivity between sense-datum theory, naïve realism, and intentionalism. On my preferred taxonomy, Bermudez is a naïve realist and Forrest an intentionalist.

⁹ There’s also *adverbialism*, the view that different kinds of perceptual experiences are to be understood in terms of how one perceives (say, redly *vs.* greenly) rather than what one

Sense-datum theory is commonly illustrated using analogies and metaphors. It's often said that sense-datum theorists think that perception is analogous to a virtual reality simulation occurring inside one's head, that the entities we're directly aware of via perception are in some sense mental pictures, and that there's a veil of phenomenology between ourselves and the external world. These expressions are sometimes invoked to evince the implausibility or extravagance of sense-datum theory. But these ideas all strike me as fundamentally correct, at least once we interpret them charitably. A goal of this paper is to argue that the kind of picture evoked by these colorful remarks is defensible.

The Core Motivation

My aim is to develop a theory of sense-data. But I won't develop new motivations for sense-data; instead, my new theory will retain the support from old motivations. Although there are a number of classic arguments for sense-data, I'll mention only a simple argument that I find compelling. The argument appeals to the following two premises:

PRESENTATION If one has a perceptual experience, then one is presented with some concrete particulars.¹⁰

perceives. However, adverbialist theories tend to focus on a somewhat different explanatory target than other theories of perception. First, adverbialism is primarily an account of how to differentiate between different kinds of perceptual experiences, leaving open the question of what it is to have a perceptual experience in the first place. Second, adverbialist theories tend to focus mainly on linguistic issues (such as how to translate the objectual clauses in sentences about perceptual experiences into adverbial expressions), rather than the metaphysical and epistemological questions that other theories tend to focus on. These divergences make it difficult to specify the relationship between adverbialism and other theories of perception. Sometimes, adverbialism is defined as rejecting PRESENTATION (see below), in which case my theory is incompatible with adverbialism. Other times, adverbialism is taken to reject merely the claim that perceptual experience involves perceptual awareness of perceptual objects, in which case my theory is compatible with adverbialism.

¹⁰ PRESENTATION leaves open whether the objects one is presented with are ordinary external objects, sense-data, or something else, and whether they instantiate sensible qualities, sensational qualities, or something else.

HALLUCINATION For any perception, there's a possible hallucination that has the same phenomenal character.

Much of the philosophy of perception is oriented around how to deal with these two claims (and whether we must give up one of them). Those who endorse intentionalism tend to give up PRESENTATION (by taking perceptual experience to be a matter of presentation of universals, rather than particulars).¹¹ Those who endorse naïve realism tend to give up HALLUCINATION (either by rejecting the possibility of hallucinations altogether, or by holding that hallucinations and perceptions have different phenomenal characters).¹² Many, however, find both PRESENTATION and HALLUCINATION compelling. Since there's already plenty of discussion of these claims, I won't try to defend them here. Instead, I'll simply note how those these claims can be used to motivate sense-datum theory. To develop the argument, we'll need one more claim as a bridge principle:

COMMON KIND If two experiences have the same phenomenal character, then they are of the same metaphysical kind.

COMMON KIND doesn't specify what it is for two experiences to be of the same metaphysical kind. But I'll assume that anyone who endorses COMMON KIND is committed to the following: if experience x is of the same metaphysical kind as experience y , and if the phenomenal character of x consists of being presented with entities of kind F , then the phenomenal character of y also consists of being presented with entities of kind F . This cumbersome claim is intended to capture the idea that the phenomenal characters of hallucinations and perceptions ought to be given the same metaphysical analysis.

¹¹ Some intentionalists hold that some perceptual experiences have object-involving contents (where external objects are constituents of the contents). On my preferred classification scheme, such views are combinations of intentionalism and naïve realism.

¹² See Masrour [2020] and Byrne & Manzotti [2023] for articles contesting the very possibility of hallucinations, and Hinton [1967], Martin [2006], and Fish [2009] for articles contesting the claim that hallucinations have the same phenomenal character as perceptions.

With these premises, it's straightforward to construct an argument for sense-datum theory. Given HALLUCINATION, some perceptual experiences aren't a matter of being presented with external objects.¹³ Given PRESENTATION, those perceptual experiences still involve being presented with particulars of some kind. And given COMMON KIND, the particulars that are presented in perception must be of the same kind as the particulars that are presented in hallucination. The sense-datum theorist retains all these claims by postulating sense-data: entities that satisfy the theoretical roles outlined earlier in the paper. In other words, the sense-datum theorist holds that all perceptual experience—whether veridical or hallucinatory—is a matter of being presented with sense-data.

This is a classic argument: it's nothing new, it isn't the only way to motivate sense-datum theory, and there's plenty of room for debate on whether it's viable to give up on either PRESENTATION or HALLUCINATIONS (or COMMON KIND). Nevertheless, I find this classic argument compelling. My plan, for the rest of the paper, is to take the force of this argument for granted and to show how we can build a plausible theory around it.

The Standard Theory

Before turning to my theory of sense-data, I'll first define what I'll call 'the standard theory'. The standard theory is the version of sense-datum theory that most contemporary philosophers have in mind when they hear 'sense-datum theory'. It's also the target of standard objections to sense-datum theories, and it will serve as a useful foil for my own view.

The standard theory accepts NATURE and CHARACTER, the core commitments of any sense-datum theory. It also accepts the following:

¹³ D'Ambrosio & Stoljar [2023] argue that 'perceive' can be interpreted as an intensional transitive verb, where one can perceive a particular x even if x doesn't exist (just as one can search for x even if x doesn't exist). This move might enable one to vindicate the idea that whenever one has an experience, one is presented with some external particular instantiating sensible qualities. But this move won't satisfy the version of PRESENTATION that motivates sense-datum theory, since the particulars that one is aware of via hallucinations would be non-existent (whereas PRESENTATION is to be interpreted as concerning existing particulars).

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| SUBSTANCE DUALISM | Sense-data are non-physical entities. |
| QUALITY MONISM | Sensational qualities are sensible qualities. |
| OBJECTUALISM | Sense-data are perceptual objects. |

The challenges for these claims are familiar and well-examined. I'll mention some of these challenges later, when I explain how my theory of sense-data handles objections to the standard theory. I'll also soon explain how my theory of sense-data rejects all three of the claims above. But before turning to my view, let me first address a metatheoretical worry:

The Verbal Objection: No view that rejects SUBSTANCE DUALISM, QUALITY MONISM, and OBJECTUALISM can count as a sense-datum theory. At least one of these claims is built into the definition of 'sense-data'. Therefore, even if the theory developed in this paper is defensible, it's not a version of sense-datum theory.

I'll make five points in response. None is intended to be individually decisive, but I think they collectively make a strong case for resisting this objection.

HISTORICAL PRECEDENT—In the early twentieth century, many sense-datum theorists, such as Moore [1914] and Russell [1914: 149], explicitly rejected SUBSTANCE DUALISM, holding instead that sense-data are physical entities. Other sense-datum theorists, such as Price [1932: 18], took it to be an open question whether sense-data are mental, physical, both, or neither.¹⁴

During this time, sense-datum theorists usually took for granted that sense-data instantiate sensible qualities (such as redness). But this may be partly due to the limited vocabulary available for describing the qualities of experiences. Furthermore, some historical philosophers explicitly rejected QUALITY MONISM: for example, Russell [1912: 17] held that the qualities

¹⁴ Russell [1914: 116] says, "I regard sense-data as not mental, and as being...part of the actual subject-matter of physics." See Hatfield [2021] for more discussion.

instantiated by sense-data differ in kind from the qualities instantiated by external objects.¹⁵

Historically, sense-datum theorists often claimed that sense-data are the objects of perception. By contrast, the theory of sense-data I'll develop construes sense-data as the vehicles of perception. However, the term 'vehicles' became popular within analytic philosophy only in the late twentieth century.¹⁶ In fact, historical sense-datum theorists often drew a distinction between direct *vs.* indirect objects of perception, which mirrors the distinction that I'll later draw between perceptual vehicles and perceptual objects. This makes it plausible that some historical sense-datum theorists would have accepted the idea that sense-data are perceptual vehicles, even if they wouldn't have expressed the idea using that vocabulary.

TERMINOLOGICAL DRIFT—Sometimes 'physical' means any entities that are ultimately grounded in microphysical entities. Other times 'physical' means only entities that are paradigmatic physical objects, usually with clear spatial boundaries. As examples, economies and beliefs are physical in the former sense but non-physical in the latter sense. Similarly, sense-data may be non-physical in the same way that anything that's not a material object is non-physical. But they needn't be construed as non-physical in the same way that ghosts, souls, and ectoplasm are non-physical.

The core theoretical roles associated with sensible terms have shifted over time. Historically, sensible terms were used primarily to denote whichever qualities are directly presented in experiences. Nowadays, sensible terms are used primarily to denote the qualities of external objects. If we privilege the former role, then sense-data instantiate sensible qualities (but it's an open question whether sensible qualities are instantiated by external objects). If we privilege the latter role, then external objects instantiate sensible qualities (and it's an open question whether sense-data instantiate

¹⁵ Hatfield [2002: 210], using the language of contemporary philosophy, writes that Russell [1912] distinguished "between phenomenal color as found in sense-data and the physical color properties that cause those sense-data."

¹⁶ It's not clear exactly when the term 'vehicles', in the relevant sense, was first used within analytic philosophy, but Dennett [1991], Millikan [1991], and Dennett & Kinsbourne [1992] were influential in popularizing the term.

sensible qualities). Given this shift in theoretical roles, it's unsurprising that sense-data are often defined as instantiating sensible qualities. But once we disentangle these roles, it's better to leave the question of whether sense-data instantiate sensible qualities as a matter open for debate.

CONTEMPORARY DEFINITIONS—In contemporary philosophy, it's relatively common to see either SUBSTANCE DUALISM, QUALITY MONISM, or OBJECTUALISM built into the definition of 'sense-datum theory'. But there's no single standardized definition associated with 'sense-datum theory', and it's often unclear whether a given gloss is intended to cover all versions of the view (including historical precedents). Moreover, many contemporary authors focus mainly on mentioning the excesses of the standard theory, rather than on developing a general analysis of 'sense-datum theory'.

For each of the claims of the standard theory, there are contemporary precedents for leaving that claim out of the definition of 'sense-datum theory'. Crane & French [2021: 3.1] characterize a sense-datum as "just *whatever* it is that you are directly presented with that...characterize[s] the character of your experience," leaving open questions about "the *nature* of sense-data." They also suggest that the sense-datum theorist might construe sense-data as "the medium by which we perceive ordinary objects." Robinson [1994: 214] considers versions of sense-datum theory that take the qualities of sense-data to be merely isomorphic (rather than identical) to the qualities of the objects they represent. García-Carpintero [2001: 26, 29] distinguishes the "primed" redness instantiated by sense-data from the redness instantiated by external objects, leaving open whether the primed redness "might be identified *a posteriori* with a neurological property." And Macpherson [2014: 388] discusses sense-datum theories that hold that "sense-data...are vehicles of representation" and where "phenomenal character consists in the sense-datum...(the vehicle)" rather than "what is represented."

THEORETICAL SPACE—A taxonomy of theories of perception ought to carve up the theoretical space in interesting and fruitful ways. A more loaded definition of 'sense-datum theory' yields a less elegant partition of the theoretical space, leaving unsightly cracks between the categories. On my preferred taxonomy, the major philosophical theories of perception are

distinguished by their answers to two central questions: (1) What is it to have a perceptual experience at all?, and (2) What constitutes the phenomenal characters of perceptual experiences? Further questions—about whether experiences are physical or not, about whether sensible qualities are instantiated by experiences or not—depend on the specific version of the theory one favors.

CONCEPTUAL ENGINEERING—Theoretical terms vary in how standardized their definitions are. When a term is loosely defined—as with ‘sense-datum theory’—it’s partly up to us how to define it. There’s probably no definition of ‘sense-datum theory’ that includes all and only those who have called themselves sense-datum theorists. But we can still construct a definition that respects historical precedent, that fits within a natural taxonomy, and that captures the spirit of the view. In other words, constructing a definition of ‘sense-datum theory’ is an endeavor both in conceptual analysis and in conceptual engineering.¹⁷

It may strike some readers as silly to expend this much effort over how we classify views. But while classification is in some sense a verbal issue, it’s also dialectically significant, at least in this particular case. The mere suggestion that a view can be classified as a sense-datum theory is oftentimes construed as an objection to that view. And this fear of embarrassment by association distorts the philosophical conversation. Occasionally, a philosopher develops a theory of perceptual experience that looks, sounds, smells, and feels very much like a sense-datum theory, yet then stresses that their view isn’t actually a version of sense-datum theory. Other philosophers, meanwhile, will accuse such views of merely being sense-datum theory repackaged in language more agreeable to contemporary philosophers.¹⁸ A goal of this paper—alongside developing a theory of

¹⁷ Coates [2007] says the following: “There has never been a single universally accepted account of what sense-data are supposed to be; rather, there are a number of closely related views, unified by a core conception. This core conception of a sense-datum is the idea of an object having real existence, which is related to the subject’s consciousness. By virtue of this relation the subject becomes aware that certain qualities are immediately present.”

¹⁸ Here’s a recent example: Jackson [2018: 2], in a review of Levine’s “Quality and Content: Essays on Consciousness, Representation, and Modality,” says that Levine’s “virtual

perception—is to undermine the dialectical force of that move. Whatever you think about my view, you won't win a debate by accusing me of being a sense-datum theorist.

§2 The Core Theory

I'll now present the package of claims that collectively comprise my theory of sense-data. In the next section, I'll further characterize my theory by discussing how acquaintance and representation fit into the view.

A preliminary qualification: I won't have room to fully defend each individual component of my theory. But, when possible, I'll note other authors (who may or may not be sense-datum theorists) who have defended similar claims. A general theme behind my arguments is that contemporary sense-datum theorists can avail themselves of philosophical moves that hadn't yet been developed in earlier periods.

The first two claims of my theory are simply the claims that are definitive of any sense-datum theory:

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| NATURE | What it is to have a perceptual experience is to be acquainted with some sense-data. |
| CHARACTER | What it's like to have a perceptual experience is a matter of the sense-data with which one is acquainted. |

The other three claims mark the ways in which my theory diverges from the standard theory:

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| SUBSTANCE MONISM | Sense-data are first-person presentations of neural states. |
| QUALITY DUALISM | The sensational qualities of sense-data differ in kind from the sensible qualities of external objects. |
| VEHICALISM | Sense-data are perceptual vehicles. |

objects"—objects that characterize what it's like to have perceptual experiences, and that are of a distinct metaphysical category from external objects—are perhaps merely "sense data under another name."

In what follows, I'll discuss and motivate each of these claims. I'll also discuss advantages of my theory over the standard theory.

1. SUBSTANCE MONISM

According to SUBSTANCE MONISM, sense-data are first-person presentations of neural states.¹⁹ Put another way, sense-data are neural states accessed from a first-person perspective.

There's a subtle metaphysical question concerning whether sense-data are to be identified with the first-person presentations or with the neural states that are presented. I'll remain agnostic between these options. It may turn out that the relevant neural states are individuated in such a way that they exist only when presented first-personally, in which case these two versions of the view will be extensionally equivalent. Otherwise, the question basically turns on whether sense-data can exist unconsciously (at least if we accept that for x to be presented first-personally just is for x to be presented consciously). I don't see a strong reason for favoring either view, and I suspect that which option is best will depend on one's other theoretical commitments. For the rest of the paper, I'll talk as though sense-data are identical to the neural states themselves (but that we call them 'sense-data' only when they're presented first-personally). But this is mostly for simplicity of prose: those who instead favor identifying sense-data with the first-person presentations can translate all my claims.

SUBSTANCE MONISM is a claim about particulars, rather than properties or facts. In the context of classic metaphysics of mind, SUBSTANCE MONISM is a very modest claim: it's merely a token identity theory, which leaves open whether sensational facts are grounded in physical facts (and hence whether or not physicalism is true). Nevertheless, SUBSTANCE MONISM is an important point of divergence between my theory of sense-data and the standard theory. Whereas the standard theory takes sense-data to be

¹⁹ I frame my discussion in terms of neural states. But nothing essential turns on either the term 'neural' or the term 'state'. For those who instead prefer the view that sense-data are identical to (say) *functional* states or to neural *events*, there are straightforward ways of translating my claims into the preferred framework.

fundamentally different in kind from physical entities, my theory holds that every sense-datum is identical to some physical entity. As I'll discuss later (in §4), this enables my view to circumvent a number of classic objections to sense-data.

Some might object that SUBSTANCE MONISM is in tension with the appearance-reality condition for sense-data. If sense-data are identical to neural states, then sense-data have neural properties, but sense-data don't appear to have neural properties, so perhaps sense-data cannot be identified with neural states. However, the appearance-reality criterion says only that if a sense-datum appears F, then it is F. By contrast, the present objection appeals to the converse conditional: if a sense-datum is F, then it appears F. This converse conditional is implausible. A sense-datum might have the property of being my favorite object, but that doesn't mean that it appears to have that property. Just because sense-data have all the properties they appear to have doesn't mean that they appear to have all the properties they have.²⁰

The idea that sense-data are identical to neural states may strike some as puzzling. After all, sense-data and neural states seem like very different kinds of things. And it feels like a category mistake to say that a neural state instantiates sensational qualities, or to say that a sense-datum is located in the parietal lobe or fires at a rate of .3Hz. I think this is fundamentally a puzzle about the relationship between sensational properties and physical properties. Because of this, I'll address the puzzle in the discussion of QUALITY DUALISM.

2. QUALITY DUALISM

On my view, the sensible qualities of external objects (which I'll denote using terms such as 'redness', 'sweetness', and 'loudness') differ in kind from the sensational qualities of sense-data (which I'll denote using terms such as 'redness★', 'sweetness★', and 'loudness★'). Tomatoes are red and cabbages are green, but the sense-data in virtue of which we perceive tomatoes and cabbages are red★ and green★.

²⁰ Pautz [2021: 58] similarly argues that 'sense-datum theory' ought not be defined as committed to the claim that if a sense-datum is F, then it appears F.

This follows a familiar move in the philosophy of mind.²¹ While it's clear what's meant when someone uses sensible terms to describe experiences, few people nowadays think that it's literally true that experiences themselves are red, sweet, or loud. Still, it's obvious that the qualities that characterize experiences bear important relations to sensible qualities. Because of this, many philosophers denote the qualities of experiences via some systematic modification of sensible terms. For example, the quality of experiences typically caused by red objects might be labeled 'phenomenal red', 'reddish', or (using the convention I adopt here) 'red★'.²² Most philosophers who make this move don't endorse the existence of sense-data. But they do endorse a view in the spirit of QUALITY DUALISM, since they draw a distinction between the kinds of qualities that characterize experiences versus the kinds of qualities instantiated by external objects.

By endorsing QUALITY DUALISM, my theory avoids many of the problems that face standard sense-datum theories. Suppose you hallucinate a red tomato. Any sense-datum theorist who endorses QUALITY MONISM must accept that you're thereby aware of something that is red. But where is this red thing? Since you're hallucinating, there may be nothing red in your local environment. And while there may be some red things inside your head (such as blood), those obviously aren't viable candidates for the particular that you're presented with via your perceptual experience. If we instead adopt QUALITY DUALISM, then this puzzle dissolves. The fact that you hallucinate a red tomato doesn't entail that you're aware of anything red. Instead, it merely entails that you're aware of something red★. And there's no reason to think that an external observer looking inside your head would be able to see the redness★ of your sense-data (just as there's no reason to think that they would be able to see your pain).

Sometimes sense-datum theories are characterized as committed to the PHENOMENAL PRINCIPLE: if it perceptually appears to one that something

²¹ See, for example, Peacocke [1986], Brown [2006], Papineau [2021], and Warren [2023].

²² Byrne [2009] distinguishes qualities of experiences ('sensory qualities') from qualities of sense-data ('sensational qualities'). This is a subtle distinction that isn't important for present purposes—I'll assume that the qualities instantiated by an experience just are the qualities instantiated by the sense-data that constitute that experience.

is F, then one is aware of something that is F.²³ However, the PHENOMENAL PRINCIPLE is a commitment only for sense-datum theorists who accept QUALITY MONISM. More precisely, one could motivate the PHENOMENAL PRINCIPLE by appealing to QUALITY MONISM, PRESENTATION, and the appearance criterion. Since I reject QUALITY MONISM, however, I think the PHENOMENAL PRINCIPLE is mistaken. Furthermore, my theory can explain the intuitions that motivate the PHENOMENAL PRINCIPLE in the first place. On my view, there's a variant of the PHENOMENAL PRINCIPLE that's true: if it perceptually appears to one that something is F, then one is aware of something that is F★. For example, if you have an experience as of a green circle, then you're aware of some green★ circular★ sense-data (even if you aren't aware of any actual green circle).

QUALITY DUALISM is primarily a metaphysical thesis, rather than a semantic thesis. There's debate about whether sensible terms, such as 'redness', 'sweetness', and 'loudness' denote properties of external objects, or experiences, or both, or neither.²⁴ I'm following current orthodoxy and assuming that sensible terms denote properties of external objects. But the semantic question (what do our sensible terms refer to?) is distinct from the metaphysical question (are the qualities that characterize sense-data different in kind from the qualities that characterize external objects?). The core dispute behind QUALITY DUALISM *vs.* QUALITY MONISM isn't about which things are properly labeled 'red', 'sweet', and 'loud'. Instead, the principal issue is whether there are two distinct classes of qualities, which I've distinguished using the labels 'sensational qualities' and 'sensible qualities'.²⁵

²³ See Crane & French [2021].

²⁴ See Peacocke [1984], Rosenthal [1999], Brown [2006], and Raleigh [2022] for discussion.

²⁵ Some—such as Papineau [2021: 29]—contend that it's "essential to sense-data" that they instantiate sensible qualities. I think we ought to resist that way of defining 'sense-data' (see §1: 'The Verbal Objection'). But even if we were to accept that definition, I could still retain a version of QUALITY DUALISM by drawing a distinction between *sensible qualities* of sense-data and *perceptible qualities* of external objects. On such a view, nothing in the external world is red, loud, or sweet; instead, it's only our experiences that instantiate those qualities. What's important to my theory—and to QUALITY DUALISM, in particular—is drawing a distinction between two categories of qualities (rather than taking a stance on which of kinds of qualities are denoted by sensible terms).

Some might object that QUALITY DUALISM renders sensational properties mysterious. We all know what redness, sweetness, and loudness are. But what, exactly, are redness★, sweetness★, and loudness★? The options for responding to this challenge are structurally analogous to the options for addressing the explanatory gap in the philosophy of consciousness. For example, one possible move is to hold that (a) every sensational fact is grounded in some neural fact, but that (b) the very same fact strikes us differently when it's accessed via a first-person mode of presentation *vs.* a third-person mode of presentation. This strategy is analogous to the phenomenal concepts strategy in the consciousness literature.²⁶ Another possible move is to hold that (a) physical sciences yield knowledge of only structural and functional properties of physical entities (leaving open their qualitative nature), but that (b) sensational facts concern the qualitative natures of neural states. This strategy is analogous to Russellian monism in the consciousness literature.²⁷ Since different sense-datum theorists will favor different options, I'll leave open which option is best. My point is simply that sense-datum theorists can avail themselves of familiar moves from contemporary philosophy of consciousness.

3. VEHICALISM

A *perceptual vehicle* is a mental state in virtue of which one perceives; a *perceptual object* is that which is perceived. A central claim of my theory is that sense-data are perceptual vehicles, rather than perceptual objects. Put another way, sense-data are *how* we perceive, rather than *what* we perceive.

Sometimes philosophers contrast vehicles with contents, rather than with objects.²⁸ A vehicle is what does the representing; a content is what is

²⁶ See Loar [1990], Papineau [2002], and Balog [2012] on the phenomenal concepts strategy.

²⁷ See Stoljar [1991], Strawson [2003], and Altar & Nagasawa [2012] for a few different developments of Russellian monism. See Russell [1927] for the historical origin of the view. Personally, I favor this kind of view. More specifically, I favor a view where *all* physical particulars instantiate intrinsic qualities, and where the sensational qualities that characterize our experiences are just the intrinsic qualities of our brains.

²⁸ Dretske [2003: 68]: "There are representational vehicles—the objects, events, or conditions that represent—and representational contents—the conditions or situations the

represented. However, the term ‘content’ is ambiguous between denoting something abstract (such as a proposition or a property) *vs.* something concrete (such as an external object). Throughout this paper, I’ll always use ‘content’ in the former way (I’ll use ‘object’ to express the latter). On my definition of ‘sense-data’, it’s an analytic truth that sense-data are concrete particulars. By consequence, sense-data cannot be contents.²⁹ But that still leaves open whether sense-data are vehicles or objects, which turns on the question of OBJECTUALISM *vs.* VEHICALISM. In §4, I’ll say more about contents; for now, I’ll focus on vehicles and objects.

Historically, many sense-datum theorists distinguished between *direct* and *indirect* perceptual objects. On these views, sense-data are direct perceptual objects (because there is no x such that we perceive sense-data in virtue of perceiving x), while external objects are indirect perceptual objects (because we perceive external objects only in virtue of perceiving sense-data). By letter, these versions of sense-datum theory accept OBJECTUALISM. But in spirit, these theories yield a picture of perception that is structurally similar to VEHICALISM. On both pictures, the relation we bear to sense-data differs in kind from the relation we bear to external objects. So, what exactly is the difference between these views?

The question comes down to whether both relations (or only the latter) are forms of perception. This question is somewhat verbal. But I think it’s conceptually cleaner to reserve ‘perception’ for relations we bear to external objects. By doing so, we (1) avoid the consequence that we perceive our own sense-data, (2) avoid the consequence that we never perceive external objects directly, (3) retain a mutually-exclusive distinction between acquaintance and perception, and (4) recover intuitively correct verdicts about direct *vs.* indirect perception of external objects.

Here’s a way of explaining that last point. Given VEHICALISM, when you see a tomato in your immediate environment, you perceive the tomato directly. And when you see a picture of that tomato, you perceive the

vehicle represents as being so. In the case of mental representations, the vehicle (a belief or an experience) is in the head.”

²⁹ If there are object-involving contents, then sense-data could be constituents of those contents. But that’s still different than saying that sense-data are themselves contents.

tomato indirectly.³⁰ Given OBJECTUALISM, you perceive the tomato only indirectly in both cases. A proponent of OBJECTUALISM could recover the distinction by appealing to higher-order indirectness (perhaps you indirectly-indirectly perceive the tomato when seeing the picture). But a simpler approach is to just reserve ‘perception’ for the representational relation we bear to external objects (rather than taking ‘perception’ to also cover the acquaintance relation we bear to sense-data).

Now I can explain how my theory takes sense-data to be analogous to pictures inside one’s head. A picture is itself a vehicle. But when you look at a picture, your attention isn’t directed at vehicular properties of the picture itself; instead, it’s directed at what the picture represents. You see *through* the picture, into the scene. Yet you’re able to attend to the scene only in virtue of your awareness of the picture. And even though your attention is directed at the scene, there’s still a sense in which you’re aware of the picture. There are limits to this analogy: whereas you directly perceive the picture (and indirectly perceive the scene), you don’t perceive sense-data at all (you perceive external objects). But I think this pictorial analogy—at least when charitably interpreted—still evokes a useful illustration. The picture is a vehicle (and represents a scene); likewise, your sense-data are vehicles (and represent your local environment).

Sense-datum theory is often characterized as an indirect theory of perception. My theory of sense-data takes perception to be indirect in some senses but direct in other senses. Perception is indirect in that (a) perception of external objects is mediated by sense-data, and (b) perceptual experiences aren’t constituted by external objects. But perception is direct in that (c) perception of external objects isn’t mediated by perception of some other kind of entity, and (d) normally, the objects of perceptual attention are external objects (rather than experiences).

³⁰ I’ll take for granted that one can indirectly perceive an object by perceiving a picture of that object. This follows Kulvicki [2009: 1]’s remark that “[e]xperiences of pictures combine awareness of a plane surface with awareness of what is depicted,” and Newall [2015]’s remark that to us “‘see’ a picture’s subject matter ‘in’ its surface.” For some complicating considerations, though, see Hopkins [2012] and Matthen [2019].

§3 Acquaintance, Representation, and Sense-Data

I've now articulated the core claims of my theory. To further characterize the view, I'll say more about acquaintance and representation. I'll also explain how my theory of sense-data satisfies the criteria for sense-data mentioned in §1.

Acquaintance

Both NATURE and CHARACTER—the core claims of any sense-datum theory—invoke acquaintance. Most authors who work on acquaintance take it to be conceptually primitive, meaning they think there's no conceptual analysis of acquaintance in terms of more basic concepts. But that doesn't mean that there's nothing informative that we can say about acquaintance: we can still identify its theoretical roles and contrast it with other epistemic relations. Here are two of its core roles:³¹

| | |
|-----------|---|
| AWARENESS | If one is acquainted with x , then one is directly aware of x . |
| FACTIVITY | If one is acquainted with x , then x actually exists. |

Acquaintance is often contrasted with representation. I'll assume, following orthodoxy, that acquaintance (unlike representation) cannot be illusory, and that states of acquaintance (but not representation) are partially constituted by their objects. I'll also assume that if we're acquainted with a sense-datum, then we're also acquainted with its sensational qualities. I won't assume that acquaintance suffices for any sort of knowledge, and I won't make any assumptions about what one is in a position to know about x in virtue of being acquainted with x .

Traditionally, acquaintance theories have been associated with principles that take knowledge of one's own experiences to be especially secure: for example, some acquaintance theorists have held that one is in a position to know every phenomenal fact about the experience with which one is

³¹ See Hasan [2019] and Duncan [2021] for overviews of acquaintance, including more comprehensive discussions of its theoretical roles. See Brown [2016] on AWARENESS and FACTIVITY. For a systematic discussion of awareness, see Silva [2023].

acquainted, or that knowledge formed on the basis of acquaintance is infallible. But my theory of sense-data doesn't require endorsing any such principles, and I'll leave open exactly how we should understand the epistemic consequences of acquaintance.

Because sense-datum theories are committed to acquaintance, they're often described as endorsing the idea that experiences have an *act/object structure*. This is sometimes intended to demarcate sense-datum theories from qualia/inner-state theories (see the [APPENDIX](#) for more discussion) and might be thought of as a motivation for OBJECTUALISM. However, I find it obscure what exactly the expression 'act/object structure' means. A first pass analysis is to analyze it as the claim that experiences have the metaphysical structure $R(S, x)$, where R is the awareness relation (the "act"), S is the subject, and x is the experience (the "object"). But that claim by itself says almost nothing: for example, it leaves open the possibility that the subject is partly constituted by (or even identical with) the experience.

Some might think that the ascription of an act/object structure requires that the subject be metaphysically disjoint from the experience itself. But there's no obvious reason that acquaintance theorists must be committed to that claim. Some acquaintance theorists, such as Bonjour [2003], say that acquaintance is "an intrinsic feature of experiences" and think that the grammatical structure of acquaintance ascriptions misleads us about the metaphysical structure of the target phenomenon. These acquaintance theorists favor a deflationary analysis of subjects (where, say, facts about subjects are grounded in facts about sequences of experiences).³² In my view, the term 'acquaintance' is foremost intended to express a relation of awareness that differs in kind from representation. But what metaphysical consequences follow from postulating that relation is a matter for debate.

Sometimes sense-datum theory is criticized on the grounds that acquaintance itself is obscure.³³ Although it's beyond the scope of this paper to defend acquaintance, it's worth noting that many rival theories also

³² Hasan [2019] describes that view as follows: "On this view, awareness is not a relation between the self and something else, but is an intrinsic feature of the mental state itself, though one that is still relational in the sense that it is directed at something."

³³ See Coates [2007: §5.c] for a version of this objection.

postulate acquaintance. Many naïve realists hold that perceptual experience is a matter of acquaintance with external objects, and some intentionalists hold that perceptual experience is a matter of acquaintance with certain kinds of universals.³⁴ If the sense-datum theory's appeal to acquaintance is objectionable, then analogous worries apply to these rival views as well.

We're now better positioned to see how my theory of sense-data satisfies both PRESENTATION and COMMON KIND. When one has an experience, one is presented with some particulars (the sense-data that constitute one's experience) instantiating certain qualities (the sensational qualities of those sense-data). So, PRESENTATION is true. Furthermore, the category of particular that vindicates PRESENTATION isn't perceptual *objects*, but instead perceptual *vehicles*. When one has an experience as of a red tomato, there may be no red tomato in one's local environment. But there will be some sense-data (representing a tomato) that one is aware of via acquaintance. And since this metaphysical analysis of perception applies equally both in cases of perception and in cases of hallucination, my theory satisfies COMMON KIND.

Representation

There's a close connection between vehicles and contents. To say that x is a vehicle is to say that x is something that represents. And to say that x is something that represents is to say that x has representational content. Therefore, if sense-data are vehicles, then sense-data have contents. In what follows, I'll say more about the role of representation in my theory. I'll also clarify the relationship between sense-datum theory and intentionalism.

To many readers, an appeal to representational contents will bring to mind intentionalism. But aren't sense-datum theory and intentionalism supposed to be competing views? The meaning of 'intentionalism' varies across different contexts, so it's important to specify exactly which view is under consideration. Sometimes 'intentionalism' is used very weakly, to cover *any* view that ascribes contents to experiences. This sense of 'intentionalism' is clearly compatible with sense-datum theory. And the idea that

³⁴ See Pautz [2017, 2021] for an example of such a version of intentionalism.

sense-data are representations is nothing new. In fact, years ago, sense-datum theories were often called ‘representative theories’.³⁵

A stronger sense of ‘intentionalism’ can be expressed as a supervenience thesis: the phenomenal characters of experiences supervene on the contents of those experiences. But supervenience intentionalism is also compatible with sense-datum theory. Sense-datum theory is committed to metaphysical claims about what perceptual experience is, while supervenience intentionalism is merely a modal claim about how phenomenal characters covary with representational contents.³⁶ You could think that what it is to have a perceptual experience is to be acquainted with some sense-data *and* that sense-data vary systematically with contents.

The most interesting definition of ‘intentionalism’—at least in the context of this paper—is as a metaphysical thesis about the nature of perceptual experience. Intentionalism, in this sense, takes perceptual experience to be a propositional attitude, akin to believing or desiring.³⁷ Following Byrne [2001], let’s call the relevant propositional attitude ‘exing’. For the rest of the paper, I’ll understand intentionalism as any view committed to the following two claims: (a) to have a perceptual experience just is to ex some content, and (b) the phenomenal character of a perceptual experience is constituted by the content that one ex’s. These claims parallel NATURE and CHARACTER, the core claims of any sense-datum theory.³⁸

Intentionalism, in the sense expressed above, is incompatible with sense-datum theory. The fundamental disagreement isn’t about whether perceptual experiences have contents, or even whether phenomenal character systematically covaries with contents. Instead, it’s a disagreement about what phenomenal character *is*. Whereas the intentionalist takes

³⁵ As an example, one of the most prominent defenses of sense-datum theory in analytic philosophy is Jackson [1977]’s *Perception: A Representative Theory*.

³⁶ See Byrne [2001, 2014] on intentionalism. See Macpherson [2014] on the relationship between sense-datum theory and intentionalism. Both Byrne and Macpherson explicitly state that sense-datum theory is compatible with supervenience intentionalism.

³⁷ There’s debate amongst intentionalists about whether phenomenal character is determined wholly by content (or also by attitudes, such as perceiving *vs.* imagining). For simplicity I assume the pure content view here.

³⁸ See Pautz [2021: 99] for an example of an intentionalist view in this sense.

phenomenal character to be constituted by certain kinds of universals (contents), the sense-datum theorist takes phenomenal character to be constituted by certain kinds of particulars (sense-data). And whereas intentionalism holds that phenomenal character is a matter of *what is represented*, my sense-datum theory holds that phenomenal character is a matter of *what does the representing*.

It's useful to return to the analogy with pictures. Everyone agrees that pictures have contents. But nobody thinks that pictures *just are* relations to contents: it's hard to understand what that would even mean. Instead, it's much more natural to think of pictures as vehicles of representation. A picture has certain color and spatial properties, which determine its "character." But that character is a property of what does the representing, rather than of what is represented. Even though pictures have contents, the picture itself is the vehicle. Analogously, even though sense-data have contents, sense-data themselves are vehicles.

In fact, there's another respect in which sense-data are analogous to pictures. It's widely accepted that the way in which pictures represent differs from the way in which sentences represent: pictures represent *iconically* whereas sentences represent *symbolically*.³⁹ There's no consensus on how exactly to understand the difference between iconic *vs.* symbolic representation. But one general point of agreement is that iconic representations involve some kind of structural correspondence between the parts and features of vehicles and the parts and features of contents.

It's natural for sense-datum theorists to hold that sense-data are iconic representations. A full defense of this claim is well beyond the scope of this paper, since that would require an analysis of the structure of sense-data (as well as the structure of the contents of sense-data). But as some indication of its intuitive plausibility, consider how (a) similarity relations between sensational qualities of sense-data seem mirrored in similarity relations between sensible qualities of external objects, and (b) how parthood relations amongst sense-data seem mirrored in parthood relations in the objects represented by sense-data. If sense-data are indeed iconic

³⁹ See Greenberg [2023] and Lee, Myers, & Rabin [2023] on representational format.

representations, then that marks another respect in which sense-data are analogous to pictures.

There are many other questions we could ask about the contents of sense-data. This includes first-order questions about whether the contents are narrow or wide, whether they're Russellian or Fregean, and whether they represent properties beyond sensible qualities (such as high-level properties or objectual properties). This also includes metasemantic questions about what makes it the case that a sense-datum has the content that it does, and what exactly it takes for a sense-datum to represent veridically. I'll remain neutral on all these questions. Such questions are interesting and important for developing a sense-datum theory in more detail, but my main task in this paper is to paint the general picture.

It's worth pointing out that the sense-datum theorist has much more flexibility than the intentionalist in answering those sorts of questions. Since the intentionalist takes phenomenal character to be constituted by representational contents, the intentionalist's theory of the contents of experience must satisfy the constraint of phenomenological adequacy. This leads to a number of familiar challenges, such as spectrum inversion scenarios. By contrast, there's no analogous constraint of phenomenological adequacy for the sense-datum theorist, since the sense-datum theorist takes phenomenal character to be constituted by sense-data (rather than by contents).

Now we're in position to see a way in which my theory of sense-data fits naturally in a taxonomy of philosophical theories of perception. If we think of perception as a process whose elements are vehicles, contents, and objects, then we might ask: Which of these elements of the perceptual process constitutes one's perceptual phenomenology? Naïve realism says 'objects'; intentionalism says 'contents'; and my version of sense-datum theory says 'vehicles'.

'Sense-Data'

Previously, I defined sense-data as any entities that satisfy the following criteria:

- (a) perceptual experience just is acquaintance with sense-data.

-
- (b) sense-data are particulars.
 - (c) sense-data have all the properties they appear to have.
 - (d) sense-data are private.
 - (e) sense-data are located in mental spaces.

Let's verify that each of these criteria are satisfied by my theory.

It's trivial to verify that (a) is satisfied, since that's just a paraphrase of NATURE and CHARACTER, the core commitments of any sense-datum theory. It's also easy to verify that (b) is satisfied. Sense-data are identical to neural states. While neural states may be classified in terms of the universals they instantiate, neural states themselves are particulars. This leaves the appearance criterion, the privacy criterion, and the location criterion.

The appearance criterion admits of multiple interpretations, depending on how we understand the term 'appears'. There's one sense of 'appears' that makes the claim trivially true: if 'x appears F' means that x instantiates the sensational property F, then it's trivially true that if a sense-datum appears F, then it is F. There's another sense of 'appears' that makes the claim arguably false: if 'x appears F' means x strikes its subject as F, then it's implausible that if a sense-datum appears F, then it is F. And there's yet another sense of 'appears' that makes the claim neither trivial nor false: if 'x appears F' means that the subject is acquainted with the F-ness of x, then it's both substantive and plausible that if a sense-datum appears F, then it is F. I think this last sense is the interpretation of the appearance criterion that the sense-datum theorist ought to be understood as endorsing.

The privacy criterion also requires disambiguation. On my view, there's a sense in which sense-data are private, though also a sense in which they're public. Since sense-data are identical to neural states, sense-data are publicly accessible in the same ways in which neural states are publicly accessible (say, by looking at a person's brain). However, since only the subject of an experience has *first-person* access to that experience, it's only that subject to whom those neural states are presented *as* sense-data. Since first-person presentations are private, this means that there's a sense in which sense-data are private. As an analogy, consider how some physicalist theories of conscious experiences / beliefs / emotions entail that there's a sense

in which those mental states are public. Yet accepting those versions of physicalism doesn't commit one to denying that there's also a sense in which such mental states are private.

The location criterion is often discussed under the presumption of a false dichotomy: sense-data are located *either* in physical space or mental space, but not both. Against this, note that there are many kinds of objects that are located in *both* physical space and some other kind of space. As examples of locative spaces that aren't wholly individuated by positions in physical space, consider (a) positions on a chessboard, (b) places on a map, (c) websites on the internet, or (d) rooms in a virtual reality simulation.⁴⁰ On my view, sense-data are located in mental spaces (such as one's visual field). But they're also located inside one's head, since they're identical to neural states.

You might wonder, at this point, how exactly sense-data are supposed to be individuated. Does every perceptual experience consist of a collection of atomic sense-data? Or might it be that every perceptual experience is itself a single complex sense-datum? These questions mirror analogous questions concerning the individuation of conscious experiences (and related issues about atomism *vs.* holism). Since those questions remain unsettled even outside the context of sense-datum theory, the sense-datum theorist can remain agnostic on how to best individuate sense-data.

§4 Objections

I'll now explain how my theory handles standard objections to sense-data. I'll initially formulate most objections in the way that the objection is standardly expressed (rather than in the language and framework that I've developed throughout this paper). This is to draw attention to the fact that many standard objections to sense-datum theory hardly even get off the ground if we adopt my theory of sense-data.

⁴⁰ These locations exist within space. But the locations aren't identical to regions of space. If you pick up a chessboard, then the spatial locations of the chess pieces have changed. But each chess piece remains in the same location on the chessboard.

Objection 1: EXTRAVAGANCE

Sense-data are metaphysically extravagant.

The standard theory is committed to SUBSTANCE DUALISM, which leads to obvious worries about metaphysical extravagance. But my theory of sense-data instead endorses SUBSTANCE MONISM, and thereby identifies sense-data with neural states (which are hardly extravagant). You might then object that my theory faces the cost of metaphysical extravagance at the property level, since QUALITY DUALISM requires us to posit a new class of sensational qualities. But this is no more extravagant than the commitments of any phenomenal realist view, and it's even possible to both accept my theory of sense-data while identifying sensational qualities with neural properties (see §2: SUBSTANCE MONISM).

Objection 2: LOCATIONS⁴¹

Sense-data aren't located anywhere. They aren't in one's local environment, since sense-data are present in hallucinations. But they aren't in one's head either, since there may be nothing in one's head that instantiates the relevant sensible qualities (redness, sweetness, loudness, etc.).

The objection appeals to the fact that nothing in one's local region of space need instantiate the relevant sensible qualities. But if we accept QUALITY DUALISM (instead of QUALITY MONISM), then the objection is straightforwardly disarmed. This is because sense-data are red★, sweet★, and loud★, not red, sweet, and loud. Hence, the fact that one is aware of a sense-datum that's F★ is compatible with the possibility that nothing in one's local region of space is F. Furthermore, SUBSTANCE MONISM yields a straightforward answer

⁴¹ See Huemer [2001: 150] for a version of this objection.

as to where sense-data are located: sense-data are neural states, so they're located inside one's head.

Sometimes, in response to this objection, sense-datum theorists say that sense-data are instead located in private mental spaces. As noted earlier (§3: 'Sense-Data'), I agree that sense-data are located in mental spaces: for example, some of your current sense-data are located at positions in your visual field. But—as also noted earlier—that's compatible with thinking that sense-data also occupy locations in physical space.

Objection 3: TRANSPARENCY

Perceptual experience is transparent: we attend to what our experiences represent, rather than to the experiences themselves.

If we assume OBJECTUALISM, then it's not obvious how to recover the datum that we normally attend to external objects (or representational contents), rather than to sense-data. But if we instead accept VEHICALISM, then it's hard to even motivate this objection. For most representations, we normally "see through" the vehicles into what is represented. For example, when looking at a photograph, we tend to attend to what the photograph represents (rather than the two-dimensional mosaic of color patches). If sense-data are perceptual vehicles, then it's unsurprising that perceptual experience is transparent.

If we accept transparency, then you might wonder whether we can explain our introspective knowledge of our own sense-data. But on my theory of sense-data, it's more natural to accept WEAK TRANSPARENCY (according to which it's possible to attend to experiences themselves, even though we normally attend to what they represent), rather than STRONG TRANSPARENCY (according to which it's impossible to attend to experiences themselves). It's useful to once again draw an analogy with pictures: while we normally attend to what a picture represents, it's nevertheless possible to shift our attention to the picture itself. By contrast, those who accept STRONG TRANSPARENCY (alongside my theory of sense-data) are committed to a view

analogous to one where we can attend only to what pictures represent (but never to pictures themselves).⁴²

Objection 4: INDETERMINACY⁴³

Some perceptual experiences are indeterminate: a peripheral color experience might be merely red (and not any determinate shade of red). But nothing in reality is indeterminate. So, sense-datum theory is committed to a dubious kind of metaphysical indeterminacy.

If we accept QUALITY MONISM, then it's hard to escape the conclusion that a peripheral visual experience instantiates mere redness (rather than any specific shade of redness). But if we instead accept QUALITY DUALISM, then the objection loses its force. In particular, the objection conflates indeterminacy, a property of the contents of sense-data, with imprecision, a property of sense-data themselves.

Let's say a content is *indeterminate* just in case there are many ways for that content to be satisfied, and that an experience is *imprecise* just in case it has the kind of phenomenal character associated with indeterminate contents (such as the phenomenal character associated with peripheral visual experiences).⁴⁴ It's plausible that more imprecise experiences have more indeterminate contents. But that doesn't mean that imprecise experiences are themselves indeterminate. As an analogy, consider an impressionistic painting. The fact that the content of the painting is indeterminate doesn't entail that the vehicle itself is indeterminate. There are perfectly determinate facts about the paint on the canvas, even if there's indeterminacy about the details of the scene depicted by the painting.

⁴² It's possible to accept both my theory of sense-data and STRONG TRANSPARENCY. This combination of views does indeed face a puzzle about how introspective knowledge of sense-data is possible. But this is an instance of a well-known puzzle about how to reconcile STRONG TRANSPARENCY with introspective phenomenal knowledge. See Byrne [2012].

⁴³ See Huemer [2001: 168] and Pautz [2021: 52] for versions of this objection.

⁴⁴ See Lee [2021] for a more systematic discussion of imprecise experiences and the distinction between imprecision and indeterminacy.

Some might be tempted to reformulate this objection by appealing to determinability (the relationship between determinable properties and determinate properties), rather than indeterminacy. A property is *determinable* if there are multiple ways for that property to be instantiated; a property is *determinate* if there's only one way for that property to be instantiated. This version of the objection contends that the sense-datum theorist is committed to holding that imprecise experiences involve the instantiation of determinable properties in the absence of determinates. However, imprecision and determinability are also independent.

Here's an example of an imprecise property that's determinate: the determinate property that characterizes exactly what it's like for you to have your current peripheral color experience. There's only one way for this property to be instantiated, so it's determinate. But it's also imprecise, since it characterizes the kind of color experience you have in peripheral vision. And here's an example of a determinable property with only precise determinates: the determinable property that characterizes the various kinds of red★ experiences you can have in foveal vision. There are many ways for this property to be instantiated, so it's determinable. Yet each of its determinates characterizes a precise color experience you have via foveal vision.

The fact that imprecision and determinability are dissociable indicates that neither can be analyzed in terms of the other. So, the fact that some perceptual experiences are imprecise (meaning they instantiate certain kinds of sensational properties) is compatible with thinking that all perceptual experiences are determinate (meaning there's never the instantiation of a determinable without the instantiation of a determinate).

Objection 5: DEMONSTRATIVE REFERENCE⁴⁵

To demonstratively refer to x , one must be directly aware of x . Since the sense-datum theorist denies we're directly aware of external objects, they cannot explain demonstrative reference to external objects.

⁴⁵ See Bermudez [2000] for a version of this objection.

The expression 'directly aware' admits of multiple interpretations. On one interpretation, my theory of sense-datum theory denies that we can be directly aware of external objects, but it's implausible that direct awareness is a condition on demonstrative reference. On another interpretation, it's plausible that direct awareness is a condition on demonstrative reference, but my theory of sense-data accepts that we can be directly aware of external objects.⁴⁶

Suppose we interpret 'direct awareness' as acquaintance: to be directly aware of x is to be acquainted with x . Since sense-datum theory entails that we're acquainted with sense-data (rather than with external objects), this version of the objection precludes sense-datum theory from securing demonstrative reference to external objects. But notice that the same considerations apply to intentionalism; it's only naïve realism that can account for demonstrative reference to external objects (given this condition on demonstrative reference). This might raise some suspicions about whether this is the most apt way of thinking about demonstrative reference.

Here's a more intuitive reason for resisting the claim that acquaintance is a condition for demonstrative reference. Suppose you and I are standing in a hall of portraits of American Presidents. You ask me which American President was oldest on their inauguration day. I respond by pointing to the portrait of Biden and saying, "That guy." Obviously, I'm not expressing the thought that the portrait in front of us was the oldest American President. Instead, my utterance demonstratively refers to Biden. Even though I've never been acquainted with Biden, I can still plausibly demonstratively refer to him.

The objector might respond by distinguishing between direct acquaintance and indirect acquaintance. Though I've never been directly acquainted with Biden (since I've never seen him in person), perhaps I've still been indirectly acquainted with him (by seeing his photograph). Then the objection can be reformulated as the claim that indirect acquaintance is necessary for demonstrative reference. But that claim is compatible with my theory. Although my theory of sense-data denies that we're directly

⁴⁶ See Brown [2008, 2009] for responses to related objections.

acquainted with external objects, it's compatible with holding that we're indirectly acquainted with external objects. Therefore, interpreting 'directly aware' as acquaintance either renders the objection implausible or renders it compatible with my theory.

Suppose we instead interpret 'direct awareness' as attention: one is directly aware of x just in case one attends to x . On this interpretation, the objection claims that one can demonstratively refer only to things to which one is attending. That strikes me as plausible. But now there's no tension with my theory of sense-data, since my theory holds that we normally attend to external objects. In response, one might flip the objection by contending that my theory now cannot account for demonstrative reference to our own experiences. But that objection has force only if we presume STRONG TRANSPARENCY. If we instead accept WEAK TRANSPARENCY, and hence allow that we sometimes attend to sense-data themselves, then we can account for demonstrative reference to our own sense-data.

Objection 6: SKEPTICISM

Sense-data generate a "veil of phenomenology" between ourselves and the external world. Therefore, sense-datum theory cannot account for our knowledge of the external world.

Skepticism is a challenge for many theories. The relevant question here is whether there's a distinctive challenge for sense-datum theory.

There's some unclarity about what it even means to adequately respond to skeptical challenges. One answer is that an adequate response requires showing that skeptical scenarios are incoherent, untenable, or self-undermining. To meet this challenge is to show that skepticism *must* be false. I don't think the sense-datum theorist can meet this challenge: I doubt that it's possible to prove that skepticism is false. But the inability to meet this challenge is no indictment on sense-datum theory. Few contemporary philosophers take infallibility to be the relevant standard for answering skeptical challenges. And it's not clear, anyway, that other theories of perception are in a better position to satisfy this standard.

Nowadays, it's more common to characterize the skeptical challenge as a matter of meeting a more modest epistemic standard, such as fallible knowledge or justified belief. There are many strategies for answering this challenge—as a few examples, consider inference to the best explanation, dogmatism, contextualism, externalism, and structuralism.⁴⁷ And these strategies are all available to the sense-datum theorist. For example, a sense-datum theorist might argue that postulating an external world best explains our patterns of perceptual experiences,⁴⁸ that perceptual seemings provide immediate justification for perceptual beliefs, that ordinary knowledge ascriptions are true in ordinary contexts, that semantic externalism precludes us from even entertaining skeptical scenarios, or that our perceptual experiences are veridical so long as there's a systematic structural match with their external causes.

My theory of sense-data leaves open questions about the nature of knowledge, justification, and evidence. Because of this, it leaves which epistemological framework one ought to favor. For example, while sense-datum theories have traditionally been associated with internalist epistemologies, there's nothing that precludes someone who accepts my theory of sense-data from endorsing externalism (or pluralism). Consider, for example, a sense-datum theorist who thinks that a belief is justified just in case it's formed on the basis of a reliable process. Just because a process involves sense-data (or other sorts of intermediaries) doesn't mean that the process cannot be reliable. If reliability is a matter of standing in the right kinds of causal and modal relations, then perceptual beliefs formed on the basis of sense-data may very well be reliable (and hence justified, on this sort of view). More generally, nearly every response to skepticism—and nearly every way of developing a general epistemological framework—is available to the sense-datum theorist.⁴⁹

⁴⁷ As examples, see Vogel [1993] on inference to the best explanation, Pryor [2000] on dogmatism, DeRose [1995] on contextualism, Putnam [1981] on externalism, and Chalmers [2021] on structuralism.

⁴⁸ See Warren [2023] for an extended defense of sense-datum theory (in response to skeptical challenges) that appeals to inference to the best explanation.

⁴⁹ Pautz [2021: 47] makes a similar point.

But what should we make of the claim that sense-datum theory induces a “veil of phenomenology” between ourselves and the external world?⁵⁰ I think there’s a sense in which this is true: since sense-data are the vehicles in virtue of which we perceive external objects, sense-data might be said to stand “between” ourselves and the external world. But the existence of a medium of representation doesn’t preclude knowledge of what’s represented. If you watch a documentary / read a book / listen to a recording, then in some sense there’s a veil of pixels / words / sounds between you and the subject-matter of the representation. But few would want to say that this precludes the possibility of attaining knowledge of those subject-matters on the basis of such representations. Instead, the representation is what enables us to have knowledge in the first place.

Conclusion

Here’s the essence of my theory: (1) what it is to have a perceptual experience is to be acquainted with some sense-data, (2) what it’s like to have a perceptual experience is a matter of the sense-data with which one is acquainted, (3) sense-data are first-person presentations of neural states, (4) the sensational qualities of sense-data differ from the sensible qualities of external objects, and (5) sense-data are perceptual vehicles (rather than perceptual objects).

On my view, perception is a representational relation, and the direct objects of perception are external objects. But hallucinations and veridical perceptions are of a common kind, since both kinds of experiences consist in acquaintance with sense-data. And while perceptual experience doesn’t always involve awareness (via perception) of external objects, it does always involve awareness (via acquaintance) of particulars.

Many readers will find the substance of my view agreeable but feel reluctant about the label ‘sense-datum theory’. I empathize with that impulse: it’s hard to think of a term more anathema in contemporary

⁵⁰ See Silins [2011] on the epistemic significance of the veil of perception.

philosophy.⁵¹ But I also felt a sense of dishonesty whenever I allowed myself to succumb to the impulse of distancing myself from the label. The classic motivations for sense-datum theory have always resonated with me, and I used to secretly wonder why the view is so disparaged. I used to strain to explain why my preferred picture of perception doesn't technically count as a sense-datum theory. But I've now come to think that it's better to just embrace and reclaim the label.

I suspect that many people think about perception in ways much closer to sense-datum theory than they might publicly admit. An aim of this paper is to reduce the stigma associated with the label 'sense-datum theory'. Historical versions of sense-datum theory strike me as sources for inspiration, rather than as philosophical blunders. The term 'sense-data' strikes me as apt for describing the kinds of entities we are directly presented with in perceptual experience. And the metaphors used to caricaturize sense-datum theory—where perceptual experiences are described as pictures in one's head, as internal virtual reality simulations, or as veils of phenomenology between oneself and the external world—all strike me as expressing more truth than falsehood.

A decade ago, in a conversation with another philosopher of mind, I described the picture of perception that I favored. The other philosopher said: "But isn't that basically a version of sense-datum theory?" Even back then, the seeds of sense-datum theory had already begun festering in my mind. But at the time, I was too embarrassed to admit this, so I covered and prevaricated. Since then, I've come to think that that philosopher was right in their accusation. This paper is an admission of guilt, and a coming out of the closet.

⁵¹ Kriegel [2011] claims—plausibly—that "[o]ne of the most ill-reputed theories in the philosophy of mind, perhaps the whole of philosophy, is the sense-datum theory of perception."

APPENDIX: Sense-Datum Theory *vs.* Qualia/Inner-State Theory

Some readers might think that my view is better classified as a version of 'qualia theory' or 'inner-state theory' rather than 'sense-datum theory'. This appendix discusses the murky relationship between these labels.

In contemporary philosophy of perception, the dominant views are intentionalism and naïve realism. But how should we categorize the other views? Well, there's also sense-datum theory, of course, but few contemporary philosophers want to call themselves 'sense-datum theorists'. In recent years, the most common terms for alternative theories of perception are 'qualia theory' and 'inner-state theory'. But it's unobvious how exactly to interpret those labels and how to think about their relations to 'sense-datum theory'.

In many contexts, 'qualia theory' and 'inner-state theory' are used interchangeably. Both are usually characterized as alternatives to intentionalism and naïve realism and as internalist theories of perceptual experience. But the terms also have somewhat different connotations. 'Qualia theory' is sometimes interpreted as involving a rejection of supervenience intentionalism. 'Inner-state theory' is sometimes interpreted as involving a commitment to physicalism. And while 'qualia theory' sounds committed to phenomenal realism, 'inner-state theory' sounds compatible with illusionism. For present purposes, though, I'll treat 'qualia theory' and 'inner-state theory' as equivalent, and I'll interpret the differences mentioned above as a matter of connotation rather than definition.

The more interesting question is how qualia/inner-state theory relates to sense-datum theory. Some of the criteria that are used to draw a line between sense-datum theory and qualia/inner-state theory include: (a) whether perceptual experiences have an act/object structure, (b) the metaphysical nature of sense-data *vs.* qualia/inner-states, (c) whether the relevant entities instantiate sensible qualities, and (d) whether the relevant entities are particulars or properties. In what follows, I'll argue that none of these criteria is a good way of distinguishing sense-datum theory from qualia/inner-state theory.

Act/Object Structure: Sometimes sense-datum theory is taken to entail that perceptual experiences have an act/object structure (because sense-

datum theorists take perceptual experience to be a matter of acquaintance with sense-data), while qualia/inner-state theory is taken to deny such a claim (because qualia/inner-state theorists take perceptual experience to be a matter of instantiating monadic experiential properties).⁵² However, nothing precludes a qualia/inner-state theorist from also being an acquaintance theorist. Furthermore, since a commitment to acquaintance doesn't entail a commitment to holding that the subject of experience is metaphysically disjoint from the experience itself (see §3: Acquaintance), a sense-datum theorist could agree that perceptual experiences are, in the relevant sense, a matter of instantiating monadic experiential properties.

Metaphysical Nature: Sometimes sense-data are regarded as more mysterious than qualia (and certainly as more mysterious than inner-states). If we assume the standard theory of sense-data, then this line of thought may feel compelling, since the standard theory endorses SUBSTANCE DUALISM. But I've argued that we ought not define sense-data as non-physical, especially if we want 'sense-datum theory' to include many historical exemplars of sense-datum theories. And nothing precludes a qualia/inner-state theorist from taking qualia (or the relevant kinds of inner-states) to be non-physical. Furthermore, if we instead focus on defining sense-data/qualia/inner-states in terms of their theoretical roles, then sense-data and qualia/inner-states turn out to play very similar roles in their respective theories: for example, both kinds of entities are usually regarded as private, as constituting the phenomenal characters of perceptual experiences, and as common across perception and hallucination.

Sensible Qualities: Sometimes sense-data are defined as instantiating sensible qualities, while qualia/inner-states are not. If we assume the standard theory of sense-data, then this line of thought may feel compelling, since the standard theory endorses QUALITY MONISM. But I've argued that we ought not interpret sense-datum theory as committed to holding that sense-data instantiate sensible qualities. Sense-data instantiate qualities of some kind. But whether those are sensible qualities depends on

⁵² For example, Pautz [2021: 63] says that "internal physical state theorists allow that the "act-object" view seems true, but they insist that it is totally false [...] The true nature of experience is different from how it seems."

semantic and metasemantic questions about the referents of sensible terms. On my theory, sensible terms denote properties of external objects, and sense-data instead instantiate sensational qualities (rather than sensible qualities). Conversely, there are authors who have argued on semantic grounds that sensible terms can be felicitously applied to both experiences and external objects. Yet taking a stance on that semantic issue shouldn't preclude such authors from endorsing a qualia/inner-state theory.

Particulars vs. Properties: Sometimes sense-datum theory is taken to be committed to phenomenal particulars (namely, sense-data), whereas qualia/inner-state theory is taken to be committed to only phenomenal properties (namely, qualia). If we follow this approach, then my view is clearly a version of sense-datum theory. But I doubt that this is the best way of distinguishing sense-datum theory from qualia theory. If 'phenomenal particular' merely means a particular that instantiates some phenomenal properties, then both theories are committed to phenomenal particulars. If 'phenomenal particular' means a special kind of non-physical particular, then neither theory is committed to phenomenal particulars. And if 'phenomenal particular' means something else, then a clearer analysis is needed.

In my opinion, the lines drawn between sense-datum theory and qualia/inner-state theory tend to be superficial rather than substantive. There are versions of sense-datum theory (such as the standard theory) that arguably ought not count as versions of qualia/inner-state theory, and there are versions of qualia/inner-state theories (such as those that reject acquaintance) that arguably ought not count as sense-datum theories. But there are many views—perhaps including my own—that may reasonably be taken to fall under either label.

If my theory of sense-data may be construed as a qualia/inner-state theory, then some might object that it's thereby misleading to label my view 'sense-datum theory'. However, the reasoning behind this objection cuts both ways: one could just as well contend that some qualia/inner-state theories ought to instead label themselves 'sense-datum theorists'. In any case, the principle behind that objection is questionable: the mere fact that a theory may be described using one label doesn't mean that it cannot also be

described using another label. The goal of this paper has been to defend a theory of sense-data. The relevant question isn't whether my theory can justifiably be labeled 'qualia/inner-state theory' (or, for that matter, 'intentionalism'), but instead whether my theory can justifiably be labeled 'sense-datum theory'. And if you think, for whatever reason, that one must choose one of these labels over the others, then I choose 'sense-datum theory'.[†]

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