A New Perceptual Adverbialism

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In this paper, I develop and defend a new adverbial theory of perception. I first present a semantics for direct-object perceptual reports that treats their object positions as supplying adverbial modifiers, and I show how this semantics definitively solves the many-property problem for adverbialism. My solution is distinctive in that it articulates adverbialism from within a well-established formal semantic framework and ties adverbialism to a plausible semantics for perceptual reports in English. I then go on to present adverbialism as a theory of the metaphysics of perception. The metaphysics I develop treats adverbial perception as a directed activity: it is an activity with success conditions. When perception is successful, the agent bears a relation to a concrete particular, but perception need not be successful; this allows perception to be fundamentally non-relational. The result is a novel formulation of adverbialism that eliminates the need for representational contents, but also treats successful and unsuccessful perceptual events as having a fundamental common factor.

1. Introduction

In the philosophy of perception, two views on the nature of perception dominate the theoretical landscape: representationalism and relationalism.[1] Representationalism can be formulated in a variety of ways, but generally, representationalists hold that fundamentally, perceptual states are representational states. Representational states are, or at least involve, relations to semantically evaluable contents; typically, representationalists treat such contents as propositional—involving the ascription of a property to an object—and so as capable of being true or false.[2] For a per-

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[1]In adopting this terminology, I am following Campbell [2002]. This is not the only terminological option for distinguishing between the philosophy of perception's two dominant views, but I choose it partly for definiteness, and partly because the terms help to highlight the features of the two kinds of views with which I am concerned.

[2]Some prominent representationalists who approximately fit this description include Burge [2007, 2010], Byrne [2001, 2009], Dretske [1995, 2003], Fodor [1991], Millikan [1989, 2004], Pautz [2010], Peacocke [1983], Searle [1983], Siegel [2010a,b], and Tye [1995], among many others. I acknowledge, however, that there is a great deal of variation among these views; they differ

ception to be veridical or non-veridical is for its content to bear a certain semantic relation—such as truth or falsity—to the world. As a consequence, what ultimately distinguishes non-veridical perceptual states from veridical perceptions is not anything mental—rather, the facts in the world distinguish between them. This allows the representationalist to hold that veridical and non-veridical perceptual experiences are of the same fundamental mental kind.[3]

On the other hand, relationalists hold that perception is not representational. Instead, they hold that fundamentally, perception is a relation between a perceiver and a concrete particular. As with the representational view, relationalism can be formulated in a variety of ways, but generally, relationalists hold that perception, as a relation, is partly constituted by the object perceived, and so reaches out into the world.[4] Non-veridical perceptual experiences, such as hallucinations, fail to relate us to concrete objects in the world, and so, these non-veridical perceptual states must be of a different fundamental kind than genuine perceptions.[5] Given that veridical and non-veridical perceptual states differ fundamentally, the relationalist often treats the category of perceptual experiences, which subsumes both veridical and non-veridical perceptual experiences, as a disjunctive, derivative category.

In treating representationalism and relationalism as the only viable views, philosophers of perception ignore several historically important theories, one of which is the adverbial theory of perception. The adverbial theory is the view that fundamentally, perception is not relational in structure. Rather, on the adverbial view, to perceive an object is to be the agent of an event of an event with certain properties, and these properties explain perception's directedness and its phenomenal character. While the features of perceptual events may be correlated with the environment, such correlations are not constitutive of, or required for the directedness of perception. In denying that perception is relational, and developing an alterna-

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on which kinds of properties are represented in perception, the nature of perceptual contents, and how content is to be naturalized, to name only three points of contention. There is also family of views which hold that perception is representational, but does not fundamentally involve predication. I take Crane [2006, 2009b,a, 2012, 2014] to fall in this camp, along with Johnston [2004, 2014], although Johnston would likely not call himself a representationalist.

[3]The claim that veridical perceptions and hallucinations are of the same fundamental mental kind is what Martin [2004, 2006] calls the Common Kind Assumption (or CKA). The CKA is sometimes taken to be a principle that can cleanly distinguish between representationalists and relationalists: representationalists are almost universally taken to endorse it, while relationalists are often taken to deny it.

[4]Versions of relationalism are defended by Bill Brewer [2011], John Campbell [2002], Bill Fish [2009], Heather Logue [2012], Michael Martin [2002, 2004, 2006], Lisa Miracchi [2017], Paul Snowdon [1980], Scott Sturgeon [2008], and Charles Travis [2004], among others. As is the case with representationalism, relational views vary significantly, and so my characterization of relationalism will not capture all of these views equally well.

[5]For ease of exposition, I am temporarily ignoring issues concerning veridical hallucinations and illusions. In §6, I will discuss the problems they pose for representationalism, and show how these problems do not arise for my version of adverbialism.

tive theory in terms of events and their properties, the adverbialist presents what looks to be a highly parsimonious, unified theory of perception: perception consists only of events with various properties, and these properties explain the directedness of perception, covary with the features of our environments, and account for the phenomenology of our experiences.

However, most philosophers of perception think that adverbialism has been ignored for good reason; in fact, adverbialism is typically treated as a dead view. Frank Jackson [1975] raised what has seemed to many to be an insurmountable problem for the adverbial view of perception: the many-property problem. The many-property problem purports to show that adverbialism lacks the expressive resources to distinguish between perceptual situations in which different properties seem to be jointly instantiated. While there have been attempts to respond to the problem—most notably by Sellars [1975] and Tye [1975, 1984, 1989]—these responses are subject to serious objections, and fail decisively when faced with a strengthening of the original problem: the many-relations problem.[6] Moreover, even if the adverbialist could solve these problems, it seems that the view would still be semantically and metaphysically implausible. It would be semantically implausible because an adverbial semantics for perceptual reports appears strongly at odds with the most natural semantics for perceptual ascriptions, and seems able to serve, at best, as a *post hoc*, revisionary regimentation of such reports. It would be metaphysically implausible because it is puzzling how an adverbial metaphysics of perception can account for even the most basic features of perceptual directedness: how can an event having a certain property explain how our perceptions manage to be *of* things in the external world?

In this paper, I develop and defend a new form of adverbialism about perception. First, I present a semantics for perceptual reports that solves the many-property problem and the many-relations problem for adverbialism. The semantic view I endorse is novel in that it articulates adverbialism from within a well-established formal semantic framework, and ties adverbialism to a plausible formal semantics for direct-object perceptual ascriptions in English. This shows that not only can the adverbialist respond to what have been seen as decisive logical and semantic objections, but that adverbialism as a semantic proposal may even have the weight of semantic orthodoxy on its side. Second, I go on to show that this semantic proposal provides an attractive view of the metaphysics of perception. The metaphysics I develop treats adverbial perception as a directed activity: it is an activity with success conditions. When a perception is successful, the agent relationally perceives a concrete particular. But since on my view, perception is not constitutively successful, unsuccessful perception is still perception, and so adverbial perception can be fundamentally non-relational. The result is a novel formulation of adver-

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[6]The many-relations problem is suggested by Jackson [1975], and developed by Alexander Dinges [2015].

bialism that eliminates the need for representational contents and treats relational perception as explanatorily basic, but also treats veridical and non-veridical perceptual events as having a fundamental common factor. Thus, my formulation of adverbialism provides an attractive alternative to both representationalism and relationalism, while incorporating some of the most appealing features of each view.

2. The Many-Property Problem

Adverbialism was originally developed with the aim of providing an alternative to the act-object conception of experience: the view that in every perceptual experience, there is an act of awareness and an object of which we are aware.[7] This conception serves as a premise in the argument from hallucination. When coupled with the premises that we sometimes hallucinate, and that the objects of veridical and hallucinatory perceptions are of the same kind, the act-object conception seems to lead to the view that the objects of which we are aware in perceptual experience are non-physical objects: they are sensations, or sense-data.

In order to avoid this conclusion, the adverbialist proposes that we alter our view of the fundamental structure of perceptual experience. Instead of holding that perceptual experience consists in bearing relations to sensations or sense-data, and that these sense-data are correlated with features of our environment, the adverbialist holds that we sense in particular ways, and that these ways of sensing are themselves correlated with the features of our environment. The adverbialist then articulates this structure linguistically by paraphrasing the direct-objects of reports of sensation with adverbs. This paraphrase strategy is why adverbialism warrants its name.

The traditional adverbial proposal begins by considering the case where, in the absence of a physical object, I have a sensation of a square, perhaps in the form of an afterimage. How are we to understand my having such a sensation? Consider an analogy. Suppose that I make a horrible error. Is the right understanding of my situation that there is some thing, an error, such that I made it, and which has the property of being horrible? Surely not—I was just the agent of an event of a certain kind: I erred horribly. Similarly, the adverbialist holds that if I have a sensation of a square, it would be a metaphysical mistake to think that there is some non-physical thing—a sensation or an after-image—such that I have it, and which is square. Rather, the adverbialist holds that I am the agent of a sensing of a particular kind, and so, we should paraphrase direct object perceptual reports such as (1) and (2) adverbially, as in (3):

(1)   I have a sensation of a square.

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[7]The act-object conception of experience is embraced by many philosophers of perception on both sides of the representationalism-relationalism divide. See Pautz [2007] for discussion.

(2)   I sense a square.

(3)   I sense square-ly.

Further, if I happen to sense a red square, it is natural for the adverbialist to extend her paraphrase strategy, paraphrasing (4) with (5):

(4)   I sense a red square.

(5)   I sense red-ly and square-ly.

This pairs well with our analogy: if I make a horrible, unforgiveable error, how did I err? It seems apt to say that I erred horribly and unforgiveably. These intuitive motivations and paraphrases form the basis of the traditional adverbial theory: the adverbialist holds that the structure of sensation and perception consists only of an agent involved in an event of a certain kind, and exhibits this by paraphrasing the object-positions of perceptual reports with adverbs.

But how does this strategy extend to more complex cases? It is here that the adverbialist faces a problem: the many-property problem. The many-property problem concerns the logical and expressive resources of the language the adverbialist uses to provide her paraphrases. It seems to show that the adverbialist cannot express complex perceptual reports using adverbs while at the same time validating highly intuitive inference patterns within the complements of perceptual reports.

Consider how the adverbialist might paraphrase a sentence such as the following:

(6)   I sense a red square and a green circle.

At first pass, it seems like the adverbialist must paraphrase the report with a series of conjunctions, all of which are on a par:

(7)   I sense red-ly and square-ly and green-ly and round-ly.

But in this paraphrase, the structure apparent in (6) has been lost. Instead of two, distinct sensations, each of which instantiates two specific properties, we have only one, conjunctive way of sensing. Paraphrasing in this way would entail that (6) is equivalent to (8):

(8)   I sense a red circle and a green square.

Clearly, however, (6) and (8) are not equivalent: they pair the same collection of properties differently. Call this the *expressive* problem for adverbialism. The expressive problem can be illustrated with the help of our analogy: if John made an unforgiveable, horrible error and a forgiveable, harmless error, how did John err? If he erred unforgiveably and horribly and forgiveably and harmlessly, we are left

without entities—in this case, errors—on which to hang coincident properties.

In order to solve the expressive problem, it is more common for the adverbialist to invoke structured adverbs. For instance, Tye [1975] proposes the following series of grammatical transformations:

(9)   a.   I have a sensation of a red square.
      b.   I have an of-a-red-square sensation.
      c.   I sense a-red-square-ly.

Making use of (9-c) allows us to paraphrase (6) with (10):

(10)   I sense a-red-square-ly and a-green-circle-ly.

This kind of paraphrase distinguishes (6) from (8), but at a cost: it seems to undermine our ability to validate inferences from (10) to sentences such as (11) and (12):

(11)   I sense a-square-ly,

(12)   I sense a-red-object-ly.

Validating these inferences requires two steps. First, we need to allow for conjunction elimination in (10), to obtain (13):

(13)   I sense a-red-square-ly.

We then need a way of inferring from (13) to (11) and (12). The problem, however, is that forming structured adverbs using hyphenation seems to undermine the status of "red" and "square" as genuine syntactic constituents of the report. Thus there appears to be no way of validating these inferences in virtue of the logical forms of the ascriptions. The general problem is that in order to solve the expressive problem, the adverbialist forms complex adverbs using hyphenation. But this hyphenation deprives the adverbs of structure, and renders them inferentially inert. Call this the *inferential* problem for adverbialism. The many-property problem is the dilemma formed from the expressive problem and the inferential problem. Either adverbialism lacks the expressive resources to distinguish between perceptual situations, or it lacks the logical resources to validate intuitive inference patterns.

3. Intensional Transitive Verbs and Adverbial Semantics

My defense of adverbialism begins from Anscombe's famous claim that perceptual verbs exhibit the features of intensionality. More specifically, Anscombe [1965] claimed that perceptual verbs, including "sees", "hears", "smells" and "perceives", are *intensional transitive verbs* (*ITVs*)—paradigmatic instances of which are "seeks",

"expects", "fears", "hopes", and "wants". Intensional transitive verbs exhibit a collection of peculiar features in their direct-object positions, and one semantic explanation for the presence of these features, originally proposed by Goodman [1976] and developed formally by Forbes [2000, 2006], is that ITVs have a reading that is non-relational. On this reading, intensional noun phrases in the object-positions of ITVs do not provide arguments to the verb. Instead, they serve as verbal modifiers, or adverbs. This semantic idea forms the basis of my defense of perceptual adverbialism.

However, the claim that perceptual verbs are intensional transitive verbs is highly controversial.[8] Initially, for the purposes of solving the many-property problem, I will assume that two perceptual verbs, "perceives" and "senses", are intensional transitive verbs. On the basis of this assumption, I will show that applying Forbes' formal semantics for ITVs yields a solution to the many-property problem. Further, independently of its plausibility as a hypothesis concerning natural language, treating perceptual verbs as ITVs yields a novel, plausible metaphysics of perception. However, the assumption I make concerning the intensionality of "perceives" and "senses" can be discharged. There is conclusive evidence that these verbs are intensional, and I will discuss this evidence in §6. But in order to get the adverbial proposal on the table, we first need to lay out the distinctive semantic features of intensional transitive verbs.

3.1. Intensional Transitive Verbs

A verb is transitive when it takes nominal expressions in both subject and object positions, occurring in sentences of the form **NP V NP′**.[9] A transitive verb **V** is intensional when it occurs in sentences that exhibit at least one of the following three properties.

Nonexistence: NP V NP′ has a reading which fails to entail **NP′ exists**, where **NP′** is a positively quantified NP, a bare plural, or a proper name.[10]

Nonspecificity: NP V NP′ has a reading that fails to entail **NP Vs a particular NP′**.

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[8]This debate is long, and many papers have been written on it, but the debate originates with Moore [1952], and is carried on by Ayer [1956], Cartwright [1957], Anscombe [1965], Hintikka [1969], Coburn [1977], Lewis [1983], Harman [1990], and Bourget [2017a,b], among many others.

[9]Many verbs that are technically intransitive are treated as transitive when they occur in constructions of the form **NP V P NP′**, where **P** is a preposition. This is typically done when the combination of intransitive verb and preposition have a transitive verb as a near-synonym, such as in the case of "seeks" and "is looking for". Many of these verb + preposition combinations behave identically to transitive verbs, and so unless otherwise noted, IâĂŹll treat them as intensional transitives also.

[10]The restriction to *positively* quantified NPs includes quantified NPs like "a dog", "the men who robbed him", "four gorgons", and "infinitely many numbers", while excluding negative NPs like "no dogs", "no one", "at most three gorgons", *etc.*

Opacity: NP V NP′ has a reading that fails to entail **NP V NP***, where **NP′**, and **NP*** are extensionally equivalent.

To illustrate with a traditional example, we can see that "seeks" exhibits NONEXISTENCE by noting that (14) has a reading that does not imply (15):

(14)   John seeks the fountain of youth.

(15)   The fountain of youth exists.

John can perfectly well seek the fountain of youth, even though no such thing exists, but he could never find it.

"Seeks" also exhibits NONSPECIFICITY, which we can see from the fact that (16) does not imply (17):

(16)   John seeks a capable business partner.

(17)   John seeks a particular capable business partner.

In this case, John may merely be seeking to share his entrepreneurial tasks with someone he thinks will help his business, and he might be satisfied with a great number of different individuals. We can bring this out with the following continuation:

(18)   John is looking for a capable business partner—but no one in particular.

Finally, "seeks" exhibits OPACITY. Given two coextensive NPs, substitution of one for another within its complement does not preserve truth:

(19)   John seeks Ortcutt.

(20)   John seeks the shortest spy.

When John seeks Ortcutt, he may not know that Ortcutt is the shortest spy, and so the goal of his search may be to find Ortcutt and not the shortest spy. Thus (19) has a reading that can be true while (20) is false.

    The reading that accounts for the failure of these entailments is one that resists existential quantification, admits of nonspecific interpretations for its object-position nominal, and resists substitution of co-extensive expressions. Following Quine [1956], we may call this reading the *notional* reading. However, the notional reading is not the only reading of sentences such as (14), (16), and (19); they also have a reading that lacks these features. Consider John's search for a capable business partner above. As we saw, John need not be looking for any particular person, but he might be, and (16) can also be used to report just such a search. We can bring out this other kind of search with the following paraphrase:

(21)   There's a particular capable business partner for whom John is looking.

Call the reading of (16) brought out by (21) its *relational* reading.[11] The truth-conditions of the notional reading of an ITV ascription differ from those of the relational reading: the notional reading can be true independently of whether the relational reading is true, which is why the notional reading is sometimes said to be "existence neutral". When a transitive verb exhibits all three of the features outlined above, and figures into ascriptions that are ambiguous between notional and relational readings, I will say that it is *paradigmatically intensional*.

3.2. Adverbial Semantics for ITVs

Suppose that John seeks a dragon. Dragons do not exist, and even if they did, John might not be seeking a particular one. This leaves us with a puzzle: is seeking a relation? If so, when John seeks a dragon, what kind of thing is it that he seeks? Different approaches to the semantics of intensional transitive verbs give different answers. Some claim that the direct object of John's search is a property, while others claim that it is a generalized quantifier. Others claim that searches are covertly propositional attitudes, or that John is searching for a non-existent dragon.

An alternative view is that there is no object for which John is searching, and that on its notional reading, "seeks", does not express a relation. Rather, John is engaged in a search of a particular kind: a dragon-search. This is the basic idea underlying Goodman and Forbes' non-relational account of the notional reading of ITV ascriptions. On their view, on the notional reading of a sentence such as (22),

(22)   John seeks a dragon,

there is no object which John seeks. Rather than providing a direct-object argument, the noun phrase in object position, "a dragon", serves as a modifier: it classifies John's search as a search of a particular kind. According to Forbes, intensional verb phrases, such as that in (22), have a semantics on a par with phrases involving complex, quantificational modifiers such as "one-woman university", "two-man bobsled", "three-story building", and "many-splendoured thing".

Forbes develops this idea into a compositional theory of the semantics of ITVs. Forbes holds that many intensional transitive verbs denote kinds of events, and so he presents his theory in a neo-Davidsonian framework in which events are a basic type. Event-semantic frameworks make use of *thematic roles*, which specify the roles that various objects play in an event. Simple sentences involving extensional transitive verbs typically employ a thematic role called a "Theme" which specifies the event's direct object. For example, the logical form of (23) is given in (24):

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[11]What I am here calling the "notional" and "relational" readings go by many names in the literature. The terms "notional" and "relational" are due to Quine [1956], but the readings also go by "intensional" and "extensional", "nonspecific" and "specific", and "*de dicto*" and "*de re*". I have chosen "notional" and "relational" mostly because the terms are relatively theoretically neutral, and are evocative of the kinds of states attributed by the two readings in question.

(23)   John found a dog.

(24) $\exists e$(finding(e) & Agent(e,John) & Theme(e,a dog).

When an extensional transitive verb has a quantificational argument in object posi-
tion, it is common to "raise" the quantifier; in this case, "a dog" can be raised all
the way above the event quantifier, leaving a variable behind as a trace.[12] With the
quantifier raised, the logical form of (23) is given by (25):

(25) $\exists x$[dog(x)]($\exists e$(finding(e) & Agent(e,John) & Theme(e,x)).

In (25), the quantifier binds the variable from the outside—it "quantifies in"—which
is why we only get a specific, existence-entailing reading for the indefinite: this
reading says that there is a particular dog that is the theme, or direct-object, of
John's finding.

But this strategy of raising the quantifier cannot account for notional readings.
On the notional reading of (22), "a dragon" is interpreted nonspecifically, and the
ascription is not existence-entailing, but raising the quantifier to a wide-scope po-
sition forces a specific, existence-entailing reading.[13] The solution to this problem,
according to Forbes, is to treat the notional reading as *non-thematic*, or "theme sup-
pressed": notional searches, unlike findings, do not have direct objects.[14] This cap-
tures the idea that on their notional readings, ITV ascriptions are non-relational; in
the case of (22), there is nothing for which John is searching. In place of a theme,
Forbes introduces a new thematic role, which he calls "Char", to account for the
Nonexistence and Nonspecificity of the notional reading. "Char" is short for
"characterization" or "is characterized by". According to Forbes [2006, p. 83], Char
is a theoretical primitive that expresses Goodman's notion of classification: Char
is posited specifically to capture the semantic contribution of quantificational mod-
ifiers such as "three-story" in "three-story building" and "many-splendoured" in
"many-splendoured thing"

Formally speaking, Char is a relation between an event and a generalized quan-
tifier. Generalized quantifiers are the semantic values of quantified NPs such as "a
dragon" and "three bears".[15] Thus, on Forbes' view, the logical form of the notional

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[12]For an account of this approach to quantifiers in argument position, see Heim and Kratzer
[1998, Ch. 6].

[13]The inability to raise an embedded intensional QNP is just illustrative. Other accounts of
quantification, including views that employ type shifting [Hendriks, 1993] and continuization
[Barker, 2003] also fail to capture the nonspecificity of notional readings.

[14]Forbes' term is "non-thematic", but the term "theme suppression" is an independent term for
the same idea from the literature on incorporation. We will discuss incorporation further below.

[15]Formally speaking, in an extensional type theory, generalized quantifiers are sets of sets,
which are the semantic values of expressions of type $\langle\langle e,t\rangle,t\rangle$. In Forbes' framework, ⟦a danc-
ing dragon⟧ is the function $\lambda P \exists x(dragon(x) \wedge P(x))$: it is the set of all sets that contain at least
one dragon. In an intensional framework such as Montague's, the type of a quantified NP is

reading of (26) is given by (27):

(26)   John seeks a dragon.

(27) $\exists e$(search(*e*) & Agent(*e*,John) & Char(*e*,⟦a dragon⟧).

In (27), Char is a relation between an event—specifically, a search of which John is the agent—and the generalized quantifier that is the semantic value of the quantified NP "a dragon" (which I denote with ⟦a dragon⟧). The reason that "Char" can serve as a modifier is that it does not specify *what John is searching for*. John is not searching for a generalized quantifier; if there were an object for which John was searching, it would be the theme of his search, but as we have seen, John's search has no theme. Characterization allows the quantifier to play a different role in John's search: the generalized quantifier characterizes John's search, but is not its object.

An analogy may be helpful here. John may run a marathon, or John may run with scissors. In the former case, the marathon is the theme of John's running—it is *what* he runs—but in the latter case, even though John does bear some relation to scissors, namely, running *with* them, he does not *run* them: the scissors are not the theme of his running. To say that John runs with scissors is to specify *how* John runs: it is to say that John runs in a particular way, namely, *with scissors*.[16] Analogously, for John's search to be characterized by the quantifier ⟦a dragon⟧ is not for him to search for a generalized quantifier—the generalized quantifier is not the direct object, or Theme of his search. Rather, the quantifier plays a role analogous to that of the scissors, in that it helps to specify *how* John searched: John searched in a way characterized by ⟦a dragon⟧.

According to Forbes, for an event to be characterized by a generalized quantifier is for that event to have certain success conditions. For John to search for *a dragon*, notionally, is for him to be the agent of a search that is successful only under certain circumstances: he is the agent of a search that is successful only if he *finds* a dragon. Thus, intensional NPs in the object-positions of intensional ascriptions serve to categorize or classify the event in question as one with certain success-conditions. It is these conditions that account for the the directedness of John's search as well as the inferential behavior that we observe within the complements of ITVs.

Forbes uses Char to fix the success conditions of an intensional ascription by stating meaning postulates that govern Char's behavior. In order to accomplish this, Forbes states a schema every instance of which serves as a meaning postulate in his theory. The schema, for non-compound QNPs is the following:

$\langle s, \langle\langle s, \langle e, t\rangle\rangle, t\rangle\rangle$: it is a function from worlds to sets of properties, where properties themselves are functions from worlds to sets of entities.

[16]However, "run" certainly does not mean different things in the two cases: it is not lexically ambiguous. The same is true for "seeks": the difference between "Char" and "Theme" in a verb's argument structure does not reveal a lexical ambiguity.

(28) $(\text{Char}(Q))(e)$ iff $\Box$(for any $\vec{e}$ such that $R\vec{e}e$, for Qx, there is some e' that is part of $\vec{e}$ such that Fe' and x is a theme of e')   [Forbes, 2006, p. 106]

In the schema, $\vec{e}$ is a course of events, R is a relation that holds between an event and a course of events when the latter makes the former successful, and F stands in for a fully extensional verb denoting a kind of event that makes e successful. The entire schema then says roughly the following: an event e is characterized by a generalized quantifier $[\![Q]\!]$ iff necessarily, every course of events that makes e successful has a subevent e' which has Qx as its theme.

An example will be helpful here. If you are searching for a dog, you are engaged in a search with certain success conditions. Searches are successful when you find what you are looking for, so the schema above says that a successful search will require a finding of a certain sort. A bit more formally, a search is characterized by the quantifier $[\![\text{a dog}]\!]$ just in case, necessarily, whenever that search is successful, you find a dog. This example illustrates how the quantified NP complements of intensional transitive verbs specify conditions under which events are successful, and spells those conditions out in terms of certain objects being the themes of a corresponding non-intensional ascription.[17]

Explaining the behavior of intensional transitive verbs in terms of success conditions allows us to validate crucial inference patterns that hold within the complements of intensional verbs. Most notably, it allows us to validate an inference pattern called *upward monotonicity*:

(29)   John seeks an F $\rightarrow$
       John seeks a G,   where F $\subseteq$ G.

To use a concrete example, the schema above governing the behavior of Char entails that inferences such as the following are valid:

(30)   John seeks a dog $\rightarrow$
       John seeks a mammal.

This inference is valid because necessarily, every event in which John finds a dog is one in which he finds a mammal, and so, necessarily, his original search is successful only if he finds a mammal, which is just to say that John seeks a mammal.

We can recast this argument schematically as follows: a search e is characterized by a generalized quantifier $[\![Q]\!]$ iff necessarily, in every course of events that makes e successful, the agent finds Q. But if, necessarily, whenever the agent finds Q, she also finds Q', then necessarily, her search is successful only if she finds Q', and so

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[17]Specifying such conditions will be difficult: in particular, specifying the success conditions for any particular intensional ascription will requiring finding a verb that states what qualifies as success for that event: for every verb like "seek", we must have a verb like "find", in terms of which its success can be specified.

her search is also characterized by $[\![Q']\!]$. But this means she was also searching for Q'. It follows that if John seeks a dog, he seeks a mammal, and that Mary seeks a building block, she seeks a material object. Further, this basic pattern does not just hold for non-compound NPs. As we will see below, this schema also validates upward monotonic inferences that result from characterization by conjunctive and disjunctive quantified NPs. In the next section, we will see that the validity of these inference patterns serves as an important part of the solution to the many-property problem.

4. Adverbial Semantics for Perceptual Verbs

We can now apply Forbes' semantics—in particular, the mechanisms of theme-suppression and characterization—to perceptual verbs. This application yields an initial adverbial semantics for perceptual reports on which perception has no direct object. However, this semantics still involves the relation of characterization, which some might argue keeps the view from being fully adverbial. To address this worry, I then go on to develop a modified version of Forbes' semantics which eliminates even this relation. On the modified view, perceptual verb phrases, construed notionally, do not involve relations at all.

4.1. Adverbialism through Characterization

Consider the following example:[18]

(31)   Mary perceives a dragon.

If we treat (31) as an intensional ascription, (31) will have two readings. Applying Forbes' semantics, the logical form of the notional reading is given by (32):

(32) $\exists e(\text{perceiving}(e) \ \& \ \text{Agent}(e,\text{Mary}) \ \& \ \text{Char}(e,[\![\text{a dragon}]\!]))$,

while the logical form of the relational reading is given by (33):

(33) $\exists e(\text{perceiving}(e) \ \& \ \text{Agent}(e,\text{Mary}) \ \& \ \text{Theme}(e,\text{a dragon}))$.

In (32), the event of perceiving, of which Mary is the agent, has no theme: there is no object of any type that Mary perceives. Rather, according to (32), Mary is the agent of a perceiving, and that event is characterized by the generalized quantifier $[\![\text{a dragon}]\!]$. For Mary to be the agent of a perceptual event that is characterized by a quantifier is not for her to bear the perceptual relation to the generalized quantifier;

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[18]As I mentioned above, here, when stating my own view, I will make use of "perceives" as opposed to "senses", since the goal of my view is to give a theory of perception rather than a theory of sensation.

characterization does not specify what Mary perceives. Rather, characterization allows the generalized quantifier to modify the perceptual event, and it does so by specifying the event's success-conditions. Hence, for Mary to perceive a dragon notionally is for her to be the agent of a perceptual event that has certain success conditions, but lacks a direct object.[19]

In order to specify what it is for a perceptual event to be successful, we need to make use of another, extensional verb; just as what it is for a search to be successful is to *find* what you're looking for, we need to find a verb that specifies what it is for a perception to be successful. Once we find this verb, we will be able to instantiate the schema above that governs the behavior of Char. One possibility is to find a fully extensional perceptual verb and use it to state these conditions. For instance, if "sees" (or "hears", or "smells") is fully extensional, then we can say that a perception of a dragon is accurate only in the case that we see one. But since intensional transitive verbs have a relational reading in addition to their notional readings, there is another option available to us: we can state the success conditions for the notional reading of each ascription with the corresponding relational reading. This allows us to state the success conditions of perceptions using two readings of the very same verb: we can state the success conditions of a perception reported with the notional reading of "perceives" using the relational reading of "perceives".

With these points out of the way, we can now instantiate the schema governing the behavior of Char with our generalized quantifier $[\![a\ dragon]\!]$.

(34)   An event of perceiving e is characterized by the quantifier $[\![a\ dragon]\!]$ iff $\Box$ for every event $\vec{e}$ that makes e successful, $\vec{e}$ has some subevent e' such that e' is a relational perception, and a dragon x is such that e' has x as a theme.

Roughly, this says that an event of perceiving is characterized by the quantifier $[\![a\ dragon]\!]$ just in case, necessarily, every event that makes the perceiving successful has a subevent which is a relational perceiving of a dragon. To take another example, an event of perceiving is characterized by the quantifier $[\![two\ red\ squares]\!]$ iff, necessarily, every event that makes this perception successful has a subevent which is a relational perceiving of two red squares.

The schema above shows how characterization provides success conditions for perceptual events: characterization specifies success-conditions in terms of a modal pattern of relational perceivings. Thus, while an agent may fail to relationally per-

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[19]One might ask how can this view be formulated in standard first-order logic without events. Such a reformulation is not easy, since ordinary first-order logic does not allow for the modification of predicates. However, we might say that in cases of notional perception, the agent bears a non-perceptual relation to a non-dragon. We can call this relation "perceptual characterization". We then have that Mary perceives a dragon notionally iff Mary bears the relation of perceptual characterization to the generalized quantifier $[\![a\ dragon]\!]$. Importantly, the relation of perceptual characterization is not the relation of perception, and so in notional perception, the agent does not bear the perceptual relation to anything at all.

ceive at our world, they may still be the agent of a perceptual event that has success conditions at this world. Insofar as an event of perceiving has such conditions, it will be an instance of non-relational perception: it will have success-conditions specified by Char, and so will be directed, but will not have a relational structure, since the event has no direct object. However, when the event is successful, there will be an event of perceiving with a relational structure: an event in which the perceptual event has a theme, and so one in which the agent relationally perceives a dragon.

4.2. Adverbialism through Incorporation

When applied to perceptual reports, Forbes' semantics for notional readings is adverbial in the following sense: on such readings, there is no object that the agent perceives, and so in hallucinatory cases where the relational reading is false, there is nothing to which the agent bears the perceptual relation. However, the semantics for notional readings involves characterization, which is a different, non-perceptual relation that holds between an agent and a generalized quantifier. Given the claim in the introduction that adverbialism is a non-relational account of perception, on which the properties of perceptual events explain all of perception's important features, one might reasonably object that the account just given is not fully adverbial. But such an account, on which perceptual events have only unary properties, can be easily formulated, and there are semantic reasons in favor of adopting it.[20]

Before positing Char as a theoretical primitive, Forbes considers the proposal that the logical form of the notional reading of (35) is given by (36):

(35)   Mary perceives a dragon.

(36) $\exists e((\text{a-dragon}(\text{perceiving}))(e) \,\&\, \text{Agent}(e,\text{Mary}))$.   Forbes [2006, p. 83]

In (36), "a-dragon" modifies "perceiving": it takes a predicate of events, "perceiving", and returns a new predicate of events, "a-dragon-perceiving". The hyphenated modifier "a-dragon" is derived from the the quantificational denotation of "a dragon" through a type-shift occasioned by the notional reading. Using this idea, we can formulate the semantics of the notional reading of a perceptual ascription schematically as follows:

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[20]It is illuminating to compare these two forms of adverbialism to the forms of representationalism discussed by Pautz [2007]. The adverbial view that results from characterization is structurally similar to the view, endorsed by Pautz, on which one sensorily entertains, but is not aware of, a property or a complex of properties. On both of these views, in perception, an agent bears some theoretically defined relation to an abstract object, but the agent is not perceptually aware of that abstract object—the abstract object is not the direct object of perception. The difference between the views is that characterization is designed to function like an adjunct such as "with", while "sensorily entertaining" is not. The form of adverbialism that I develop in this section eliminates the relation of characterization, and in so doing eliminates the similarity to Pautz's form of representationalism.

(37) $\exists e(Q_n\text{-perceiving}(e)\ \&\ \text{Agent}(e,\text{Mary}))$[21]

On this view, the semantic structure of the notional reading is identical to that of complex NPs such as "three-story building" and "many-splendoured thing"; this view treats intensional noun phrases as *semantically incorporated* [van Geenhoven, 1998, van Geenhoven and McNally, 2005, Carlson, 2006, Borik and Gehrke, 2015].[22] When a nominal is semantically incorporated, instead of contributing an argument to the verb, it serves, semantically, as a modifier that restricts the verbal denotation. The resulting verb phrase is interpreted as a complex, *intransitive* verb.

Unlike a semantics that makes use of characterization, on an incorporated semantics, the only object involved in the perceptual event is the agent. There is no generalized quantifier, or any other kind of entity, to which the agent or the event bears a relation. Formally speaking, however, the incorporated semantics is equivalent to the semantics given with characterization: each instance of characterization can be translated into an instance of incorporation, and vice-versa. Further, the other elements of Forbes' analysis carry over to the incorporated case straightforwardly, which allows the incorporated semantics to validate all of the same inferences as the semantics given in terms of characterization. Instead of stating a schema governing Char, we can state a schema governing the behavior of hyphenated quantificational modifiers. Just as in the case of Char, these modifiers specify the success-conditions of events:

(38) Q_n-perceiving(e) iff $\square$ for every event $\vec{e}$ that makes e successful, $\vec{e}$ has some subevent e' such that e' is a relational perception, and Qx are such that e' has x as a theme.

In other words, to perceive notionally is to Q_n-perceive, and to Q_n-perceive is just to be the agent of an event with certain success conditions. Those success conditions are specified by using the relational reading of "perceives": in order for an agent to succesfully Q_n-perceive, there must be Qx such that the agent relationally perceives x. However, the agent can Q_n-perceive whether or not these conditions are satisfied. The fact that these two formulations are intertranslatable should be unsurprising: characterization is a theoretical primitive designed to capture the ways in which the meanings of notional readings are like those of their incorporated paraphrases.

However, there is an important difference between characterization and the incorporated view. The proposal that notional readings are instances of semantic

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[21]Since many different kinds of arguments can be incorporated, the resulting modifiers can modify the verb in many different ways. In (37), the subscripted n serves to index the modifier to the argument-place that it incorporates. In this case, the subscripted n shows that the modifier is derived from a notional QNP in direct-object position, and so that Mary's perception is *of* a dragon (in the notional sense), rather than, for instance, *by* a dragon or *with* a dragon.

[22]Most notably, compare this semantics to the one for incorporation structures given in Dayal [2003, p. 16], which also makes use of theme-suppression and hyphenation.

incorporation is a substantive empirical hypothesis, while characterization is a theoretical primitive posited to explain incorporation-like behavior. Thus characterization is not subject to empirical constraints in the same way that the incorporated proposal is. But there is much to be said in favor of the view that notional readings are genuinely incorporated. First, most intensional NPs meet all six of the criteria laid out by Carlson [2006] for qualifying as semantically incorporated. Additionally, treating notional readings as semantically incorporated straightforwardly explains NONEXISTENCE and NONSPECIFICITY, and perhaps OPACITY as well. Finally, theme-suppression, which is the mechanism by means of which Forbes accounts for notional readings, is characteristic of semantic incorporation anyway [Dayal, 2003, Borik and Gehrke, 2015]. While a full defense of the view that notional readings are instances of semantic incorporation goes beyond the scope of this paper, I take the proposal that notional readings are semantically incorporated to at least be an empirically plausible variant of Forbes' view.[23]

Thus we have two forms of adverbial semantics: one provided by Forbes' notion of characterization, and one provided by semantic incorporation. Which view we should adopt will depend on the results of detailed semantic investigation. My own view is that the intensionality of ITVs should be accounted for in terms of incorporation—or at least that incorporation plays a central role in the semantics of ITVs—but such a view is admittedly controversial. For the purposes of solving the logical and semantic problems for adverbialism, I will make use of characterization, since this is a mainstream, off-the-shelf account of the semantics of ITVs. However, given their formal equivalence, everything that can be done with characterization can likewise be done with an incorporated semantics and the accompanying schema, given in (38).

5. Solving the Problems for Adverbialism

We are now in a position to show how the adverbial semantics presented in the last section can solve the many-property problem and the many-relations property for adverbialism. I will illustrate how this can be done using characterization, but the solution using an incorporated semantics is exactly analogous.

5.1. *Solving the Many-Property Problem*

Let's begin by considering the first horn of the dilemma that the many-property problem poses. Recall that the first horn is the problem of distinguishing between complex perceptual reports such as those below:

(39)   Mary senses a red, square patch and a green, circular patch.

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[23]I defend the view that intensional transitive verbs semantically incorporate their object-position nominals in my manuscript "Intensionality and Semantic Incorporation".

(40)   Marys senses a red, round patch and a green, square patch.

Jackson originally objected that adverbial paraphrases of (39) and (40) would lose all structure, leaving something to the effect of:

(41)   Mary senses redly and squarely and greenly and roundly.

However, characterization allows us to preserve the structure of the verb's complement. For example, the logical form of (39) would be the following:

(42) $\exists e$(sensing(e) & agent(e,Mary) & Char(e,⟦a red square patch and a green round patch⟧)).

This is easily distinguished from (43):

(43) $\exists e$(sensing(e) & agent(e,Mary) & Char(e,⟦a red round patch and a green square patch⟧)).

Thus, Forbes semantics solves the expressive problem for adverbialism: since Forbes' adverbs are quantificational modifiers, and the complements of the verbs denote different generalized quantifiers, the events will be characterized differently, and so will be distinct.

But Forbes' semantics also validates inferences involving the quantificational modifier. As we saw above, the rules governing Char validate upward-monotonic inferences, and the key to solving the inferential problem is to treat the inferences that the adverbialist needs to underwrite as monotonicity inferences. However, the schema above did not apply to conjunctive QNPs. But a similar schema can be stated for conjunctive quantifiers, and this schema validates conjunction elimination:

(44)   Char(e,$\mathcal{Q}$ and $\mathcal{Q}'$) iff $\Box$(for any $\vec{e}$ such that $R\vec{e}e$, for $\mathcal{Q}x$ there is some e' which is part of $\vec{e}$ such that Fe' and x is a theme of e', and for $\mathcal{Q}'y$, there is some e'' which is part of $\vec{e}$ such that Fe'' and y is a theme of e'')

Roughly, (44) says that an event is characterized by a conjunctive quantifier if and only if, necessarily, in every event $\vec{e}$ that makes the original event e successful, for $\mathcal{Q}x$ and $\mathcal{Q}'y$, $\vec{e}$ has two relational subevents, one of which has x as a theme and one of which has y as a theme. To illustrate with an example, Mary's search is characterized by the quantifier ⟦a dog and a cat⟧ if and only if every course of events in which her search is successful has a subevent in which she finds a dog and a subevent in which she finds a cat.

This transfers over easily to the case of perception. Consider (42). Mary senses a red square patch and a green round patch notionally just in case her search is characterized by the quantifier ⟦a red square and a green circle⟧. Mary's sensing is characterized by this quantifier iff necessarily, every course of events in which

her sensing is successful has a subevent in which Mary relationally senses a red, square patch and a subevent in which she relationally senses a green, round patch. But necessarily, every such course of events is one with a subevent in which Mary relationally senses a red, round patch. Thus it follows that, necessarily, in every situation where Mary's sensation is successful, she relationally senses a red, round patch. But this is just to say that Mary's sensing is characterized by the quantifier ⟦a red, round patch⟧. Thus, we validate the weakening inference from Mary senses Q and Q′ to Mary senses Q. But we know from above that ITVs validate monotonic upward inferences for non-compound QNPs: necessarily, every event in which Mary relationally senses a red, round patch is one in which she relationally senses a round patch. So Mary senses a circle notionally, or senses round-ly. This solves the inferential problem for adverbialism.

5.2. *Solving the Many-Relations Problem*

The last section showed how a theory of perceptual adverbialism based on the semantics for intensional transitive verbs solves the many-property problem, as it was presented by Jackson [1975, 1977]. However, Dinges [2015] presents a strengthening of the many-property problem that he calls the "many-relations" problem. The problem is as follows: perceptual reports not only attribute many properties to particular sensations, but these sensations are related to one another. Consider the following perceptual report:

(45)   Jane senses a red object that is brighter than a green one and to the left of a yellow one.

In (45), Jane is in a perceptual situation in which she senses three things, each of which has different properties, and in which one of these objects stands in relations to the other two. The challenge for the adverbialist is to construct modifiers that not only pair properties correctly, but reidentify a single sensation as standing in two separate relations.

This problem refutes the only other solution to the many-property problem on offer: the operator theory proposed by Tye [1989].[24] However, Forbes' semantics handles relational ascriptions such as (45) easily. The logical form that Forbes' semantics provides for (45) is given in (46):

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[24]See Dinges [2015] for a demonstration that Tye's view cannot account for multiple relations. While Tye's proposal is the only fully developed solution to the many-property problem on the table, a more recent proposal, given by Kriegel [2007, 2008], gestures at a solution. Kriegel's idea is to adopt a version of the fused adverb solution to the expressive problem, and then solve the inferential problem by pointing out that Jane perceives a-red-square-ly is a determinate of the determinable Jane perceives a-square-ly, and inferences from determinates to determinables are generally valid. The proposed solution has been criticized by Alexander Grzankowski [2018].

(46) $\exists e$(sensing(e) & agent(e,Jane) & Char(e,⟦a red object that is brighter than a green one and to the left of a yellow one⟧))

Importantly, "a red object that is brighter than a green one and to the left of a yellow one" is a single, intensional, quantificational NP, and in (46) it contributes a generalized quantifier as an argument to Char. Here is the lambda expression for the generalized quantifier it provides as an argument:

(47) $\lambda P\exists x\exists y\exists z$ (red(x) & green(y) & yellow(z) &brighter-than(x,y) & left-of(y,z) & $P(x)$

In (47), the relative clause "that is brighter than a green one and to the left of a yellow one" serves to restrict the original quantifier denoted by "a red sensation": it tells us what kind of red sensation Jane is having. The multiple relations are built into this relative clause. In light of this, the quantifier serves to characterize the event of sensing as one that would be accurate in certain circumstances, namely, in the circumstances in which Jane in fact sees a red patch that is brighter than a green patch and to the left of a yellow patch. Further, Char licenses inferences from (45) to sentences such as (48):

(48)   Jane senses a red object.

Thus, applying Forbes' semantics solves both the expressive and inferential problems, even when applied to perceptual reports with highly structured, relational complements. Characterization, together with the tools of generalized quantifier theory, yields a method for specifying the accuracy conditions for arbitrarily complex perceptual experiences.

6. Perception and Intensional Transitive Verbs

Above I showed how treating perceptual verbs as intensional transitive verbs, and providing an adverbial semantics for ITVs, solves the many-property problem and the many-relations problem for adverbialism. But are perceptual verbs in fact intensional transitives? This question is vexed. Versions of the question go back at least to Moore [1905], and many papers have addressed the paper since, but there is no clear philosophical or linguistic consensus on its answer; philosophical and linguistic opinion is largely divided.[25]

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[25]Among those who hold that some of our perceptual verbs exhibit the features of intensionality are Moore [1905, 1952], Ayer [1940, 1956], Smythies [1956], Anscombe [1965], Hintikka [1969], Brogaard [2014, 2015], and Bourget [2017a]. Among those in the opposing camp, who hold that perceptual verbs are fully extensional, are Cartwright [1957], Austin [1962], Dretske [1969], Jackson [1977], Barwise [1981], and Soames [2003], to name just a few.

However, there is empirical evidence that points toward a resolution of this long-running dispute. In order to test perceptual verbs for the features of intensionality, I designed and ran three studies. Each study compared three perceptual verbs, "sees", "perceives", and "senses", to one paradigmatically intensional verb, "search", and one paradigmatically extensional verb, "touch", with respect to one of the three features of intensionality. The results of these studies were striking: "perceives" did not differ statistically from "search" with respect to either Non-specificity or Opacity, and while it did differ statistically from "search for" with respect to Nonexistence, its mean score was still much closer to that of "search" than to that of "touch". "Senses" likewise exhibited intensional behaviors: it behaved intensionally with respect to two out of the three features: Nonspecificity and Opacity. By contrast, "sees" exhibited primarily extensional behaviors: it was both existence-entailing and fully specific, and received an intermediate score with respect to Opacity.[26] Thus, these studies provide strong evidence in favor of the conclusion that "perceives" and "senses" are intensional transitive verbs.[27]

Historically, however, there has been significant resistance to the idea that perceptual verbs have notional readings, and there have been attempts to explain the apparent presence of such readings in alternative ways. Developing a view due to Austin [1962], Dretske [1969] and Soames [2003] have argued that apparent notional readings of our perceptual verbs are a result of pragmatics, rather than semantics. Briefly, Dretske and Soames argue that our perceptual reports may convey propositions that are free from existential commitments, but semantically, perceptual ascriptions have only one reading, and do not exhibit the features of intensionality. But the results of the experiments give us two reasons to think that this proposal is incorrect. First, if apparent notional readings are in fact pragmatic, then we lack an explanation of the stark differences between "sees" and "perceives". If we can convey an existence-neutral proposition with "perceives", there seems to be no reason why we could not do so with "sees" as well—pragmatics cannot account for the constrast. Second, given that "perceives" does not differ from "search for" with respect to two of the three properties of intensionality, and is close to it with respect to a third, the pragmatic proposal would lead to us treating the notional reading of "search for" as merely apparent as well, even though "search for" is paradigmatically intensional.

Thus, the results of the experiments above give us strong reasons to think that some perceptual verbs have genuine notional readings. Forbes' adverbial semantics is one of the most the most fully developed accounts of the notional reading,

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[26]For a full discussion of the intensional features of these perceptual verbs, see my manuscript "An Empirical Solution to the Puzzle of Macbeth's Dagger". The manuscript, along with the analyses and raw data from the studies I mention here, is available upon request.

[27]They also provide a surprising resolution to the puzzle of Macbeth's dagger: Macbeth cannot see a dagger, given that there is no dagger for him to see, but he can *perceive* one; "perceives" is semantically weaker than "sees".

although as I indicated above, I prefer an incorporated variant on Forbes' view. If one of these adverbial semantic accounts is correct, it shows that adverbialism, as a view on the nature of perception, is semantically conservative: adverbialism follows from the true semantics for perceptual reports in English. However, adverbial accounts are not the only accounts of the semantics of ITVs. Some approaches to the notional reading that treat it as having a direct object, but treat this direct object as an abstract object, such as a property or a generalized quantifier. Other views treat the notional reading as a covert propositional attitude. When applied to perceptual verbs, these competing semantic views yield different accounts of perception.[28] I do not have space here to argue that all of these relational approaches to the notional reading are inadequate.[29] For my purposes, it suffices to point out that adverbial views are among the best candidates in the semantic literature for giving the true structure of the notional reading.

7. The Metaphysics of Perceptual Adverbialism

We have seen that the adverbialist has at her disposal a semantics with the expressive and logical resources to solve both the many-property problem and the many-relations problem, and that this semantics is also a plausible semantics for natural language perceptual reports. However, this is not an advance for the philosophy of perception unless the adverbial semantic proposal yields an otherwise plausible metaphysics of perception. The goal of this section is to show that it does.

7.1. *From Semantics to Metaphysics*

Consider a perceptual ascription such as (49):

(49)   John perceives a unicorn.

Assuming that "perceives" is an intensional transitive verb, (49) has two readings: a notional reading and a relational reading. On the further condition that Forbes' semantics for intensional verbs is the correct one, these two readings have the following logical forms:

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[28] For example, Bourget [2017a] likewise argues that perceptual ascriptions are sometimes intensional. In [Bourget, 2017b], he applies the traditional Montagovian semantics for ITVs to perceptual ascriptions, and so, on his view, perception has a generalized quantifier as a direct object. Bourget then claims that the result favors a version of representationalism. There are many connections between Bourget's approach and my own, but I maintain that Forbes' view is superior to the traditional Montagovian view, and so the adverbial view has a better claim to the semantics of our perceptual ascriptions.

[29] For a criticism of relational approaches to the notional reading, and a defense of adverbial approaches, see Forbes [2006, pp. 70-72].

(50) $\exists e$(Perceiving(e) & Agent(e,John) & Char(e,⟦a unicorn⟧))

(51) $\exists e$(Perceiving(e) & Agent(e,John) & Theme(e,a unicorn))

If we adopt the incorporated variant of Forbes' view, then the notional reading of (49) will instead have the form given in (52):

(52) $\exists e$(Q_n-perceiving(e) & Agent(e,John).

Everything I say below concerning the metaphysics of perception will hold whichever of the two adverbial semantic proposals we choose.

   If we treat the logical structure of the notional and relational readings as the basis for a metaphysics of perception, we see that perception comes in two forms: what I will call the *adverbial* and *relational* forms of perception. Since the logical forms above are articulated in a neo-Davidsonian semantic framework, intensional verbs introduce quantification over events, and so both the adverbial and relational forms of perception are events with agents. Claiming that perceptual events have agents does not mean that perception is a fully intentional activity. However, it does mean that the agent plays an important role in the event, and that perception must be person-level, as opposed to subpersonal. In a certain sense, perception is something that we do. However, beyond this, I do not wish to take a hard stance on the nature of perceptual agency. For now it will suffice to say that agents play an active role in perceiving, while leaving the details of this proposal for another time.[30]

   Recall that in our semantic proposal above, the notional and relational readings of a perceptual ascriptions are intimately related: the latter is used to specify the success-conditions for the former. Metaphysically speaking, this means that the success conditions of an instance of adverbial perception are specified in terms of corresponding relational perceptions: whenever an adverbial perception is successful, the agent relationally perceives the correct (kind of) object. One way of putting this is to say that adverbial perception aims at relational perception. But what kinds of events are adverbial and relational perceptions? Let's begin by considering relational perception.

   The features of relational perception are the features of the kinds of events expressed by extensional verbs in neo-Davidsonian semantics more generally. Such verbs, in addition to having an agent, typically also have themes. But there are many kinds of events that have themes—which kind of event is relational perceiving? First, relational perception is something that is *aimed at*, and it is constitutively successful. In these respects, relational perception resembles an achievement. In Vendler's [1957] classic categorization of verbs in terms of temporal structure,

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[30]Miracchi [2017] argues that perception is an activity with an agent and an aim, and claims that insofar as it has an agent, perception must be person-level. However, she too wishes to resist the idea that perception is a fully intentional action.

achievements are both punctual and telic: they are the endpoints, or goals, of various kinds of activities. Paradigm cases of achievements are events such as reaching the summit of a mountain, stabbing Caesar, and finding Nemo: these events are instantaneous, and involve achieving a certain goal; if this goal is not achieved, the event has simply not occurred. However, unlike paradigmatic achievements, relational perception need not be punctual: we can perceive things for certain amounts of time. I can perceive John's face for several minutes, and track a ball through the air for several seconds. If I can perceive in this way, it seems that perception cannot be an achievement, at least in Vendler's sense, since achievements are instantaneous. This pushes us toward the more traditional view that relational perception is a state that is temporally extended.

I hold that relational perception has some features of both achievements and states. Consider one kind of relational perception: touching. On the one hand, touching something can be an achievement: its onset is instantaneous, and it may be the endpoint or goal of an activity: trying to touch something. But you can also touch things for periods of time, or touch things without trying. My view is that all relational perceiving is like touching. Relational perceiving is telic, insofar as there is an instant at which it is achieved, namely, the moment at which you perceive something relationally. Further, if you fail to perceive something relationally, no relational perceiving has occurred. However, after this endpoint, there may be a state of relational perceiving that is temporally extended. In what follows, I will treat it as an achievement that may be temporally extended, although I think it could equally well be seen as a state at which adverbial perception aims; for my purposes, nothing turns on deciding between these two ways of speaking. Of course, there is much more to say about relational perception, but since my focus here is on adverbial perception, I will remain agnostic about the remaining details.

Adverbial perception is a novel kind of perceptual event. Adverbial perception does not have a theme, and so is not relational; instead, to perceive an *F* is to be the agent of a an event of a particular kind. Being the agent of such an event is best construed as being the agent of an activity. Typical examples of activities are running, talking, and cycling, which stand in contrast to achievements: on Vendler's categorization, activities are temporally extended and atelic. However, adverbial perception differs from these activities in that it has success conditions. As we saw above, these success-conditions are specified by Char: an instance of adverbially perceiving a unicorn is successful only if the agent relationally perceives a unicorn. In virtue of having success conditions, adverbial perception is directed, or has a goal. The goal of a particular instance of adverbial perception is *to perceive relationally*. However, unlike in the case of achievements, it is not constitutive of adverbial perception that this goal be reached; since the notional readings of intensional transitive verbs are existence-neutral, we can perceive adverbially without perceiving relationally.

The resulting picture is one on which adverbial perception is telic, insofar as it has a goal, but achieving the goal is not constitutive of perceiving adverbially.[31] Other events falling into this category are searches, tryings, chasings, huntings, flee-ings, plannings, and foreseeings, just to name a few. Using the language of activities and achievements, adverbial perception is an activity that is aimed at an achieve-ment, namely, a relational perception, although it need not be aimed at a particular relational perception. Taken together, we can see adverbial and relational percep-tion as different parts of a single event: an *accomplishment*. An accomplishment is a temporally extended, telic event; it is a successful directed activity, or an activity together with an achievement. Thus, accomplishments have the right properties to subsume successful instances of adverbial perception, in which the goal of the ad-verbial perception is reached. A useful comparison is to treat successful perceptions as analogous to successful searches: in a successful perception, you perceive both adverbially and relationally, while in a successful search, you seek and you find. In both cases, events of the former kind are aimed at events of the latter kind, and the latter is involved in specifying the success conditions of the former.

7.2. *Fundamentality and Factoring*

No proposal concerning the metaphysics of perception would be complete with-out a discussion of how adverbial perception and relational perception relate to the perceptual kinds ordinarily discussed in the philosophy of perception: perceptual experience, hallucination, illusion, and perception (where the latter is construed as a factive or existence-entailing state). Roughly speaking, adverbial perception cor-responds to perceptual experience: it is neutral between success and failure—one can adverbially perceive whether or not one relationally perceives. Relational per-ception corresponds to the ordinary sense in which relationalists use "perception", except for the fact that, as I said above, I treat relational perception as a certain kind of event.

Hallucination is ordinarily taken to be a kind perceptual experience in which the object of our experience does not exist, or is simply absent from our environ-ment.[32] Hallucinations differ from illusions in that, when we are under an illusion, we are perceptually related to an object in our environment, but somehow perceive or perceptually represent that object incorrectly: as having a property that it does not in fact have. On my view, hallucination occurs when we perceive adverbially, but our adverbial perception fails to culminate in an event of relational perception. In other words, when we adverbially perceive, but are not also the agents of a rela-

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[31]This means that Vendler's traditional categorization of kinds of events neglects an important category: intensional events. Intensional events are directed activities that are not constitutively successful.

[32]Although veridical hallucinations are an exception to this idea; I will discuss veridical hallu-cinations at the end of this section.

tional perception that makes our adverbial perception successful, we are subject to a hallucination. This construes hallucination as a failure: it is a failure to perceive relationally, or a failure to achieve. The requisite event, an instance of relational perception in which the adverbial perception culminates, has simply not occurred. However, our adverbial perception still has success-conditions, and can still explain why our hallucination still has a distinctive phenomenal character.

What about illusions? How can the adverbial view account for the properties things seem to have? The most natural way to account for illusions is to claim that in an illusion, there is a single event in which we both adverbially perceive and relationally perceive, but that the adverbial perception is not made successful by the relational perception: there is a mismatch between the adverbial perception's success conditions and the instance of relational perception. In such a case, the event will have both a theme and be characterized by a quantifier, and in such an event, I am perceptually related to a particular object, but I see the object as my adverbial perception dictates. Property ascription, and "seeing as", are part of adverbially perceiving. I might be perceptually related to a clump of seaweed, while having an adverbial perception of that seaweed as an octopus. In such a case, my adverbial perception clashes with the concrete object to which I am related by means of relational perception, and so I perceive the object as it is not: I am subject to an illusion.

Alternatively, it is possible to treat illusions as being expressed by the so-called "split" readings of intensional transitive verbs.[33] On a split reading, the quantificational determiner is "split" from its restrictor by the verb: the determiner is interpreted outside of the scope of the verb while the restrictor is interpreted inside its scope. The most natural interpretation of a split reading is that there is a particular thing to which one is related, but one is related to it only under a certain guise or description which the object may not satisfy: one does not see it *as* the thing that it is. If illusions can in fact be captured by split readings, this would present interesting correspondence between the different scopal readings of intensional transitive verbs and the important perceptual kinds. I do not have space to defend this proposal at length here, but I simply gesture to it as an interesting route available to me in explaining the nature of illusions.

We can summarize my view as follows. There are two forms of perception: adverbial and relational perception. To adverbially perceive an *F* is to be the agent of an event with a certain property: it is to *F*-perceive, or to perceive *F*-ly. In turn, what it is to *F*-perceive is to have certain success conditions: it is to be the agent of an event that is successful only if you relationally perceive an *F*. I take this as a definition of what it is, metaphysically speaking, to *F*-perceive: for a perception

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[33]Williamson [2013] makes use of split readings of modal sentences in arguing for necessitism, but such split readings go back at least to Fodor [1970], and are discussed at length by Keshet [2008, 2011] and Szabó [2010, 2011].

to have certain success conditions is just for it to be a perception of a particular kind, specified adverbially via characterization. In turn, these success conditions can either be satisfied or unsatisfied. When they are satisfied, adverbial perception is successful, and we have achieved our goal, which was to relationally perceive. But when these conditions are not satisfied, we will be in the grip of a hallucination or an illusion. We are subject to illusion when we relationally perceive, but this relational perception does not satisfy the adverbial perception's success conditions, while when we hallucinate, we fail to perceive relationally at all.

How does this view differ from representationalism and relationalism about perception? Representationalists often endorse two principles which I will here call FACTORING and COMMON FACTOR. Typically, these principles are taken as going hand in hand. The basic idea behind factoring is that veridical and non-veridical perceptual experiences can be factored into components: they can be analyzed into a mental component, namely a representational state, and a non-mental component: the state of the world, perhaps together with some other conditions ensuring that the state of the world is appropriately related to the representation.[34] Veridical and non-veridical perceptual states are then taken to be mentally alike: they have a common mental factor: they are both representational states, and differ only with respect to how the representation is related to the world. This is similar to the way that the traditional theorist about knowledge holds that knowledge can be factored into belief, truth, justification, and perhaps an anti-Gettier condition, and then holds that belief is a common factor between cases in which a subject knows and cases in which she does not.

Relationalists, by contrast, typically deny both FACTORING and COMMON FACTOR: often, relationalists take perception, as a relational state, to be explanatorily prior to other states, and part of taking perception to be explanatorily primary is that it cannot be factored into components, or analyzed. As a consequence of both the relational nature of perception and its explanatory primacy, relationalists often hold that perception is of a fundamentally different kind than other perceptual states such as hallucination—there is no common factor between veridical perception and hallucination. In this respect, the relationalist's position is similar to that of a knowledge-first epistemologist: relational views of perception are sometimes called "perception-first" views, in that they treat relational perception as explanatorily primary.[35]

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[34]Such conditions are needed to rule out veridical hallucinations from cases of genuine perception. On some views, such as that in Searle [1983], the condition that the state of the world be appropriately related to the perception is built into the content of the perception itself.

[35]For an account of pereption-first views, see Miracchi [2017]. Miracchi takes perception-first views in the philosophy of perception to be analogous to knowledge-first views in epistemology. Similarly to how Williamson [2000] holds that Gettier cases pose an insurmountable problem for analyses of knowledge, Miracchi holds that cases of veridical hallucination pose an insurmountable obstacle for views of perception that involve FACTORING. Analogously to Williamson,

Where does the adverbialist view stand with respect to these two principles? First, does the adverbialist accept FACTORING? The short answer is: no, not in the form in which the representationalist accepts it. The adverbialist holds that a successful adverbial perception can be factored into an adverbial perception and a relational perception which makes it successful. But both adverbial and relational perception are ultimately explained in terms of relational perceptions. Thus my view does not involve factoring successful perception into worldly and mental factors, and so does not need to provide an analysis of veridical perception in terms of a mental state bearing an appropriate relation to the world. Rather, my view takes relational perception as explanatorily primitive, and defines the success-conditions of adverbial perception in terms of it. My view is thus a perception-first view: it gives explanatory primacy to relational perception.

But given that perception-first views typically reject COMMON FACTOR, does the adverbialist have to reject it as well? No, the adverbialist can still endorse COMMON FACTOR, at least in a certain form. Since we know that the notional reading of a perceptual report can be true whether or not its relational reading is true, the form of perception it expresses, adverbial perception, can be present whether or not we relationally perceive. To put this in terms of events, adverbial perception is a directed activity can either be successful or unsuccessful. Successful perception is an accomplishment: it includes both the activity of adverbially perceiving and an achievement of relationally perceiving. Hallucination is a case where the activity of adverbially perceiving fails to culminate in an achievement. But adverbial perception is a fundamental part of both of these cases. This is what we should expect, given the nature of adverbial perception: to perceive adverbially is to be the agent of an event with certain success conditions, and these conditions may or may not be satisfied. Of course, in the case of successful adverbial perception, there is something additional present: there is an event of relational perception in which the adverbial perception culminates. But both successful and unsuccessful perceptions are fundamentally events with success conditions specified in terms of a modal pattern of relational perceivings. This allows veridical and hallucinatory perceptual events to be instances of the same kind of activity.

Miracchi adopts a perception-first view partly in light of such puzzles. The view I endorse here is similar to the view proposed by Miracchi, in that it takes perception to be explanatorily primitive, and takes perception to be an activity whose aim is to perceive relationally, but it differs on several important points, and is motivated by radically different considerations. Unlike Miracchi, I hold that successful and unsuccessful perceptual events have a common factor, and that this factor is a person-level perceptual event. Additionally, where Miracchi invokes competences to explain the directedness of perception, I invoke person-level intensional events that have success-conditions, but are not constitutively successful.

8. Conclusion

Above I showed how the adverbialist can adopt the tools used to provide a semantics for intensional transitive verbs and use them to solve the many-property problem, and its strengthening, the many-relations problem. In itself, this is a significant advance for adverbialism about perception. But additionally, articulating adverbialism with the tools of intensional semantics opens the prospect of unifying the semantics and metaphysics of perception: it is empirically plausible that perceptual verbs are intensional transitive verbs. Further, by taking the adverbial semantic proposal seriously, I articulated a metaphysics of perception on which adverbial perceptual states are person-level perceptual activities aimed at relational perception. On this view, a successful instance of perception is an *accomplishment*—it involves both a directed activity and an achievement. On my view, the success-conditions of adverbial perceptual states are specified in terms of a modal pattern of relational perceivings, and thus my view takes relational perception as explanatorily basic. My view is thus a "perception first" view. But in contrast to other perception-first views, my view allows veridical and hallucinatory perceptual to have a common mental factor: they both involve adverbial perception, and are differentiated by whether adverbial perception culminates in an event of relational perceiving. This rehabilitation shows that the adverbial theory of perception is not dead; it is alive and well, and provides an attractive third option to representational and relational views in the philosophy of perception.

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