1 Introduction: meaning beyond intensions

It's possible for speakers to have conflicting beliefs, despite not differing in the way they take the world to be. These differences in attitude are often traceable to differences in how speakers construe the truth-conditional content of certain words. Malcolm (1942: 356) gives an example:

Now suppose a case where two people agree as to what the empirical facts are, and yet disagree in their statements. For example, two people are looking at an animal; they have a clear, close-up view of it. Their descriptions of the animal are in perfect agreement. Yet one of them says it is a fox, the other says it is a wolf. Their disagreement could be called linguistic.

The issue in this scenario isn’t what properties the animal has, but rather how to describe the animal, given that it has properties of a certain sort. This is a question of the meaning of the describing predicates, in the narrow truth-conditional sense: what do fox and wolf denote, such that predicating them of a certain animal results in truth or falsity?

In the tradition of Carnap (1947), the truth-conditional content of a predicate is its intension, which is the property that the predicate denotes. So the above disagreement can be thought of as one concerning how to treat the intensions of the disputed predicates, with different speakers treating the words as if they had distinct intensions. This is how Chisholm (1951: 319) puts it with another example:

For example, people sometimes argue over the question, “is a whale a fish?” and yet seem to be in agreement about the properties of whales; usually, in such cases, the word “fish” does not have the same intension for each of the persons concerned.

Some speakers may treat the intension of fish as a property that whales have, while others may treat it as a property that they don’t (say, a property requiring that its bearer not be air-breathing). The former speakers will affirm that whales are fish, while the latter will deny this.

1 Cf. Campbell (1945: 7-8).
2 Chisholm (ibid., fn. 8) clarifies his notion of intension as follows: “The intension of a word, say ‘horse,’ for some person, might be said to comprise those characteristics which it is necessary for him to believe an object to have before he will refer to it as a ‘horse’ (or apply the word ‘horse’ to it).” Cf. Carnap (1955), esp. §§3, 5. I take this to be the same notion appealed to here, of a speaker treating the intension of a word as such-and-such. Section 2.3 characterizes this notion further.
Ludlow (2008: 118) offers a related example, regarding whether or not the racehorse Secretariat is an athlete. The treatment of the intension of *athlete* is variable enough among the speaker population in English to allow different, and often conflicting, answers to this question. Even knowing all the relevant things there are to know about Secretariat — say, that he is a Virginian Thoroughbred that won the Triple Crown — the question remains open, presumably owing to speaker variance as to whether racehorses, or perhaps non-humanlike creatures generally, are to be called athletes.

The answer to the question of whether Secretariat is an athlete is the same as the answer to the question of whether the intension of *athlete* is a property that Secretariat has. The linguistic conventions across the speaker community do not decide what exactly this intension is, and so it follows that these conventions and the way the world is don’t together decide whether Secretariat is an athlete. And so the meaning of *athlete* in a broader sense is not merely intensional, or does not determine a single property that the predicate denotes. If it did, then speakers fully informed about the facts would not competently and sincerely disagree as to its application. They would instead just take Secretariat to be an athlete or not, in line with whether or not he had this property.

To appropriate Cresswell’s (1975) terminology, the meaning of *athlete* at this level of description is *hyperintensional*, and so contains information beyond what a merely intensional treatment of it allows. While the meaning of *athlete* in some sense stays constant across the linguistic community, such that it can be disputed whether this meaning is applicable to Secretariat, its precise truth-conditional construal is variable across (and often within) speakers. And so its meaning is not equivalent to its intension: the former determines the latter under certain conditions.

The same holds for the other examples above, and also for the vast majority of natural language predicates. Infinite examples can be constructed: take any predicate you like, and find a case where it’s unclear given the conventional treatment of that predicate whether it is applicable or not, or where different speakers give different verdicts on the matter. In general, linguistic conventions do not uniquely determine intensions for predicates, and so merely intensional treatments of their meaning are inadequate.

In what follows, I provide a sketch of a general treatment of hyperintensionality that allows facts like these to be captured, employing a characterization of word meaning at a finer grain than intensions. I claim that hyperintensionality is deeply linked to the sorts of phenomena discussed above, pertaining to how speakers behave to treat the truth-conditional content of expressions. In brief, hyperintensions are mappings from linguistic behaviors of a certain sort to traditional intensions, and so it is speakers’ behaviors that determine, more or less precisely, the truth-conditional content of an expression, in a way that need not be perfectly consistent across the population. A hyperintensional grammar then has access to this behavioral component of meaning, by which intensions are determined, and to which merely intensional grammars are blind.

This treatment further allows hyperintensionality to be admitted into the compositional semantics of a language. It’s long been known that there are hyperintensional linguistic contexts, though they haven’t always gone under this name, and that they include belief reports (Carnap 1947: §13 ff., Partee 1973, Cresswell 1975, Bigelow 1978, a.m.o.). The treatment of hyperintensionality here allows for a treatment of these reports, along with reports of agreement and disagreement, which

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3This isn’t to say that every predicate is equally variable in the construal of its intension across the population: cf. section 3.3. There may be some predicates that actually do have fixed intensions throughout the population, or near enough, like *even* as predicated of nonzero natural numbers, but they are the exception and limiting case. As for the rest, thinking up borderline cases might form an endless Austinian parlor game. Cf. Ludlow (2014: Ch. 1) for some exercises of this sort.
exploits quantification over models in hyperintensional contexts and assigns them plausible truth conditions simultaneously relating agents to linguistic behaviors and factual beliefs. These reports can be used to describe the sorts of situations discussed above, in which speaker attitudes converge or diverge based on how they construe the truth-conditional contents of expressions.

Section 2 outlines the promised treatment of hyperintensionality. I characterize hyperintensional grammars as those that make reference to models, and which include a domain of models in the type theory. Models in turn are characterized as patterns of truth-conditional behavior that speakers can enact.

Section 3 offers a compositional semantics for attitudes of belief, agreement, and disagreement, and demonstrates that all these attitudes are simultaneously sensitive to the way speakers take the world to be, and to their truth-conditional behaviors. A number of consequences follow regarding how hyperintensionality allows speakers to express non-factual matters of opinion using truth-apt constructions, and speakers’ general hyperintensional competence and blindness.

Section 4 demonstrates that the method developed in sections 2 and 3 and extends to treat traditional puzzles of hyperintensionality, which require that meanings be finer-grained than intensions to account for certain features of attitude contexts. I show that the present treatment assigns illuminating truth-conditional differences to hyperintensional attitude reports with cointensive expressions in their complement clauses. I therefore claim that hyperintensionality as treated here is the same phenomenon that authors have traditionally called by that name, and that its empirical domain is extended by the concerns addressed in the prior sections.

Section 5 offers some suggestions for how to apply these results to a wider range of phenomena. I suggest that certain new strands of research that make explicit appeal to alternate ways that speakers could construe the truth-conditional contribution of expressions should be viewed as appealing to hyperintensions, and that the framework offered here is compatible with them. Hyperintensionality therefore forms a robust domain that should be taken seriously by semanticists on empirical grounds.

Section 6 concludes by briefly taking up the metasemantic question of the foundations of meaning. I suggest that truth conditions, characterized by the intensions of truth-apt constructions, do not have the foundational status that formal semantics has traditionally afforded them. Rather, the truth-conditional properties of expressions are emergent from speaker behaviors, and natural language grammars are systematically sensitive to this fact.

2 Hyperintensional grammar

This section outlines the core features of a hyperintensional grammar, which treats the meanings of expressions as hyperintensions, or mappings from linguistic behaviors to intensions. The move to hyperintensions is shown to be a formally uneventful one, making use only of materials already present in standard Montagovian frameworks for compositional semantics.

But these familiar materials are given novel empirical import. The models of traditional model-theoretic, truth-theoretic semantics are interpreted as patterns of speaker behavior, which determine the intensional, or truth-conditional, content of expressions. This is a formal reflection of the adage that the truth-conditional content of an expression is determined by how speakers use it. Roughly, an expression denotes what speakers treat it as denoting.

Intensional grammar is therefore shown to be an idealized fragment of its hyperintensional
counterpart, much in the way that extensional grammar is an idealized fragment of its intensional counterpart. Where extensional grammar describes truth conditions on the simplifying assumption that these conditions are to be evaluated only with respect to a single world-state or point of evaluation, intensional grammar describes truth conditions on the simplifying assumption that speakers in a speech community exemplify a single, maximally determinate pattern of linguistic behavior that fixes these conditions. In reality, speaker behavior pertaining to truth-conditions is partially indeterminate, and the grammar reflects this.

Section 2.1 approaches hyperintensionality through the inadequacy of intensional grammars to treat the lexical semantics of predicates, using the conditions of application for the noun *athlete* as an exemplar. Section 2.2 offers a schematic way to hyperintensionalize predicates, taking the models that determine intensions to constitute the members of a domain in the type theory. Section 2.3 then demonstrates how this machinery can be interpreted in terms of the behavior of speakers in acting to construe the truth-conditional content of predicates.

### 2.1 What exactly does *athlete* mean?

When giving an intensional lexical entry for a predicate like *athlete*, the compositional semanticist is likely to offer something like the following.

\[
\begin{align*}
\text{[[athlete]]} &= \lambda w_s. \lambda x_e. \text{athlete}'(w)(x) \\
= \text{athlete}'
\end{align*}
\]

Here, ‘*athlete’’ denotes some type-\((s, \langle e, t \rangle)\) function in the metalanguage. This entry therefore provides a type-theoretic schema for the interpretation of *athlete*: per the Carnapian tradition, it says that its intension is a property of individuals, viz. some function from worlds \(w\) to individuals \(x\) to truth values, which returns true just when *athlete'*(\(w\))(\(x\)) is true. This is the same as to say that *athlete* denotes the property *athlete'*. 

This does not tell us the exact, specific lexical content of the predicate, as it is not specified exactly which function *athlete' is*. It is supposed to be a function that appropriately tracks whatever requirements an arbitrary individual \(x\) has to meet at an arbitrary world \(w\) in order for the predicate *athlete*, as actually used in English, to apply to \(x\) at \(w\). We therefore read the metalanguage predicate ‘disquotationally,’ giving it the following trivial gloss: *athlete'*(\(w\))(\(x\)) iff \(x\) is an athlete at \(w\).\(^4\) The compositional semantics typically doesn’t go any further into the specific lexical content of the noun, and so explicates nothing beyond the type-theoretic schema noted above.\(^5\) If exactly what it is to be an athlete (and so exactly what it is for the predicate *athlete* to appropriately apply to an individual) is to be addressed non-trivially, then this is left for a distinct lexical semantics.

But the intensional entry in (1), even if it doesn’t specify how exactly to interpret the noun, does place severe limitations on how it’s to be interpreted. In particular, the intensional semantics guarantees that the noun has a fixed, unique intension, and so there must be some unique function

\(^4\)The denotation is trivial in the following sense: it only allows us to place limits on the identity of the function by accessing our prior competence with the word *athlete*, and so such a denotation is enlightening only to the extent that we master the natural predicate that the metalanguage predicate mimics. Since this is here just *athlete* itself, the denotation is trivial for an English speaker with respect to lexical content, and *athlete' only specifies a precise function to the extent that the English speaker can already delineate precisely what, for an English-speaking population, counts as an athlete.

\(^5\)Cf. Glanzberg (2014) for comments on this fact.
athlete', whatever it is. That function is in turn perfectly decisive, with respect to any arbitrary world and individual, as to what truth value it returns. In other words, athlete must denote a unique property of individuals, and it must be perfectly determinate whether, given a world and an individual, that individual has that property at that world.

If (1) were an adequate entry, the grammar of English would therefore specify such a property, and to be competent with the word athlete would be to understand which property that was. A competent speaker of English would then presumably know to apply the predicate just when an individual has that property. And from this it follows that two equally competent speakers with the same factual beliefs regarding an individual could not ingenuously disagree as to the application of the predicate. Where they did differ, it would have to be that they differed either in their factual beliefs, or in their competence with the use of the predicate (i.e., in knowing what it means), or both.

And in fact this conclusion has often been casually accepted: authors have ruled that if interlocutors disagree as to the application of a predicate, despite having the same knowledge about the world, this must be because at least one of them is making a linguistic error. Returning to the examples from section 1, we have Malcolm (1942: 356-357):6

There is, of course, a right and a wrong with respect to linguistic disagreements. One or the other, or both of them, is using incorrect language.

And then Chisholm (1951: 319):

In the whale case [...] at least one person is using language incorrectly.

A similar conclusion is implied by Montague’s (1974: 209) notion of the actual model of a language. Since a model assigns intensions to predicates, the existence of a unique actual model implies the existence of a unique intension for each predicate in the language. Not to interpret a predicate with respect to just this intension is then to employ a non-actual model, which is presumably a form of linguistic incompetence or error.7

The point in drawing attention to examples like the one involving whether Secretariat is an athlete is to suggest that this isn’t right. In fact, different competent speakers across a normal linguistic population, and even single speakers in different situations or over time, construe the very same predicate with distinct intensions. If there really were some single function athlete', then it ought to determine, for Secretariat (s) and w@ the actual world, whether athlete'(w@)(s) is true. So is Secretariat an athlete or not? English speakers, in spite of their competence and sufficient knowledge of the relevant facts, have no consistent answer to this question. This is unexpected, if an intensional entry like (1) is adequate – and so I suggest it isn’t adequate. Likewise for any lexical item that licenses variation in the speaker population (almost all of them).

6Malcolm (1942: 363) later refers to ‘undecidable cases’ of the application of predicates, and so apparently allows for scenarios in which competent speakers are uncertain as to their conditions of application. But he apparently thinks that where disagreement is involved, this must be due to some error.

7Montague (ibid. 209-210) does consider the idea that ‘there are several equally natural choices of the actual model...’ so that ‘We are thus led to consider a set of actual models, and not a single actual model.’ But he has in mind here lexical ambiguity of the (river) bank versus (financial) bank variety, not distinct intensional construals of the same predicate.
This line of thinking is premised on the idea that speaker behaviors are constitutive of the meaning of expressions, in the narrow intensional sense. That is, for a predicate to have a certain intension is for speakers of the language to treat it as having that intension. To use Caie’s (2014) terminology, the appropriateness of the assignment of an intension to an expression depends on the level of fit of that proposed intension to the community’s linguistic behavior. This may be criterially correct: there is no reason whatsoever to think that the English word athlete applies to individuals competing in competitions of bodily prowess, unless actual English speakers tend to apply the predicate to such individuals, and their doing so is reason enough in of itself to say that this is the intensional meaning of the predicate. But if this is so, then where the behavior doesn’t uniformly decide, the grammar doesn’t either. An intensional grammar cannot reflect this fact. And so we want a way to represent, in the meaning of lexical expressions, (i) that there is potential variation in the speaker population as to how a predicate’s intension is construed, and (ii) that this is the result of distinct speaker behaviors.\footnote{There are multiple ways one might try to salvage the idea that lexical predicates have single intensional entries. For reasons of space, I won’t address them specifically, and will just let the appeal of the present approach speak for itself in the following sections. I’m aware of five alternatives: (i) simply declare by fiat that some intension is the true unique intension of a predicate, based on a stipulated statistical measure on the speech community’s behavior; (ii) supervaluate over speaker behaviors, and declare only those predicates treated perfectly consistently across the population (or near enough) to have an intension simpliciter, rather than just relative to a delineation; (iii) stipulate massive ambiguity or underdetermination in the lexicon, with a distinct intension for each lexical entry, or a single massively underdetermined entry (in the spirit of Ludlow 2014); (iv) take an epistemicist position, and say that while there is a true unique intension for each predicate, we cannot know what it is (in the spirit of Williamson 1994); and (v) say that it is metaphysically indeterminate which intensional grammar a normal speech community employs (cf. Caie 2014). A very brief note on these options: (i) and (ii) are possible and might even be useful for some purposes, but don’t have much to say about how to treat hyperintensional contexts (see sections 3-5); (iii) makes it mysterious how single reports using what must be a single predicate carry specific hyperintensional information (again, sections 3-5); and the relevance of (iv) and (v) to empirical semantics is unclear.}

2.2 Models and hyperintensions

In order to show that lexical items aren’t assigned intensions simpliciter, but rather in virtue of something else, we introduce a parameter that determines intensions. Such a parameter already exists in the model-theoretic tradition, viz. the model, which traditionally houses an interpretation function relative to which the intensions of expressions in the language are assigned.\footnote{For the purposes of the present treatment, the introduction of any parameter beyond an intensional point of evaluation will do. I appropriate the model because it already performs precisely the intended function, and so all that’s needed is to reinterpret its empirical import. The model is also not typically used by compositional semanticists for any substantive purposes, but just houses the interpretation function and relevant typed domains (though there are exceptions: e.g., Montague 1974: 208 originally wanted quantification over models to figure in a definition of logical truth, and the tradition of analyzing gradable adjectives as vague predicates, e.g. in Kamp 1975, uses quantification over models for comparative constructions). This makes the appropriation harmless.} We therefore say that an expression is assigned a hyperintensional meaning simpliciter, and that this meaning determines an intension relative to a model.

Let \([\cdot]\) be a function that assigns meanings to expressions \(\alpha\) of a language. A meaning is not intensional, but hyperintensional: so we say that \([\alpha]\) is the hyperintension of \(\alpha\).\footnote{The motion of meaning here, as opposed to intension, is meant to reflect the distinction found between the two in e.g. Lewis (1970: §5). But what is offered here isn’t meant to be assimilated to the ‘structured meanings’ tradition, ultimately tracing back to Carnap (1947), in which Lewis and others worked.} This hyperinten-
sion is itself a function from models $\mathcal{M}$ to intensions, and as before intensions are functions from world-states or points of evaluation $w$ to extensions. We therefore say that $\llbracket \alpha \rrbracket^\mathcal{M} = \llbracket \alpha \rrbracket(\mathcal{M})$ is the intension of $\alpha$ at $\mathcal{M}$, and that $\llbracket \alpha \rrbracket^\mathcal{M, w} = \llbracket \alpha \rrbracket(\mathcal{M})(w)$ is the extension of $\alpha$ at $\mathcal{M}$ and $w$.

And so in moving to hyperintensions, no strictly new elements need to be added to the traditional model-theoretic setup. What will change is (i) the empirical interpretation of what a model is, and (ii) the incorporation of models themselves into the type theory for the language. The latter will also allow models to be accessed by the grammar, meaning that models can be quantified over in the interpretation of hyperintensional contexts like belief reports (see section 3).

We’re now in a place to say what a model is. A model is what determines the intension of an expression – but we saw in section 2.1 that what determines the intension of an expression is the behavior of speakers. A model is therefore a pattern of linguistic behavior that a speaker can in principle employ, as it is relevant to determining the truth-conditional content of an expression. Because an intension of an expression is a maximally determinate truth-conditional contribution, it follows that a model is a maximally determinate pattern of behavior, or a pattern of behavior that is perfectly decisive with respect to all decisions to construe the intensions of the language’s predicates (and whatever other expressions have non-trivial hyperintensional content).

Hyperintensional grammar is meant to represent how speakers in a linguistic population do not employ a single model in interpreting a language, and so do not behave in a maximally determinate way in the truth-conditional applications of its expressions. Traditional intensional grammars assign intensions with respect to a single model (or interpretation function), and therefore describe the truth-conditional functions of language on the idealization that a linguistic community employs a single, maximally determinate pattern of behavior. Intensional grammars are therefore incomplete, but valid so far as they go, and hyperintensional features of the language can be ignored where not formally relevant, just as intensional features of the language can be ignored where irrelevant in using extensional grammars.¹¹

It will be helpful going forward to treat models as belonging to a primitive semantic type: we therefore say that models are of type $m$, where $\mathcal{D}_m$, the domain of models, is the set of possible patterns of truth-conditionally relevant linguistic behaviors.¹² With that said, a hyperintensional denotation for a predicate like $\text{athlete}$ can be written as (2-a), where $\text{athlete}'$ is now a type-$(m, (s, (e, t)))$ function, mapping behaviors to worlds to individuals to truth values, such that $\text{athlete}'_{\mathcal{M}}(w)(x)$ is true iff at $w$, $x$ has whatever property $\text{athlete}$ denotes, as construed by the pattern of behavior $\mathcal{M}$. An extensional counterpart to the denotation is given in (2-b).

¹¹This fact justifies the sanguineness compositional semanticists have typically had towards hyperintensionality and the puzzles it raises, as characterized by Pollard (2015: 536-537) and exemplified in Heim & Krazter (1998: §12.4). While I think the move to hyperintensional grammar is of great conceptual and empirical import, it is not formally all that interesting, such that “The switch to a hyperintensional system should not be much more eventful [than the switch from an extensional to an intensional system]. What we have learned about particular extensional or intensional phenomena should be adaptable to a new foundation without too much ado.” (ibid. 311) I even think that intensional grammars show that languages are hyperintensional, much in the way that extensional grammars show that languages are intensional (ibid. §2.1.2); but obviously this isn’t enough to allow us to represent operations on hyperintensions, which I claim is necessary.

¹²This is a slightly confusing way of putting things on the traditional approach, since models themselves are traditionally taken to contain all the relevant type-theoretic domains, as well as having the interpretive function they’re assigned here. This is just a notational issue, though: if you like, you can see the relevant domains employed by the language, including that of models, as being contained within a wider universe of domains $\mathcal{U}$, which however serves no important formal function and so can be left out of the explication.
Where an expression has non-trivial hyperintensional content, this is reflected by model-sensitivity in its extension. Perhaps all expressions are ultimately model-sensitive in this way, as they all require a coordination of speaker behavior to receive their intensional contents – but in what follows, model-sensitivity will be included in denotations only where we’re interested in highlighting the specific hyperintensional features of a certain expression.

The denotation in (2) remains a type-theoretic schema: it doesn’t say anything about how speakers in a linguistic community might actually behave, to construe *athlete* as denoting some property or other. In fact, if \(D_m\) is the set of all possible patterns of linguistic behavior, then speakers could in theory treat the predicate as denoting anything at all, and so this denotation by itself leaves the intensional lexical content of *athlete* totally open. This is true of the hyperintensions of lexical predicates in general.\(^\text{13}\)

An interesting grammar therefore limits the set of models with respect to which a language is interpreted. To say that only certain models are active during interpretation is to say that the speech community only employs certain patterns of behavior, or in other words, its speakers act in a certain restricted way to construe the truth conditions of predicates. To restrict the set of models is effectively to provide a lexical semantics for predicates that are model-sensitive, and this amounts to an empirical hypothesis about how speakers in the speech community actually behave, or what properties they act to construe a predicate as denoting.\(^\text{14}\) Because the set of models can be restricted without assigning a single model for all interpretation, the grammar allows for limited variation in the assignment of intensions across the population.

In this way we might assign an intensional range to a predicate, or establish relations of meaning among distinct predicates, relative to a restricted class of behaviors associated with a speech community. For instance, we might say that where a set of behaviors \(B \subset D_m\) is somehow characteristic of a linguistic population, then for any predicate \(\alpha\), the intension \[\llbracket \alpha \rrbracket^M\] falls within the intensional range of \(\alpha\) for that population, just in case \(M \in B\).\(^\text{15}\) We might then say that any predicates \(\alpha\) and \(\beta\) are synonymous (intensionally equivalent) for that population, where for every \(M \in B\), \[\llbracket \alpha \rrbracket^M = \llbracket \beta \rrbracket^M\]. This would be to say, respectively, that the linguistic population treats a certain predicate as having a certain range of possible truth-conditional contents, and that the population treats two predicates truth-conditionally in the same way. Where a lexical semanticist is interested in what exactly a predicate like *athlete* means intensionally, it remains to study the micro-variation, or whose behaviors are compatible with which patterns.

\(^{13}\)It follows that two simplex lexical predicates are identical just in case they share a hyperintension. When all models are considered, each predicate has a distinct hyperintension, since it is possible, for any two distinct predicates, to construe their truth conditions differently by behaving a certain way: so for any predicates \(\alpha, \beta\), there will be a model \(M\) such that \[\llbracket \alpha \rrbracket^M \neq \llbracket \beta \rrbracket^M\]. The ability for speakers to behave differently with respect to two lexical predicates in principle is necessary and sufficient for them to have distinct hyperintensions. But two expressions might be hyperintensionally identical with respect to a restricted set of models: see below.

\(^{14}\)I take the possibility of this procedure of narrowing models based on speaker behavior to be a refutation of the worries about model-theoretic semantics e.g. in Lepore (1983).

\(^{15}\)Such a procedure would probably not be ultimately successful, since although allowing a range of variation in behavior is an improvement, there would be vagueness relating to the fringe of the intensional range of predicates among the speech community. That is, the question of what exactly a predicate’s intension is gets recapitulated in the question of what set of behaviors, exactly, a linguistic population employs: the precisely delineated set \(B\) is, like the unique intension of a predicate, an idealization. Section 2.3 mitigates this issue somewhat.
But we are interested not just in making generalizations over linguistic populations, but in how the hyperintensional content of predicates allows specific distinct speakers, or the same speaker in different scenarios, to employ distinct truth-conditional patterns of behavior, and ultimately how this relates to hyperintensional contexts. And so we require a more fine-grained way of talking about what it is for a speaker to employ a certain model or pattern of behavior.

2.3 Speaker behavior

We begin with the notion of treating a hyperintension as true. We say that a hyperintension \( \Phi \) is truth-apt just in case it is of type \( \langle m, \langle s, t \rangle \rangle \), i.e. where its extension is a truth value, and so the hyperintension itself is a mapping from patterns of behavior to traditional propositions of type \( \langle s, t \rangle \). Only truth-apt hyperintensions can be treated as true, and to treat \( \Phi \) as true is to tend to make use of expressions of a language whose hyperintension is \( \Phi \) in a way characteristic of truth-conditional behavior as defined by an independently justified pragmatics.

Treatment of a hyperintension as true is an irreducibly pragmatic notion: it can be cashed out only with respect to what a linguistic pragmatics says about what behaviors a speaker will enact in carrying out conventions of truthfulness. This notion won’t be elaborated fully here, but some features of it can be outlined. A speaker who treats \( \Phi \) as true will ceteris paribus be inclined to make sincere assertions using expressions whose hyperintension is \( \Phi \) as a vehicle, will be inclined to refuse to sincerely deny or retract assertions made using those expressions, will approve of belief-ascriptions targeting them made using those expressions in their complement clauses, and so on. Treating a hyperintension as true is a linguistic behavior: a creature with no linguistic pragmatic competence, and so incapable of proffering, approving of, or objecting to linguistic acts made using certain expressions can’t do it.

Speakers are then more or less consistent with what truth-conditional behaviors they employ, making use of expressions with certain hyperintensions in truth-conditional acts in certain circumstances. To behave in such a way is to employ a certain model, or range of models, and a speaker who was utterly decisive and consistent to the last detail with respect to the way they employed every single expression of their language would employ only a single model, viz. that model that assigned to every expression the precise intension that they used. We might call such a hypothetical speaker an intensional speaker. Real speakers are not intensional: they are undecided or inconsistent on a number of cases with respect to how the truth-conditional content of an expression is to be construed.

And so we want a way of representing a speaker’s tendency to behave in a certain truth-conditional way that is imperfectly decisive or consistent. We do this by assigning to a speaker a set of models. On analogy with Hintikka’s (1969) doxastic alternatives (3), which represent how an agent takes the world to be via a set of worlds consistent with their factual beliefs, we introduce the notion of semantic alternatives (4), which is the set of models with which a speaker’s truth-conditional behavior is consistent.

\[
\begin{align*}
\text{(3)} & \quad \text{Dox}_{x,w} := \{ w' : w' \text{ is consistent with how } x \text{ takes the world to be at } w \} \\
\text{(4)} & \quad \text{Sem}_{x,w} := \{ M : M \text{ is consistent with } x\text{'s truth-conditional behaviors at } w \}
\end{align*}
\]

A speaker’s semantic alternatives track the expressions that they are willing to employ in order to characterize a situation, or how that speaker is inclined to behave truth-conditionally, given that
they take the world to be a certain way (cf. fn. 2). Semantic alternatives can therefore be defined in terms of a speaker’s doxastic alternatives, and the notion of treating a hyperintension as true, as follows.

(5) \( x \) treats \( \Phi \) as true at \( w \) iff \( \forall w' \in Dox_{x,w}, M \in Sem_{x,w}[\Phi(M)(w')] \).

In other words, a speaker treats \( \Phi \) as true just in case \( \Phi \) is true at all their semantic and doxastic alternatives. This characterization is meant to be constitutive of semantic alternatives: given that a speaker takes the world to be some way, and has a certain set of truth-conditional pragmatic behaviors, the semantic alternatives are automatically determined, and consist of whatever models verify the relevant hyperintensions at the relevant worlds. Semantic alternatives are therefore just the third term describing how a speaker’s factual beliefs dispose them toward linguistic behaviors.

It’s important to emphasize that semantic alternatives reflect a speaker’s dispositions, i.e. the way they would tend to treat hyperintensions as true, if they were to have certain factual beliefs about the world. The intensions that a speaker is willing to construe a certain predicate as having therefore involve not only how they actually take the world to be, but also how they would behave if they took the world to be some other way – if their behavioral dispositions remained constant, while their factual beliefs altered.\(^{16}\) It’s further important to note that semantic alternatives do not in of themselves reflect beliefs of any kind, factual or otherwise, not even beliefs about how words are used or ought to be used. They merely reflect dispositions to behave in a certain way, given that one has certain factual beliefs – though they may empirically attend various metalinguistic beliefs, this is not necessary.\(^{17}\)

As an illustration, suppose that Alfonse \((a)\) at \( w \) is the sort who tends to think that racehorses are athletes. He has the following disposition: where he takes an individual to be a racehorse,\(^{18}\) he is disposed to apply the predicate \( \text{athlete} \) to it in his linguistic behaviors. This means that were he to know about Secretariat and ascertain his properties (it doesn’t matter if he actually does this or not, since we are discussing only his dispositions), he would sincerely call Secretariat an athlete, and so on. We can characterize Alfonse’s semantic alternatives as in (6-a): they are such as to verify the hyperintension of \( \text{Secretariat is an athlete} \) at \( w \). Since \( \text{athlete}' \) is the hyperintension of \( \text{athlete} \), (6-b) and (6-c) are equivalent formulations.

\[ (6) \quad \text{a. } \forall M \in Sem_{a,w}[\text{Secretariat is an athlete}^{M,w}] \]
\[ \text{b. } \forall M \in Sem_{a,w}[\text{athlete}(M)(w)(s)] \]
\[ \text{c. } \forall M \in Sem_{a,w}[\text{athlete}'_M(w)(s)] \]

That is, Alfonse’s linguistic dispositions are such that, given the way \( w \) actually is, he would be disposed to treat the intension of \( \text{athlete} \) as applying to Secretariat, if he found out the relevant facts about \( w \).

Suppose that Bethany \((b)\) at \( w \) is the opposite of Alfonse, and is adamant that racehorses are

\(^{16}\)Cf. Carnap (1955: §3).

\(^{17}\)Cf. Chisholm (1951: 323): “From the fact that they use words differently, it does not at all follow that they have different beliefs concerning which use is more nearly correct. Possibly, like people using different regional accents, they have no beliefs about the correctness or other virtues of their different uses. Nor does it even follow that they have [...] a disagreement in attitude concerning their respective uses; they might be people who are tolerant linguistically.”

\(^{18}\)This characterization is of course problematic, in that there can be disagreement as to what \text{racehorse} applies to, that predicate also having non-trivial hyperintensional content. This sort of thing has to be ignored, or talking about hyperintensionality becomes unmanageably difficult.
not athletes. This means that her semantic alternatives differ from Alfonse’s at \( w \), and in particular they falsify the hyperintension of \textit{Secretariat is an athlete} at \( w \). Bethany is the sort, in other words, that were she to know enough about \( w \) to determine that Secretariat was a racehorse, would deny that he is an athlete, and so on.

To characterize this, it is helpful to have a notion of \textit{treating a hyperintension as false}. This is likewise an irreducibly pragmatic notion, that is the inverse of treating a hyperintension as true: a speaker treats \( \Phi \), of type \( \langle m, \langle s, t \rangle \rangle \), as false by sincerely tending to make assertions using expressions whose hyperintension is the truth-conditional negation of \( \Phi \) (i.e., \( \lambda M \exists w, \lambda w, \neg \Phi(M)(w) \)) as vehicles, and so on for denial, retraction, belief-ascription, etc. Semantic alternatives can then be additionally characterized in terms of treatment of falsity as in (7), and Bethany’s semantic alternatives are as in (8-a)-(8-c).

(7) \( x \) treats \( \Phi \) as false at \( w \) iff \( \forall w' \in \text{Sem}_{x,w}, M \in \text{Sem}_{x,w}[-\Phi(M)(w')] \).

(8) a. \( \forall M \in \text{Sem}_{b,w}, [-[\text{Secretariat is an athlete}]]^M_{w} \)
   b. \( \forall M \in \text{Sem}_{b,w}, [-[\text{athlete}(M)(w)(s)]]^M_{w} \)
   c. \( \forall M \in \text{Sem}_{b,w}, [-[\text{athlete}'_{M}(w)(s)]]^M_{w} \)

Treating a hyperintension \( \Phi \) as true or false can be thought of as asymptotic cases, where a speaker’s pragmatic behavior is consistent enough (according to whatever metric you like) to be thought of as treating the hyperintension as true or false \textit{simpliciter}. But nothing in the above definitions requires that a speaker either treat a hyperintension as true or false, even given that they have perfectly decisive relevant factual beliefs about a situation. That is, it’s perfectly possible for the semantic alternatives of a speaker to be such that, even where they are totally opinionated with respect to \( w \), neither (5) nor (7) applies to them at \( w \) with respect to \( \Phi \).

This is as it should be, since again speakers’ truth-conditional behaviors are neither perfectly decisive nor perfectly consistent. Suppose for instance that Gamela at \( w \) is undecided on the matter of whether racehorses are athletes – she’s never thought about it, or just has no strong feelings one way or the other. If that is so, she might be disposed, even after learning all about Secretariat, to treat the hyperintension of \textit{Secretariat is an athlete} as neither true nor false. She may be inconsistent on the matter, judging one way or another according to the context, or she may just not say anything, or claim ignorance or indifference (cf. Caie 2014: 65ff. on the ‘interval of silence’).19 Gamela’s semantic alternatives are also characterizable, as containing models both that verify and falsify the hyperintension at \( w \).

(9) a. \( \exists M, M' \in \text{Sem}_{g,w}, [\llangle \text{Secretariat is an athlete} \rrangle^M_w \land \neg[\llangle \text{Secretariat is an athlete} \rrangle^{M'}_w] \]
   b. \( \exists M, M' \in \text{Sem}_{g,w}, [\text{athlete}(M)(w)(s) \land \neg[\text{athlete}(M')(w)(s)] \]
   c. \( \exists M, M' \in \text{Sem}_{g,w}, [\text{athlete}'_{M}(w)(s) \land \neg[\text{athlete}'_{M'}(w)(s)] \]

---

19Cf. Henle (1957: 754-755): “Thus, if one were investigating someone’s use of the term ‘mammal,’ [...] one cannot tell from other people’s uses of the term whether the requirement of being lactiferous is necessary; and even if I asked whether they would call a warm-blooded quadruped which didn’t give milk a mammal, most people would not know [...] Given some pair of rules, both of which conform with one’s actual past usage, but which differ in their prescription for some case which has not arisen [...] I may be unable to make up my mind [...] There would be too many situations in which one would just not be sure how he would use the word.” Cf. also Carnap (1955: 39-41), on ‘intensional vagueness.’
Where \( \exists M, M' \in Sem_{x,w}[\Phi(M)(w') \land \neg \Phi(M')(w')] \), we say that \( x \) is in a state of *semantic indecision* at \( w \) over \( \Phi \), with respect to \( w' \). That is to say, at \( w \), \( x \)'s disposition to behave is such that, given that they were to be maximally opinionated about the world and took it to be \( w' \), this would not suffice for them to treat \( \Phi \) as either true or false.

The assignment of semantic alternatives to individuals allows us to represent speakers as employing a range of possible intensional contents, even for a single lexical item. What’s more, setting things up this way allows for a gradable notion of speaker behavior, which allows representation of which behaviors are more robust for a speaker, and which more inconsistent or marginal. Before moving on, I’ll demonstrate just one way to do this.

We may want to say that, even where a speaker is inconsistent in treating predicates as applying or not applying to certain sorts of individuals, they nonetheless are more consistent in applying the predicate to one sort than to another. That is, despite their semantic indecision, certain sorts of individuals are *more canonical* instances of the denotation of the predicate for that speaker, and so in any situation where the speaker is willing to apply the predicate to a less canonical case, they are willing to apply it to the more canonical case. If, for example, Gamela is unsure both whether Secretariat, as a racehorse, and Shamu, as a performing orca, are athletes, she might nonetheless be more sure that Secretariat is an athlete than Shamu.

Let \( \text{Sem}_{x,w,\alpha} \) be the semantic alternatives for the predicate \( \alpha \) that \( x \) has at \( w \), defined as follows.

(10) \[
\text{Sem}_{x,w,\alpha} = \{ P : \exists M \in \text{Sem}_{x,w}[\llbracket \alpha \rrbracket^M = P] \}.
\]

That is, \( x \)'s semantic alternatives for \( \alpha \) at \( w \) is the set of those properties (of type \( \langle s, \langle e, t \rangle \rangle \)) that \( x \)'s linguistic behavior is consistent with treating \( \alpha \) as denoting. In Gamela’s case, where \( \alpha \) is *athlete*, her semantic alternatives for the predicate might include, jointly exhaustively: (i) properties true of individuals just in case they perform strenuous physical activity, but that don’t entail that the individuals compete physically or are human (as is true of Shamu); (ii) properties true of individuals just in case they perform strenuous physical activity, and compete physically, but that don’t entail that the individuals are human (as with Secretariat); and finally (iii) properties true of individuals just in case they perform strenuous physical activity, compete physically, and are human (as with Usain Bolt).

Since Usain Bolt has all of these properties, it follows that Gamela treats the predicate *athlete* as applying to him, given that she knows the relevant facts about him. Since Shamu and Secretariat have some of these properties but lack others (Shamu lacks the second and third sort, and Secretariat lacks the third), she is ambivalent about the application of the predicate to them, even where fully informed about them. Despite her indecision, we can represent that Gamela takes Secretariat to be a *more canonical athlete* than Shamu as follows.

\( x \)'s semantic alternatives for a predicate \( \alpha \) at \( w \) constitute an ordering source on individuals, ranking them according to which properties they have that are relevant to whether a predicate \( \alpha \) appropriately applies to them at a world. Let \( \leq_{x,w,\alpha,w'} \) be a preorder on individuals at \( w' \), according to \( x \)'s semantic alternatives for \( \alpha \) at \( w \). \( 'y \leq_{x,w,\alpha,w'} z' \) is then read, \( 'y \) is at least as canonical an \( \alpha \) at \( w' \) as \( z \) is, according to \( x \)'s semantic alternatives at \( w' \); and is defined as follows.

(11) \[
y \leq_{x,w,\alpha,w'} z \text{ iff } \forall P \in \text{Sem}_{x,w,\alpha}[P(w')(z) \rightarrow P(w')(y)]
\]

That is, \( y \) is at least as canonical an \( \alpha \) as \( z \) at \( w' \), according to \( x \)'s semantic alternatives at \( w \), just in case \( y \) has all the properties in \( x \)'s alternatives at \( w \) for the predicate \( \alpha \) at \( w' \) that \( z \) has, and possibly
more. In Gamela’s case, we say that Shamu (h) is not at least as canonical an athlete as Secretariat at w, according to Gamela’s semantic alternatives for athlete at w, as in (12-a). This is true because there is a property P in Gamela’s alternatives that Secretariat has, and Shamu doesn’t, viz. some property of type (ii) above, but there is no such property that Shamu has and Secretariat doesn’t (12-b).

\[(12) \quad \begin{align*}
& a. \ h \nleq_{g,w,\text{athlete},w} s \\
& b. \ \exists P \in \text{Sem}_{g,w,\text{athlete},w}[P(w)(s) \land \neg P(w)(h)] \\
& \quad \land \neg \exists P \in \text{Sem}_{g,w,\text{athlete},w}[P(w)(h) \land \neg P(w)(s)]
\end{align*}\]

This is the same as to say that as far as Gamela’s linguistic behavior is concerned, Secretariat is a more canonical athlete than Shamu. As the reader can confirm, Gamela also takes Usain Bolt to be a more canonical athlete than either Shamu or Secretariat, and the right results are obtained even in the cases where a speaker is not in a state of indecision (e.g., Bethany, on a plausible construal of her alternatives, will take Usain Bolt to be a more canonical athlete than Secretariat, since she doesn’t take Secretariat to be an athlete at all).

With this machinery, we have a working way of formally representing speakers’ fine-grained dispositions to treat expressions as having certain intensions. We now want to show how this method is effective in handling the hyperintensional content of expressions in hyperintensional contexts, like belief reports.

### 3 Hyperintensional attitudes

This section extends the basic machinery outlined in section 2 to treat belief reports, which are hyperintensional contexts. In particular, we want to account for the fact that attitude reports using verbs like think relate their agents not only to factual beliefs about the world, but also to patterns of linguistic behavior they are disposed to enact, in virtue of the hyperintensions of the expressions that make up the complement clauses of those reports. And so again taking Alfonse, who takes racehorses to be athletes, and Bethany, who takes them not to be athletes, the following belief reports become appropriate given that they become aware of the relevant facts about who Secretariat is and what he did.

\[(13) \quad \begin{align*}
& a. \ \text{Alfonse thinks Secretariat is an athlete.} \\
& b. \ \text{Bethany thinks Secretariat isn’t an athlete.}
\end{align*}\]

What makes these attitude reports especially interesting for present purposes is that they can both be read as true, even where Alfonse and Bethany do not differ in any of their factual beliefs. As noted in section 1, they may have conflicting beliefs simply in virtue of the fact that they are disposed to treat the word athlete as having distinct intensions. In fact, what makes (13-a) true, given Alfonse’s factual beliefs, is precisely his linguistic behavior regarding the predicate, viz. that he is willing, given what he takes to be the facts about Secretariat, to apply athlete to him (and vice-versa for Bethany). This sensitivity to how the agent of the attitude report construes the intension of predicates in the embedded clause of the reports is precisely what makes such reports hyperintensional contexts.

Below, it’s demonstrated how plausible truth conditions for these reports can be assigned using
the proposed hyperintensional machinery. Section 3.1 offers a semantics for belief reports using \textit{think}. Section 3.2 then shows that reports of agreement and disagreement are likewise hyperintensional, and can be handled by trivially extending this account. Section 3.3 demonstrates how beliefs, in virtue of targeting hyperintensional objects, contain non-factual commitments, which allow speakers to express ‘matters of opinion’ linguistically whose truth is not solely dependent on the way the world is. Section 3.4 finally discusses some consequences pertaining to how speakers use hyperintensions, and to what extent they might understand or not understand how attitudes relate simultaneously to how the world is and speaker behaviors.

### 3.1 Belief

It’s been known since Carnap (1947) that belief reports are not merely intensional, and that their truth value pertains in some special way to how the subject of the attitude relates to the expressions making up the complement clause. We treat this issue by saying that beliefs target the hyperintensional objects denoted by the lower clauses of reports (of type $\langle m, \langle s, t \rangle \rangle$), and not traditional (intensional) propositions.

As hinted above, what it takes for an agent to have a reported belief is roughly for that agent to take the world to be such that, given how they are disposed to construe the intension of expressions, they take the hyperintension of the complement clause to denote a truth. Thus, where Alfonse (i) takes Secretariat to be a racehorse, and (ii) construes the intension of \textit{athlete} such that it applies to racehorses, this is sufficient for him to think that Secretariat is an athlete – and this belief will be reflected in his linguistic behaviors, e.g. in being willing to make sincere assertions using the hyperintension of \textit{Secretariat is an athlete}, and so on. Furthermore, both these things are necessary for Alfonse to have this belief – if he either thinks Secretariat is just a show horse, or doesn’t construe \textit{athlete}’s intension as applying to racehorses, or both, then he does not think that Secretariat is an athlete.

In other words, to believe a truth-apt hyperintension is to treat it as true. As a first pass on the semantics of \textit{think}, we might therefore offer the following:

\[
\begin{align*}
\llbracket \text{think} \rrbracket_{M, w} &= \lambda \Phi_{m,s,t}. x. \lambda e. x \text{ treats } \Phi \text{ as true at } w \\
&= \lambda \Phi_{m,s,t}. x. \forall w' \in \text{Dox}_{x,w}. M' \in \text{Sem}_{x,w}. [\Phi(M')(w')] 
\end{align*}
\]

So \textit{think} takes a truth-apt hyperintension and an agent, and returns true just in case that agent treats that hyperintension as true. Given the definition in (5), this is the same as to say that it returns true just in case all the agent’s semantic and doxastic alternatives verify the hyperintension.

This is almost a serviceable denotation, but it requires a slight adjustment. In making belief reports, speakers apparently do not consider the full range of possible linguistic behaviors in $\mathcal{D}_m$, but only a contextually restricted subset of these, that are likely to be relevant for interpretation of the attitude. We therefore additionally evaluate the extension of \textit{think} relative to a context of utterance $c$, which will serve to restrict the quantification over models that need to verify the hyperintension of the complement clause relative to the agent’s doxastic alternatives. We use \textquote{\textit{M}_c\textquote} as a variable over models in the subset of $\mathcal{D}_m$ contextually relevant in $c$ (and the purpose of this

\[\text{Note that for simplicity we treat } \textit{think} \text{ as model-invariant, and act as if it has no non-trivial hyperintensional content. That this is a simplification can be seen from the fact that under what exact conditions someone believes something is itself not precisely determined by linguistic convention and the way the world is.}\]
move will become apparent shortly). Our denotation for think is therefore as follows.\(^2\)

\[
\text{think}^{M_{c,w}} = \lambda \Phi_{m,s} \cdot \lambda x_e \cdot \forall w' \in Dox_{x,w}, M'_c \in Sem_{x,w}[\Phi(M')(w')]
\]

And so, think relates a truth-apt hyperintension to an agent, and returns true just in case all the
agent’s doxastic alternatives, and all the agent’s contextually relevant semantic alternatives, verify
that hyperintension.

Belief reports can then be composed, on the assumption that expressions whose extensions take
hyperintensional objects as arguments can compose with the hyperintensions of their complements.
This requires a notion of hyperintensional function application, on analogy with the notion of
intensional function application, e.g., in von Fintel & Heim (2011: 11, ex. 25). For familiarity’s
sake, the rule is written in the style of these authors, as determining the extensions of binary-
branching nodes, but a similar notion can apply in whatever formalism one prefers.

\[(16) \hspace{1cm} \text{Hyperintensional Function Application}\]

If the set of daughters of \(\alpha\) is \(\{\beta, \gamma\}\), and \(\beta \alpha^{M_{c,w}}(\gamma)\) is defined, then:

\[
\alpha^{M_{c,w}} = \beta \alpha^{M_{c,w}}(\gamma).
\]

That is, where the result of applying the extension of the functor to the hyperintension of the clause
it takes as argument is defined (at a context), then the extension of the expression that results from
composing the two is just the extension of the former applied to the hyperintension of the latter.

The belief report in (13-a) is then composed as follows, allowing both for hyperintensional
function application, and ordinary extensional application as well.

\[
(17) \hspace{1cm} \text{Alfonse thinks Secretariat is an athlete}^{M_{c,w}}
\]

\[
= \text{think}^{M_{c,w}}(\text{Secretariat is an athlete}^{c})(\text{Alfonse}^{M_{c,w}})
\]

\[
= (\lambda \Phi_{m,s} \cdot \lambda x_e \cdot \forall w' \in Dox_{x,w}, M'_c \in Sem_{x,w}[\Phi(M')(w')])
\]

\[
(\lambda \alpha \beta \lambda w'_c \cdot \lambda w'_c \cdot \text{athlete}_c^{w'_c}(w'_c)(s))(a)
\]

It returns true just in case Alfonse takes the world to be such that his (contextually relevant) se-
mantic alternatives dispose him to treat the intension of athlete as applicable to Secretariat. The
attitude report thus commits Alfonse to a certain belief, in virtue of which he must have a certain
combination of factual beliefs about Secretariat and dispositions to use the predicate athlete in a
certain way, viz. in such a way to make Secretariat is an athlete true. This looks to be the right
result.

Some comments on the contextual restriction to the agent’s semantic alternatives, represented
by the appearance of ‘\(c\)’ in the extension of the report, bear mentioning. We can think of the
contextual restriction as pertaining to what the speakers in a context take to be the ordinary bounds
of linguistic competence for their dialect (see the end of section 2.2). That is, speakers tend only
to construe as relevant for the evaluation of hyperintensional attitudes those ways of treating the
intensions of expressions that are not ‘beyond the pale’ of their linguistic community. In the case
of Alfonse, if Alfonse is an ordinary speaker of English, this restriction is not of any special

\(^2\)Some bookkeeping, if you want to keep the formalism straight: the introduction of contexts of utterance means
that we treat \([\cdot]\) as a function from expressions \(\alpha\) to characters, which are themselves functions from contexts to
hyperintensions, such that \([\alpha]^{c} = [\alpha](c)\) is the hyperintension of \(\alpha\) in \(c\), which is as before a function from models to
worlds to extensions. We then write \(\text{\llbracket} \alpha \text{\rrbracket}^{M_{c,w}}\) for \(\text{\llbracket} \alpha \text{\rrbracket}(c)(M)(w)\).
importance. Where it becomes visible is in cases where speakers consider cases at the fringes of competence, or outside of it altogether.\textsuperscript{22}

Suppose, for instance, that Alfonse is instead learning English, and is under the mistaken impression that in English, \textit{athlete} is usually used to refer to horses. Then, on seeing Secretariat, Alfonse utters \textit{Secretariat is an athlete}, meaning by this only that Secretariat is a horse (perhaps he does \textit{not} think that Secretariat is an athlete in the ordinary sense). We then ask how to interpret the following attitude report, repeated from (13-a).

\begin{align*}
(18) & \quad \text{Alfonse thinks Secretariat is an athlete.}
\end{align*}

Plausibly, this can be read as true \textit{or} false, depending on what range of models speakers in the context are willing to consider. If they consider a wide range of models (or a totally unrestricted range, allowing for any pattern of linguistic behavior whatsoever, as the denotation in (14) would have it), then the report comes out true: Alfonse does indeed have factual beliefs, such that, given his idiosyncratic way of understanding \textit{athlete}, he treats \textit{Secretariat is an athlete} as true. I do think that this is a legitimate and true reading of the sentence, accessed where speakers are willing to entertain quantification over models outside the bounds of ordinary English competence, precisely because of Alfonse’s idiosyncratic behavior.

But there is also plausibly a false reading of (18): Alfonse \textit{doesn’t} think Secretariat is an athlete at all (and he may even deny as much, say in Icelandic). He just thinks Secretariat is a \textit{horse}, and is using the predicate \textit{athlete} in the ‘wrong’ way in an attempt to express this. This would be the reading that arises, where \textit{c} excludes models beyond the pale of what is taken to be ordinary English competence, at least some of which belong to Alfonse’s alternatives.

How to treat the truth conditions of such a report in terms of what’s been said above is a tricky question, but I offer the following gloss. Supposing that Alfonse’s semantic alternatives at \textit{w} to be fixed such that he always treats \textit{athlete} as applicable to individuals just in case they are horses, and supposing that \textit{c} excludes all such models as beyond the pale of English (in no English dialect does the word consistently mean this), there are no models \textit{M} in \textit{Sem}_{a,w}. The universal quantification over such alternatives according to (15) is then vacuous. If we read that quantification as having existential import (the truth of a belief report requires that there be \textit{some} model to work with), then the report as a whole comes out false. This would mean that for any such report, where the context interprets competence narrowly, and a speaker is using an expression far beyond the bounds of that competence, a speaker’s treatment of a hyperintension containing that word as true can’t verify the corresponding belief expressed using that expression (though Alfonse might be truly reported as believing this for other reasons). I believe that this is just the right thing to say.

The contextual restriction further makes sense of how cross-linguistic belief reports are interpreted in rather subtle ways. Up to now, we’ve been considering hyperintensions with respect to single languages, but of course belief reports can be made using complement clauses cast in languages that the attitude holder doesn’t speak. In these cases, that attitude holder’s semantic alternatives are (where the agent doesn’t use the language in question at all) wide open, and admit

\textsuperscript{22}I take ‘competence’ here to be something like linguistic behavior in conformity with some surrounding population. Cf. Chisholm (1951: 319): “To say that someone uses a word correctly, then, is to say, in part at least, that it has for him the same intension it has for most people.” This is a vague notion, which can be precisified where needed, but in the end an independent notion of competence is not required – all that matters is how \textit{speakers} construe the notion of competence in adopting a range of semantic alternatives to consider.
of no relevant restriction, since their behavior is compatible in principle with any pattern of using the relevant words.

Suppose for instance that at \( w \) Alfonse (now Alfons, I suppose) knows no English at all, but is a monolingual speaker of Icelandic. He therefore has no inclination to apply the predicate horse in one way or another, though he may have dispositions relating to other predicates (e.g. hestur). His semantic alternatives therefore are restricted in accordance with his Icelandic competence, but they leave the matter of the intension of horse entirely open: in the extreme case, this means that for any property \( P \) and context \( c \), there is an \( M \in \text{Sem}_{a,w} \) such that \( 
abla \text{horse}^M \cdot \nabla_c = P \). In other words, since Alfons has no relevant behavioral dispositions with respect to horse, his semantic alternatives do not construe the intension of the expression in any particular way: all properties are ‘live options’ as far as his behaviors are concerned.

Suppose then that Alfons is aware of Secretariat, and knows all the relevant facts about him. Then in line with the above, the extension of the report in (19) is as in (20), assuming that horse has a hyperintensional denotation analogous to athlete’s.

\[
\text{(19) Alfons thinks Secretariat is a horse.}
\]

\[
\text{(20) } \nabla \text{Alfons thinks Secretariat is a horse}^M \cdot \nabla_c \cdot \nabla \ = \ \forall w' \in \text{Dox}_{a,w}, M_c \in \text{Sem}_{a,w}[\text{horse}'^M(w')(s)]
\]

Where \( c \) excludes all models beyond the pale of English, this report comes out true, as desired – merely from his factual beliefs, it is true that Alfonse thinks Secretariat is a horse, even though he wouldn’t, or couldn’t, express this belief in English using the predicate horse. The reason for this is that since the models in Alfonse’s semantic alternatives decide nothing with respect to the intension of horse, the only relevant parameter for deciding which models to quantify over is \( c \). This means that (20) can be recast as (21).

\[
\text{(21) } \forall w' \in \text{Dox}_{a,w}, M_c'[\text{horse}'^M(w')(s)]
\]

In other words, Alfons thinks Secretariat is a horse just in case he takes the world to be such that, given the set of models (contextually construed as) permissible in English, all those models verify the hyperintension of Secretariat is a horse relative to all of Alfons’ doxastic alternatives. This means that Alfons thinks Secretariat is a horse is true at \( w \), so long as Alfons takes the world to be such that, on any reasonable English construal of the intension of horse, that intension applies to Secretariat as far as Alfons’ factual beliefs are concerned. Alfons therefore holds a factual belief expressible using an English report, despite the fact that he speaks no English: and in fact his very lack of commitment with respect to English-speaking behavior is what makes his application of horse irrelevant to the evaluation of the report.

We see therefore that hyperintensions, despite having an intimate relationship with linguistic behavior, are free of what Partee (1973: 321) calls ‘accidental language-dependence in the ascription of belief.’ Although hyperintensional reports relate agents to their linguistic behaviors, they do so in a way that appropriately tracks when competence with respect to a specific expression is required. Hyperintensions themselves, it must be remembered, are not linguistic objects: they are mappings from patterns of behavior to classical intensions.

And so Partee’s (ibid. 313) question, ‘whether the object of believe should be construed as a sentence or proposition,’ receives the answer, ‘neither.’ In thinking Secretariat is a horse, Icelandic Alfons is not related to a sentence of English, nor to an intensional object, but rather to an object
that places certain constraints both on his factual beliefs and linguistic behavior, and the latter falls out of consideration precisely where he has no commitments to how the predicate is used.\footnote{A similar point can be made about ascribing beliefs to individuals with no linguistic competence at all, and also animals (cf. Partee \textit{ibid.} for scattered comments about attributing beliefs to dogs). Though animal belief ascriptions are trickier, because it is independently hard to decide what sorts of beliefs various animals are capable of having, the result is the same -- hyperintensional attitude reports construe animals as having factual beliefs, based on a contextual restriction of relevant models. Individuals without linguistic competence, it follows, cannot have hyperintensional attitudes that do not reduce in some way to factual beliefs, and so cannot, as will be seen shortly, agree or disagree in virtue of anything but factual dispositions, nor hold opinions in the way linguistic individuals can (see sections 3.2 and 3.3).}

But there are cases where competence in a specific language affects the kinds of beliefs one is capable of having, and the present machinery tracks this fact as well. This occurs when one has some set of factual beliefs that, given the indeterminacy of the use of an expression in another language, do not serve to decide, on any model not ‘beyond the pale’ for that language, whether a belief ascription using that expression would be appropriate. For Alfonse who speaks no English, this would happen, for instance, if he knows all the relevant facts about Secretariat, and the report \textit{Alfonse thinks Secretariat is an athlete} is used. Since there are many ways of construing the intension of athlete ‘within the pale’ of English, all of which are compatible with Alfonse’s factual beliefs, we cannot say, based on the fact that Alfonse thinks Secretariat is a racehorse, whether he additionally thinks Secretariat is an \textit{athlete} specifically.\footnote{An exception would be if Alfonse speaks a language that includes a predicate very obviously synonymous with, or even cognate with, \textit{athlete}. Spanish \textit{atleta} is a clear case. If Alfonse (now Alfonso, I suppose) were a monolingual Spanish speaker who knew the facts about Secretariat and was disposed to treat as true the hyperintension of \textit{Secretariat es atleta}, then there is a good case that \textit{Alfonso thinks Secretariat is an athlete} comes out true, even if Alfonso knows no English. What is happening here, I suggest, is that speakers sometimes construe corresponding words cross-linguistically as \textit{near-perfect synonyms}, in the sense that they take their meaning to be so exactly correlated that they refuse to take as relevant any models that construe these two predicates differently. The result will be that speakers who have beliefs expressible with near-perfect synonyms will allow for the cross-linguistic report using that synonym, regardless of which languages they speak. If you’d like a clearer case of these language-specific beliefs, a more idiosyncratic contestable predicate can be used, like Spanish \textit{duende}, which has no widespread cross-linguistic counterparts.}

But the truth of the report will become clear, the minute he learns the world \textit{athlete} and starts applying it to Secretariat. In these cases, having a certain belief may require speaking a certain language.

That \textit{Alfonse thinks Secretariat is an athlete}, where Alfonse is not an English speaker (and possibly also does not speak any language with a clear synonym or cognate of \textit{athlete}: cf. fn. 24) does not come out as true, even if Alfonse knows all the relevant facts about Secretariat, is shown by the following. The extension of the report is as in (22), factoring out Alfonse’s semantic alternatives as irrelevant, like in (21).

\begin{equation}
\begin{array}{l}
\langle \text{Alfonse thinks Secretariat is an athlete}\rangle^M_{c,w} \\
= \forall w' \in Dox_{a,w}, M'_c[\text{athlete}'_{A'}(w)(s)]
\end{array}
\end{equation}

This truth condition is not fulfilled in the relevant scenario, because if $c$ restricts the relevant models to those safely within English competence, these will include both models on which, given Alfonse’s factual beliefs, Secretariat is treated as an athlete and treated as not an athlete. Therefore, it is false that Alfonse thinks Secretariat is an athlete, and also false that he doesn’t think Secretariat is an athlete – without acquiring a disposition to use the word \textit{athlete} in a certain way, he cannot hold these beliefs.

\textit{That Alfonse thinks Secretariat is an athlete}, where Alfonse is not an English speaker (and possibly also does not speak any language with a clear synonym or cognate of \textit{athlete}: cf. \textit{ibid.} for scattered comments about attributing beliefs to dogs). Though animal belief ascriptions are trickier, because it is independently hard to decide what sorts of beliefs various animals are capable of having, the result is the same -- hyperintensional attitude reports construe animals as having factual beliefs, based on a contextual restriction of relevant models. Individuals without linguistic competence, it follows, cannot have hyperintensional attitudes that do not reduce in some way to factual beliefs, and so cannot, as will be seen shortly, agree or disagree in virtue of anything but factual dispositions, nor hold opinions in the way linguistic individuals can (see sections 3.2 and 3.3).
So we see that the method of treating hyperintensions as in section 2 allows for a treatment of hyperintensional contexts that track speakers’ behavioral dispositions to use language in interesting ways. We can now turn to the issue with which we opened, viz. how this relates to speakers’ beliefs differing as a result of these behaviors differing.

3.2 Agreement and disagreement

With a hyperintensional characterization of belief in hand, it is possible to characterize how distinct speakers’ beliefs converge or diverge based both on how they take the world to be, and how they are disposed to construe the intentions of expressions, and this in turn allows for a characterization of reports of agreement and disagreement.

Returning to Alfonse and Bethany, they can be reported as disagreeing based on their attitudes towards whether athlete is applicable to Secretariat or not. And so in a case like the one described above, where they both know all the relevant facts about Secretariat, and Alfonse is happy to apply athlete to him, while Bethany refuses to do so, the following reports are typically appropriate.\textsuperscript{25}

\begin{enumerate}
\item Alfonse thinks Secretariat is an athlete.
\item Bethany thinks Secretariat is not an athlete.
\item Bethany disagrees with Alfonse that Secretariat is an athlete.
\end{enumerate}

Disagree-reports are therefore licensed even where the disagreement does not concern how the world is, but is just a matter of Alfonse’s and Bethany’s different truth-conditional construals of athlete. This follows if disagreement only requires mutually incompatible belief, and belief is hyperintensional: so disagreement is hyperintensional as well, and can be defined trivially in terms of belief. The same holds for agreement, where beliefs accord, and so we get the following denotations.

\begin{align}
\text{\textlangle agree\textrangle}_{M,c,w} &= \lambda x_e, \lambda \Phi_{m,s,t} \cdot \lambda y_e . \llbracket \text{think\textrangle}_{M,c,w} \Phi(x) \wedge \llbracket \text{think\textrangle}_{M,c,w} \Phi(y) \\
&= \lambda x_e, \lambda \Phi_{m,s,t} \cdot \lambda y_e . \forall w' \in D o x_{x,w}, D o x_{y,w}, M'_c \in S e m_{x,w}, S e m_{y,w} [\Phi(M')(w')] \\
\text{\textlangle disagree\textrangle}_{M,c,w} &= \lambda x_e, \lambda \Phi_{m,s,t} \cdot \lambda y_e . \llbracket \text{think\textrangle}_{M,c,w} \Phi(x) \wedge \llbracket \text{think\textrangle}_{M,c,w} (\lambda M'_m \cdot \lambda w', \neg \Phi(M')(w'))(y) \\
&= \lambda x_e, \lambda \Phi_{m,s,t} \cdot \lambda y_e . \forall w' \in D o x_{x,w}, M'_c \in S e m_{x,w} [\Phi(M')(w')] \\
&\wedge \forall w'' \in D o x_{y,w}, M''_c \in S e m_{y,w} [\neg \Phi(M'')(w'')] 
\end{align}

And so where x agrees with y that \Phi, this means that x’s and y’s doxastic and (contextually relevant) semantic alternatives all verify \Phi, and this is just to say that both x and y think that \Phi (24). And

\textsuperscript{25}It’s tempting to say that the move from (23-a)-(23-b) to (23-c) is one of entailment: perhaps the existence of these conflicting beliefs, as diagnosed by the think-reports, is sufficient for the disagree-report to be true. But perhaps, at least for some speakers, there is a subtle additional requirement, to the effect that Alfonse and Bethany need to come into conflict over their incompatible beliefs, perhaps by having an exchange about it, or at least being disposed to do so (and similarly mutatis mutandis for the agree-report inference in (26-a)-(26-b) to (26-c)). For simplicity, I assume the entailment holds here. The sorts of complements disagree takes in English are also slightly fickle: I use constructions like (23-c) for ease of exposition, but if you’re more comfortable with question-clauses (Bethany disagrees with Alfonse [about / over] whether Secretariat is an athlete), the account will not be interestingly different for these. Making one or both of the arguments to disagree implicit can also serve to make the report more natural without changing the meaning, e.g. Bethany disagrees with Alfonse, or Bethany disagrees (where the context makes clear who Bethany is disagreeing with, and about what).
where \( x \) disagrees with \( y \) that \( \Phi \), this means that \( y \)’s doxastic and (contextually relevant) semantic alternatives all verify \( \Phi \), while those of \( x \) verify its truth-conditional negation (25), and this is just to say that while \( y \) thinks \( \Phi \), \( x \) thinks its truth-conditional negation. This licenses inferences of the sort from (23-a)-(23-b) to (23-c), as well as their agree-report counterparts, as from (26-a)-(26-b) to (26-c).

(26)  
\begin{enumerate}
  \item Alfonse thinks Secretariat is an athlete.
  \item Bethany thinks Secretariat is an athlete.
  \item Alfonse agrees with Bethany that Secretariat is an athlete.
\end{enumerate}

The composition of the reports in (26-c) and (23-c) is as in (27) and (28), respectively.

(27) \[
\Phi_{M_{c,w}}^{\text{c}}(\text{Alfonse agrees with Bethany that Secretariat is an athlete})
\]
\[
= \Phi_{M_{c,w}}^{\text{c}}(\text{with Bethany})(\text{that Secretariat is an athlete})^{\text{c}}(\text{Alfonse})^{\text{c}}(\text{Secretariat is an athlete})^{\text{c}}
\]
\[
= \lambda x_{e}. \lambda y_{e}. \lambda x_{w}. \lambda y_{w}. \forall w' \in D o x_{x_{e}, y_{e}} \cdot D o x_{y_{w}, x_{w}} \cdot \forall M_{e} \in S e m_{x_{w}, y_{w}} \cdot [\Phi(M')(w')]((b)\lambda M''_{w}. \lambda w''_{s}. \text{athlete}'_{M''_{w}}(w''_{s})(s))(a)
\]
\[
= \forall w' \in D o x_{a_{e}, b_{w}} \cdot D o x_{y_{w}, x_{w}} \cdot \forall M_{c} \in S e m_{a_{w}, b_{w}}[\text{athlete}'_{M_{c}}(w')(s)]
\]

(28) \[
\Phi_{M_{c,w}}^{\text{c}}(\text{Bethany disagrees with Alfonse that Secretariat is an athlete})
\]
\[
= \Phi_{M_{c,w}}^{\text{c}}(\text{with Alfonse})(\text{that Secretariat is an athlete})^{\text{c}}(\text{Bethany})^{\text{c}}(\text{Secretariat is an athlete})^{\text{c}}
\]
\[
= \lambda x_{e}. \lambda y_{e}. \lambda x_{w}. \lambda y_{w}. \forall w' \in D o x_{x_{e}, y_{e}} \cdot \forall M_{c} \in S e m_{x_{w}, y_{w}}[\Phi(M')(w')]
\]
\[
\land \forall w'' \in D o x_{y_{w}, x_{w}} \cdot \forall M_{c} \in S e m_{x_{w}, y_{w}}[\Phi(M')(w'')(s)](a)
\]
\[
\land \forall w'' \in D o x_{x_{e}, y_{e}} \cdot \forall M_{c} \in S e m_{x_{w}, y_{w}}[\text{athlete}'_{M_{c}}(w'')(s)](b)
\]

Hyperintensionalizing agreement and disagreement makes these reports simultaneously sensitive to descriptive (or world-directed) and behavioral attitudes. What this means is that in virtue of the fact that two speakers agree or disagree about something, no conclusions can be drawn about how they take the world to be the same way or a different way until their behavioral dispositions to treat the intensions of the expressions in the complement clause of the report are understood.

In general, commitment to a hyperintensional belief creates a commitment to the way the world is, but only relative to some set of semantic alternatives: only given that the agent takes the relevant expressions to have such-and-such truth-conditional content does such a belief determine how they take the world to be in virtue of having it. We can determine what an agent’s world-related commitments are in holding a belief by factoring out their semantic alternatives as follows. First, let \( \Phi_{x,w} \) be the descriptive content of the hyperintension \( \Phi \) relative to \( x \) at \( w \). This is the traditional proposition of type \( \langle s, t \rangle \) that \( \Phi \) expresses, as treated by \( x \)’s truth-conditional behaviors at \( w \), i.e. the truth-conditional content of \( \Phi \) as construed by \( x \)’s semantic alternatives at \( w \).

(29) \[
\Phi_{x,w} := \lambda w'. \forall M \in S e m_{x_{w}}[\Phi(M)(w')]
\]

\[26\]If we want this descriptive content to factor in \( x \)’s semantic indecision at \( w \) (see section 2.3), we can additionally restrict the domain of (29) so that the function is defined only on those worlds \( w' \) such that \( \Phi(M)(w') \) has a constant value for all \( M \in S e m_{x_{w}} \). Then if e.g. Gamela is indecisive at \( w \) as to whether Secretariat is an athlete, because she has no opinion on whether racehorses are athletes, then where \( \Phi \) is the hyperintension of Secretariat is an athlete, \( \Phi_{g,w} \) will be undefined at any world where Secretariat is a racehorse.
In other words, \( \Phi_{x,w} \) is the proposition that maps to true each world that the hyperintension verifies on all of \( x \)'s semantic alternatives at \( w \). We can think of this as what traditional proposition \( x \) would be committed to the truth of, in virtue of believing \( \Phi \) at \( w \). Different agents will therefore be committed to the truth of distinct traditional propositions, even in virtue of holding the same beliefs, if their semantic alternatives appropriately misalign. This is because belief doesn’t target propositions: it targets mappings from behaviors to propositions.

We then say that where \( x \) believes \( \Phi \) at \( w \), \( \Phi_{x,w} \) is the descriptive commitment that \( x \) has in virtue of holding that belief. With this vocabulary in place, we're in a position to show in what sense Alfonse and Bethany can disagree about whether Secretariat is an athlete, even while they do not affirm and deny respectively the same descriptive commitments. For simplicity's sake, we assume that both speakers are perfectly decided with respect to the intension of athlete (at some context \( c \)): Alfonse treats its intension as some property \( P_1 \), true of individuals just in case they compete in athletic events, while Bethany views its intension as a property requiring an individual to have \( P_1 \), as well as to be human (i.e. also to have the property \( P_2 \)).

(30) a. \( \forall M \in Sem_{a,w}[\text{athlete}^{M_{c}} = P_1] \)
b. \( \forall M \in Sem_{b,w}[\text{athlete}^{M_{c}} = \lambda w'.\lambda x. P_1(w')(x) \land P_2(w')(x)] \)

In other words, Bethany’s semantic alternatives reflect that she has stricter requirements on the application of athlete than Alfonse does: only humans are allowed. Suppose again that Alfonse thinks Secretariat is an athlete (26-a), while Bethany thinks Secretariat is not an athlete (26-b). From the above, their descriptive commitments in believing these things are as follows, where \( \Phi \) is the hyperintension of Secretariat is an athlete.

(31) a. \( \Phi_{a,w} = \lambda w'. P_1(w')(s) \)
b. \( \Phi_{b,w} = \lambda w'. \neg [P_1(w')(s) \land P_2(w')(s)] \)

In other words, due to the way they construe the intension of athlete differently, Alfonse commits to Secretariat being an individual that completes in athletic events, while Bethany commits to Secretariat not being an individual that both competes in athletic events and is human. And so while Bethany believes the truth-conditional negation of what Alfonse believes, her descriptive commitments in virtue of doing so are not the truth-conditional negation of Alfonse’s.

In this scenario, Alfonse’s and Bethany’s beliefs have another interesting property. On the one hand, their beliefs are contradictory: there is no model \( M \) and world \( w \) with respect to which \( \text{athlete'}_{M}(w)(s) \) and \( \neg \text{athlete'}_{M}(w)(s) \) are both true. This means that there is no way of behaving that consistently construes the hyperintension of Secretariat is an athlete as both true and false (at any world). Here, where Alfonse and Bethany do not differ in any relevant way as to how they take the world to be (we can even stipulate that their factual beliefs are exactly the same, i.e. that \( Dox_{a,w} = Dox_{b,w} \)), their disagreement is solely due to this difference in behavior – one acts to

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27 This is an idealization, in the sense that typically no real speaker is going to have their semantic alternatives totally decided even for a single predicate. There is also a cheat here in declaring e.g. \( P_1 \) to be that property true of individuals who compete in athletic events, since the description of this property has hyperintensional content and so does not really pick out a single function. Really, Alfonse and Bethany would consider a range of relevant intensions with the same result, but doing it this way makes the exposition simpler.

28 I take this to be an instance of what Sundell (2011: §3.4) calls ‘character disagreement.’ Sundell himself uses Ludlow’s example with Secretariat to illustrate this notion.
construe the intension of *athlete* in a way incompatible with the way the other construes it, since one cannot both consistently apply it and its negation to Secretariat.

On the other hand, the descriptive commitments that they have in virtue of holding these incompatible beliefs are compatible, in the sense that there are worlds \( w' \) such that both \( \Phi_{a,w}(w') \) and \( \Phi_{b,w}(w') \). These are just worlds at which Secretariat competes in athletic events, but is not human. We can characterize the situation as follows, where ‘\( \phi \)’ and ‘\( \psi \)’ are variables over traditional propositions, of type \( \langle s, t \rangle \), and ‘\( \Phi \)’ and ‘\( \Psi \)’ are variables over truth-apt hyperintensions, of type \( \langle m, \langle s, t \rangle \rangle \).

(32) a. \( \phi \) is compatible with \( \psi \) iff \( \exists w'[\phi(w') \land \psi(w')] \).
   b. \( x \)'s belief that \( \Phi \) is descriptively compatible with \( y \)'s belief that \( \Psi \) at \( w \) iff \( \Phi_{x,w} \) is compatible with \( \Psi_{y,w} \).

Plugging in for Alfonse’s and Bethany’s beliefs, we get: Alfonse’s belief that Secretariat is an athlete is descriptively compatible with Bethany’s belief that Secretariat is not an athlete at \( w \) iff \( \lambda w'.P_1(w')(s) \) is compatible with \( \lambda w'.\neg[P_1(w')(s) \land P_2(w')(s)] \). But there is a \( w' \) such that \( P_1(w')(s) \) and \( \neg[P_1(w')(s) \land P_2(w')(s)] \), i.e. a world such that \( P_1(w')(s) \) and \( \neg P_2(w')(s) \), and so these beliefs are descriptively compatible.

In fact, more can be said than this. If \( w \), the world of Alfonse’s and Bethany’s belief, really is such that Secretariat competes in athletic events and is not human, then the descriptive contents of Alfonse’s and Bethany’s beliefs are both true.\( ^{29} \) We can therefore say that neither makes a *descriptive error* in holding their beliefs, in the following sense.

(33) \( x \) makes a descriptive error in believing \( \Phi \) at \( w \) iff:
   1. \( x \) believes \( \Phi \) at \( w \);
   2. \( \neg \Phi_{x,w}(w) \).

Supposing that at \( w \), Secretariat both competes in athletic events and is not human, i.e. that \( P_1(w)(s) \) and \( \neg P_2(w)(s) \), then by the above, Alfonse makes no descriptive error in believing that Secretariat is an athlete, and Bethany makes no descriptive error in believing that he is not. There is a well-defined sense in which their disagreement is therefore ‘faultless,’ to echo the terminology of Köbel (2004): it is *descriptively faultless*, in that it commits neither party to the disagreement to a descriptive error.

(34) \( x \) disagrees descriptively faultlessly with \( y \) that \( \Phi \) at \( w \) iff:
   1. \( x \) disagrees with \( y \) that \( \Phi \) at \( w \);
   2. \( y \) makes no descriptive error in believing \( \Phi \) at \( w \);
   3. \( x \) makes no descriptive error in believing \( \lambda Mw.\neg\Phi(M)(w') \) at \( w \).

While MacFarlane (2014: §6.7) has detailed the numerous dimensions along which a disagreement might be ‘faultless,’ and so expressed skepticism about the usefulness of the general notion of ‘faultless disagreement,’ the notion expressed here, whereby disagreement commits neither of its

\( ^{29} \)This vindicates the idea, expressed e.g. in Stojanovic (2007: 692), that the beliefs of disagreeing parties might in some sense be mutually true. This is limited to the descriptive contents of the beliefs in question, however: the hyperintensional objects at which these beliefs are directed cannot be mutually true.
parties to taking the world to be some way that it is not, is a theoretically interesting one, and the one that some authors, e.g. Lasersohn (2005), appear to have in mind.

The case in which only speakers’ linguistic behaviors are at stake in a disagreement is an extreme one. Since both agreement and disagreement pattern both beliefs about the world and dispositions to construe the intensions of words simultaneously, there might be any combination of descriptive and behavioral reasons that speakers’ attitudes converge or conflict.

Descriptively faultless disagreement therefore has no special theoretical status, and any number of related matches and mismatches in attitude can be formally characterized. For instance, on the present machinery, if both Alfonse and Bethany think Secretariat is an athlete, but Alfonse does so because he thinks racehorses are athletes, while Bethany still thinks only humans are athletes, but mistakenly thinks Secretariat is a human sprinter, then they agree descriptively ‘faultily:’ it is only in virtue of Bethany’s false belief about the world that the agreement occurs, and so they agree despite the fact that only one of them is not mistaken in their descriptive commitments.

3.3 Matters of opinion

From the above, we see how differences of belief between specific agents may not depend on facts about the world, but only on differing linguistic dispositions. In cases like the disagreement between Alfonse and Bethany over Secretariat, the differences in attitude are a matter of opinion, in the following narrow sense: differences of opinion are incompatibilities of belief not constituted by incompatibility in the way agents take the world to be.

The present hyperintensional machinery therefore illustrates how differences in opinion are possible using truth-conditional language. And in fact it suggests a hypothesis about what opinions are: opinions are artifacts of hyperintensionality, since it is hyperintensionality that allows beliefs to have content over and above their purely truth-conditional commitments. To have an opinion is, roughly, to believe in such a way that the belief is relevantly decided by the way one is disposed to use words, and not by how one takes the world to be. It follows that a merely intensional language, being solely truth-conditional, cannot be used to express opinions in this specific sense.

In the extreme case, a pure opinion is one that an agent idiosyncratically holds utterly regardless of how the world is – they are disposed to use words, such that they assent to a certain hyperintension ‘come what may’ regarding the world, despite the fact that this hyperintension is not generally recognized as tautological by the stable conventions of the speech community. This occurs when their belief of the relevant hyperintension has no descriptive commitments, i.e. when x believes $\Phi$ at w, but the descriptive content $\Phi^{s,w}$ is the function characterizing the complete set of possible worlds, i.e. $\lambda w^{s}.true$. It is possible to change a pure opinion, but only by changing the way one uses words, i.e. by simply deciding not to hold that opinion anymore by no longer assenting to the hyperintension.$^{30}$

$^{30}$An analogous notion could be defined in terms of taking a hyperintension to be false. It seems to me that this notion of a pure opinion is what some warners against linguistic nonsense have traditionally had in mind – beliefs without what has traditionally been called ‘cognitive content,’ where this lack of content is not the result of widespread linguistic convention, as with tautologies. I do not think there is anything nonsensical, in of itself, about holding pure opinions, and there might be reasons for self-consciously adopting idiosyncratic linguistic behaviors with no descriptive commitments. Nonsense occurs, perhaps, when one does not realize that one is holding a pure opinion in this sense, but lacks some metasemantic faculty to recognize that one’s belief is ‘cognitively empty.’
In the usual cases, though, a belief can’t be characterized as a matter of opinion, or not a matter of opinion, *simpliciter*. So long as one uses words in some consistent way in response to the way one takes the world to be, any belief expressible using those words, whether in the complement clause of a belief report, or imposed on the speaker via assertion, will come with descriptive commitments that can be falsified by the way the world is, and so runs the risk of descriptive error. Furthermore, since the same words have distinct descriptive commitments depending on the semantic alternatives of the agents that construe them in distinct ways, it cannot be determined from the meaning of a word alone whether it relates intrinsically to opinion as opposed to fact, or vice-versa. Likewise, it cannot be determined, without reference to some specific agents’ doxastic and semantic alternatives, whether a certain agreement or disagreement between them is a matter of opinion or not.

For instance, slightly modifying the disagreement with Alfonse and Bethany makes it not a matter of opinion, even where the exact same words are used to express their conflicting attitudes. Suppose that Alfonse and Bethany have the exact same semantic alternatives at $w$ ($Sem_{a,w} = Sem_{b,w}$), and so are disposed to apply the predicate *athlete* in the exact same way. Then if *Bethany disagrees with Alfonse that Secretariat is an athlete* is true, its extension is still as in (28), but now, since their sets of semantic alternatives are identical, Bethany’s descriptive commitments in thinking Secretariat is not an athlete are the truth-conditional negation of Alfonse’s descriptive commitments in thinking he is an athlete, meaning they are incompatible, meaning that $w$ does not verify them both, meaning that at least one of them is making a descriptive error in virtue of this disagreement happening. This is not a matter of opinion: given that they construe *athlete* in the same way, the disagreement turns solely on the way the world is.

Another way of putting this is that there is no such thing as a semantically intrinsically ‘objective’ or ‘descriptive’ predicate as opposed to a ‘subjective’ or ‘evaluative’ one, e.g. Lasersohn’s (2005) ‘predicates of personal taste,’ or Coppock’s (2018) ‘discretionary predicates.’ Roughly, all predicates display descriptive behavior to the extent that speakers use them in truth-conditionally consistent ways across the population, so that they come to track features of the world across that population, and they display evaluative behavior to the extent that speakers do not use them in truth-conditionally consistent ways, and so they come not to track any consistent feature of the world, but rather beliefs expressed using them tend to turn on speakers’ idiosyncratic linguistic behaviors.

That said, it is a fact that some expressions do tend to be used in roughly truth-conditionally consistent ways across the population (speakers’ semantic alternatives converge tightly, though usually not perfectly, with respect to their use), while others tend not to be. In this respect, we might be tempted to say that *horse* is a more descriptive predicate than *athlete*, but even this is not right – *horse* displays more evaluative behavior in the domain of borderline cases of horses (as they differ from ponies, let’s say), and the fact that we picked a borderline domain for *athlete* instead is just happenstance.\(^{31}\)

Nevertheless, we might loosely speak of evaluative expressions as those whose truth-conditional

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\(^{31}\)Here I am not particularly moved by Plunkett & Sundell’s (2013: 18) suggestion that *athlete* is a term that literally connotes a positive evaluation, which accounts for its purported evaluative component. There seems to me to be no reason why calling someone an athlete could not take on a negative cast, where athletes are disrespected in a certain cultural climate. These aren’t facts about the semantics of the word, but reflections of the fact that speakers can do whatever they want with their opinions, including deciding that being an athlete is good or bad. The same, of course, goes for *horse*. 

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application is so inconsistent across the population that it is difficult to track their typical descriptive import at all – e.g. with political terms like liberal or conservative. There are furthermore expressions that diverge in their intensional construal across the population in principled ways, which have therefore been thought to be predicates of opinion par excellence. Among these are predicates pertaining to experiential reaction, such as tasty.

A word on the case of tasty might clarify the present position. First, tasty is not intrinsically a predicate of opinion – it has a robust lexical semantics pertaining to how stimuli produce gustatory pleasure in experiencers, and in many grammatical contexts it occurs in ordinary factual reports of the sort pertaining to who has, or is disposed to have, this kind of experience (on these points, see e.g. Anthony 2016). In the restricted range of grammatical contexts in which what is tasty is taken to be a matter of opinion, this lexical semantics is still active. What is special about the predicate, and experiential predicates like it, is that speakers each construe its intension so as to track their own experiential dispositions: as MacFarlane (2014: 3-4) says, speakers roughly apply tasty to that which tastes good (or would taste good) to them. In Lasersohn’s (2005) terms, the predicate here encourages self-directed or ‘autocentric’ construals of its truth conditions.

This is easily representable by going hyperintensional: we say that each speaker’s semantic alternatives are such that they construe the property that tasty denotes to be the property true of an individual just in case it is disposed to stimulate gustatory pleasure in they themselves. For instance, suppose that at w Alfonse thinks licorice is tasty, while Bethany thinks licorice isn’t tasty, and they both believe this on the grounds they have tasted licorice for themselves and respectively liked and not liked it. Where we write ‘gus’(w)(x)(y) to mean that y is disposed to produce gustatory pleasure in x at w, their semantic alternatives at w (for some context c) are as follows.

\[
\begin{align*}
(35) \quad & \forall M \in Sem_{a,w}[\llbracket tasty \rrbracket^M_{c} = \lambda w'.\lambda x.e.gus''(w')(a)(x)] \\
& \forall M \in Sem_{b,w}[\llbracket tasty \rrbracket^M_{c} = \lambda w'.\lambda x.e.gus''(w')(b)(x)]
\end{align*}
\]

But the meaning for tasty, which has a hyperintensional layer, is the same for the both of them, and is the usual schematic sort that other lexical predicates like athlete have.

\[
(36) \quad \llbracket tasty \rrbracket^M_{a,w} = \lambda x.e.tasty'_{a}(w)(x)
\]

As the reader can confirm, this means that Alfonse and Bethany’s beliefs are directed toward conflicting hyperintentions, and they disagree over whether licorice is tasty, but the descriptive commitments they take on in virtue of having these beliefs remain compatible, in the sense of section 3.2: Alfonse is descriptively committed to licorice being disposed to stimulate gustatory pleasure in him, while Bethany is descriptively committed to licorice not being disposed to produce gustatory pleasure in her. They further disagree descriptively faultlessly, so long as they are each not mistaken about their own experiential dispositions.

There is therefore no formal difference as far as the hyperintensional setup is concerned between representing the athlete and tasty cases. There is an interesting empirical difference between the two, however. While the way speakers construe the intension of athlete is idiosyncratic for each individual, but remains within a small range of properties for the community as a whole, the way they construe tasty (in the relevant grammatical environments) is highly systematic for each indi-

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32The treatment in the text is a bit of a simplification, since the attitude represented is de re, but autocentric behavior is in reality de se, as e.g. Stephenson (2007) stresses.
vidual, but spans a huge domain of properties for the community as a whole, since by convention speakers are typically required to make their construal of the predicate’s intension track their own dispositions. Why this happens is an interesting question, that ought to be explained in terms of the experiential semantics predicates like tasty, and this has not seriously been attempted.

As to the question of whether such a predicate is one that pertains to opinion specifically, even in these contexts: first, note that Alfonse and Bethany do have descriptive commitments in virtue of holding these beliefs, and they can perfectly well be in descriptive error in holding them. Second, note that the fact that their disagreement turns on their distinct truth-conditional behaviors, rather than on features of the world, is due to the fact that (i) linguistic convention bids speakers to make the predicate’s intension track their own experiential dispositions, and (ii) Alfonse and Bethany have relevantly distinct experiential dispositions. Just like with the athlete case, if they did construe the intension of the predicate the same way, here because they had relevantly similar dispositions, their dispute would not be a matter of opinion anymore, and would turn not on their differing behaviors but on whether licorice factually produced the relevant experience, according to their shared construal of the predicate.

The situation is therefore the same as before: these predicates of experiential reaction also display descriptive or evaluative behavior depending on whether speakers’ semantic alternatives align or not. The fact that speakers’ experiential dispositions are highly variable means that in fact their semantic alternatives tend to misalign often. But this has nothing to do with the semantics of the predicate – it’s just an accidental fact about human physiology. Where a speaker population for some reason began to converge in its gustatory dispositions, the predicate would lose its evaluative behavior, and start to track the properties that speakers uniformly treated it as tracking, viz. the property of being disposed to stimulate gustatory pleasure uniformly in the members of the speech community.

There are three reasons that the semantic alternatives of speakers in the same population might misalign with respect to the same words, giving rise to the possibility of opinion. The first is due to linguistic convention, as with the tasty case, where speakers are ‘forced’ to align or misalign their alternatives in accordance with some other feature of the world (like their experiential dispositions). The second is due to behavioral noise: it would simply be a miracle if an entire speech community managed to perfectly converge in its disposition to construe the truth-conditional content of a language’s words, and so it is just inevitable that linguistic conventions leave a number of cases borderline, and that speakers have idiosyncratic ways of resolving the borderline cases. The third reason, to be discussed shortly, is deliberate, and involves speakers’ competence with the hyperintensions of words.

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33This does not mean that the predicate would come to mean something like ‘tasty to members of this speech community.’ It would still mean just plain tasty, as in (36), and the property of plain-tastiness would be construed to be the property of being disposed to produce gustatory pleasure uniformly in members of the speech community, since all the individuals’ dispositions happened to align. The difference is that in the latter case, the linguistic conventions would ensure that, where the experiences started to diverge again, so would speakers’ construal of the intension to match this fact, and the evaluativity would reemerge, which would not happen if the predicate was intrinsically relativized in its content to some group of experiencers or other.
3.4 Competence and blindness

From the above it follows that speakers have a certain competence with the hyperintensional content of expressions, made evident from the fact that they interpret belief reports hyperintensionally. But if speakers are in general able to use words in a way that is sensitive not only to their truth-conditional contents, but also to how their linguistic behaviors determine these contents, this has consequences for how these expressions are used even outside of hyperintensional contexts.

First, since speakers are able to navigate the machinery of hyperintensional agreement and disagreement, they are capable of stating and evaluating convergent or contrary beliefs while implicitly understanding how these can in principle turn not only on matters of fact, but also on patterns of linguistic behavior. They are therefore not only able to express opinions, but also to adopt them strategically. Where it is within the pale of ordinary competence in a language to construe the intension of an expression in a certain way, speakers might deliberately construe it that way toward some end – and so their opinions might reflect not just responses to linguistic convention, or behavioral noise, but attempts to accomplish something by exploiting non-cognitive belief-attitudes.

For instance, we have assumed nothing so far about the reasons for Alfonse’s and Bethany’s disagreement about whether Secretariat is an athlete: for all we have said, it might have been a disinterested accident of divergent linguistic behaviors. But the two might also adopt these conflicting views for other reasons – say, because Alfonse has a respect for horses, and thinks they deserve the dignity of being referred to using the term athlete, while Bethany thinks that it cheapens the title to grant it to anything but human competitors. In this case, their dispute would have normative import.

The reason for this is that, so long as certain attitudes are directed by convention at any individual to whom the term athlete applies, consistency in one’s linguistic behaviors will oblige one to have those attitudes towards Secretariat, so long as the predicate applies to him. To the extent that one uses this expression, one by default expresses those attitudes, and to the extent that one pressures others to use the predicate in the same way, one pressures others to have those same attitudes. Hence the truth-conditional machinery of the language can be used towards non-cognitive ends, since speakers implicitly understand that patterns of behavior in using words automatically track attitudes associated with using them.

Beyond this, consistency in one’s linguistic behavior has real-world consequences for any action adopted on the basis of the evaluation of the truth value of a piece of language. If, for instance, the law dictates that athletes are to be granted certain rights, then construing athlete as applying to racehorses grants racehorses those rights, automatically, in the relevant legal domain: this just follows as a consequence of the words used in the stipulation. To insist on the use of athlete to refer to Secretariat or any other horse is then ipso facto an insistence that he and any other horses relevantly like him be granted these rights. Changing one’s opinion so that one thinks Secretariat is an athlete, even on the basis of no factual change in one’s belief, automatically has real-world consequences for any action tied to assessments for truth using the corresponding predicate.34

34Concerns like these have been talked about at some length in Plunkett & Sundell (2013) and Ludlow (2014), under the titles of ‘metalinguistic negotiation,’ and ‘lexical warfare,’ respectively. Plunkett & Sundell’s characterization is misleading on the present approach, because it implies that these hyperintensional concerns about how to construe the intension of a predicate do not have to do with the meanings of the predicates themselves, and so are ‘metalinguistic;’ but the treatment of hyperintensional contexts requires that the compositional semantics has access to hyperintensional
It follows that whether a disagreement turns on attitudes toward the world, or behavioral attitudes dealing with construing the intensions of expressions in a certain way, is orthogonal to whether that dispute is substantive, interesting, genuine, etc. Just as there are disputes implicating linguistic behavior that are important, there are descriptive disputes that don’t matter — and so it is not a semantic question whether some disagreement or other is substantive, or should be recognized as such by speakers who engage in it. Where a speaker realizes that another speaker is holding a belief differing from their own merely in virtue of their distinct semantic alternatives, they may recognize on the one hand that the beliefs contradict, in that one speaker cannot adopt the linguistic behaviors of the other consistently, and yet simply not care — only where something is at stake in the relevant behaviors will a speaker insist on their own attitude against the other. But the same is true of factual beliefs: speakers may or may not care that their beliefs about the world are incompatible with those of others.

The above comments are also not meant to imply that speakers, if asked, will give an explanation of disagreements as matters of opinion like the one given here. The point is not that speakers self-consciously recognize that matters of opinion turn on linguistic behaviors, but only that speakers in fact use their own language in a way that competently manipulates the fact that this is how these matters work to their own ends (and to interpret the truth conditions of hyperintensional contexts). Offering and disputing matters of opinion using the hyperintensional machinery, and manipulating one’s own and others’ linguistic behaviors as a result, is like the competence expressed in articulatory phonetics: the extent to which speakers self-consciously understand what is going on in their own mouths varies, and is typically partial.

Further, semantic competence does not equip speakers, for any particular case of comparing attitudes, to know why those attitudes converge or diverge. Since the semantics of belief tracks linguistic behavior and attitudes towards the world simultaneously, knowing that someone believes something only gives information about how their combined semantic and doxastic alternatives must be arranged to treat a hyperintension truly — it says nothing about what combination of these is being utilized. And so speakers can draw inferences based on commitments to belief from surrounding convention, but there will be cases where speakers are not sure exactly in virtue of what they believe something, or over exactly what they are agreeing or disagreeing. This kind of hyperintensional blindness is more possible, the less speakers have a grip on how the use of an expression is systematically correlated with certain beliefs about the world.

4 The puzzles of hyperintensionality redux

There is in reality only one traditional puzzle of hyperintensionality, though it appears in multiple guises. It is what Pollard (2015: §4.7.1) calls ‘the granularity problem:’ words seem to have meanings finer-grained than intensions, since many expressions that a reasonable intensional grammar treats as identical in meaning (i.e. as cointensive) are not always substitutable salva veritate in certain content, making sensitivity of intensions to speaker behavior part of the genuine meaning of expressions. I also want to make clear that this jockeying over the intensions of words is not somehow of foundational importance to these kinds of disputes. The hyperintensional machinery exists independently of any of these normative concerns, possibly for reasons that have nothing to do with them, and while speakers can co-opt them to have non-cognitive disputes over word intensions (speakers can do whatever they want with their language, given what it is), they also don’t need to, and can also dispute over hyperintensional content to no particular end, or as an artifact of randomly divergent behavior.
What has caused concern are the embedded clauses of attitude reports that we’ve taken to be hyperintensional contexts here – and they’re traditionally called hyperintensional for this reason.

To give one popular illustration of the problem: belief reports allow their agents to be contradictorily directed towards attitudes expressed using apparently cointensive complement clauses without contradiction. Examples are often attested with both names and predicates, like these old favorites.

(37) a. Alfonse thinks a groundhog tore up his garden.
   b. Alfonse doesn’t think a woodchuck tore up his garden.

(38) a. Alfonse thinks Superman can fly.
   b. Alfonse doesn’t think Clark Kent can fly.

The assumption is that groundhog and woodchuck have the same intension, since plausibly they are truth-conditionally synonymous in English (and for the sake of argument, we can take for granted that they are, within the bounds of most ordinary competence). The same holds for Superman and Clark Kent, since after all they refer to the same man, and if names’ non-trivial semantic contents are exhausted by their referents, then these ought to have the same intension as well (traditionally, a constant function from worlds to that very man). So an intensional grammar might assign denotations to these expressions as follows, where s is Superman.

(39) a. \[\llbracket \text{groundhog} \rrbracket = \lambda w_e. \lambda x_e. \text{groundhog}'(w)(x)\]
   b. \[\llbracket \text{woodchuck} \rrbracket = \lambda w_e. \lambda x_e. \text{groundhog}'(w)(x)\]

(40) a. \[\llbracket \text{Superman} \rrbracket^e = \lambda w_s. s\]
   b. \[\llbracket \text{Clark Kent} \rrbracket^e = \lambda w_s. s\]

But once this plausible move is made, no matter what compositional semantics are assigned to the rest of the expressions in the attitude reports in (37) and (38), the prediction is that the (a)-sentences ought to contradict the (b)-sentences, on a de dicto reading of both: the (a)-sentence attributes to Alfonse an attitude towards a proposition, and the (b)-sentence attributes a lack of that very same attitude towards that same proposition – it must, since the intensions of the complement clauses are identical across the two cases.

And there is plausibly a way to read these sentences as mutually contradictory – yet there is also plausibly a way to read them as non-contradictory, which the intensional treatment of attitude reports cannot capture. But in which cases are these true readings possible? When, for instance, can Alfonse think that a groundhog tore up his garden, but not a woodchuck? This is possible precisely when he construes the meaning of groundhog and woodchuck differently, and so is willing to assent to the hyperintension of A groundhog tore up Alfonse’s garden, but not to that of A woodchuck tore up Alfonse’s garden. In other words, the ability for Alfonse to hold contradictory attitudes towards what is apparently the same intension occurs only if Alfonse, against ordinary English competence

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35 Pollard (ibid. ff.) goes on to attest two more problems of hyperintensionality: ‘the nonprincipal ultrafilters problem,’ and ‘the total omniscience problem.’ I leave these to the side, since have to do not with hyperintensionality per se, but with the model-theoretic treatment of possible worlds in the Kripke-Montague tradition.

36 Note that the problem is not that the reports attribute contradictory beliefs to Alfonse, which might be fine, depending on how one treats the nature of belief. The issue is that the sentences themselves ought always to be contradictory, and competent speakers do not always treat them as such.
with the terms, does not think (does not know) that woodchucks are groundhogs, as reflected by his linguistic behaviors.

But this is precisely what the hyperintensional machinery outlined here predicts. Our hyperintensional denotations for the two expressions are not identical (and cf. fn. 13).

\[
(41) \begin{align*}
\text{a. } \llbracket \text{groundhog} \rrbracket^M_{e,w} &= \lambda M \in S \in M_{s,w}\lambda x, \text{groundhog}'^M_M(w)(x) \\
\text{b. } \llbracket \text{woodchuck} \rrbracket^M_{e,w} &= \lambda M \in S \in M_{s,w}\lambda x, \text{woodchuck}'^M_M(w)(x)
\end{align*}
\]

\text{groundhog}' and \text{woodchuck}' are not the same functions, since it is possible for the same pattern of behavior \( M \) to map them to distinct intensions: witness Alfonse, who evidently does not treat them the same way. That in English the two expressions are typically synonymous is represented by the fact that the set of models typically in use by speakers of the language (cf. section 2.2) all map them to the same intensions. But the truth of both attitude reports depends on Alfonse not recognizing this typical synonymy, and so employing models outside of this set, that do not equate the intensions of the expressions.

Here is what we get with the semantics outlined in section 3.1 for (37-a) and (37-b), on a \textit{de dicto} reading, where for simplicity we take \textit{his garden} to denote \( g \).

\[
(42) \begin{align*}
\text{a. } \llbracket \text{Alfonse thinks a groundhog tore up his garden} \rrbracket^M_{e,w} &= \forall w' \in \text{Dox}_{a,w}, M' \in S \in M_{s,w}[\exists x[\text{groundhog}'^M_M(w')(x) \land \text{tore up}''(w')(g)(x)]] \\
\text{b. } \llbracket \text{Alfonse doesn't think a woodchuck tore up his garden} \rrbracket^M_{e,w} &= \neg \forall w' \in \text{Dox}_{a,w}, M' \in S \in M_{s,w}[\exists x[\text{woodchuck}'^M_M(w')(x) \land \text{tore up}''(w')(g)(x)]]
\end{align*}
\]

Are these attributions contradictory? Whether they can jointly be satisfied at \( w \) depends on what Alfonse’s semantic alternatives are like at \( w \). If for all \( M \in S \in M_{s,w}, \llbracket \text{groundhog} \rrbracket^M_{e} = \llbracket \text{woodchuck} \rrbracket^M_{e} \), i.e. if Alfonse’s behavior consistently treats the predicates synonymously, then these reports cannot be jointly true. But if this is not the case, then they can be – and this happens just when the report actually can come out true, i.e. when Alfonse doesn’t recognize the truth-conditional synonymy between the two expressions. In this case, the reports only commit Alfonse to (a) taking the world to be such that something that he would apply \textit{groundhog} to tore up his garden; and (b) not taking the world to be such that something he would apply \textit{woodchuck} to tore up his garden. And these reflect the appropriate truth conditions.

Not only are the reports then non-contradictory, but the beliefs thereby attributed to Alfonse might be descriptively compatible as well. Supposing for instance that Alfonse thinks that woodchucks are beavers, and so treats the predicate \textit{groundhog} as applying to groundhogs (i.e., to woodchucks), but the predicate \textit{woodchuck} as applying to beavers, then his descriptive commitments are only that (i) he takes the world to be such that a groundhog (i.e. woodchuck) tore up his garden, and (ii) he is not committed to taking the world to be such that a beaver tore up his garden. These are compatible commitments, and so long as Alfonse is right about what destroyed his garden, everything relevant that he thinks about the world is true. Alfonse’s error is therefore a ‘merely linguistic’ one.

The above assumes a ‘wide’ reading on the contextual restriction enforced by \( c \), on what models to consider relevant for evaluation of the report (cf. section 3.1). This allows the report to consider models beyond the pale of ordinary English competence, which plausibly includes models at which \textit{groundhog} and \textit{woodchuck} are not cointensive. What if a ‘narrow’ construal of \( c \) is given instead, so that only models compatible with ordinary English are considered? Then Alfonse’s deviant
alternatives are excluded, only models at which *groundhog* and *woodchuck* are cointensive are considered, and so the reports again are read as contradictory, even if Alfonse doesn’t use the words the same way. As mentioned above, this reading is apparently real as well: it doesn’t matter how Alfonse uses words, he just *can’t* think a groundhog tore up his garden, while not thinking a woodchuck did, since those are the same thing!37

Once at $w$ Alfonse realizes the synonymy, though, and so is never disposed to do something like affirm that a groundhog tore up his garden, but deny that a woodchuck did, the conflicting reports will start to come out mutually incompatible on either reading (relative to $w$), as desired.

How the Superman versus Clark Kent case works out should now be clearer. Names, being lexical items, are hyperintensionalized in a way similar to predicates, even where their intensional content is constant across worlds relative to a model, since it is possible to treat the same name as referring to distinct individuals. We then say that $s$ and $k$ are functions of type $\langle m, e \rangle$, which map patterns of behavior to individuals, such that e.g. $s_M$ is that individual that the pattern of behavior $M$ construes *Superman* as denoting.

(43) a. $\llbracket \text{Superman} \rrbracket = \lambda M_m. \lambda w_s. s_M$
b. $\llbracket \text{Clark Kent} \rrbracket = \lambda M_m. \lambda w_s. k_M$

Again, $s$ and $k$ are not the same functions, since it is possible to construe the two names as denoting distinct individuals with the same pattern of behavior. And as with the *groundhog* versus *woodchuck* case, the attributions of belief to Alfonse in (38-a) and (38-b) will not have to be contradictory at $w$, so long as Alfonse’s behavior at $w$ does not treat *Superman* and *Clark Kent* as synonymous, i.e. where is it not the case that for all $M \in \text{Sem}_{a,w}$, $\llbracket \text{Superman} \rrbracket^M_c = \llbracket \text{Clark Kent} \rrbracket^M_c$. The denotations for the belief reports are as follows.38

(44) a. $\llbracket \text{Alfonse thinks Superman can fly} \rrbracket^{M_c,w} = \forall w' \in \text{Dox}_{a,w}, M'_c \in \text{Sem}_{a,w}[\exists w'' : w'Rw''[\text{fly}'(w'')(s_M)]]$
b. $\llbracket \text{Alfonse doesn’t think Clark Kent can fly} \rrbracket^{M_c,w} = \neg \forall w' \in \text{Dox}_{a,w}, M'_c \in \text{Sem}_{a,w}[\exists w'' : w'Rw''[\text{fly}'(w'')(k_M)]]$

But under what conditions can these belief reports be taken to be mutually true? They might be in cases, like those above, where Alfonse simply is ignorant of some widely known synonymy between the two names. But the cases one typically has in mind in these examples are ones in which Alfonse knows the same man, Kal-El, under two guises, as a superhero and as a reporter, and does not realize the two are the very same man. The reason in turn that the use of these distinct names is meant to track this ignorance in the attitude report is because these are the names used for that same man in his distinct guises, *Superman* for the superhero, and *Clark Kent* for the reporter.

If Alfonse is ignorant in this way, does he construe these names the same way truth-conditionally? No – for he refuses to apply or not apply them in the same situations, precisely because of his ignorance, and so his inability to identify the same man in different guises patterns with his inconsistent linguistic behavior (he is unwilling to consistently call that same man by the names *Superman* and *Clark Kent*). The reason that the belief reports can come out mutually true here is then the same

37Where Alfonse’s semantic alternatives exclude the possibility that *woodchuck* is true of groundhogs, then the report in (37-a) will still come out false, for the reasons noted in section 3.1.
38For simplicity, the hyperintensional content of *fly* is ignored, but note that it automatically plays a role too, in genuine belief reports: this is relevant where it is under dispute what exactly counts as flying.
reason as before, and is traceable to Alfonse’s linguistic behavior: he must be willing to treat as true the hyperintension of Superman can fly, but not the hyperintension of Clark Kent can fly, in order for this to happen. It is only by happenstance that this divergence in linguistic behavior is tracked by some other form of incapacity to recognize the same man over time.

If Alfonse’s semantic alternatives at \( w \) were such as to refer to Kal-El using either Superman or Clark Kent perfectly consistently, then the following would hold, where \( e \) simply refers to Kal-El, making the belief reports incapable of being mutually true at \( w \).

\[
\begin{align*}
(45) \quad &\forall M \in Sem_{a,w}[\lambda [\text{Superman}^{ML}] = \lambda w, e \\
&\forall M \in Sem_{a,w}[\lambda [\text{Clark Kent}^{ML}] = \lambda w, e
\end{align*}
\]

But this is precisely the situation that does not obtain where Alfonse cannot recognize the same man across his two guises, and so applies Superman to him in one guise, and Clark Kent to him in the other. His semantic alternatives cannot be arranged this way, because he is not consistent in referring to Kal-El using Superman, nor is he consistent in referring to him using Clark Kent. While in the guise of superhero, Alfonse in fact refuses to refer to him using Clark Kent, and vice-versa for the reporter guise. His linguistic behaviors therefore do not treat either expression as referring consistently to Kal-El, since Alfonse is disposed to outright refuse Kal-El each name half the time.

What remains true, however, is that Alfonse’s factual beliefs and linguistic behaviors are such that, given his use of the name Superman, he does verify the hyperintension of Superman can fly, and and likewise he doesn’t verify the hyperintension for Clark Kent can fly with those same alternatives. This looks to be the right result, and it is obtained so long as a ‘wide’ reading is given to \( c \), to allow all Alfonse’s associated models to be quantified over. These models are all such that, whoever Superman refers to according to that model, Alfonse’s doxastic alternatives verify the proposition that that individual can fly. In other words, Alfonse’s beliefs commit him to taking whichever individual Superman refers to (whoever Superman is) as capable of flight, and likewise his beliefs do not commit him to whoever Clark Kent is being able to fly.\(^{39}\)

If instead \( c \) gives a ‘narrow’ reading to the quantification over models, such that e.g. they include only models at which Superman and Clark Kent are cointensive and refer to Kal-El, (37-a) will commit Alfonse to the de re belief that the man referred to by Superman on these models (Kal-El) can fly, and (37-b) will deny that Alfonse holds this very same attitude. The result is a contradiction. This is the right result for the intended reading: Alfonse can’t think that Superman can fly, but not Clark Kent: they’re the exact same man, so either he thinks he can fly, or not!\(^{40}\)

\(^{39}\)In order to represent this belief properly, some additional structure might have to be added to Alfonse’s doxastic alternatives, to make certain models and worlds pattern together, rather than being mutually interchangeable. What we want is a way of saying that Alfonse, given that a model in his semantic alternatives construes Superman as denoting \( x \), has doxastic alternatives according to that model such that \( x \) can fly. We might then say that Alfonse has a more richly-structured set of doxastic alternatives at \( w \), \( \text{dox}_{a,w} \), which is a set of ordered pairs of models and worlds compatible with Alfonse’s beliefs simpliciter, as opposed to his merely factual beliefs about the world. We then might say that for every \( \langle M, w' \rangle \in \text{dox}_{a,w}, \text{fly}'(w')(s_M) \). This would allow Alfonse to hold some such belief as, ‘whoever I mean to refer to using Superman, that individual can fly.’ Whether this elaboration is necessary is not clear to me, and may depend on how exactly one construes (ordinary, world-directed) doxastic alternatives.

\(^{40}\)This sort of de re reading of the name might also be accomplished if arguments, including names, are allowed to scope out of the embedded clause, as is normal on most treatments of quantifier raising or its formal equivalent. This could, depending on how one sets things up formally, allow the name to escape the hyperintensional context and so be interpreted merely ‘extensionally.’ I believe that it’s right to allow for this possibility, which predicts that names
Finally, given that Alfonse realizes the two are the same man, and so begins to use both names consistently to refer to him across guises, the reports become mutually incompatible at $w$ regardless of $c$.

With that, we see how traditional puzzles of hyperintensionality are addressed with the present treatment, and I suspect that a good deal more of these puzzles receive solution in the same way: I will not cover any more of them (such as the traditional problems with omniscience and logical truths), but encourage the reader to see what this machinery says about them as exercises. The core idea is simple: first, meanings are finer-grained than intensions, in the obvious formal sense that two expressions may be cointensive at a model while not being cohyperintensive. Second, these expressions’ hyperintensional meanings relates to how speakers behave so as to construe their intensions, and so hyperintensional differences that do not reduce to intensional differences crucially implicate how the agents of the attitudes use words.

Unlike previous treatments of the puzzles of hyperintensionality, like those found e.g. in Cresswell (1975) and Pollard (2015), the present approach therefore not only makes cointensive expressions not necessarily have identical meanings (so that they do not have to be intersubstitutable *salva veritate*), but also assigns plausible truth conditions to attitude reports directed at distinct hyperintensional objects, whether cointensive or not. The previously mentioned approaches have not done this, since they have treated expressions, even where they have hyperintensional meanings, as also having intensions *simpliciter*, meaning that the accounts were solely concerned with achieving the formal result of making some attitudes towards objects with identical intensions non-equivalent. Unlike the present approach, they have had no way of giving this difference empirical content, since they have had no independent notion of what an attitude towards a hyperintensional object consists in.41

### 5 Other empirical applications

This section reviews some recent work that has dealt explicitly with alternate ways that speakers can construe the intensions of expressions. In each case, I briefly demonstrate that the machinery of the relevant authors is straightforwardly translatable into the machinery proposed here. We do undergo *de dicto* / *de re* ambiguities, but only as they relate to their hyperintensional, and not intensional, content (on a traditional world-rigid view of names). It also predicts that arguments should be able to escape hyperintensional interpretation more easily than expressions in non-argument positions, like predicates, since they can do so either by outscoping the clause, or by modulation of $c$, and that they might be able to do so independently of one another. I think this is the right thing to say, but it would require a close examination of these constructions and their possible interpretations.

41This is a bit of a simplification, in that Cresswell (1975) is working in the Carnap-derived ‘structured meaning’ tradition, and following Lewis (1970) has belief reports relate agents to meanings, which are themselves quasi-syntactically-structured objects consisting of further meanings as their constituents. The structured meaning theorist might try to cash this out in some way, e.g. by saying that believing a hyperintension is accepting the truth of some quasi-linguistic object that semantically and quasi-syntactically maps onto the expression making up the report’s embedded clause, in the vein of Carnap’s (1947) old notion of ‘intensional isomorphism.’ I don’t have much hope in such a project, since the truth conditions of belief reports, so far as I know, simply don’t track any quasi-syntactic structure in this way (and cf. Partee 1973: 321-322 for harsh criticisms along these lines); see Cresswell (1985) for an elaboration of the program. Pollard (2015), by contrast, deliberately refrains from taking any position on the nature of hyperintensions or beliefs directed towards them, beyond the minimal formal properties required to resolve the puzzle of granularity.
ought, therefore, to see the treatment in this paper as a notational variant of these, generalized and made applicable to a different set of phenomena. Another way of saying this is that the authors in question have been implicitly appealing to hyperintensions, and these research programs converge. The applicability of the present account to multiple domains of empirical phenomena makes the case that hyperintensionality ought to be taken seriously by semanticists.

Section 5.1 deals with the discourse dynamics of vague predicates, as characterized by Chris Barker. Section 5.2 deals with subjective attitude reports, as characterized by Malte Willer and Chris Kennedy. Section 5.3 deals with counterconventionals, as characterized by Alexander Kocurek, Ethan Jerzak, and Rachel Rudolph.

### 5.1 Vagueness and discourse dynamics

Barker (2002, 2013) proposes evaluating the extension of vague predicates, like the positive forms of relative gradable adjectives, relative to a discourse parameter \( d \), in addition to a world-state \( w \). For instance, the denotation for *tall* in its positive form might be as follows (adapted from Barker 2013: 243, ex. 1).\(^{42}\)

\[
\langle \text{tall} \rangle^{w,d} = \lambda x.e.\text{height}(w)(x) > s(d)(\text{height})
\]

**height** is a type-\(\langle w, \langle e, d \rangle \rangle \) measure function that maps a world and individual to the maximal degree of height that individual possesses at that world. \( s \) is a function from discourses \( d \), to measure functions of type \( \langle w, \langle e, d \rangle \rangle \), to degrees, viz. the degree that represents the ‘cutoff point’ for vague predicates associated with the relevant scale according to the discourse \( d \). In other words, *tall* in its positive form is true of an individual \( x \) at \( w \) and in discourse \( d \), just in case \( x \)’s height at \( w \) exceeds the standard of height according to \( d \).

Barker (2013) details the ways in which, where the extension of a predicate is sensitive to both these parameters simultaneously, various consequences follow for how an assertion of a predicate using that predicate updates conversational commitments to both the world and the discourse simultaneously, and for how speaker disputes involving vague predicates can turn on the discourse, the world, or both simultaneously. The parallel with the treatment of hyperintensionality here is clear: \( d \) is analogous to \( M \), and tracks the ways speakers are disposed to use words, i.e. the standards they enforce in conversation on when the application of a predicate is appropriate. The extension of *tall* might be trivially rewritten as follows using the present notation.

\[
\langle \text{tall} \rangle^{M,e,w} = \lambda x.e.\text{height}(w)(x) > s_M(\text{height})
\]

Here, \( s \) is instead a type-\(\langle m, \langle w, \langle e, d \rangle \rangle \rangle, d \) function mapping patterns of behavior to measure functions to degrees, where e.g. \( s_M(\text{height}) \) can be thought of as the standard of height required for the positive form of *tall* as construed by the pattern of behavior \( M \). Speakers then act to construe the intension of *tall* as a property determined by a dimension, with behavioral decisions determining cutoff points along that dimension. It follows that vagueness generally is a hyperintensional matter, and the only difference between a one-dimensional vague predicates and those like *athlete* is that the former have their hyperintensional content arranged along a linear scale.\(^{43}\)

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\(^{42}\)This denotation ignores the presence of the comparison class, which as Barker (*ibid.* 245) rightly notes is a parameter distinct from that determining the cutoff for vague dimensional predicates.

\(^{43}\)This is an idealization; in reality *tall* likely has hyperintensional content related to what counts as something
Barker’s concern is with conversational dynamics at a particular context, and so he doesn’t address stable cross-contextual commitments, or beliefs tracked across contexts by attitude reports. However, there is no reason why his machinery could not make use of the account of hyperintensional attitudes presented here. Nor is there any reason that the present approach cannot adopt his discourse dynamics: this requires only construing the common ground as tracking both commitments about the world, and commitments about which models are in effect, via a two-parameter extension of the traditional update semantics in Stalnaker (1978).\(^{44}\) Barker’s implementation already accomplishes this, with respect to the dual parameters \(w\) and \(d\), and the latter only need be swapped for \(M\) to be roughly in line with the present treatment.

5.2 Subjective attitude reports

Kennedy & Willer (2016) and Willer & Kennedy (m. s.) deal with subjective attitude reports, i.e. reports using attitude verbs that require that their complement clauses be ‘subjective’ in some way. They treat the one of these verbs, English *consider*, by casting it as an ordinary doxastic verb with respect to its assertoric content, and imposing a constraint on its presuppositional content, to the effect that the denotation of the clause it embeds must be ‘counterstance contingent’ for the agent in the context of utterance.\(^{45}\) Here is their denotation (adapted from Kennedy & Willer m. s.), where \(s\) is a point of evaluation yielding an extension, containing several parameters of evaluation, including \(w_s\), the world-state of \(s\).

\[
\langle \text{consider} \rangle_{c,s} = \lambda \phi_{st} \lambda x_e : \phi \text{ is counterstance contingent in } c \text{ with respect to } \text{Dox}_{x,w_s}. \\
\forall s' \in \text{Dox}_{x,w_s}[\phi(s)]
\]

A proposition \(\phi\) is then counterstance contingent in \(c\) with respect to \(\text{Dox}_{x,w}\) just in case in \(c\), \(\text{Dox}_{x,w}\) has a ‘counterstance’ that verifies \(\phi\), as well as a counterstance that falsifies it. A counterstance in turn is an alternate way \(x\)’s belief state could be at \(w\), given that \(x\) resolved to treat the meanings of words in some possibly different way (or to ‘resolve semantic underdetermination’), without making \(x\)’s belief state strictly stronger, or changing \(x\)’s beliefs about the world.

For Willer & Kennedy (m. s.), this in effect means that a counterstance to \(\text{Dox}_{x,w}\) is a set of indices (points of evaluation) that has identical commitments with respect to the status of the world parameter as \(\text{Dox}_{x,w}\), but potentially differs from it with respect to commitments on non-world parameters, in a way that does not make \(x\)’s belief commitments strictly stronger. Where \(\kappa_c\) is a function from sets of indices \(i\) (including belief states) into the set of counterstances of \(i\) in \(c\), the denotation in (48) is then equivalent to the one in (49).

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\(^{44}\) There are a number of other analogues to this project, providing extensions of traditional conversational dynamics meant to track not only matters of vagueness, but also different speaker commitments to matters of opinion: cf. Stephenson (2007: §5.1), Fleisher (2013), Coppock (2018: §4), and Lasersohn (2017: §9.2). All these treatments are getting at pretty much the same thing, and have pretty much the same implementation: they just have a narrow focus than different ways of construing the intensions of expressions in general. Kocurek et al. (m. s.), which will be discussed briefly in section 5.3, have a proposal for updating Stalnaker that more directly corresponds to the treatment in this paper.

\(^{45}\) Kennedy & Willer also deal with the English subjective attitude verb *find*. I leave their treatment of this verb to the side here, since it involves machinery that goes beyond what the formalism proposed in this paper can treat. This requires a simplification of their formalism, to exclude the features of it introduced to treat *find*. 
This presupposition is meant to reflect the semantic selectional restrictions of consider, and explain: (i) why a sentence like (50-a) requires that it be somehow ‘up to’ the way the meanings of words are construed by the agent, and not purely a matter of the way they take the world to be, that Bethany is believed to be vegetarian, and (ii) why, as in (50-b), when there is no contextually recoverable difference in the way the meanings of words could be construed that would make a difference to the truth of the complement clause according to the agent’s belief, the sentence is anomalous (due to presupposition failure).

(50) a. Alfonse considers Bethany vegetarian.
    b. ?Alfonse considers Bethany six feet tall.

The parallels with the present treatment are clear: Kennedy & Willer quantify over counterstances in the presupposition they adduce for consider, and counterstances are alternate belief states that result from an agent construing the meaning of expressions in a certain way. While they make no explicit formal reference to patterns of behavior, or another formal correlate of models, they do make reference to the result of appealing to such an object, in characterizing how counterstances can differ from an originating belief state.

Adopting the same presuppositional treatment, the hyperintensionalized version of this attitude verb presupposes that the hyperintension of its complement clause is true with respect to one of the contextually relevant models that a speaker could adopt, while holding their doxastic alternatives (beliefs about the world) constant, and false with respect to another. The contextual restriction in quantifying over models mirrors that seen for belief in section 3, and corresponds to Willer & Kennedy’s own contextual restriction.

(51) \[
\llbracket \text{consider} \rrbracket^{c,s} = \lambda \Phi_{c,t} \lambda x : \exists i, i' \in \kappa_c(Dox_{x,w},)[\forall s \in i[\Phi(s)] \land \forall s' \in i'[-\Phi(s')]].
\forall s' \in Dox_{x,w}[, \Phi(s)]
\]

This denotation has the same assertoric content as the denotation for think from section 3, but adds a presupposition that there is some contextually relevant way that the agent could behave to construe the intension of the complement clause, such that given their same factual beliefs, the complement clause could either be verified or falsified. Hence the hyperintensionality tracks the way the selectional requirements of the report depend on some way that it is ‘up to’ the agent how to treat the truth of the hyperintension.

5.3 Counterconventionals

Kocurek et al. (m.s.) are concerned with counterconventionals: these are linguistic environments in which expressions are treated as denoting intensions according to counterfactual linguistic conventions. While they survey a number of constructions, they spend the most time discussing the ability of counterfactual conditionals to shift the conventions with respect to which their antecedent
and consequent clauses are interpreted, as in (52).\footnote{It isn’t clear to what extent counterfactual conditionals should be construed as C-monstrous (or hyperintensional) environments generally: unlike with belief reports, the hyperintensional content of the relevant expressions is not obligatorily accessed, and perhaps certain constructions, e.g. predications in the antecedent clause, make the counter-conventional reading more accessible. Nonetheless, at least some such readings are genuine.}

(52) If Pluto were a planet, there would be too many planets in the solar system.

The reading of interest is the one on which (52) is true just in case if the predicate planet were to appropriately apply to Pluto, then there would be too many individuals to whom the predicate planet appropriately applied in the solar system.

Kocurek et al. treat these constructions by evaluating expressions relative to models, which are associated with ‘hyperconventions’ $c$. A hyperconvention is a perfectly determinate convention for assigning intensions to expressions: it therefore corresponds almost exactly to a model in the present hyperintensional machinery. The extensions of expressions are then evaluated relative to indices associated with the relevant model, where each index $i$ is an ordered pair consisting of a world $w_i$ and hyperconvention $c_i$. Expressions are therefore effectively assigned intensions relative to hyperconventions, and their intensions are effectively assigned extensions relative to words, so that the two components of the index mirror the functions of the model and world adopted here.

They then offer a syncategorematic treatment of a counterfactual operator, $\square \rightarrow$. Assigning what are effectively hyperintensions (sets of indices, i.e. world-hyperconvention pairs) to expressions relative to models $M$, they offer the following denotation for a counterfactual construction, where ‘$A$’ and ‘$B$’ are variables over well-formed formulae of the language (expressions that themselves denote sets of indices), and $f$ is a selection function, as in a Stalnaker-Lewis semantics for conditionals, that takes a set of indices and an index into a set of indices, intended roughly to track the relevantly ‘closest’ indices to the evaluation index that verify the antecedent, at which the consequent is to be evaluated to determine the truth conditions of the counterfactual as a whole.

(53) $[A \square \rightarrow B]^M = \{i \in I^M | f([A]^M, i) \subseteq [B]^M\}$

In other words, ‘$A \square \rightarrow B$’ is true at all and only those indices whose relevantly ‘closest’ indices at which ‘$A$’ is true are such that ‘$B$’ is true. What makes the semantics special is that the indices $i$ in question each contain a hyperconvention $c_i$, which means that the counterfactual possibilities considered by $f$ include not only counterfactual worlds, but counterfactual conventions as well.

Where ‘$A$’ has the denotation of Pluto is a planet, and ‘$B$’ has the denotation of There are too many planets in the solar system, (53) therefore entails that (52) is true (on the relevant model) at all and only those indices, the ‘closest’ of whose indices, i.e. world-hyperconvention pairs, that verify Pluto is a planet according to the conventions local to the index, also verify There are too many planets in the solar system, at that same index. This means that the counterfactual can search out indices whose hyperconvention treats planet as having an intension that makes it applicable to Pluto, and affirm that at those indices, it is true that there are too many planets in the solar system, according to the local construal of planet. Therefore, the counterfactual can be verified by the existence of alternate possible uses of planet, rather than by alternate possible states of Pluto.

Rewriting such a denotation into the hyperintensional machinery is then trivial, placing the model in the role of the hyperconvention. We simply say that, at a context, every model-world pair in the set to which the selection function maps the hyperintension of ‘$A$’ and the pair consisting of
the model and world of evaluation verifies the hyperintension of ‘$B$.’

\[(54) \quad \llbracket A \to B \rrbracket^{M,c,w} = \forall (M', w') \in f(\llbracket A \rrbracket, \langle M, w \rangle)[\llbracket B \rrbracket(M'(w'))] \]

This denotation can then be decomposed as needed to fit the counterfactual constructions of specific languages.

6 Conclusion

The core vision of this paper is a simple one. Meaning has a conventional component, which tracks how speakers behave, and a non-conventional component, which makes words sensitive to the way the world is, given that speakers behave a certain way. The former component is represented by the determination of an intension by a model, and the latter component is represented by the determination of an extension by a world-state or point of evaluation. Taken together, these two components form a hyperintension, or the meaning of an expression \textit{simpliciter}.

What is perhaps surprising is that the conventional component of meaning is not just a necessary precondition of the compositional semantics of an expression, as accessed by the grammar. If what is said here is correct, then the grammar can ‘see’ and manipulate this conventional component, which is reflected by the fact that speakers, in determining the truth conditions of expressions, are sensitive to different ways in which the intensions of words can be construed. I have further claimed that this feature of the grammar is what has traditionally been called hyperintensionality, and that it is the source both of the traditional puzzles of hyperintensionality, and speakers’ ability to express opinions using truth-conditional language.

The result of the above is that truth conditions are not intrinsic features of expressions, but arise only in virtue of speakers behaving in a certain way, and the grammar is sensitive to this fact. This means that truth conditions are, in effect, a kind of epiphenomenon – they arise just when speakers behave a certain way, and they are themselves just artifacts of that behavior, since to accept the hyperintension of an expression is to accept whatever behavioral commitments this implies, and if behaviors are conventionally associated with world-states, this will in turn require taking the world to be a certain way. The evaluation of hyperintensions therefore comes to have factual commitments, precisely insofar as speakers behave consistently with respect to the world.

I therefore end by suggesting that truth conditions are not foundational in the way that formal semantics has traditionally treated them. To study truth conditions is to study intensions, which are the meanings of expressions seen only ‘from the other side,’ i.e. as they result from a perfectly consistent, determinate pattern of behavior construing expressions in a certain way. Expressions do indeed have the formal properties that truth-theoretic semantics attributes to them, but only in virtue of this deeper prior feature of the language, that it is capable of coordinating speaker behavior.

Where speakers act more or less the same way, tracking the truth conditions of an expression can effectively go proxy for tracking its meaning, but this still tells us nothing about what we really ought to be interested in, in the end – what the language is, as a nonlogical natural phenomenon that coordinates speakers in such a way that allows these logical properties to emerge as a result. The study of semantics can’t be limited to tracking just the formal properties of the idealized end-state of this phenomenon. And in the case of many expressions, like \textit{tasty} addressed in section
3.3, their truth conditions cannot be understood without reference to deeper linguistic conventions about how speakers are bid to behave.

References


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