An alternative semantics for hedging: what *sorta* tells us about the nature of the compositional system

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Contents

1 Introduction **2**

2 What *sorta* does **3**

3 Background **6**
3.1 Pragmatic slack and pragmatic halos 6
3.2 Alternatives and metalinguistic imprecision 9

4 How to hedge **12**
4.1 Hedging an adjective phrase 12
4.2 Hedging a verb phrase 18
4.3 Why indefinite objects can be hedged 21
4.4 Constraints on hedging 23
4.4.1 Option 1: Functional head 26
4.4.2 Option 2: Restrict and Specify 28

5 Connections **30**
5.1 The discourse particle *like* 30
5.2 Why fuzzy logic won't work 32
5.3 Granularity functions, scalar vagueness, and epistemic vagueness 32

6 Conclusion **33**

References **34**

1 Introduction

Speech is rarely perfectly precise. Well-known from the work of Grice (1957) is that speakers are experts at implicated unsaid meanings — how something is said matters to the way it is interpreted. But the competence system allows for other avenues to express things that are not quite what was said; quantifiers can have restricted domains, and hedges such as *loosely speaking* and *sorta* can mark words and expressions as being interpreted in a way that is outside the norm. This paper is an analysis of one such hedge, *sorta*.

Hedges are interesting to both semanticists and pragmaticist because of the questions they raise about the nature of the semantics and pragmatic systems and their interface with each other. For a semanticist, a natural question is about the representation behind hedging, and how a *sorta* can grade over different meanings. This question becomes all the more interesting if it can be shown that *sorta* interacts with the compositional semantics. In this paper I present evidence suggesting that it does; *sorta* is sensitive to noun phrase semantics and verbal semantics. In order to account for this, assumptions regarding alternatives (Hamblin, 1973; Rooth, 1985) will need to be rethought. Alternatives aren't part of a post-compositional pragmatic system, but are systematically available in the compositional semantics.

A brief roadmap for this paper: in section 2, I describe the basic facts of *sorta* that I wish to account for. In section 3, I provide the theoretical background that will drive my eventual analysis, namely Lasersohn (1999)'s concept of pragmatic halos and Morzycki (2011)'s implementation of them using an alternative semantics. Section 4 presents my analysis. I take stock in section **??**. Section 5 compares my approach here against other papers on hedges and imprecision in the semantics literature. I conclude

the paper in section 6.

2 What *sorta* does

The English modifier *sorta* is part of a family of modifiers often called *hedges*[1]. Like other hedges, *sorta* pragmatically serves to signal a mismatch between what a speaker is saying and what a speaker actually means. This may be done for the metalinguistic reason of not knowing the correct word or phrase to use at the time of utterance, or as a rhetorical strategy to soften the impact of what is said. In this respect, it behaves similar to *like* (Siegel, 2002).

The mismatch *sorta* provides between what is said and meant is demonstrated in (1a) below, where the natural interpretation is that the speaker does not mean to actually use the word *kick* in the sentence, but some other word. Furthermore, denying the use of the word *kick* in a followup is perfectly acceptable (1b), as the semantic content of *kick* is neutralized by *sorta* (Bolinger, 1972).

(1) a. The player sort of kicked the ball.

b. The player sort of kicked the ball – not really kicked, but something else.

Sorta is able to modify verb phrases headed by most types of verbs, including stative verbs[2]. For many verbs, the behavior of *sorta* mirrors the behavior in (1a) above, where *sorta* hedges the verb. For some verbs, however, a second reading arises where *sorta* can hedge not just the verb but also its direct object. Verbs that *sorta* can do this for verbs in the SEARCH class of intensional transitive verbs including *look for* as well as creation verbs (*build*), depiction verbs (*draw*, *paint*), and performance verbs (*sing*). To illustrate, in (2) below, the sentence is ambiguous between two readings: one reading where the verb is hedged, but also one reading where the direct object of the verb is hedged. (3) demonstrates the same phenomenon with a depiction verb, and (4) with *look for*.

[1]In this paper I am concerned with the adverbial *sorta* that can modify verb phrases. The nominal *sorta*, i.e. *a sort of cat*, doesn't figure into this story. *Sorta* has a reduced variant, *sorta* [sɔɹɾə], which I assume is arrived at phonologically with the same semantic meaning as *sorta*. *Kind of*/*kinda* appears to be related to *sorta*, and for the purposes of this paper I assume that they have the same semantics and pragmatics. Some speakers report that judgements with *sorta* are strange while using *kind of* is better, but I assume that this is stylistic variation.

[2]*Sorta* has interesting properties with stative verbs which I'm setting aside in this paper.

(2) The carpenter sorta built a barn.

a. The carpenter did something that was like building (e.g., putting together a prefabricated structure).

b. The carpenter built something like a barn (e.g., a shed).

(3) The boy sorta drew a house.

a. The boy did something like drawing (e.g., connected the dots in a picture).

b. The boy drew something that was like a house.

(4) I'm sorta looking for a horse.

a. I'm only half-assedly looking for a horse.

b. I'm looking for something like a horse.

Looking at the examples above, we might think that this is simply an effect of the indefiniteness of the direct object. To some extent, it is; replacing the indefinite noun phrases with definite noun phrases in the sentences above makes the hedging effect on the direct object disappear. Both (5) and (6) below are unambiguous, showing that the determiner does have an effect.

(5) The amateur carpenter sorta built the house.

a. The amateur carpenter did something that was akin to building that resulted in the house.

b. *The amateur carpenter built something that was like the house (a shack, a hovel, . . .).

(6) The patron sorta sang the song.

a. The patron did something that was like singing (mumbling, bellowing, . . .).

b. *The patron sang something that was like the song (a poem, a verse, . . .).

When we look at more mundane verbs such as *kick* with indefinite direct objects, however, a different picture begins to emerge. (7) does not have the same sorts of readings that verbs such as *build* above do, and neither does *eat* in (8). Namely, the reading where the direct object is hedged is unavailable, even though the verb may still be hedged. Both of these verbs are outside of the verb classes delineated above, the creation verb and intensional verb classes.

(7) The player sorta kicked a ball.

a. The player did something that was like kicking to a ball.

b. *The player kicked something that was like a ball.

(8) The woman sorta ate a cracker.

a. The woman did something that was like eating to a cracker.

b. *The woman ate something that was like a cracker.

What should be clear from this data is that there is a confluence of both indefinite noun phrase direct objects and verb class in getting this additional reading with *sorta*. First, only indefinite objects may be hedged — definite objects resist the hedging effects of *sorta*. Second, indefinite objects may only be hedged if they are selected for by one of a particular class of verbs, namely verbs of creation or intensional verbs.

A matter worth reflecting on for this puzzle is how *sorta* can affect a direct object at all. Given standard syntactic assumptions, *sorta* and the direct object never form a constituent, and in fact, *sorta* directly modifying a noun phrase is quite degraded (9). Under common assumptions about compositionality, it should be a bit of a mystery about how *sorta* can affect the interpretation of an NP when it doesn't form a syntactic constituent with it.

(9) a. *I saw sort of a bird.

b. *She ate sort of a cracker.

Sorta can also combine with adjectives. Scale structure doesn't appear to be an influence in the acceptability of *sorta* with adjectives; relative adjectives as well upper closed and lower closed adjectives are allowed to combine with *sorta*, as diagnosed by the tests from Kennedy and McNally (2005).

(10) a. The man is $\left\{\begin{array}{c}\text{*completely}\\ \text{*slightly}\\ \text{very}\end{array}\right\}$ tall.

b. The door is $\left\{\begin{array}{c}\text{completely}\\ \text{slightly}\\ \text{??very}\end{array}\right\}$ open.

c. The room is $\left\{\begin{array}{c}\text{*completely}\\ \text{slightly}\\ \text{very}\end{array}\right\}$ dirty.

(11) a. The man is sorta tall.

b. The door is sorta open.

c. The room is sorta dirty.

The interim conclusion here is that *sorta* can hedge both verb and adjectives. When hedging verbs, some but not all verbs allow for their direct objects to be hedged by *sorta*. The relevant factor seems to be verb class. Complicating this generalization is that, for those verbs that allow their direct object to be hedged, it is only indefinite objects that are allowed to be hedged. Definite direct objects are never allowed to be hedged. This naturally leads to several questions about the nature of *sorta*. First, how can we represent the effect that *sorta* has on words, the so-called hedging effect? Second, what representation of *sorta* can derive the correct behavior of *sorta* with certain types of objects – why can indefinite objects but not definite objects be hedged? Finally, why is it that the indefinite objects of certain verbs are special? Why are only indefinite objects available for hedging with *sorta*?

In the rest of this paper, I'll present an analysis of *sorta*, creation verbs, and indefinite noun phrases that accounts for the facts outlined above. The analysis presented will make liberal use of a Hamblin semantics (Hamblin, 1973) to model the hedging effect of *sorta*. This hedging function of *sorta* represented with a framework that introduces alternatives into a variety of places of the grammar, modeling denotations as denoting Lasersohnian pragmatic halos (Morzycki, 2011; see also Lasersohn, 1999). By adopting a system that Hamblinizes large portions of the grammar, I can account for the behavior of *sorta* in a natural way, with some interesting consequences for the architecture of the grammar and the semantics-pragmatics interface.

3 Background

3.1 Pragmatic slack and pragmatic halos

Examining natural language expressions, Lasersohn (1999) notes that the pragmatics of many expressions allows them to be used even in situations where they would normally be considered false, strictly speaking. For example, consider the context and discourse in (12).

(12) *Jen is discussing with Jim and Jill when various people arrived at their party the night before. Jack arrived at exactly 6:58pm.*
Jen: What time did Jack arrive?
Jim: He arrived at 7pm.

(13) #**Jill**: No, he arrived at 6:58pm.

In this discourse, we do not consider Jim to have said anything particularly pathological in terms of discourse structure. What Jim said was perfectly licit, given the standards of the conversation. In light of these standards, it's in fact odd for Jill to follow Jim's comment with the comment in (13). This is even more puzzling consider the facts of the matter: Jack did in fact arrive at 6:58pm. What Jim has said is absolutely false given this fact, and what Jill has said is absolutely true, but Jill's comment is illicit with respect to the conversation at hand while Jim's is perfectly acceptable.

What Lasersohn argues is going on is that discourses allow for a certain amount of pragmatic slack or imprecision in interpreting expressions. Although certain things people say may in fact be absolutely false, discourses allows for an amount of leeway in what expressions count as good enough to be used. In casual speech, speakers typically allow each other quite a bit of pragmatic slack, as shown in the fictional discourse above. Jim's statement that Jack arrived at 7pm is good enough given the aims of the conversation, even though it is not truthful in the strictest sense. Jill's follow-up comment, although true, is regarded as odd because it is too precise given the imprecision allowed in this context. In fact, such utterances can be accommodated so long as we acknowledge we're entering a context where such pedantry is tolerated.

(14) **Jim**: Well, I guess that's true, Jill, but you're just being a pedant.

Lasersohn suggests that an appropriate way to model the effect of imprecision in discourse is to consider natural language expressions as projecting two types of meaning. One type of meaning is the ordinary truth conditional meaning of an expression, the other being a set of pragmatically ignorable differences given the context that he calls a pragmatic halo. Speakers are allowed imprecision in the meaning of their words and phrases so long as they fall within the pragmatic halo of an expression. For the discourse above, Jen and Jim will still interpret *7pm* as **7pm**, but implicitly acknowledge that *6:58pm* falls within the pragmatic halo of **7pm** and is hence an ignorable difference given the imprecision allowed to each other.

Not only do pragmatic halos shrink or expand implicitly with the context, but certain expressions that Lasersohn terms slack regulators can also affect the size of pragmatic halos. *Exactly* is argued to be a slack regulator, having the ability to shrink the size of a halo and hence allowing for less imprecision in how an expression may be evaluated. The effect of this can be seen in the discourse below, where Jen asks the exact time that Jack arrived.

(15) *Jen is discussing with Jim and Jill when various people arrived at their party the night before. Jack arrived at exactly 6:58pm.*
Jen: At exactly what time did Jack arrive?
*__Jim__: He arrived at 7pm.
Jill: No, he arrived at 6:58pm.

In this discourse, Jim's statement is false as before, but it is now also pragmatically unacceptable, due to Jen's insistence on knowing the exact time that Jack arrived. The effect of *exactly* here was to shrink the pragmatic halo enough that *6:58pm* was excluded from the halo. Jill's follow-up that Jim is wrong is still true in this discourse, but now also pragmatically acceptable, given that Jill has an appropriate amount of imprecision, given the amount of slack Jen has allowed for Jim and Jill.

I suggest that *sorta* has some of the same flavor as a slack regulator. Namely, what *sorta* does is allow for normally ignorable expressions to be considered in place of the expression that *sorta* modifies. If *sorta* α is some expression, *sorta* allows for variants to α that would not otherwise be available given the discourse. This is essentially a slack regulating function, but with an important difference — although slack regulators like *exactly* shrink the size of the pragmatic halo, *sorta* does the opposite in increasing the size of the pragmatic halo.

There is an important difference in what *sorta* does compared to other slack regulators, however. Although both slack regulators and *sorta* modify the size of a pragmatic halo, for standard Lasersohnian slack regulators the objects in the halo are still false. *Sorta* is different because the objects it allows speakers to consider are now true alternatives. Slack regulators expand halos around objects, while *sorta* expands a denotation into a halo.

3.2 Alternatives and metalinguistic imprecision

An important part of my analysis will be a framework developed by Morzycki (2011) for metalinguistic comparatives (see also Giannakidou and Stavrou (2009); Giannakidou and Yoon (2011) for an alternate view). Metalinguistic comparatives are species of comparatives that seem to compare word choice rather than over some scale inherent in the lexical semantics of a predicate. As such, they can compare not just adjectives, but also verbs and nouns. The relevant reading for the metalinguistic comparatives in (16) below is a comparison over something akin to the appropriateness of a word, loosely speaking. For example, it might be more appropriate to call Clarence a syntactician than a semanticist.

(16) a. George is more dumb than crazy.

b. Clarence is a syntactician more than a semanticist.

The intuition here for Morzycki is that metalinguistic comparatives compare amounts of imprecision – how loose (or how strict) a speaker is being with a particular word. A metalinguistic comparative compares not over a scale inherent to a word, but rather the size of a Lasersohnian pragmatic halo associated with a word.

Morzycki's proposal is to parameterize the interpretation function $[\![.]\!]$ to a degree of precision and a context. Informally, what lower degrees of precision in interpretation allow for are more (imprecise) ways in which to interpret a linguistic expression. For instance, with a lowered degree of precision, *dumb* could be interpreted also as *foolish* or *dopey*. Raising the degree of precision requires more exactness in interpreting an expression, meaning *dumb* could only be interpreted as *dumb*. Context plays a role in this; the imprecise alternatives to an expression can vary depending on the requirements of the context. What counts as a less precise alternatives in one context may not count in a different context.

The intuition is that increased increased imprecision corresponds to a widening of a pragmatic halo. The machinery behind this is Hamblin alternatives, familiar to many from the work of Rooth on focus (Rooth, 1985, 1992). The particular approach adopted by Morzycki is that of Kratzer and Shimoyama (2002), who suggest that alternatives are part of the compositional semantics. Lasersohn himself notes that his idea of pragmatic halos has commonalities with focus alternatives as developed by Rooth. Rooth's analysis of alternatives was developed in turn from Hamblin (1973)'s work,

who suggested that questions should be analyzed as denoting sets of possible answers.

This suggestion of using alternatives to model pragmatic halos is situated within a broader program of using alternatives to explain various phenomena. This includes not just the familiar cases of questions (Hamblin, 1973), and focus (Rooth, 1985), but also topichood (Büring, 1997), indefinites (Alonso-Ovalle & Menéndez-Benito, 2003), pronouns (Kratzer & Shimoyama, 2002; Kratzer, 2005) and scalar implicatures (Chierchia, 2004). Bringing alternatives into the compositional semantics may seem a radical idea, and it raises sticky questions about the relationship between pragmatics and semantics, but noting these connections to other work making use of alternatives, in my view, makes the perceived cost of adopting such a system much less than if alternatives didn't seem to be so pervasive.

Denotations are represented as sets of alternatives corresponding to pragmatic halos, which I shorthand to *imprecision alternatives*. Sets are generated by means of a relation $\approx$, formalized below in (17). Only alternatives for which $\approx$ is true will be in denotation for any particular expression. The $\approx$ relation is meant to be conceptualized as something akin to natural language "resembles." Expressions can resemble each other to varying degrees in this system. $\approx$ is parameterized to a degree d (a real number in $[0,1]$), which is intended to capture this. Parameterizing to a degree of resemblance allows for the set of imprecision alternatives to have not just the most perfectly resembling object (which would make the set a singleton), but also objects which resemble each other to at least d. Denotations are partially ordered sets of alternatives ranging from the d-resembling alternative to the perfectly resembling alternative. Important to note also is that the ordering for $\approx$ is contextually provided; this makes it so that it's pragmatically ignorable differences between alternatives that's being compared, formalizing Lasersohn's intuition that slack regulation is about the pragmatically ignorable differences between expressions.

(17) $\alpha \approx_{d,C} \beta$ iff, given the ordering imposed by the context C, α resembles β to (at least) the degree d and α and β are of the same type (Morzycki, 2011).

The degree on the interpretation function binds the degree parameter on $\approx$. Given these two things, a denotation for an adjective such as *dumb* would be as (18) below. In prose, $[\![dumb]\!]$ is a set of functions f such that f resembles the predicate **dumb** to at least degree d in context C.

(18) $[\![dumb]\!]^{d,C} = \{f_{\langle e,t\rangle} : f \approx_{d,C} \mathbf{dumb}\}$

To illustrate this, we can set the degree of precision in our interpretation to varying degrees. The highest degree, 1, requires that the two objects resemble each other perfectly. In other words, $\approx$ is equivalent to $=$ when $d = 1$. The effect of this on interpreting *dumb* is in (19), the singleton set containing only **dumb**. Relaxing the amount of precision, though, expands the halo. Interpreting *dumb* with less precision gets us not only **dumb**, but other related predicates (as in 20). And finally, with absolutely no precision ($d = 0$), everything resembles everything else. We get a set equivalent to the domain of objects of whatever type we're comparing to.

(19) $[\![dumb]\!]^{1,C} = \{\textbf{dumb}\}$

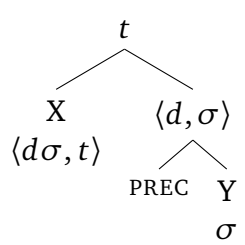
(20) $[\![dumb]\!]^{.9,C} = \{\textbf{dumb}, \textbf{ignorant}, \textbf{dopey}, \textbf{foolish}, \ldots\}$

(21) $[\![dumb]\!]^{0,C} = D_{\langle e,t\rangle}$

By itself, the imprecision parameter isn't available for composition. In the normal course of the semantic derivation, the degree of imprecision simply doesn't play a role. However, for *sorta*, it will be useful to have access to imprecision parameter. Morzycki independently needs a typeshift PREC in his system to accomplish this. PREC binds the precision parameter and makes it available as an argument. We can view this operator as a syntactic head in the tree if we like, or as a typeshift that applies as a last resort whenever there are certain type-theoretical or structural environments. For convenience, I represent PREC as a node in the tree (schematized in 23), but in principle I don't have a claim as to whether it is a head or a typeshift.

(22) $[\![\text{PREC } \alpha]\!]^{d} = \lambda d'.[\![\alpha]\!]^{d'}$

(23)



A final note before concluding this section: an interesting consequence of adopting a system such as this is that it weakens in the divide between pragmatics and semantics. Alternatives are now part of the compositional semantics, and the derivation can play a role in determining when and where alternatives are available. (Kratzer and

Shimoyama (2002) make use of this in their analysis of Japanese indeterminate pronouns.) Having this ability will be independently useful later in explaining the facts about *sorta*'s ability to hedge a direct object of a verb.

4 How to hedge

In this section, I work towards a unified account of *sorta* with both adjectives and verbs. Although the focus of this paper is the behavior of *sorta* in the verbal domain, a large portion of this section will be spent on accounting for the properties of *sorta* with adjectives. I think it's instructive here to look at *sorta* with adjectives, since it allows for certain aspects of the analysis to come into much clearer focus than they otherwise would. It's also an interesting exercise in cross-categorial modification, and how we might be able to unify gradability in domains with different primitives.

I first show my analysis of *sorta* with adjectives here, arguing that *sorta* is a type of degree word. After that, I extend the analysis to the verbal domain. The analysis will remain much the same, but the core assumption laid out in the previous section – that the grammar is Hamblinized – will do much of the work for verbs.

4.1 Hedging an adjective phrase

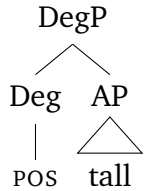
The semantics of gradability has largely divided into several camps. One camp used tools that were already present in the Montogovian semantic tradition, treating gradability as being dependent on the extensions of gradable predicates such as *tall*. What made a gradable predicate such as *tall* gradable was partitioning the universe in such a way as to have a set of entities that were definitely tall in a context – the positive extension – and a set of entities that were definitely not tall – the negative extension (Kamp, 1975). Cresswell (1976), taking a different approach, used a degree system. However, degrees were never a primitive in his ontology, but rather equivalence classes of individuals; the degree SIX-FEET-TALL, corresponding to *six feet tall*, would be the set of individuals that were six feet tall.

The second camp articulates the semantic ontology with degrees, abstract units of measurement (Kennedy, 1999; Seuren, 1973; Schwarzchild & Wilkinson, 2002; von Stechow, 1984, a.o.). This is the approach for gradable adjectives I assume here, and also for the representation behind degrees of imprecision in the framework I'm adopt-

ing. Under this approach, gradable adjectives are thought to be measure functions from individuals to degrees (type $\langle d, e\rangle$) or relations between individuals and degrees (type $\langle d, et\rangle$). I assume the latter approach, since it makes the compositional semantics somewhat easier, although I see no problem with adopting a measure function approach to the semantics of gradable adjectives.

Adjectives by themselves in this model are incomplete; they need to be saturated with a degree. A null morpheme POS is assumed to be present in the unmarked (absolutive) constructions (Cresswell, 1976; von Stechow, 1984; Bierwisch, 1989; Kennedy, 1999, a.o.). The function of POS in a system where gradable adjectives are relations is to existentially quantify over degrees and supply a degree that meets a contextually supplied standard. For an adjectives such as *tall*, this makes it so that not only does someone have some height (which mere existential quantification over a degree would give you), but that someone also meets the standard for being tall in a context. This matches our intuitions for what *tall* means; to be tall isn't to have just any height, but to meet the height for which we would call someone *tall*. A predicate **standard** is used in the semantics, which takes a gradable predicate as an argument and returns the degree for the context which represents the standard. POS is argued to be a degree head, with a DegP being in the extended projection of AP (Abney, 1987; Kennedy, 1999; Corver, 1990; Grimshaw, 1991). The syntax and semantics of this is illustrated in (24–27).

(24)



(25) $[\![\textit{tall}]\!] = \lambda d \lambda x [\textbf{tall}(d)(x)]$

(26) $[\![\text{POS}]\!] = \lambda G_{\langle d,et\rangle} \lambda x \exists d [d \geq \textbf{standard}(G) \wedge G(d)(x)]$

(27) $[\![\text{POS } \textit{tall}]\!] = \lambda x \exists d [d \geq \textbf{standard}(\textbf{tall}) \wedge \textbf{tall}(d)(x)]$

Constructions involving POS involve a comparison to a contextually supplied standard, and I argue that *sorta* also involves such a comparison. While absolutive constructions involve meeting or exceeding the norm, intuitively what *sorta* does is require that something be below the norm. The argument for this comes from the entailments of *sorta*. *Sorta tall*, for instance does not seem to have the entailment that someone meets the standard for being tall. Rather, it is non-committal about someone's tallness. Likewise, *sorta dirty* has the flavor of not committing something to meeting the standard

for dirtiness. What I take these intuitions to mean is that *sorta* involves a degree that does not meet the standard for the predicate.

Sorta should be in the same syntactic position as POS, namely in the degree head. Several pieces of evidence support this. First, *sorta* is degraded when used with an adjective in the comparative. The comparative is also implicated as heading a DegP. Even if these examples do not seem unrecoverably degraded, it's difficult to figure out what they even mean.

(28) a. ??Jen is sorta taller than Jill.

b. *Jen is more sorta intelligent than Jill.

c. *Jen is sorta more intelligent than Jill.

Some speakers report that (28a, 28c) aren't so degraded. Certainly, if *sorta* were heading DegP, it should be the case that the example would be ruled out. However, there are some plausible interpretation differences. If we form a question from the *sorta*+comparative, we're allowed to answer with a degree word such as *slightly*. If *sorta* were operating as a degree word like *slightly* in contexts with the comparative, and not as a Deg head, we might expect that it also be good. This seem to not be the case.

(29) How much taller is Jen than Jill?

a. Slightly taller.

b. *Sorta taller.

What this shows, I argue, is that the interpretation that *sorta* gets in this context might not be an actual degree interpretation, but rather the non-degree interpretation more typical of verbal hedging instead (an analysis of which is presented in the next section of this paper).

Second, *sorta* cannot be modified by degree words such as *completely*, *slightly* and *very*, nor by measure phrases. Analyzing these as degree heads, they would be expected to be in complementary distribution with *sorta*. Some analyses suggest that they may be licensed in SpecDegP by a phonologically null head. In this case, their being anti-licensed by *sorta* would also be consistent with *sorta* being a degree head. These facts, however, underdetermine the syntactic analysis of *sorta*; *sorta* could still be a degree adverb competing with other degree words like *completely* for SpecDegP.

(30) a. *Jill is very sorta tall.

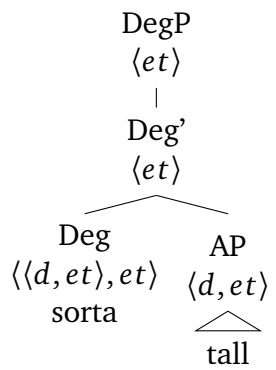
b. This wire is $\left\{\begin{array}{c}\text{*sorta completely}\\ \text{*completely sorta}\end{array}\right\}$ straight.

c. This room is $\left\{\begin{array}{c}\text{*sorta slightly}\\ \text{*slightly sorta}\end{array}\right\}$ dirty.

d. Jen is $\left\{\begin{array}{c}\text{*6 feet sorta}\\ \text{*sorta six feet}\end{array}\right\}$ tall

I'll assume that this picture is largely correct and that *sorta* is a degree head, but acknowledge that more work needs to be done on its syntax. In the interim, the picture I assume for *sorta* is as below.

(31)



Before diving into the semantics of *sorta*, I need to backtrack and discuss how adopting a Hamblin semantics works. As I'm conceiving of denotations as sets of alternatives that represent pragmatic halos, adjectives must have denotations in line with this. A basic denotation for an adjective such as *tall* would be as below. This is a view of adjectives as relations between individuals and degrees.

(32) $[\![tall]\!]^{d,C} = \{f_{\langle d,et\rangle} : f \approx_{d,C} \textbf{tall}\}$

By itself, this denotation allows for imprecision in the meaning of *tall*. It's hard to conceptualize possible alternatives here, however — what would it mean to have a scale that was like the tall scale? One possibility is that, with enough slack and a metalinguistic comparison, we could have an alternative such as *wide* instead.

(33) He's not so much tall as he is wide.

(34) He's more wide than tall.

The positive forms of adjectives — and measurement with adjectives in general — often seems to resist imprecision in the meaning of the adjective itself, as diagnosed by the scale used. Calling someone *tall* never puts them on the *wide* scale instead, no matter how imprecise the conversation is. There do seem to be cases where metalinguistic imprecision is allowed; calling someone *unpleasant*, for example, does seem to allow for some slack in interpretation. Whatever mechanism is at work to regulate imprecision among adjectives, it doesn't demand absolute precision, just that some contexts with some adjective seem to prefer more precision than others. For expository purposes I'll assume that when an AP is sister to Deg, the AP is interpreted at the absolutely precise degree; this will simplify the composition somewhat, so that we don't lose track of the larger theoretical picture. The denotation for an adjective will then be a singleton containing the perfectly resembling member of the set.

(35) $[\![tall]\!]^{1,C} = \{\lambda d \lambda x[\mathbf{tall}_w(d)(x)]\}$

Sorta will have to do several things. First, it will have to existentially quantify over some degree, with some constraints on what that degree is. Second, *sorta* will have to select a function from a set of alternatives (assumed here to trivially be a singleton). Finally, the function that was selected must be predicated of a degree and individual. The alternative semantics for imprecision that I've adopted seems to not be doing much for us so far — and arguably, is making things even more complex. It could have been the case that we could've done without reference to alternatives at all. I'll grant this. However, although alternatives are superfluous at this point, the semantics I provide for *sorta* with verbs will make use of alternatives, and with that goal in mind I'm introducing them here.

First I address the degree *sorta* existentially quantifies over. It has to be the case that there are constraints on this degree. This degree must have an upper bound to it. As discussed above, I argue that *sorta* involves a degree less than a contextually determined standard. Simply saying that the degree doesn't meet the standard, though, is far too weak for *sorta*. *Sorta* involves a sort of approximative meaning. Not only does *sorta* involve a degree less than a standard, but that degree intuitively must still be close to the standard for *sorta* to be licit. Without constraints on the lower limit of this degree, we could in theory allow *sorta* α to mean anything at all, due to having an incredibly low degree of precision. With this in mind I define a relation "less than but close to" $\lessdot$, as defined in (36).

(36) $\forall d \forall d'$, $d \lessdot_{C,P} d'$ iff $d < d'$ and the value of d is close to d' as determined by the context C and a gradable predicate P.

Addressing the second point, *sorta* also has to pick something from the set of alternatives denoted by (in this case) the adjective. The reason for this should be obvious; because it's a set, we need to pick one alternative to apply to individual argument of *sorta*. For reasons that will become clearer when I get to how *sorta* works with verbs, I'll assume that the degree that *sorta* existentially quantifies over is applied to the set of alternatives before an alternative is picked from the set. How this works will be discussed in more detail later when pointwise function application becomes relevant. For now, assume that such a move is possible, and that every member of the set of imprecision alternatives is applied to this degree in turn, generating a new set of alternatives with the degree saturated.[3] These pieces come together in the denotation in (37).

(37) $[\![sorta\ \alpha]\!]^{d',C} = \lambda x \exists d [d \lessdot_{C,[\![\alpha]\!]} \textbf{standard}([\![\alpha]\!]^{d',C}) \wedge \exists f \in [[\![\alpha]\!]^{d',C}(d)][f_w(x)]]$ where α is a gradable predicate type $\langle d, et \rangle$.

One thing to compare here is the denotation of *sorta* to that of POS. Both do similar sorts of things; both involve a comparison to a standard, both involve existential quantification over degrees, and both involve applying a gradable adjective to some entity. In a very real sense, *sorta* is a cousin to POS, except that it involves parts of the scale lower than the norm.

(38) illustrates the effect of *sorta* with a gradable adjective. This works as expected.

(38) a. $[\![sorta\ tall]\!]^{d',C} = \lambda x \exists d \begin{bmatrix} d \lessdot_{C,[\![tall]\!]} \textbf{standard}([\![tall]\!]^{d',C}) \wedge \\ \exists f \in [[\![tall]\!]^{d',C}(d)][f_w(x)] \end{bmatrix}$

b. $[\![sorta\ tall]\!]^{d',C} = \lambda x \exists d \begin{bmatrix} d \lessdot_{C,[\![tall]\!]} \textbf{standard}([\![tall]\!]^{d',C}) \wedge \\ \exists f \in \{\lambda x[\textbf{tall}_w(d)(x)]\}[f_w(x)] \end{bmatrix}$

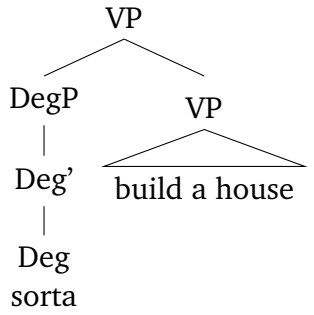
To summarize, I treat *sorta* as a degree word. *Sorta* behaves like POS, but involves using a degree lower than rather than meeting the standard.

[3]There is another complication here. Pointwise function application allows for sets to combine with sets in a manner that essentially amounts to taking their product. However, this is defined only over sets. Therefore, if $[\![\alpha]\!]$ is a set of alternatives and in $D_{d,\sigma}$, and d a degree, $[\![\alpha]\!](d)$ isn't strictly coherent. In order to make these coherent, I'll assume that where x is a term in the logic, x and $\{x\}$ are interchangeable. This would allow then for $[\![\alpha]\!](\{d\})$, which is coherent.

4.2 Hedging a verb phrase

From the previous section, *sorta* is argued to be a type of degree head. It is marginal with the degree head *more*, suggesting that it competes for the same syntactic slot that *more* does. Furthermore, other degree words such as *slightly* and *completely* are also unable to be used with *sorta*. Whatever the evidence for degree structures in the extended AP, there seems to be less evidence for degree structures in the extended VP (although see (Kennedy & Levin, 2008; Piñón, 2005, 2008; Caudal & Nicolas, 2005)). Carrying the syntactic analysis of the previous section over to the verbal domain, supposing a kind of verbal degree system seems to be a much more difficult undertaking. Therefore, I won't suggest that there is, say, a Deg_v that selects for a VP or *v*P. Rather, I'll assume that a DegP headed by *sorta* can be adjoined to VP (or *v*P). This is illustrated in (39).

(39)



Nothing in the type theory itself prevents such an analysis, if the types could be made to be compatible. And, nothing in the syntax prevents such an analysis either, as far as I can determine. Bare DP quantificational adverbials exist in English (*every week*, *most days*), and so we might regard this as a case of a bare DegP adverbial.[4]

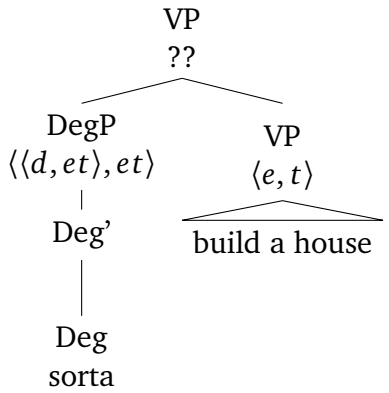
Doing this does present a problem, however. As developed in the previous section, *sorta* takes a gradable predicate as an argument. Assuming a model where degrees are needed for gradability, this would require a predicate with a degree argument. Under standard assumptions about the argument structure of verbs, verbs typically do not have degree arguments.[5] If verbs are not gradable predicates, then this analysis stops

[4]However, this does raise the question of why *sorta* can optionally select for an AP. I set that question aside for further research into the syntax of *sorta*.

[5]This has been debated, though. See Caudal and Nicolas (2005) and Piñón (2008) for suggestions that verbs do have a degree argument (used in aspectual composition), and Rett (to appear) for an

cold due to a type clash between the type of verb phrases ($\langle e, t\rangle$) and the requirements of *sorta* (an argument of type $\langle d, et\rangle$).[6]

(40)



A way out of this would be to shift the the type of the VP in order to fit the type requirements of *sorta*. This would be a typeshift that adds a degree argument where there wasn't one before. The trick here, though, would be to figure out what the semantic content of such a typeshift would be. What would it mean to add a degree argument to a predicate? It could be simply the case that this is a formal move meant to fix a type incompatibility, and the degree is not used meaningfully. This would be deeply unsatisfying, though. But, there is an option available to us through the metalinguistic imprecision machinery I am assuming.

Thinking about how the alternatives semantics for imprecision of Morzycki (2011) structures denotations, we find that denotations themselves are (in a sense) already gradable. If an object is being interpreted less than absolutely precisely, there is likely to be a non-trivial set of alternatives, such that the alternatives are ordered with respect to each other with the $\approx$ relation. In other words, denotations are (nearly) scales of not degrees but functions, and the functions are (partially) ordered by resemblance to each other. If there is a way to get access to this scale, then *sorta* can keep the scalar semantics it had in the adjectival domain.[7]

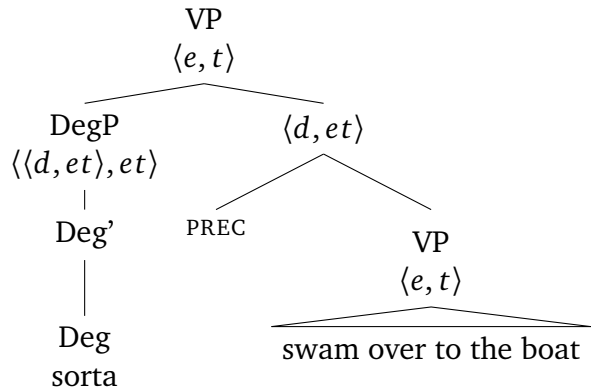
argument that verbs do not have a degree argument. In any case, even if aspectual composition happens via degrees, this is the wrong kind of degree argument for the kind of gradability *sorta* involves, since *sorta* doesn't have interactions with aspect.

[6]Strictly speaking, *sorta* doesn't have the type $\langle\langle d, et\rangle, et\rangle$, since the gradable predicate it combines with isn't an argument. The point stands, though, that by definition *sorta* looks to combine with something of that type.

[7]One thing to mention around here is that the objects in the halo for a VP — or any object — need not be actual lexical items, and in fact probably won't be. If the function of *sorta* is to signal something

By using the PREC operator, we can fix the type incompatibility between *sorta* and a VP while giving the new degree argument some role to play in the composition. First, recall that PREC is a typeshift or node in the tree that binds a degree of precision parameter and opens it back up for further composition. This amounts to adding a degree argument, which would lift something of type $\langle e, t\rangle$ to $\langle d, et\rangle$. The type problem is solved.

(41)



(42) $[\![\textit{swim over to the boat}]\!]^{d,C} = \{f_{\langle e,t\rangle} : f \approx_{d,C} \textbf{swim}\}$

(43) $[\![\text{PREC } \textit{swim over to the boat}]\!]^{d,C}$
$= \lambda d.\, [\![\textit{swim over to the boat}]\!]^{d,C}$
$= \lambda d.\{f_{\langle e,t\rangle} : f \approx_{d,C} \textbf{swim}\}$

Second, recall that part of what *sorta* does is existentially quantify over a degree that is close to but does not meet the standard. In the adjectival domain, this placed the degree somewhere on the scale denoted by the adjective *sorta* took as its argument. Following this line of reasoning for the verbal domain, what *sorta* does is also use a degree lower than but close to the standard. We can regard the standard here as being the standard degree of imprecision in the context. Therefore, by using a degree lower than the standard, we can increase the amount of imprecision used to interpret a linguistic expression.[8] The scale here is a scale of resemblance, as that is how denotations are

like a form–meaning mismatch, then if there are words or phrases to express some concept, those should plausibly be preferred over the less specified meanings that *sorta* provides. This shouldn't be surprising, but it's an interesting thought because it gets at a notion that we're really digging deeper than simply the words, but at the conceptual content itself, in some fashion.

[8]The **standard** function is normally described as being sensitive to features of the gradable predicates it combines with, such as scale structure. The crucial assumption here is that **standard** is also sensitive to the scale of degrees of imprecision.

constructed with $\approx$, where the top of the scale — the absolutely precise alternative — is also what corresponds to the standard.

We can use the same denotation for *sorta* in the verbal domain as we did in the adjectival domain. After applying G to d, what we wind up with is a set of imprecision alternatives resembling the object denoted by G to at least degree d. We pick a function f from that set, and apply it to x (the subject of the clause in this case).

(44) a. $$[\![\textit{sorta}\ \textsc{prec}\ \textit{swim}]\!]^{d',C} = \lambda x \exists d \left[\begin{array}{c} d \lessdot_{C,[\![\textsc{prec}\ \textit{swim}]\!]} \textbf{standard}([\![\textsc{prec}\ \textit{swim}]\!]^{d',C}) \wedge \\ \exists f \in [[\![\textsc{prec}\ \textit{swim}]\!]^{d',C}(d)][f_w(x)] \end{array} \right]$$

$$= \lambda x \exists d \left[\begin{array}{c} d \lessdot_{C,[\![\textsc{prec}\ \textit{swim}]\!]} \textbf{standard}([\![\textsc{prec}\ \textit{swim}]\!]^{d',C}) \wedge \\ \exists f \in \{f_{\langle e,t\rangle} : f \approx_{d,C} \textbf{swim}\}[f_w(x)] \end{array} \right]$$

$$= \lambda x \exists d \left[\begin{array}{c} d \lessdot_{C,[\![\textsc{prec}\ \textit{swim}]\!]} \textbf{standard}([\![\textsc{prec}\ \textit{swim}]\!]^{d',C}) \wedge \\ \exists f \in \left\{ \begin{array}{c} \textbf{swim}, \\ \textbf{float}, \\ \textbf{wade}, \\ \ldots \end{array} \right\} [f_w(x)] \end{array} \right]$$

Sorta lowers the precision in interpreting some object, and picks from among the imprecision alternatives to that object. Hedging a VP happens by way of getting access to the imprecision of alternatives denoted by the VP once the VP is interpreted sufficiently imprecisely.

4.3 Why indefinite objects can be hedged

As noted previously, indefinite DPs direct objects of creation verbs can be hedged, but definite objects in general cannot be hedged. But, why should *any* direct objects be able to be hedged? Considering the syntax assumed in the previous section, *sorta* is too far away from the direct object to have direct access to it. However, given an alternative semantics, as I am assuming, we can have some degree of action at a distance due to the pointwise function application mechanism. If two objects have a set of alternatives, and one applies to the other, then the alternatives of *both* will project. To understand this, I take a detour into how predicates apply to their arguments in a system where everything is a set.

Composition cannot happen per the usual (e.g., functional application, Heim & Kratzer, 1998) when running a system such as the one I'm assuming, since denotations

are sets and not functions. Rather, what happens in an alternatives semantics is that each alternative in one constituent will combine pointwise with each alternative in the other constituent, giving an effect where the alternatives continue to "expand." Pointwise function application amounts to something akin to taking the product of two sets.

(45) $[\![dumb]\!]^{.9,C} = \{\textbf{dumb}, \textbf{ignorant}, \textbf{dopey}, \ldots\}$
$[\![jerk]\!]^{.9,C} = \{\textbf{jerk}, \textbf{schmuck}, \textbf{putz}, \ldots\}$

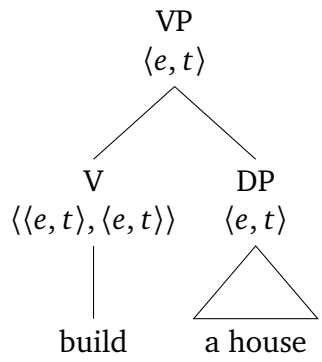
(46) $$[\![dumb\ jerk]\!]^{.9,C} = \left\{ \begin{array}{l} \lambda x.\textbf{dumb}_w(x) \wedge \textbf{jerk}_w(x) \\ \lambda x.\textbf{dumb}_w(x) \wedge \textbf{schmuck}_w(x) \\ \lambda x.\textbf{dumb}_w(x) \wedge \textbf{putz}_w(x) \\ \lambda x.\textbf{ignorant}_w(x) \wedge \textbf{jerk}_w(x) \\ \lambda x.\textbf{ignorant}_w(x) \wedge \textbf{schmuck}_w(x) \\ \lambda x.\textbf{ignorant}_w(x) \wedge \textbf{putz}_w(x) \\ \lambda x.\textbf{dopey}_w(x) \wedge \textbf{jerk}_w(x) \\ \lambda x.\textbf{dopey}_w(x) \wedge \textbf{schmuck}_w(x) \\ \lambda x.\textbf{dopey}_w(x) \wedge \textbf{putz}_w(x) \\ \ldots \end{array} \right\}$$

Functional application can be formalized in an alternative semantics with Hamblin Functional Application (Kratzer & Shimoyama, 2002; Shimoyama, 2006). This formalizes the pointwise intuition above.

(47) *Hamblin Functional Application (as in Morzycki, 2011)*
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{d,C} \subseteq D_\sigma$ and $[\![\gamma]\!]^{d,C} \subseteq D_{\langle\sigma,\tau\rangle}$, then $[\![\alpha]\!]^{d,C} = \{c(b) : b \in [\![\beta]\!]^{d,C} \wedge c \in [\![\gamma]\!]^{d,C}\}$

Pointwise function applications explains the behavior of *sorta* with indefinites, if we assume that indefinites are interpreted as having sets of alternatives. Following Kratzer and Shimoyama (2002), Alonso-Ovalle and Menéndez-Benito (2003) argue that indefinites do introduce sets of alternatives. We can recast this finding to say that indefinites denote sets of imprecision alternatives. If this is the case, then, we can see why *sorta* may hedge an indefinite object: the alternatives for the indefinite are available at the VP level, due to pointwise functional application, and the existential quantification that *sorta* does over the VP alternatives may pick one of these alternatives that also has an imprecision alternative to the indefinite. For the VP *build a house*, the set of imprecision alternatives might be as in (49) below.

(48)



(49) $$[\![\textit{build a house}]\!]^{.9,C} = \left\{ \begin{array}{c} \lambda x \exists y [\textbf{house}(y) \wedge \textbf{build}_w(x,y)], \\ \lambda x \exists y [\textbf{hovel}(y) \wedge \textbf{build}_w(x,y)], \\ \lambda x \exists y [\textbf{house}(y) \wedge \textbf{threw-together}_w(x,y)], \\ \lambda x \exists y [\textbf{hovel}(y) \wedge \textbf{threw-together}_w(x,y)], \\ \ldots \end{array} \right\}$$

Summarizing, pointwise function application provides a mechanism to get the alternatives from a DP in object position to a position in the composition where they will be visible to *sorta*. By combining the alternatives of the object DP with the alternatives of the verb, both sets of alternatives will be visible at the VP level. This leaves some questions open. Why is it only certain verbs that allow for this? And why is it that only indefinite objects and never definite objects can be hedged in those cases? I pursue both of these questions in the next section.

4.4 Constraints on hedging

In the previous sections, I provide an analysis of *sorta* to account for not only how hedging can occur, but also why the object of some verbs can be hedged. The answer, I suggest, relies on *sorta* behaving like a Lasersohnian slack regulator; for verbs, it widens the halo around a VP in order to include in the denotation of the verb things that might not otherwise "count" as part of the denotation. This in turn occurs by lowering the degree of precision required for interpretation, by setting the imprecision parameter on the interpretation function lower than the contextually supplied standard. Doing this increases the amount of imprecision alternatives available. Objects can be hedged in this system because the alternatives of the object can "project" to the VP level by combining with the alternatives of the verb in a pointwise fashion.

The story can't end here, though. This account still severely overgenerates on the readings possible. Namely, the account so far predicts that all objects should be able to be hedged. This in fact is not the case; hedging is severely constrained. Only some verbs allow for their objects to be hedged, and among those objects that can be hedged, it is only indefinite noun phrases and not definite noun phrases. The goal here is to provide an account of this, and constrain the system to allow only the attested readings.

Descriptively, I will need two constraints; one constraint to explain why certain verbs are special in allowing for their direct object to be hedged, and another constraint to explain the difference between indefinite and definite objects. The explanation, though, will be much more unified, with the descriptive constraints falling out of a broader comment on the architecture of hedging.

To pursue an explanation here, I want to start by asking the question of what makes the verbs that allow for hedging of their object special. Creation verbs and intensional transitive verbs such as those of the SEARCH class allow for hedging. Are these special in any way? The literature on verbs has suggested that they are in fact special with respect to their direct object position.

The relevant feature here is whether this is an opaque argument position or not. It's well-known that intensional verbs such as *seek* and *look for* have a referentially opaque direct object position (Van Geenhoven & McNally, 2005; Zimmermann, 1993; Montague, 1974; Quine, 1964; Moltmann, 1997, a.o.). There is no entailment that an entity instantiating the property denoted by the indefinite exists.

(50) The man was looking for a horse.

a. Transparent reading: There is a horse than the man was looking for.

b. Opaque reading: The man is looking for a horse and it may or may not exist.

Creation verbs also exhibit this failure of existential quantification, as noted by von Stechow (2001). Holding the reference time constant, the argument in (51) does not hold. In comparison, a non-intensional, non-creation verb such as *push* allows this argument to go through (52). The reasoning for this plain; creation verbs only entail the existence of the created object at the end of the event.

(51) John drew a circle.

DOES NOT ENTAIL There was a circle that John drew.

(52) John pushed a cart.
ENTAILS There was a cart that John pushed.

Zimmermann (1993) and Van Geenhoven and McNally (2005) argue that intensional transitive verbs are special because of their argument structure. Intensional transitive verbs involve an attitude towards a property – they have property-type argument – while non-intensional transitives have more mundane individual-type arguments. de Swart (2001) also argues that these verbs are special; *seek*-type verbs allow for weak readings of indefinite noun phrases because these noun phrases have well-formed property-type denotations. These arguments are built on the referentiality of the noun phrase in object position; noticing the similarities between ITVs and creation verbs with respect to their object position and existential exportation, we might extend this analysis to creation verbs and suggest that they also take property-type objects. What this amounts to, in the lexical semantics for these verbs, is local existential quantification over entities instantiating the property.

The tentative hypothesis here is to link up opaque readings of indefinite objects with the projection of their alternatives. Only opaque argument positions – and noun phrases with opaque readings – will project their alternatives to the VP level.

The data from *sorta* suggests that this is on the right track. Looking at intensional verbs, the natural reading for a noun phrase hedged by *sorta* as in (53) is one where existential exportation does not hold.

(53) He was sorta looking for a horse. (*There is something like a horse that he is sorta looking for.)

I take the constraining factor here to be one of argument types. Verbs which allow for property-type arguments (type $\langle et, et \rangle$) allow for the alternatives of their direct object to project. Verbs which only allow for individual-type arguments ($\langle e, et \rangle$) do not allow the alternatives to project. This correlates with arguments in the literature with certain types of verbs being special in the type of the arguments they combine with.

It should be noted here that this hypothesis isn't meant to rule out type e noun phrases from being imprecise. Noun phrases with an individual-type denotation can still be imprecise. The relevant factor here is in whether the imprecision alternatives associated with the noun phrase can project to the VP level.

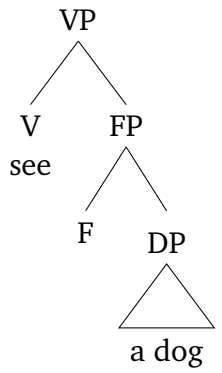
I sketch here two options for cashing out the generalizations here. The first option is highly stipulative, and involves assuming a silent head. This option provides a simple

formal basis for deriving the required readings. The second option expands on work by Chung and Ladusaw (2004) to articulate the mechanisms involved with verbs of creation and intensional transitive verbs. The assumptions depart from those laid out earlier in this section, but also presents some potentially more explanatory (but also more speculative) options for looking at the link between metalinguistic imprecision and the semantics. These, of course, aren't the only possible options — other ways of deriving these facts could exist. But, these are two natural avenues of research open at this juncture.

4.4.1 Option 1: Functional head

The first option is to pursue an explanation by positing the existence of a null functional head. This head would have an interpretation that would set prevent the alternatives from its DP complement from projecting. Syntactically, this assumption would look as in (54), where F is the proposed head.

(54)



This would leave us with the question of how to interpret this head and how to prevent alternatives from projecting. The answer here would be to pare down the set of alternatives so that only a single alternative projected. In effect, the idea would be to map a set of alternatives to a singleton set. The reason for a singleton set is that we still want some alternative to project, and there needs to be some set of alternatives to combine with the alternatives of the verb, even if that's only a set with a single member. The effect of combining with a singleton is demonstrated in (55) below.

(55) a. $[\![\textit{run}]\!] = \{\textbf{run}, \textbf{walk}, \textbf{jog}\}$

b. $[\![\textit{a race}]\!] = \{\textbf{race}\}$

c. $[\![run\ a\ race]\!] = [\![run]\!]\,([\![a\ race]\!])$

$$= \left\{ \begin{array}{c} \lambda x.\mathbf{run}_w(x)(\mathbf{race}) \\ \lambda x.\mathbf{walk}_w(x)(\mathbf{race}) \\ \lambda x.\mathbf{jog}_w(x)(\mathbf{race}) \end{array} \right\}$$

One way to get a single alternatives here would be to enforce absolute precision on the DP. Setting the precision parameter to the maximal degree forces perfect resemblance. Recalling the definition of $\approx$, $\approx$ is logically equivalent to $=$ when the degree parameter is the maximal degree. If we interpret F as setting the imprecision parameter to the maximal degree, that would make the set of alternatives a singleton. The denotation for F would be as in (56) below.

(56) $[\![F\ \alpha]\!] = [\![\alpha]\!]^{1,C}$

(57) $[\![F\ a\ dog]\!] = [\![a\ dog]\!]^{1,C}$

Although deriving a singleton is the right approach, I think, deriving in a singleton in this manner is almost definitely the wrong approach. This approach would demand absolute precision for the direct object of most verbs. However, very rarely do we ever require absolute precision. The examples in (58) demonstrate this by showing that we're allowed to be lax in interpretation. Deriving a singleton by requiring the most precise interpretation would seem to predict that any amount of laxness would be impossible, contrary to observations.

(58) a. I read the articles about types of noun phrases today. (allowed to miss an article)

b. I met the students from LIN 437 in office hours today. (some students can not be present)

A better option here is to have F encode a contextually determined choice function, demonstrated in (59) below. This allows for imprecision while still mapping the set of imprecision alternatives to a singleton.

(59) $[\![F\ \alpha]\!] = \{choice([\![\alpha]\!])\}$

The approach described in this section has a drawback. Although it's quite simple to make it work out formally, arguing that it's the correct approach is much harder. I know of little evidence in English that there is a functional head intervening between the direct object and the verb. Being able to find evidence for it would make this option easier to pursue, but in the absence of such evidence it's much harder to argue for.

4.4.2 Option 2: Restrict and Specify

The second option I'll sketch here is one based on the work of Chung and Ladusaw (2004). Here, what I'll suggest is that intensional transitive verbs and creation verbs combine with their objects differently than other verbs. Namely, these verbs will combine via Chung and Ladusaw's Restrict mode of composition, while other verbs combine via Specify.

Chung and Ladusaw (2004), based on data from Chamorro and Maori, argue for two new modes of semantic composition, what they call Restrict and Specify. Part of the problem they're trying to solve in introducing new modes of composition is the behavior of indefinites. Indefinites have a range of behaviors associated with them. Some authors have argued that this calls for a flexible type system where indefinites can be translated between quantification, property, and individual types (Partee, 1987). The approach Chung and Ladusaw argue for is that indefinites have uniformly property-type denotations, but that there exist different modes of semantic composition with different semantic effects.

They introduce modes of composition they call Restrict and Specify. Restrict contrasts with the familiar Function Application by being a non-saturating mode of composition, leaving a lambda untouched in the derivation; Function Application is a saturating mode of composition. The effect of this is illustrated in the hypothetical example in (60) (the derivation is impossible in English). Here, $[\![cat]\!]$ Restricts λy in the denotation of $[\![bit]\!]$. Conceptually, this is a form of intersection, intersecting cats with things that were bit.

(60) The dog bit cat.

a. $\textbf{Restrict}(\lambda x[\textbf{cat}(x)], \lambda y \lambda z[\textbf{bit}(z)(y)])$

b. $\lambda y \lambda z[\textbf{bit}(z)(y) \wedge \textbf{cat}(y)]$ (via Restrict)

c. $\lambda z \exists y[\textbf{bit}(z)(y) \wedge \textbf{cat}(y)]$ (via Existential Closure)

Because Restrict is non-saturating, predicates still require some way of being saturated. Function Application with the open argument position is one way. Existential Closure is a second way (illustrated in (60c). They assume that all unsaturated predicates undergo existential closure of their open arguments at what they call the event level (roughly corresponding syntactically to *v*P). This has the effect of making it so that arguments composed via Restrict take obligatory narrow-scope with respect to

negation and other operators.

The second mode of composition they introduce is Specify. Specify involves a local typeshift — a choice function. Choice functions map properties to entities, so the choice function can be an argument to a predicate that's looking for an entity-type argument. Choice functions introduce a semantic unfulfilledness — the choice function needs to be bound by an existential somewhere in the derivation — but the predicate can be saturated with a choice function. Existential closure over the choice function can happen at the event level or the clausal level (or both), depending on the parameters of the language. Specify therefore allows for both wide-scope and narrow-scope indefinites. I illustrate Specify in (61).

(61) The dog bit a cat.

a. $\textbf{Specify}(f(\textbf{cat}), \lambda x \lambda y[\textbf{bit}(y)(x)]$

b. $\lambda y[\textbf{bit}(y)(f(\textbf{cat}))]$ (via CF applied to **cat**, FA)

c. $\lambda y \exists f[\textbf{bit}(y)(f(\textbf{cat}))]$ (via EC)

Indefinites in intensional transitive verbs and creation verbs take low-scope with respect to negation. For instance, *not build a house* does not have the inference that there exists a house that wasn't built. Rather, the inference that goes through is that no house was built. Under the Chung and Ladusaw system described, this could be interpreted as the indefinite combining with the verb via Restrict. The examples in (53) also suggest that this is the case. Taking a view of referential opacity as narrow-scope with respect to an intensional operator, these also suggest that the indefinite is taking narrow-scope. Again, this can be represented as the indefinite composing with the predicate via Restrict.

Indefinites in object position for other types of verbs, outside of the creation and intensional transitive verb classes discussed, do allow for both wide and narrow-scope readings. My interpretation of this fact is that indefinite objects for these verbs compose instead via Specify, with the existential closure over the choice function happening at either the event or the clausal level.

The picture that emerges here is that Restrict allows for the alternatives of indefinites to project, while Specify does not. The cases where I argued that Restrict was active are those cases where the alternatives of an indefinite object are accessible to *sorta*. I'll suggest that the relevant difference between Specify and Restrict here is

whether they are saturating modes of composition. Saturation closes off imprecision alternatives, while non-saturating modes of composition do not.

This conclusion is supported by the behavior of definites. By their nature, definites have individual-type denotations, and therefore don't need a special mode of composition; they can compose with predicates by Function Application. Function Application is a saturating mode of composition, which would predict that definites can never be hedged. This is in fact the case; the alternatives for definite noun phrases are never accessible to *sorta*.

To summarize, saturating modes of predication close off sets of imprecision alternatives, while non-saturating modes of predication do not. Creation verbs and intensional verbs combine with indefinite objects via Restrict, a non-saturating mode of composition, and so allow for their objects to be hedged by *sorta*. I won't pursue an explanation here for why saturation versus non-saturation matters for the projection of alternatives, but framing the solution in this way provides some hooks on which to hang a theory of metalinguistic imprecision.

5 Connections

5.1 The discourse particle *like*

One option for the analysis of *sorta* that would bleed the entire analysis presented here would be to borrow the analysis of *like* from Siegel (2002). *Like*, according to Siegel is a discourse particle that also signals a mismatch between form and meaning. However, the behavior of *like* and her analysis don't carry over neatly to the problems *sorta* introduces.

First, *sorta* and *like* occur in different syntactic environments.[9] *Sorta* has a much more restricted distribution than *like*; *like* can modify DP constituents, including those headed by *every* and *the*. This isn't possible with *sorta*.

(62) a. They spoke to, like, every student.

b. *They spoke to sorta every student.

(63) a. The principle suspended, like, the school bully.

[9]When possible, examples with *like* in this section are adapted from Siegel (2002).

b. *The principle suspended sorta the school bully.

Sorta also cannot appear alongside other degree words such as *completely* and *slightly*, while *like* can appear in these environments (see also section 2).

(64) a. Jill is, like, very tall.

b. *Jill is sorta very tall.

(65) a. This wire is, like, completely bent.

b. *This wire is sorta completely bent.

(66) a. This room is, like, slightly dirty.

b. *This room is sorta slightly dirty.

(67) a. Jen is, like, six feet tall.

b. *Jen is sorta six feet tall..

Siegel's informal analysis of *like* involves *like* introducing a free variable into the representation. This is illustrated in (68). Later this is cashed out by appealing to Lasersohn's pragmatic halos.

(68) $(z : z = \alpha \vee z = \text{something like } \alpha)$ where z is a variable of the same logical type as α.

(69) a. Lana hates, like, every coach.

b. $\textbf{hate}(\textbf{Lana}, (z : z = \textbf{every coach} \vee z = \textbf{something like every coach}))$

Although *like* has some of the same hedging behavior as *sorta*, it should be clear that it is much more powerful. Some of this may come from syntactic rules prohibiting *sorta* from combining with DPs, with *like* having no such prohibition. But, as argued in earlier sections, some of *sorta*'s restrictiveness also comes from its status as a degree word. Adopting Siegel's analysis of *like* to *sorta* doesn't offer any obvious way of accounting for the facts in (64-67) that I attribute to *sorta* being a degree word. As near as I can tell, *like* doesn't allow for long-distance hedging in the way that *sorta* does with some indefinite objects. This is a fact more easily accounted for in the compositional system I assume.

However, Siegel's analysis of *like* is somewhat like the analysis I propose for *sorta*, however, with the crucial bit being that something akin to the $\approx$ relation is in the lexical semantics of *like* rather than in the denotations themselves. It does seem that

there is a connection to be made here, but this is best pursued in future research on the pragmatics/semantics interface and hedging.

5.2 Why fuzzy logic won't work

Lakoff (1973) provides an early account of *sorta* and other hedges using fuzzy logic. I won't go into the analysis here, due to influential papers by Kamp (1975) and Fine (1975) that show fuzzy logic (as developed at the time) isn't appropriate for linguistic semantics. Outside of the problems with fuzzy logic that Kamp and Fine point out, however, Lakoff's analysis of *sorta* also has additional problems. First, it's not completely clear how Lakoff would derive the restrictions on *sorta* with various predicates that I've described in earlier sections. Second, and more interesting for this paper, is that a fuzzy logic analysis of *sorta* doesn't provide an obvious way to account for how *sorta* can hedge the objects of some verbs.

5.3 Granularity functions, scalar vagueness, and epistemic vagueness

Sauerland and Stateva (2007) provides an analysis of scalar approximators such as *approximately* using what he calls granularity functions. Granularity functions map points on an interval to a scale that contains that point, similar to the work that pragmatic halos do. Granularity functions are parameterized to different amounts of coarseness; a granularity function parameterized to a larger degree of coarseness allows for more imprecision in evaluating a scalar expression than a fine grained granularity function.

(70) a. $\text{gran}_{\text{fine}}(5\text{m}) = [4.95\text{m}, \ldots, 5.00\text{m}, \ldots, 5.05\text{m}]$

b. $\text{gran}_{\text{mid}}(5\text{m}) = [4.75\text{m}, \ldots, 5.00\text{m}, \ldots, 5.25\text{m}]$

c. $\text{gran}_{\text{coarse}}(5\text{m}) = [4.50\text{m}, \ldots, 5.00\text{m}, \ldots, 5.50\text{m}]$

The denotations of scalar expressions are parameterized to a granularity function, similar to how interpretation is parameterized to a degree of precision in Morzycki (2011). The role of approximators like *approximately* and *exactly* in this system is to set the granularity function parameter.

For *sorta*'s effect with adjectives, granularity functions might be able to capture the linguistic intuitions. For verbs, though, it's much less clear that granularity functions

make sense. What would it mean to evaluate a verb like *run* to less granularity? It seems to me that granularity functions are conceptually suspect for many of the cases I've considered here.

To be fair to Sauerland and Stateva (2007), they might say that *sorta* falls in their class of epistemic approximators, like *definitely* and *maybe* instead. They don't provide a full account of these types of approximators, but suggest that *definitely* and *maybe* involves universal and existential epistemic quantification. This isn't defined, but their intention seems to be that this is quantification over possible worlds. For different possible worlds, the extension of some predicate may be different.

This does seem to make useful predictions with examples such as *sorta tall* and *sorta swim*; what *sorta* could be doing in these cases, informally, is expressing existential quantification over worlds to say that there is some world such that the predicate holds, but it's unclear whether it is the actual world. Like other accounts of phenomenon similar to *sorta*, however, it's not clear how to build in the restrictions *sorta* has with some predicates or why indefinite objects can be hedged. If the Sauerland and Stateva were to be pursued, more work would have to be done in accounting for these facts, facts which the Hamblinized system I pursue above already begins to account for.

6 Conclusion

In this paper I've presented an account of *sorta*. Although I believe the analysis I present here can account for the facts I've presented, much work remains to be done in expanding the range of the analysis. Hints of this were presented in section 4.4, where I attempted to show how to constrain the readings available to *sorta* with certain verbs and indefinite objects. It's easy enough to state formally ways of constraining interpretations, but offering principled explanations for why the system behaves as it does is much harder. The most promising path to take, in my view, is linking the availability of hedging indefinite objects with differences in composition between verbs — either verbs have arguments of a particular type (pursuing a story like that of Van Geenhoven and McNally (2005)), or different verbs select for different modes of composition (a la Chung and Ladusaw (2004)), and the modes of composition determine the projection behavior of imprecision alternatives.

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