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(COMMENTS WELCOME)

Degrees as Kinds

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Abstract This paper argues that a variety of constructions from a variety of languages suggest a deep connection between Carlsonian kinds, manners, and degrees. We articulate a way of thinking about degrees on which this connection is less surprising, rooted in the idea that degrees are Carlsonian kinds of Davidsonian states. This enables us to provide a cross-categorial compositional semantics for a class of expressions that are can serve as anaphors to kinds, manners, and degrees, and can introduce clauses that further characterize them. This puts equatives in a new light: as a special case of a cross-categorial phenomenon. Our analysis of these constructions builds on independently motivated assumptions about free relatives and type shifting. This provides evidence a view of degrees on which they are significantly more ontologically complex than is standardly assumed.

Keywords Degrees, Kinds, Manners, Equatives, Anaphora, Relative clauses, Cross-categorial phenomena

1 Introduction

It is, one normally assumes, a lexical accident of English that the same *wh*-word, *how*, is used for questioning both manners (*How did he do it?*) and degrees (*How tall is he?*). Likewise, one normally assumes that it is an accident of English that it uses the same complementizer, *as*, to build degree modifiers (*as tall as Clyde*), manner modifiers (*die as Clyde did*), and adnominal modifiers (*such people as Clyde*). This is of course all perfectly plausible a priori—languages are routinely guilty of inconsequential coincidences. But these are not accidents of English alone, or even of this corner of English alone. Rather, they are the manifestations of a much broader pattern of cross-categorial correspondences that are present in a large number of languages. The pattern is pervasive enough

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that, we will argue, it reveals something deep. Minimally, it requires explanation. Providing one requires looking at degrees in a new way.

Our chief aim in this paper is to highlight the theoretical importance of such correspondences, to provide a sufficiently cross-categorial account of at least some of them, and to bring these facts to bear on the question of what degrees are—that is, of how they should be represented in the model. On assumptions that have become the de-facto standard in linguistic semantics, a degree is a relatively impoverished thing. It is simply a representation of measurement, perhaps a point or an interval on an abstract scale. We will argue, building on Landman & Morzycki (2003), that this understanding must be enriched at least enough to construe degrees as a particular species of Carlsonian kind (Carlson 1977), and that this is part of a larger pattern of parallels between kinds, manners, and degrees.

This project accords with—and in that sense, provides independent evidence for—the agenda of Moltmann (2004, 2009, 2007b), who develops a considerably enriched understanding of degrees in which they are constructed out of particularized property instantiations, or tropes. It is not clear to us whether the patterns we will be principally concerned with are sufficient to adjudicate whether that particular enrichment is the necessary, though they certainly bear on the question. Because tropes remain to most linguists more exotic than Davidsonian states, we will frame the argument as one in which degrees correspond to state-kinds, and in which manners (following Landman & Morzycki 2003 and Landman 2006) correspond to event-kinds.[1] For the most part, we will focus on building an explicit compositional semantics for several instantiations of the pattern at issue. The strategy will be to let the linguistic facts be our guide, in the hope that developing the grammatical machinery will clarify the ontological issues.

We explore the basic patterns in section 1. Section 2 puts in place the initial assumptions about kinds, manners, and degrees we will need to get off the ground and discusses how they might make possible an analysis of the most basic constructions. Section 3 turns to the account of the cross-categorial correspondences for simple cases involving kind anaphora. Section 4 provides an analysis of more complicated cases involving clausal complements to kind modifiers, which entails unifying equatives with constructions previously thought of as a species of relative clause. Section 5 briefly revisits certain ontological and broader conceptual questions that were previously set aside. Section 6 raises some unsolved problems and concludes.

[1] We could also have invoked Kratzerian situations (Kratzer 1989), but will avoid them chiefly because they introduce additional complications and they're not obviously necessary to account for the data.

2 The cross-categorial parallels

2.1 *Polish*

Among the languages that most clearly reveal the cross-categorial parallels we will seek to explain are Polish and German. In Polish, a single anaphoric expression, *tak*, which serves as a proform for kinds, manners, and degrees, depending on whether it finds itself in the vicinity of NP, VP, or AP:

(1) a. KIND:
taki pies
such-MASC dog
'such a dog', 'a dog of that kind'

b. MANNER:
tak się zachowywać
such REFL behave
'behave that way'

c. DEGREE:
tak wysoki
such tall
'that tall'

Similar facts occur in a number of Slavic languages.

Polish also uses the same *wh*-word, *jak*, across those domains, again depending on its syntactic context:[2]

(2) a. KIND:
jaki pies
WH-MASC dog
'what kind of dog'

b. MANNER:
Jak się zachowywał?
WH REFL behaved-3MASC
'How did he behave?'

c. DEGREE:
Jaki wysoki jest Clyde
WH-MASC tall is Clyde?
'How tall is Clyde?'

In the adnominal case, a skeptic might suspect (2a) of simply meaning 'what dog'. This would be a mistake. The gloss 'what kind of' is to be found in e.g. Borsley (1981) and in reference grammars such as Feldstein (2001). Indeed, it's not clear that *what* in English isn't typically used to question kinds, as Heim (1987) has proposed on independent grounds.

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[2] *Jak* also has other uses. Citko (2000) points out that in embedded contexts it has a uses as a temporal adverbial and as the antecedent of a conditional, though she argues that these involve a different form of the word that is a *wh*-complementizer rather than the phrasal *wh* expression that gives rise to the readings in (2).

When combined, *tak* and *jak* are used to abstract over the three domains (though *tak* can often be omitted):

(3) a. KIND:
taki pies jak ten
such-MASC dog WH this
'such a dog as this', 'a dog of this kind'

b. MANNER:
zachowywać się tak jak Clyde
behave REFL such WH Clyde
'behave like Clyde'

c. DEGREE:
taki wysoki jak Clyde
such-MASC tall WH Clyde
'as tall as Clyde'

Strengthening this observation of these parallels is similar cross-categorial behavior with *sam* (roughly, 'same'), which can be used to assert similarity across kinds, manners, and degrees:

(4) a. KIND:
taki sam pies
such-MASC same dog
'a dog of the same kind'

b. MANNER:
zachowywać się tak samo
behave REFL such same-ly
'behave the same way'

c. DEGREE:
tak samo wysoki jak Clyde
such same-ly tall WH Clyde
'as tall as Clyde', 'of the same height as Clyde'

Perhaps the least appealing account of these facts would be that for *tak*, *jak*, and *sam* simply each have multiple homophonous forms. This accident would have to extend to the fact that each of them is three-ways ambiguous in a precisely parallel way: one for kind reference, one for manners, and one for degrees. But the alternative, based on these facts alone, is immediately consequential. It entails the conclusion that there are deep parallels in how these domains work.

2.2 *German*

These facts are not a peculiarity of Polish. The German anaphor *so* is also ambiguous between being anaphoric to kinds, to manners, and to degrees (on the degree use, see Umbach & Ebert 2009):

(5) a. KIND:
so einen Hund
such a dog
'a dog of the same kind'

b. MANNER:
so getanzt
such danced
'danced like that'

c. DEGREE:
Ich bin so groß
I am such tall
'I am this tall.'

And, as in Polish, there is a corresponding *wh*-word, *wie*, with precisely the same pattern of uses:

(6) a. KIND:
so ein Hund wie dieser
such a dog WH this
'a dog such as this'

b. MANNER:
Jan hat so wie Maria getanzt.
John has such WH Mary danced
'John danced the way Mary did.'

c. DEGREE:
Ich bin so groß wie Peter.
I am such tall as Peter
'I am as tall as Peter.'

2.3 *English*

The Polish and German cases are striking because the parallels manifest themselves especially clearly, but they are not unusual. Even English manifests one such parallel, as we have already mentioned, in using *as* in precisely the same way across the three domains:

(7) a. KIND: such a dog as this
b. MANNER: Clyde behaved as I did.
c. DEGREE: Clyde is as tall as Floyd.

As in Polish and German, (7c) is simply a straightforward equative.

Perhaps an even deeper similarity to the Polish and German facts is to be found in English *so*. It also has degree and manner uses:

(8) a. DEGREE: so tall (as this)
b. MANNER: stand so as not to block your view

Indeed, English *so* probably cognate with the German *so* (*Oxford English Dictionary* 1989).

It would seem to lack a kind reading, so that member of the paradigm is missing. But the situation with English *so* is in fact more complicated, in a way that suggests a deeper underlying parallel. While English does not have a full three-way homophony, *so* does have an adnominal counterpart, *such*, which has itself been analyzed as a kind anaphor (Carlson 1977, Landman & Morzycki 2003, Landman 2006, Constantinescu 2011; cf. Siegel 1994). The resemblance is not accidental. The two are cognate (*Oxford English Dictionary* 1989), and they are sufficiently similar to each other that Bresnan (1973) was driven to derive *such* from underlying *so* via transformation. Carlson followed her in this, and Landman decomposes it into *so-like*. The chief parallels that originally led Bresnan to this involve a degree-like use of *such* (apparently first observed by Bolinger 1972, discussed in Carlson 1977 and Landman 2006, and examined most extensively in Constantinescu 2011):

(9) Clyde is such $\left\{\begin{matrix}\text{a tall man}\\ \text{an idiot}\end{matrix}\right\}$.

This constitutes a resemblance to *so* in two distinct respects. First, it shares its degree meaning. Second, it participates in the fronting operation that moves both of these elements to the left of *a* (Matushansky 2002):

(10) a. *a $\left\{\begin{matrix}\text{so}\\ \text{such}\end{matrix}\right\}$ tall man

b. $\left\{\begin{matrix}\text{so}\\ \text{such}\end{matrix}\right\}$ a tall man

Third, what would seem to be an AP-modifying use of *so* is obligatorily pronounced *such* with mass nouns:

(11) $\left\{\begin{matrix}\text{*so}\\ \text{such}\end{matrix}\right\}$ fine food

Fourth, both *so* and *such* license *that* phrases (for their semantics, see Meier 2003 and Castroviejo Miró 2011):

(12) a. <u>such</u> a tall man <u>that</u> he might not fit in the car
b. <u>so</u> tall a man <u>that</u> he might not fit in the car
c. abuse him <u>so</u> much <u>that</u> he might not get in the car

The precise nature of this degree *such* is somewhat mysterious, and Constantinescu (2011) actually argues in detail that it shouldn't be viewed as a genuine degree modifier. Her alternative is a perfect fit for our larger agenda: she suggests that the degree use is essentially parasitic on the kind use. Considering all the facts collectively, though, they suggest that *such* is a relatively superficial variant of *so*—and that, by some quirk of linguistic history, English only very narrowly missed openly manifesting a full three-way contrast as well.

In addition to *so* and *such*, English manifests some two-way parallels between the relevant domains. Landman (2006) and Anderson (2010) examine parallels between English *like*, where *like* may be used for both kind and manners:

(13) a. KIND: a dog like this
b. MANNER: behave like this

And of course English has the already mentioned parallel between degree and manner uses of *how*:

(14) a. DEGREE: how tall is he?
b. MANNER: how did he behave?

More peripherally, in an informal register, overtly kind-referring expressions have a degree use:

(15) a. He's some kind of tall.
b. Those things are some kind of tasty.

At least one instance of this construction is widely-known: *Some Kind of Wonderful* has been the title of three distinct songs and a major Hollywood movie. And, of course, English has lexicalized degree words, *kinda* and *sorta*—still often spelled *kind of* and *sort of*—that wear their kind-referring origins on their sleeve.

So English too provides compelling evidence for the parallel among all the three domains. It doesn't do it quite so blatantly as some languages, but in one respect, that only makes the case stronger. The English evidence is rippling just beneath the surface of a fairly broad swath of the language, manifesting itself in different ways in several different places. Because the evidence is distributed across several morphemes, we can be sure it isn't a local peculiarity. It shows that these currents run deep.

2.4 *The broader view*

We will not undertake a systematic inventory of evidence from across languages for the larger pattern, but it is worth noting that it reverberates across a number of them—and in one form, across quite a large number.

First, two anecdotal illustrations to provide a flavor of other ways the connections can emerge. French has a three-way parallel in *comme* 'like': (Desmets & Moline 2007; (16b) and (16c) are theirs), though the cases are not perfectly analogous:

(16) a. KIND:
un chien comme Hildy
a dog like Hildy
'a dog like Hildy'

b. MANNER OR DEGREE:
Jean travaille comme son père.
John works like his father
'John works like his father/as his father did.'

c. DEGREE:
Comme il travaille!
like he works
'How he works!'

The degree exclamative in (16c) is different from the others—it is not a straightforward equative—but it is nevertheless a degree reading.

Whereas in English a single *wh*-word does double-duty for degrees and manners, Japanese has a common *wh*-expression for kinds and manners, *dono-yoo-n*{*i/a*}:

(17) a. KIND:
Dono-yoo-na hon-o yomimasu ka.
WH book-ACC read Q
'What kind of book do you read?'

b. MANNER:
Dono-yoo-ni setsumee-shimashita ka.
WH explanation-did Q
'How did you explain it?'

As with its Polish counterpart, (17a) is not simply asking about particular books.

The best-documented and most important two-way parallel, however, is in equatives and their manner counterparts (similatives)—in English, the connection between equative and manner *as*. This connection has been documented extensively from a typological perspective by Haspelmath & Buchholz (1998) and examined from a formal-semantic one by Rett (2011). Haspelmath and Buchholz identify a large number of languages spoken in Europe—not all Indo-European—that use the same morpheme to mark their counterpart of an English *as* clause in both equatives and similatives. The languages in which an identical morpheme used in both cases include those in (18):

(18) a. Romance: Spanish, Portuguese (*como*); Catalan (*com*); Occitan (*coma*); Italian (*come*)
b. Balto-Slavic: Slovene (*kot*); Russian (*kak*); Slovak (*ako*); Lithuanian (*kaip*)
c. Germanic: Dutch (*als*); Yiddish (*vi*); Danish, Swedish (*som*); Icelandic (*og*); Faroese (*sum*)
d. Romani (*kade . . . sar*)
e. Modern Greek (*san/ópos*)
f. Finnish (*kuin*)
g. Georgian (*rogorc*)
h. Armenian (*inčpes*)
i. Turkish (*kadar*)

j. Lezgian (*x̂iz*)
k. Abkhaz (*-eypş*)
l. Kabardian (*x^{o}edew*)

Of the 43 languages Haspelmath and Buchholz examined, 27 had perfectly identical expressions. Several others used expressions that are clearly cognate.

2.5 *Summary*

The overall picture that emerges from these facts is clear: the connections between kinds, manners, and degrees are too systematic and too widespread to be accidental, and suggest a profound similarity among these domains. For languages such as Polish and German, the apparent homophonies are simply too unmistakeable to maintain an account that revolves around lexical ambiguity. For others languages, a diverse range other correspondences points to the same conclusion.

3 Laying the groundwork

3.1 *What exactly is a degree?*

Over the history of degree semantics, there has been a significant amount of discussion over what exactly a degree is. Some theories simply don't make direct use of degrees as distinguished objects in the model at all (Kamp 1975, Klein 1980, 1982 and others), appealing instead to different ways of partitioning a domain according to various orderings. These approaches don't provide the tools we will need. An early alternative to these that does place degrees in the model, but does not treat them as primitives, is a better starting point. This conception, pioneered by Cresswell (1976), is that degrees are equivalence classes of individuals—that is, groups of individuals that are the same with respect to some measure. The degree 'six feet tall', for example, consists of the plurality of individuals that are six feet tall. What we will ultimately propose will invoke similar conceptual machinery.

Cresswell's ontology of degrees, however, has largely given way to a view of degrees in which they are primitives, points or intervals on an abstract scale (Seuren 1973, von Stechow 1984a, Kennedy 1997, Schwarzschild & Wilkinson 2002 and countless others). Although the way this is formalized varies, for current purposes most such approaches can be conceptualized as treating degrees as real numbers (or intervals thereof) associated with a scale representing a dimension of measurement. The precise ontological status of a 'dimension' is often left a bit vague. Setting that potential source of uncertainty aside, though, this leaves degrees as impoverished creatures. The degree 'six feet', for example, simply names a location on a scale of linear extent.

While this conception has proven extremely fruitful—quite possibly precisely because it is relatively concrete and straightforward—it is hard to maintain in the face of facts such as those marshaled most forcefully in Moltmann (2007a,

2009). On the simple conception of degrees, it's entirely unclear what adjectival nominalizations should denote. For instance, if $[\![$ *Clyde's height* $]\!] = \mathbf{6ft}$, then (19a) and (19b) should by synonymous:

(19) a. Clyde's height is $\left\{\begin{matrix}\text{striking}\\\text{impressive}\end{matrix}\right\}$.

b. ??Six feet is $\left\{\begin{matrix}\text{striking}\\\text{impressive}\end{matrix}\right\}$.

So too for (20a) and (20b):

(20) a. We were amazed at Clyde's height.

b. ??We were amazed at six feet.

Yet the sentences in both (19) and (20) are clearly not synonymous—indeed, the (b) sentences are actually pragmatically odd.

A second problem with the standard degree view is there is a large number of non-degree modifiers available with adjectives, as in (21):

(21) a. Clyde is $\left\{\begin{matrix}\text{visibly happy}\\\text{happy in a visible way}\\\text{strangely beautiful}\\\text{beautiful in a strange way}\end{matrix}\right\}$.

b. The talk was $\left\{\begin{matrix}\text{oddly unnerving}\\\text{fatally flawed}\end{matrix}\right\}$.

c. These examples might be misleadingly exceptional.

Some of these modifiers may have a degree reading. *Visibly happy*, for example, may mean 'so happy that it's visible', *strangely beautiful* may (perhaps) mean 'so very beautiful that it's strange strange', and so on (Morzycki 2004/2008, Katz 2005, Castroviejo Miró 2008, Nouwen 2011). But that is certainly not the only interpretation of these modifiers, nor indeed the most natural one—and such readings are not available at all for many of the other cases. There has subsequently been some controversy about whether they can be taken at face value as instances manner modification or are in some respect misleadingly exceptional (Katz 2003, Geuder 2005, Mittwoch 2005, Maienborn 2007, Katz 2008). But as Ernst (2011) demonstrates especially thoroughly, the pattern is so extensive that it is difficult to set aside. Degrees are too impoverished to reflect this. If a degree is just a location on a scale in the way 'six feet' is, it's hard to see how it can be visible, strange, beautiful, odd, misleading, uncomfortable, or fatal. So these examples suggest either that degrees are more complicated we might have thought, or else that something other than degrees is at play.

Moltmann's strategy here is to enrich the ontology with objects—'tropes', also known by the similarly opaque names 'accidents' or 'modes'—that are rich enough to capture these facts. A trope is a particular instantiation of a property. Moltmann illustrates this using a red box that happens to be in front of her. The redness of this box is a trope. Unlike redness in general, this trope involves the particular shade of redness that her box has. But unlike even redness of that precise shade, this trope has a spaciotemporal location—in her phrase, it is

located 'just where the box is located while it is red'. If she were later to paint her box blue, that trope will then have been located in the past. We can, in fact, refer to the trope with a nominalization: *the redness of her box*. Degrees, Moltmann argues, need to be constructed out of tropes, and degree modification is really just a species of trope modification.

We are sympathetic to this strategy, and in some respects we will follow a similar path. We too will need a richer conception of degrees than the now-typical off-the-shelf variety. We will, however, not adopt her theory wholesale at the outset. This is partly for rhetorical purposes. Many linguists find the idea of tropes uncomfortably elusive. We sympathize with this, too, but it's hard to know how to interpret that as an objection. Finding something uncomfortably elusive is a feeling, not an argument. Some of us may faintly recall having such a sensation upon first hearing about events or kinds. Things have a way of seeming more concrete and respectable as they become more familiar. Perhaps tropes are like this, too. They are, moreover, not an innovation of Moltmann's, but something with an established philosophical pedigree. Nevertheless, we think that the safest strategy is to stay out of these unfamiliar conceptual waters at the outset. We will begin by appealing only to the better-established and more familiar—if not necessarily more clear or uncontroversial—notion of (Davidsonian) states. A reader so inclined can feel free to substitute the notion 'trope' for 'state' as necessary.

Our initial avoidance of tropes is not exclusively a rhetorical strategy, however. It reflects the instinct that as linguists, the best way to maintain a steady footing is to focus on the linguistic generalizations, and to let them lead us wherever they may while extending the standard ontological assumptions only as far as necessary for the facts at hand. This is a relatively conservative take on the Bach (1989) notion of 'natural language metaphysics', one that heeds the admonition of Higginbotham (2005) that 'semantics should ... be wary of embracing more in the way of metaphysics' than absolutely necessary on linguistic grounds (see Maienborn 2005a for further discussion).[3] Once the analysis has been presented, it will be possible to step back from it and assess what broader ontological picture best accords with it. In any case, that is the approach we will adopt here, very briefly returning to the thornier ontological questions in section 6 once the analysis is in place.

3.2 *Degrees as kinds and kinds as degrees*

The lesson we can learn from the data above is that we need a richer notion of what degrees are. Our core idea is to enrich our notion of degree in order to be able to capture not just the core degree cases but also cases involving non-degree modification. We will accomplish this by expanding the concept of kind to areas not normally thought of as having kinds.

To get off the ground, we will need a model that includes kinds, in the Carl-

[3] It's worth pointing out that Moltmann (2009) makes its case above all on linguistic grounds. That tropes may be independently appealing on philosophical grounds isn't an argument against them.

sonian sense (Carlson 1977). Second, we will need events and states (Davidson 1967, Parsons 1990). Chierchia (1998) provides a way of thinking about kinds that is especially useful for current purposes: as functions from possible worlds to sets of individuals. For any particular world, the kind RABBIT (for example) picks out the rabbit or rabbits in that world. Another way of looking at this is that this kind corresponds to the plurality of all possible rabbits. To be a realization of a kind is simply to be a member of this plurality. If that's all a kind is—the plurality of all possible objects of some variety—then for any primitive type in the model, there should corresponding kinds. A kind of event is a function from worlds to sets of events, and likewise for states.

In order to make sense of the kind-manner-degree parallel, we will make use of this fact. As individuals can be realizations of kind, events and states can also be realizations of a kind. Kinds of events will represent manners, following Landman & Morzycki (2003), Landman (2006) and Gehrke (2011). This seems relatively intuitive. But what do kinds of states represent? This is less clear a priori, but language is pointing us in a clear direction: at least one thing they can represent is degrees.

This brings us closer to understanding why state-kinds correspond to degrees. The Cresswell (1976) concept of degrees was that degrees form equivalence classes of individuals. The degree 'six feet tall' consists of the plurality of individuals that are precisely six feet tall. Of course, the height of individuals varies across worlds, so 'six feet tall' could be thought of as being a function from a world to the set of six-foot-tall individuals in that world—in other words, a Chierchia-style kind.

To put a Davidsonian spin on this, we can think of having a certain height as a state. Just as the set of rabbits varies from one world to another, so too the set of states of being six feet tall varies from one world to another. We can, of course, speak of the plurality of all these states across worlds: all possible ways of being exactly six feet tall. This is a Carlsonian kind of state. Yet it is also a representation of a degree. The degree 'six feet tall' picks out the plurality of *states* of being precisely that tall. This reduces the notion of 'measuring' a state to the question of what degree state-kind it realizes. For a tallness state to have as its measure (along the relevant dimension) 'six feet', it must realize the SIX-FEET-TALL state-kind. In a nutshell, then, we are simply combining in a novel way key ideas from Cresswell, Carlson, Chierchia, and Davidson. Simply by intensionalizing equivalence classes, one arrives at a Chierchia-style kind, and it is a small additional step to arrange states rather than only individuals in this way.

Importantly, on this conception, only certain state-kinds are degree state-kinds. One can create pluralities of possible states in many ways, and only not all of them will be equivalence classes. This may be linguistically important. As already noted in section 3.1, not all modification of states involves degrees: one can be not only *six feet tall*, but also *beautifully tall*. A state of being tall can be beautiful or not, so there is a corresponding state-kind BEAUTIFUL. But this state-kind is not an equivalence class, so it is not a degree. For this reason too, it is not inherently ordered with respect to a degree state-kind like SIX-FEET-TALL.

For events and event-kinds, largely the same reasoning applies, but we (apparently) have no special need to accord equivalence classes of possible

events a special status. But we do arrive at a representation of the traditional grammatical notion of 'manner' merely by identifying pluralities of possible events as kinds. The manner 'elegantly', for example, simply picks out the event-kind ELEGANT, which corresponds, for any world, to the plurality of events in it that are performed in an elegant way.

3.3 *Background assumptions and notational conventions*

Although at this point we have not made any particularly unorthodox assumptions about the structure of the model itself, we will need to talk about combinations of elements of the model in some slightly unusual ways. It may therefore help to lay out the following parts of the domain D, along with the variables we'll use for each type:

(22) a. D_e is the non-kind individuals in D
variables: $x, y, z, \ldots$
b. D_s is the non-kind eventualities (states and events) in D
variables: $s, s', \ldots$ for states and $e, e', \ldots$ for events
c. D_k is the kinds in D, including state-kinds and event-kinds
variables: $k, k', \ldots$
d. $D_o = D_e \cup D_s$, the non-kind objects (including individuals, states, and events) in D
variables: $o, o', \ldots$

We will occasionally need to refer to 'non-kinds'. We will use the term 'objects', but it should be understood that we intend for this to include both individuals and eventualities.

We will of course also need to make frequent use the notion of realizing a kind. In Chierchia's system, this is cashed out in terms of the fact that for every kind, there is a corresponding property satisfied by all and only what its realizations. In his notation, $^{\cup}k$ is the property counterpart for a kind k, while $^{\cap}P$ is the kind corresponding to a property P. For example, if Bugs realizes the kind RABBIT, he satisfies the corresponding property of being a rabbit. This means the $^{\cup}$operator can represent the realization relation: if Bugs is a rabbit, then $^{\cup}$RABBIT(**Bugs**). The $^{\cup}$ operator is used the same way for events and states. If e is an elegant event, then $^{\cup}$ELEGANT(e), and if s is a state of being six feet tall, then $^{\cup}$SIX-FEET-TALL(s).

We will further assume that verbs and adjectives have eventuality arguments and that nouns do not. The latter assumption isn't absolutely necessary to the analysis, but it will be convenient. The evidence for a state argument for nouns is very limited in any case (see Maienborn 2007 for a review).

3.4 *The semantics of adjectives under ordinary circumstances*

What we have so far suggested is unremarkable for nouns and verbs, but unusual for adjectives. To render this initially plausible, we should say something about

how adjectives work in the contexts in which we're most accustomed to finding them. We will reserve our attention here to the positive (i.e., morphologically unmarked) form and to the measure phrase construction.

First, consider a measure-phrase sentence such as (23):

(23) Floyd is six feet tall.

Because, by hypothesis, the role of degrees will be played by a particular class of state-kinds, *six feet* can denote a property of states that realize the state-kind SIX-FEET-TALL:[4]

(24) $[\![\textit{six feet}]\!] = \lambda s \,.\, {}^{\cup}\textsc{six-feet}(s)$

On one standard view to which we are normally sympathetic, measure phrases involve a degree head MEAS that introduces the measure phrase (Svenonius & Kennedy 2006). It would be perfectly natural and unproblematic to implement this under current assumptions. But it will be easier to suppose that the measure phrase is adjoined and interpreted intersectively. To ensure a property denotation for AP, we will assume that the subject begins within the adjectival extended projection (following Bhatt & Pancheva 2004 and others, perhaps in Bhatt & Pancheva's *a*P projection). Thus the adjective itself denotes a relation between an individual and a state of having a certain height:

(25) $[\![\textit{tall}]\!] = \lambda x \lambda s \,.\, \mathbf{tall}(s, x)$

Importantly, one shouldn't read $\mathbf{tall}(s, x)$ to indicate that s is a state of x being tall rather than simply having a certain tallness. The computation continues straightforwardly:

(26) a. $[\![\textit{Floyd tall}]\!] = \lambda s \,.\, \mathbf{tall}(s, \mathbf{Floyd})$
b. $[\![\textit{[six feet] [Floyd tall]}]\!] = \lambda s \,.\, \mathbf{tall}(s, \mathbf{Floyd}) \wedge {}^{\cup}\textsc{six-feet}(s)$

The result is that Floyd is in a state of having a certain height, and this state realizes the state-kind SIX-FEET.

Second, consider a simple positive structure as in (27):

(27) Floyd is tall.

As before, one standard view to which we are normally sympathetic, would have this interpreted with a POS degree head that would introduce the requirement of having exceeded the contextually-provided standard for tallness (von Stechow 1984b, Kennedy 1997 and many others). And precisely as before, it would be perfectly natural and unproblematic to implement this under current assumptions. But again, it will be easier here to go down another path, in this instance that of Rett (2008). On the basis of evidence involving a number of degree constructions, she argues that the source of inferences about exceeding a standard is an unpronounced element, EVAL, whose effect is felt only in

[4] It's worth noting that this yields an exactly-reading for the measure phrase. The at-least reading could be obtained by a denotation closer to what's suggested for the EVAL morpheme in (28).

structures whose meaning would otherwise be trivial. The positive form is just such a structure. As (26) shows, an unmodified AP has a trivial denotation: it entails only that Floyd has some height. For this reason, only EVAL can rescue this structure from having fatally weak truth conditions. Given our assumptions, EVAL would invoke a contextually-provided degree state-kind, $\textbf{standard}_{s,c}$, the standard in the context c for the scale associated with the state s. It requires that s realize a degree state-kind that exceeds this standard:

(28) $[\![\text{EVAL}]\!] = \lambda s \,.\, \exists k \in \textbf{degree-state-kinds}(s)[^{\cup}k(s) \wedge k >_s \textbf{standard}_{s,c}]$

This also makes use of the set of degree state-kinds for s, indicated above with $\textbf{degree-state-kinds}(s)$. We will need to reframe this notion slightly later. It also appeals to the ordering associated the scale for s. EVAL can now be interpreted intersectively with *Floyd tall* to yield a property of states:

(29) $[\![\text{EVAL } \textit{[Floyd tall]}]\!] = \lambda s \,.\, \exists k \in \textbf{degree-state-kinds}(s)[^{\cup}k(s) \wedge k >_s \textbf{standard}_{s,c}] \wedge \textbf{tall}(s, \textbf{Floyd})$

Once the state argument is existentially closed, this will have the expected truth conditions: Floyd is tall iff he is in a tallness state that realizes a degree state-kind above the standard.

4 First step: kind anaphoric uses

4.1 *A simple denotation and an intersective interpretation*

In this section, we will build an analysis of kind anaphors without clausal complements (or clausal adjuncts, depending on one's syntactic assumptions; we will henceforth assume that they are complements). We will provide denotations primarily for Polish, but they should be understood as a convenient placeholder for the broader pattern—including certainly the principal German facts, and, with suitable allowances for the *such* ∼ *so* alternation, for English too.

As a starting point, we can begin with roughly the semantics for *tak* proposed in Landman & Morzycki (2003), which itself is essentially a stripped-down version of what Carlson (1977) proposed for English *such*. On this analysis, *tak* bears an index whose value is a (typically) contextually-supplied kind, and it denotes the property of realizing that kind:[5]

(30) $[\![tak_k]\!] = \lambda x \,.\, {}^{\cup}k(x)$

Providing the kind as an index on the anaphor is a natural move, but it will prove advantageous to view it in a slightly different way. In their non-anaphoric uses, *tak*, *such*, and their counterparts operate over a kind supplied another way: by its complement. To reflect this external dependency, we will assign the index its own branch (i.e., treat it as a null anaphor) so that *tak* can take as its

[5] We have adapted the denotation to accord with the Chierchia-style conception of kinds and with our other notational conventions.

argument.[6] Our *tak* will also need to apply to objects in general (individuals or eventualities). The result:

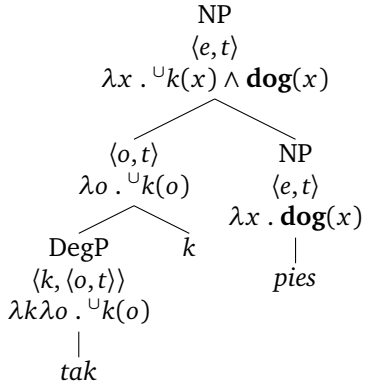
(31) $[\![tak]\!] = \lambda k \lambda o \,.\, {}^{\cup}k(o)$

For the moment, this is all that is required.

The syntax undergirding this will be fairly straightforward. Previous analyses have treated *such* as either a complex AP (Carlson 1977, Siegel 1994, Landman 2006) or as essentially a complex degree expression (Bresnan 1973). Either path would be compatible with our broader agenda, but treating it as a degree head has two virtues to recommend it. The first is that is a conveniently straightforward structure. The second is substantive. In its adjective-modifying use, *tak* (and German *so*) seems to be in a position normally occupied by degree morphemes. In its other uses, its counterparts are less clear.[7] There are two mutually incompatible widely-used structures for the extended AP: a newer one in which DegP is a functional projection above A (Abney 1987, Corver 1990, Grimshaw 1991, Kennedy 1997) and an older one in which it is within the specifier of AP (Chomsky 1965, Bresnan 1973, Heim 2000, Bhatt & Pancheva 2004). If *tak* is to take a complement, as our denotation assumes, it is natural to adopt the older view, because the newer view requires degree heads to have AP as their complement.[8]

The result is (32), a structure in which the DegP is interpreted intersectively:

(32)



We assume a rule of intersective interpretation of the same form as Heim & Kratzer (1998)'s Predicate Modification, except that it is generalized cross-categorially in the obvious way to combine any property-denoting expressions.

The intersective interpretation is potentially controversial. Carlson's semantics for *such* added a presupposition that the antecedent kind must be a subkind of the kind denoted by the *such*-modified NP. This was intended to account for

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[6] This precisely what Landman (2006) proposes for *like*, and she considers such a denotation for *such* for the same reason.

[7] On the other hand, *tak* is, in its adnominal use, obligatorily inflected, which suggests an adjectival syntax.

[8] Again, however, both options are in principle available. On the newer view, one could place the *tak* phrase in the specifier of DegP, the position occupied by measure phrases.

the oddness of, for example, introducing the kind ANIMALS into the discourse and referring back to it with *such mammals*. If we were to implement this presupposition, it would preclude an intersective interpretation because *such* and *tak* would need access to the NP denotation. It is not clear, however, that there is in fact such a presupposition. Landman (2006, p. 50) provides examples such as *Long-haired dogs can be difficult to brush, and such cats are even worse*. The oddness of at least some of Carlson's original examples might be attributed to pragmatic considerations—in these examples, *such mammals* would have precisely the same denotation as *mammals* and should be dispreferred on those grounds alone. Nevertheless, nothing we will propose will hinge on an intersective denotation.

Superficially, in extending this to the other uses of *tak*, it would seem to be smooth sailing from here. The semantics provided above is cross-categorial, and the combinatorics works just as it should. In both the VP and AP uses, *tak* should be able to combine with a property of eventualities straightforwardly:

(33) $[\![[_{VP}\ \textit{Floyd mówił}\ ]]\!] = \lambda e\ .\ \textbf{spoke}(e, \textbf{Floyd})$
$[\![[_{VP}\ \textit{Floyd mówił}\ ]\ [\textit{tak k}]]\!] = \lambda e\ .\ \textbf{spoke}(e, \textbf{Floyd}) \wedge {}^{\cup}k(e)$

(34) $[\![[_{AP}\ \textit{Floyd wysoki}\ ]]\!] = \lambda s\ .\ \textbf{tall}(s, \textbf{Floyd})$
$[\![[\ \textit{tak k}\ ]\ [_{AP}\ \textit{Floyd wysoki}\ ]]\!] = \lambda s\ .\ \textbf{tall}(s, \textbf{Floyd}) \wedge {}^{\cup}k(s)$

Sadly, things aren't so simple.

4.2 *The problem of missing readings*

As already noted in section 2, there is a systematic correspondence across languages noted by Haspelmath & Buchholz (1998) in which the same morphemes are used for equatives (constructions expressing similarity in degree) and similatives (constructions expressing similarity in manner). On the approach we're pursuing, this is what we would expect, since these would simply kinds of states and events (respectively).

There is, however, a problem: there seems to be a gap in what kinds may be constructed for events and states. If one can construct degrees out of states in the way we have suggested, it ought to be possible to construct degrees out of events in the same way. Just as one can order states of tallness according to height, one can order events of running according to distance or duration. So there should be event-kinds such as RUN-SIX-MILES that can serve as degrees. Kind modifiers of events, including similatives, should therefore be able to get degree readings as well. Yet they don't seem to. Rett (2011) notes that it seems to be impossible for a similative to have a reading where a degree is equated across events:

(35) a. Floyd ran $\left\{\begin{array}{l}\text{six miles}\\ \text{for two hours}\end{array}\right\}$, and Clyde ran as Floyd did.
b. Floyd cooled his coffee 5 degrees, and Clyde cooled his coffee as Floyd did.

In both of these cases, only a manner reading is possible. This is especially notable

for (35b) (which closely parallels her examples) because *cool* is deadjectival. The problem, then, is this: why is it that an event-kind can be constructed for a manner, but that event-kinds for measure of change, temporal intervals, or spatial intervals seem to be inaccessible to kind modifiers?

This problem has a mirror-image counterpart. If adjectives can support manner modifiers that are predicates of states as suggested in section 3.1, one might expect that these modifiers might correspond to kinds as well. For example, if there are states of being wounded, there are states of being fatally wounded. The set of these states across worlds constitute the state-kind FATALLY-WOUNDED. So we should expect kind anaphors that attach low to be interpretable as manner anaphors. But this too is impossible:

(36) a. Floyd was fatally wounded, and Clyde was (as) wounded as Floyd.
b. Floyd was contemptuously rude, and Clyde was (as) rude as Floyd.

Taking the two problems together, what is required is a means to prevent degree readings in eventive contexts and to prevent manner readings in stative contexts.

One might imagine a variety of ways of dealing with this situation by examining more closely the compositional machinery behind these structures. Perhaps what is crucial is how kind modifiers interact with degree heads, for example (this is the direction pursued in Morzycki 2011). This still strikes us as a potentially productive analytical avenue, but it is hard to see how it would ensure that only degree readings are possible in one position and only non-degree readings in another. Another approach—an alternative one or a complementary one—would be to treat the unavailability of degree readings in some positions as a consequence of morphological blocking. Degree readings might be unavailable under some circumstances precisely because they are available (unambiguously) under others. For all their appeal, however, in the end such approaches seem to miss a fundamental insight: that degrees simply have some special status with respect to states, and that manners have this special status with respect to events.

4.3 *Distinguished properties*

We don't have a satisfying answer to why this might be, but it is possible to arrive at tentative way of thinking about it. The idea that degree state-kinds have a special status with respect to states seems relatively natural. In the case of tallness states, for example, kinds constructed out of states ordered by height seem to have a special status relative to kinds constructed out of different ways of manifesting tallness (beautifully, disconcertingly, etc.). There is a sense that, in the case of states associated with gradable predicates, degrees are a central part of what states are *for*. The principal reason we talk about such states is to compare them in a scalar fashion to others, or to a standard. Plausibly, this is the case conceptually. But manifestly, it is the case linguistically.

The idea that manner event-kinds have a special status with respect to events may not have the same a-priori naturalness. Nevertheless, it seems reasonable to suppose that a core part of what it is to be an event is to be realized in a certain manner. To be sure, for some events, we care a great deal about their temporal

extent, and for others, about their spacial extent. But for virtually any event, we care about how it took place. We don't talk about events chiefly to measure them. We talk about them chiefly to characterize or explain them. Again, this may be plausible conceptually—or it may not. But again, whatever is the case conceptually, it seems to be the case linguistically.

We will therefore talk about the DISTINGUISHED properties of an eventuality, which for states are properties associated with degree and which for events are properties associated with manner of realization. This is of course not an explanation of anything. It is simply a way of representing and quarantining the problem, pending a deeper explanation. We will reflect it with a relation **dist**:

(37) **dist**(o, P) is true iff P is among the distinguished properties of o

This amounts to saying that if o is state, **dist**(o, P) iff P is a degree-related property, and that if o is an event, **dist**(o, P) iff P is a manner-related property. For individuals, the situation is less clear. So far as we can tell, no aspect of an individual has a distinguished status in the same sense. So if o is an individual, **dist**(o, P) is true for any P.

What is special about kind modifiers, then, is that they are sensitive to the distinguished properties of an object. This can be implemented as a presupposition:

(38) $[\![\, tak \,]\!] = \lambda k \lambda o : \mathbf{dist}(o, {}^{\cup}k) \,.\, {}^{\cup}k(o)$

What this requires is that the property counterpart of the kind associated with the modifier be among the distinguished properties of the modified object.

Of course, for modifiers that do not rely exclusively on distinguished properties, this presupposition is simply absent. The denotations of most manner adverbs will simply lack this requirement, which in turn allows them to achieve manner readings as AP modifiers.

Compositionally, this presupposition changes little. The VP- and AP-modifying cases will, as before, be interpreted intersectively, with a minor change in the resulting denotation:

(39) a. $[\![\, [_{VP}\ \textit{Floyd mówił }]\ \textit{[tak k]} \,]\!] = \lambda e : \mathbf{dist}(e, {}^{\cup}k) \,.\, \mathbf{spoke}(e, \mathbf{Floyd}) \wedge {}^{\cup}k(e)$

b. $[\![\, [\ \textit{tak k }]\ [_{AP}\ \textit{Floyd wysoki }] \,]\!] = \lambda s : \mathbf{dist}(s, {}^{\cup}k) \,.\, \mathbf{tall}(s, \mathbf{Floyd}) \wedge {}^{\cup}k(s)$

5 Complement clauses and abstracting over kinds

5.1 *A preview the big picture, and an initial step*

So far, only one element of the compositional system has been put into place: the basic anaphoric uses of kind modifiers. Much of what needs to be explained, however, concerns the complement clauses associated with kind modifiers. These are especially important because in the degree case, they correspond to a familiar degree construction: the ordinary equative. In the adverbial case, there is a somewhat more surprising but nevertheless important connection to free relatives. In the adnominal case, the construction is sometimes characterized as

a variety of relative clause (Carlson 1977). All of these classes of constructions are, on their own terms, relatively well-studied—but certainly not from a unified perspective. So there is a non-trivial compositional challenge in bringing these together.

The path we will take will involve, as might be expected, a syntax that involves *wh*-movement and lambda abstraction, in our case over a kind-denoting trace. The result is essentially a relative clause. Again, this much is relatively familiar. One issue that needs to be addressed in unifying the constructions is the sense that in the adnominal and adverbial uses, a existential claim is being made about a kind an individual or event realizes—but in the equative use, a claim is being made about a particular height. We will suggest that a key to providing a consistent, independently-motivated semantics for these clauses lies in the analysis of free relatives of Caponigro (2003, 2004), which relies on a uniform semantics and a principled distribution of independently motivated type shifts of a standard variety (Partee 1986). For manner and degree uses, this follows broadly in the footsteps of Rett (2011), who focuses on specifically that connection and provides an explicit account of it, to our knowledge the only existing one. She too takes free relatives as an important analogue. (We will return to her approach in 5.6.)

As before, we will take Polish as our paradigm case, with the assumption that other languages will work similarly. The first step, as before, will be the adnominal use:

(40) Taki pies jak Floyd szczekał.
TAK-MASC dog WH Floyd barked
'Such a dog as Floyd barked.'

One immediate complication is that in this instance, the embedded clause is elided, just as it would normally be in English (Carlson 1977, Landman 2006).

Following Citko (2000), we treat *jak* as a *wh*-element (as our glosses have been presupposing). The similarity between *tak* and *jak* is, of course, hard to miss. We will assign it a semantics identical to that of *tak*:

(41) $[\![jak]\!] = \lambda k \lambda x : \mathbf{dist}(x, {}^{\cup}k) \,.\, {}^{\cup}k(x)$

This will make possible an underlying structures in which *jak* occupies the same positions as *tak*. This will make possible a relatively simple structure for the embedded clause. In this instance, it would be as in (42):

(42) Floyd ~~jest~~ ~~jak~~ ~~*k*~~
Floyd is WH

Chiefly for the sake of simplicity, we will leave *jak* in situ at LF and assume it moves post-Spellout. The kind variable *k* is obligatorily abstracted over at the clause level:[9]

[9]Again, the precise implementation of this is not crucial. Other possibilities include a default binding mechanism or operator movement as in English *that* relatives in the style of Heim & Kratzer (1998). The most appealing alternative, though, is to suppose that *jak* actually spells out this relativizing operator. This would entail assuming it occurs as the complement of *tak*, denotes a kind

(43) $[\![\ \lambda k\ \textit{Floyd}\ \sout{\textit{jest jak k}}\ ]\!] = \lambda k : \mathbf{dist}(x, {}^{\cup}k)\ .\ {}^{\cup}k(\mathbf{Floyd})$

This structure echoes what Landman (2006) proposes for English *as* complements to *such*, for which she adduces independent evidence from antecedent-contained deletion. The clause will therefore denote a property of kinds. Superficially, this would seem to be a problem. It is, after all, the complement to *tak*, which expects an individual, and a type clash should result.

5.2 *Interlude: Caponigro on free relatives and type shifts*

The treatment of the embedded clause proposed here in all relevant respects resembles how Caponigro (2003, 2004) treats free relatives. On its face, this is a good result. Free relatives are, after all, *wh*-constructions which often find themselves in prototypical argument positions. This is precisely what the clausal complements to kind modifiers do. The connection is in fact deeper: a *jak* clause can be itself a free relative.

We will follow Caponigro's analysis one step further. Free relatives, for him, systematically denote properties. They often find themselves in contexts in which a property-denotation is inappropriate, however. The type clash is avoided, Caponigro proposes, by the application of one of a generally available family of type shifts in the style first envisaged by Partee (1986).

The particular case that is most relevant here involves adjoined free relatives, which Caponigro calls 'PP-like', such as (44):

(44) Captain Kirk went ~~to~~ where no man had gone ~~to~~ before.

One respect in which they are PP-like is that Caponigro analyzes them as PPs—or rather, as embedded in PPs, in this case headed by a null preposition *to*. In (44), the situation this creates is one in which the preposition expects an individual-denoting argument and receives in its place a property-denoting free relative.

The preferred type shift in his system is Iota, which shifts from properties to individuals. His definition is the standard one, which we have modified here only in generalizing it across types:

(45) **Iota Shift** (from $\langle \tau, t \rangle$ to τ, where τ is any primitive type):
shift P to $\iota x_{\tau}[P(x)]$

This type shift mirrors the meaning of *the* (on a Fregean interpretation). It applies to a property and shifts it to the unique individual that satisfies that property. In (45), however, this is of no use—there is no unique location such that no one has gone there before. So this would take us out of the frying pan and into the fire, from a type clash to a failure of presupposition.

What does rescue this structure is another type shift, which is, by hypothesis, normally dispreferred: the Existential Closure Shift, which shifts from properties

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identity function ($\lambda k\ .\ k$), and therefore must *wh*-move and leave behind a kind-denoting trace.

to generalized quantifiers. Again, we have modified it only to generalize it across types:

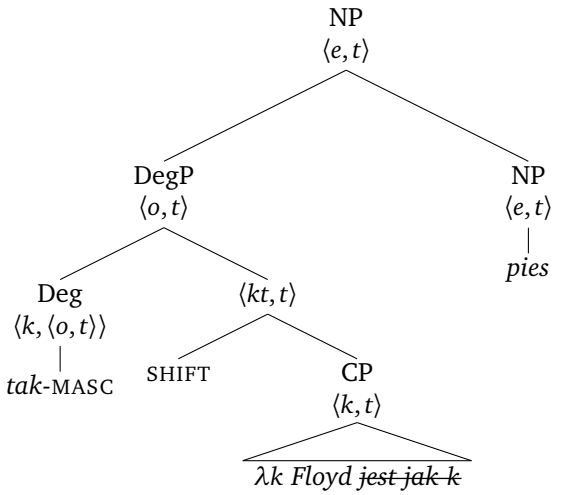
(46) **Existential Closure Shift** (from $\langle \tau, t \rangle$ to $\langle \tau, \tau t \rangle$):
shift P to $\lambda Q_{\langle \tau, t \rangle} \,.\, \exists x_{\tau} [P(x) \wedge Q(x)]$

This shift will do Captain Kirk some good. The result is that the free relative denotes a generalized quantifier, which will in the normal fashion undergo Quantifier Raising out of the clause and leaves behind an individual-denoting trace. Precisely the same strategy will serve in the *jak* clause.

5.3 *Adnominal uses, continued*

Given the Caponigro semantics for free relatives, the type clash we encountered in the complement of a kind modifier is independently expected—and we should expect that it could be avoided by the same means. As before, the the Iota Shift can't apply, because there is no single kind that any individual realizes. So, as before, the Existential Shift is invoked as a fallback measure. The result is an underlying structure like (47) (in which we leave the copula *jest* uninterpreted and skip irrelevant levels of structure):

(47)



After the shifted CP QRs to adjoin to the clause and leaves behind a kind-denoting trace, the resulting structure is:

(48) [SHIFT λk Floyd ~~jest jak k~~] [$\lambda k'$ [tak-MASC k' pies szczekał]]

The computation:

(49) a. $[\![$ SHIFT λk *Floyd* ~~*jest jak k*~~ $]\!]$
$= \lambda Q_{\langle k, t \rangle} \,.\, \exists k : \mathbf{dist}(\mathbf{Floyd}, {}^{\cup}k)[{}^{\cup}k(\mathbf{Floyd}) \wedge Q(k)]$

b. $[\![\lambda k'$ *[tak-*MASC k' *pies szczekał]* $]\!]$
$= \lambda k' \,.\, \exists x : \mathbf{dist}(x, {}^{\cup}k')[{}^{\cup}k'(x) \wedge \mathbf{dog}(x) \wedge \mathbf{barked}(x)]$

c. $[\![\text{SHIFT } \lambda k \textit{ Floyd } \sout{\textit{jest jak } k}]\!] ([\![\lambda k' \textit{ [tak-MASC } k' \textit{ pies szczekał]}]\!])$

$= \exists k : \mathbf{dist}(\mathbf{Floyd}, {}^{\cup}k)[\ {}^{\cup}k(\mathbf{Floyd}) \wedge [\![\lambda k' \textit{ [tak-MASC } k' \textit{ pies szczekał]}]\!](k)\ ]$

$= \exists k : \mathbf{dist}(\mathbf{Floyd}, {}^{\cup}k)\left[\ {}^{\cup}k(\mathbf{Floyd}) \wedge \exists x : \mathbf{dist}(x, {}^{\cup}k)\left[\begin{array}{l} {}^{\cup}k(x) \wedge \mathbf{dog}(x) \wedge \\ \mathbf{barked}(x) \end{array}\right]\right]$

Since the **dist** relation is, by hypothesis, trivial for individuals, this amounts to (50):

(50) $\exists k[{}^{\cup}k(\mathbf{Floyd}) \wedge \exists x[{}^{\cup}k(x) \wedge \mathbf{dog}(x) \wedge \mathbf{barked}(x)]]$

What this requires is that a kind that Floyd realizes also be realized by a dog that barked. This seems an appropriate rendering of the truth conditions.

5.4 *Manner uses*

The construction of primary interest here is the degree use—the equative—but before undertaking that, we should consider how the manner use will work:

(51) Floyd śpiewał tak jak Clyde śpiewał.
Floyd sang TAK WH Clyde sang
'Floyd sang as Clyde sang.'

The *jak* clause here is of precisely the sort that Caponigro examined under the rubric of PP-like free relatives, and the assumptions already in place will suffice for it. As before, because it occurs as the complement to *tak*, the Existential Type Shift applies to avoid a type clash, rendering the *jak* clause a generalized quantifier. Once it QRs, the resulting structure is as in (52):

(52) [SHIFT λk Clyde śpiewał ~~jak k~~] [$\lambda k'$ [Floyd śpiewał tak k']]

The role of Caponigro's null preposition is here played overtly by *tak*. The denotation of the type-shifted clause will be similar to the adnominal case. One difference is that, since an event argument comes into play, it has to be quantified off in the usual way. (Nothing hinges here on how this is implemented.) Thus the denotation of the higher VP is as in (53a) and that of the whole clause is as in (53b), which is then shifted into (53c):

(53) a. $[\![\textit{śpiewał } \sout{\textit{jak } k}]\!] = \lambda e : \mathbf{dist}(e, {}^{\cup}k)[\mathbf{sing}(e, \mathbf{Clyde}) \wedge {}^{\cup}k(e)]$

b. $[\![\lambda k \textit{ Clyde śpiewał } \sout{\textit{jak } k}]\!] = \lambda k\ .\ \exists e : \mathbf{dist}(e, {}^{\cup}k)[\mathbf{sing}(e, \mathbf{Clyde}) \wedge {}^{\cup}k(e)]$

c. $[\![\text{SHIFT } \lambda k \textit{ Clyde śpiewał } \sout{\textit{jak } k}]\!]$

$= \lambda Q_{\langle k,t \rangle}\ .\ \exists k[\exists e : \mathbf{dist}(e, {}^{\cup}k)[\mathbf{sing}(e, \mathbf{Clyde}) \wedge {}^{\cup}k(e)] \wedge Q(k)]$

The matrix clause, meanwhile, will involve a similar intersective interpretation of the VP, yielding (54a), and combining the two clauses yields (54b):

(54) a. $[\![\ \lambda k'$ *[Floyd śpiewał tak k']* $]\!] = \lambda k' \,.\, \exists e' : \mathbf{dist}(e', {}^{\cup}k')[\mathbf{sing}(e', \mathbf{Floyd}) \wedge {}^{\cup}k'(e')]$

b. $[\![\ \textsc{shift}\ \lambda k$ *Clyde śpiewał ~~jak k~~* $]\!]\,([\![\ \lambda k'$ *[Floyd śpiewał tak k']* $]\!])$

$$= \exists k \left[\begin{array}{l} \exists e : \mathbf{dist}(e, {}^{\cup}k)[\mathbf{sing}(e, \mathbf{Clyde}) \wedge {}^{\cup}k(e)] \wedge \\ [\![\ \lambda k'$ *[Floyd śpiewał tak k']* $]\!]\,(k) \end{array} \right]$$

$$= \exists k \left[\begin{array}{l} \exists e : \mathbf{dist}(e, {}^{\cup}k)[\mathbf{sing}(e, \mathbf{Clyde}) \wedge {}^{\cup}k(e)] \wedge \\ \exists e' : \mathbf{dist}(e', {}^{\cup}k)[\mathbf{sing}(e', \mathbf{Floyd}) \wedge {}^{\cup}k(e')] \end{array} \right]$$

Thus the sentence entails that there is a manner event-kind which both Clyde's singing event and Floyd's singing event instantiate.

5.5 *Degree uses*

The final piece of this part of the puzzle is the equative use. No further assumptions are necessary at this point, but there is important twist that follows independently from Caponigro's approach.

The construction at issue is exemplified, once again, in (55):

(55) Floyd jest tak wysoki jak Clyde.
Floyd is TAK tall JAK Clyde
'Floyd is as tall as Clyde.'

Consistent with our earlier assumptions, we will for convenience interpret *Clyde* in a low, AP-internal subject position, so the structure of the embedded clause will be as in (56):

(56) λk jest $[_{\text{AP}}\ [_{\text{DegP}}$ jak $k\ ]$ Clyde ~~wysoki~~ $]$

Also as before, the DegP will be interpreted intersectively, yielding (57a) as the AP denotation and, after the state argument is existentially closed, (57b) as the denotation of the clause:

(57) a. $[\![\ [_{AP}\ [_{DegP}$ *jak k]* Clyde ~~*wysoki* ~~*]* $]\!] = \lambda s : \mathbf{dist}(s, {}^{\cup}k) \,.\, {}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})$

b. $[\![\ \lambda k$ *jest* $[_{AP}\ [_{DegP}$ *jak k]* Clyde ~~*wysoki* ~~*]* $]\!]$

$$= \lambda k \,.\, \exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]$$

This denotes a property of degree state-kinds that are instantiated by a state of Clyde's tallness. Translating this into more traditional terms, it is a property of degrees of Clyde's tallness.

This clause is, of course, the complement to *tak*, which needs a kind as an argument. This is the point at which a type shift is triggered. Unlike in the previous cases, though, the type shift will be Iota, not Existential Closure. Recall that Caponigro's system assumes that Iota is the default, preferred type shift, and that Existential Closure is resorted to only when Iota would yield something undefined. In the individual and manner cases, Iota would indeed fail for the reasons already discussed: there is no unique kind or manner that an individual

or event instantiates. But for degree state-kinds, Iota would face no such difficulty. There is, in fact, precisely one degree state-kind that a state instantiates: the one that corresponds to the equivalence class of which it is a member.

If the Iota type shift were to be applied to the clausal denotation in (57), the result would be (58):

(58) $[\![\text{SHIFT } \lambda k \textit{ jest } [_{AP} [_{DegP} \textit{ jak } k \textit{] Clyde } \sout{\textit{wysoki}} \textit{] }]\!]$
$= \iota k[\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]]$

This is simply a definite description of the degree state-kind that Clyde's tallness realizes. It follows in an established tradition of interpreting comparative—and therefore by extension also equative—clauses as definite descriptions that goes back to Russell (1905). Because degrees here are constructed from equivalence classes, the notion of maximality is essentially built-in.

The underlying structure, then, wouldn't require QR of the embedded clause. It could be interpreted in situ, in the argument position of *tak*:

(59) jest [$_{\text{AP}}$ [$_{\text{DegP}}$ tak [SHIFT λk jest [$_{\text{AP}}$ [$_{\text{DegP}}$ jak k] Clyde ~~wysoki~~]]] Floyd wysoki]

The *tak*-headed DegP, then, would have as its denotation (60):

(60) $[\![\textit{tak } [\text{SHIFT } \lambda k \textit{ jest } [_{AP} [_{DegP} \textit{ jak } k \textit{] Clyde } \sout{\textit{wysoki}} \textit{] }]]\!]$
$= \lambda o : \mathbf{dist}(o, {}^{\cup}\iota k[\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]]) .$
${}^{\cup}\iota k[\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]](o)$

This is more complicated notationally than it is conceptually. It involves shifting the definite description of a kind to its property counterpart. What the '${}^{\cup}\iota k[\ldots](o)$' expression means is that o instantiates the maximal degree state-kind that Clyde's tallness also instantiates. The situation, if not the formula, becomes clearer at the next step, at which this whole expression is interpreted intersectively with the core AP *Floyd wysoki*:

(61) a. $[\![\textit{Floyd wysoki}]\!] = \lambda s' . \mathbf{tall}(s', \mathbf{Floyd})$

b. $[\![[_{DegP} \textit{ tak } [\text{SHIFT } \lambda k \textit{ jest } [_{AP} [_{DegP} \textit{ jak } k \textit{] Clyde } \sout{\textit{wysoki}} \textit{] }]] \textit{ [Floyd wysoki] }]\!]$
$= \lambda s' : \mathbf{dist}(s', {}^{\cup}\iota k[\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]]) .$
${}^{\cup}\iota k[\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]](s') \wedge \mathbf{tall}(s', \mathbf{Floyd})$

For the sake of readability, let's dispense with the **dist** requirement:

(62) $\lambda s' . {}^{\cup}\iota k[\exists s[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]](s') \wedge \mathbf{tall}(s', \mathbf{Floyd})$

This is a property of a state, s', of Floyd's tallness. The first conjunct requires that s' be a realization of the degree state-kind that Clyde's tallness realizes. So overall, this requires that Floyd's tallness state realize the same degree state-kind as Clyde's tallness state.

In a nutshell, then, the interaction of the proposed semantics for *tak/jak*, our standing assumptions about state-kinds, and Caponigro's independently-motivated semantics for free relatives—including his assumptions about type-

shifts—added up to a semantics for the equative that assigns to it the standard truth conditions.

5.6 *Manner and degree clauses and Rett 2011*

Having now arrived at a theory that encompasses both the manner and degree use, we should consider where this leaves us in comparison with what the Rett (2011) account of such manner and degree uses clauses in other languages, which is to our knowledge the only explicit account of this portion of the larger picture. That analysis does not take into view the adnominal cases and it is not built on a connection to kinds, but it shares our cross-categorial aims with respect to the manner and degree constructions. Its chief point of departure is instead the robust typological generalizations of Haspelmath & Buchholz (1998), who recognized the homophony between the *wh*-expressions that mark the similatives (our manner uses) and equatives across languages.

A key element of Rett's unification is that *as* clauses for her express generalized lambda-abstraction over, essentially, elements of arbitrary types. In the case of equatives, abstraction is over degrees, and in the case of similatives, over manners (however they might be construed). One way to view what we have proposed is as further articulating and constraining such an account. Other points of agreement are a desire to interpret these clauses intersectively and to assimilate them to free relatives.

The most notable difference lies in our desire to build a picture that includes adnominal kind uses and that extends to kind modifiers beyond the clausal cases. It would seem plausible to extend the idea that complement clauses involve (or can involve) generalized abstraction to the adnominal cases, since kinds would simply be another element to be abstracted over. But beyond the clausal cases, the strategy of using a sort of ontological underspecification is harder to extend.

Another major difference lies in the treatment of the equative. Rett goes down a more traditional path, in which much of the work of the equative—in particular, a maximality requirement—comes from a degree morpheme into which maximality and the degree relation is encoded. This has much to recommend it beyond its being the conventional course. For one thing, it accords with one of the Haspelmath & Buchholz generalizations: that equatives tend to involve an overt degree word and similatives tend not to. This seems an important fact, and, on the analysis offered here, remains unexplained. On the other hand, there is a clear sense in the above in which equatives are different on our analysis: they trigger a different type shift. It seems reasonable to suppose that some languages might choose to lexicalize that distinction. Of course, if the element that lexicalizes it turns out to be homophonous with kind anaphors in other categories, as would be the case in the examples at hand, on our view it would not be unexpected.

Our account and Rett's both a common difficulty: the absence of degree readings of verbs (as she formulates the generalization). She concludes from this that all verbs simply lack degree arguments entirely. This seems a plausible conclusion, but it takes some effort to reconcile it with apparent counterexamples such as degree achievements (*cool the soup fully*; Kennedy & Levin 2008) and

constructions like *hate soup very much/a great deal*. Our alternative is no less stipulative: this is a fact we cordoned off under the heading of 'distinguished properties'.

5.7 *Comparatives*

Given that we are providing a new semantics for degrees, it might be incumbent on us to provide an indication of how other degree constructions work. We have already discussed in 3.4 the positive (unmarked) form of the adjective and the measure phrase construction, and in the preceding section the equative. There are, of course, many degree constructions, and it would be far beyond the scope of this paper to attempt to reproduce the whole literature in degree semantics in terms of degree state-kinds. But minimally, something should be said about the semantics of the comparative.

We should emphasize, though, that there is a fundamental difference between the comparative and equative that is relevant here: the equative is, as we have shown, a special case of a broader cross-categorial phenomenon: the complements of kind-modifiers. In the comparative, there are no similar mysterious homophonies to explain. Partly because of this, there is no longer any reason to use the Polish data, so we will return to English.

Structurally, we will assume comparatives parallel equatives: the subject starts low in AP, and the DegP occupies a specifier position. Standardly, analyses that assume the syntax we adopt further assume that the DegP must QR out of its base position. Kennedy (1997) argues against this scoping mechanism, and Heim (2000) provides counterarguments suggesting it is necessary after all. We will leave the DegP in situ. The comparative in (63a) will have the structure in (63b):

(63) a. Floyd is taller than Clyde.
b. [$_{\text{DegP}}$ -er [$_{\text{CP}}$ than Clyde ~~is tall~~]] [Floyd tall]

The basic semantics of the comparative clause itself will be identical to that of the equative. The clause on its own denotes a property of state-kinds, as in (64a), but in order to combine with *-er* it must undergo the Iota type shift, as in (64b):

(64) a. $[\![\textit{than Clyde is tall}]\!] = \lambda k\,.\,\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]$
b. $[\![\textsc{shift}\ \textit{than Clyde is tall}]\!] = \iota k[\exists s : \mathbf{dist}(s, {}^{\cup}k)[{}^{\cup}k(s) \wedge \mathbf{tall}(s, \mathbf{Clyde})]]$

Again, it is Iota that applies rather than the Existential type shift because is systematically preferred whenever it's defined. In this case, the result is a definite description of a maximal degree.

The role of the comparative morpheme is to apply to this kind, and yield a property of states that can then be interpreted intersectively. The comparative will compare this kind to the degree state-kind that of which the matrix AP is a property:

(65) a. $[\![\textit{-er}]\!] = \lambda k \lambda s' \,.\, \exists k' : \mathbf{dist}(s', {}^{\cup}k')[{}^{\cup}k'(s') \wedge k' >_{s'} k]$

b. $[\![\textit{-er}]\!] ([\![\textsc{shift} \textit{ than Clyde is tall}]\!])$

$$= \lambda s' \,.\, \exists k' : \mathbf{dist}(s', {}^{\cup}k') \left[\begin{array}{l} {}^{\cup}k'(s') \wedge \\ k' >_{s'} \iota k \left[\exists s : \mathbf{dist}(s, {}^{\cup}k) \left[\begin{array}{l} {}^{\cup}k(s) \wedge \\ \mathbf{tall}(s, \mathbf{Clyde}) \end{array} \right] \right] \end{array} \right]$$

This can be interpreted intersectively with the A′ denotation in (66a), to yield (66b):

(66) a. $[\![\textit{Floyd tall}]\!] = \lambda s' \,.\, \mathbf{tall}(s', \mathbf{Floyd})$

b. $[\![[_{DegP} \textit{ -er } [_{CP} \textit{ than Clyde is tall }] \,] \,[\textit{ Floyd tall }]]\!]$

$$= \lambda s' \,.\, \exists k' : \mathbf{dist}(s', {}^{\cup}k') \left[\begin{array}{l} {}^{\cup}k'(s') \wedge \\ k' >_{s'} \iota k \left[\exists s : \mathbf{dist}(s, {}^{\cup}k) \left[\begin{array}{l} {}^{\cup}k(s) \wedge \\ \mathbf{tall}(s, \mathbf{Clyde}) \end{array} \right] \right] \end{array} \right] \wedge \mathbf{tall}(s', \mathbf{Floyd})$$

As before, the result is notationally if not conceptually complicated, and dispensing momentarily with the **dist** requirement and rearranging the conjuncts will make it slightly more readable:

(67) $\lambda s' \,.\, \mathbf{tall}(s', \mathbf{Floyd}) \wedge \exists k' \left[\begin{array}{l} {}^{\cup}k'(s') \wedge k' >_{s'} \iota k \left[\exists s \left[\begin{array}{l} {}^{\cup}k(s) \wedge \\ \mathbf{tall}(s, \mathbf{Clyde}) \end{array} \right] \right] \end{array} \right]$

The '$\iota k[\ldots]$' expression picks out the degree state-kind of Clyde's height. The whole thing will be true of a state of Floyd's tallness (s') iff the degree state-kind that his tallness realizes is greater than the degree state-kind of Clyde's height.

6 A brief note about ontological considerations

So what have these compositional concerns told us about the ontological assumptions necessary to undergird them? Well, minimally, they have borne out the fundamental hypothesis that degrees can be construed as Carlsonian kinds of states.

We've simply presupposed that just as the model includes Davidsonian events, it should include states. Of course, one could deny that states belong in the model at all. The linguistic evidence, though, demonstrates that if they are to be evicted from the model, they will need to be replaced with some analogue. Simply eliminating them entirely would entail arriving at an entirely different explanation of all the parallels we've noted and another theory of the compositional machinery we've put into place.

Once we accept that something like this belongs in the model, the natural question to ask, though, is what 'states' actually means in this context. One choice to be made is between two distinct notions of states, which Maienborn (2005b, 2007) argues has linguistic relevance. Alongside the familiar Davidsonian states, there are what she calls Kimian states (Kim 1976), which are more impoverished.

Kimian states are, in Maienborn's phrase, simply 'temporally bound property exemplifications'. They consist only of a property, a hold, and a time. Unlike Davidsonian states, they have no location in space, can't be directly perceived, and can't be realized in different ways. Various constructions are, she argues, sensitive to the distinction. A state of being tall, for example, would be a Kimian state because of the oddness of #*I saw Floyd be tall*. If we accept that the distinction is linguistically relevant in the way Maienborn suggests, we might be faced with a difficulty. Kimian states would seem to be too impoverished to suffice for our purposes. Certainly, they aren't easy to square with the well-formedness of examples such as Parsons (1990)'s *coarsely grooved* or Mittwoch (2005)'s *in the country illegally*, which Maienborn considers exceptional. Perhaps, if we join her in setting aside these examples, there might be a way to maintain even this impoverished view of states by smuggling additional information into what property a Kimian state is said to exemplify. One might imagine, for example, that being six feet tall is the property exemplified by a Kimian state. To say that such a state is a tallness state, then, would simply say that the property associated with it is one that predicates tallness. This is pure speculation, of course. The larger point is that if the express intention in distinguishing Kimian states is to have a more impoverished view of states, it at least superficially runs counter to our aims here.[10]

On the other hand, one might go in the opposite direction—the one suggested by Moltmann (2004, 2009, 2007b)—and take our talk of states to actually refer to tropes. So far as we can see, everything we have said is at least compatible with such a view. She explicitly uses tropes to model degrees, so at least that much is to be expected. She doesn't employ Carlsonian kinds of tropes in her degree semantics, but she does endorse the idea that there are such things in Moltmann (2004), where she takes the referents of certain abstract mass nouns like *wisdom* as referring to trope-kinds. So this approach has the theoretical equipment already in place. Moreover, manner-like modifiers of AP form part of her original motivation for appealing to tropes. The crucial question here is whether the facts we examined and the analysis we proposed uniquely favor such a view: that is, whether familiar Davidsonian states are insufficient for our purposes and the move to tropes is actually required. Moltmann (2009) characterizes states as 'nothing but the holding of a property of an individual', with no possibility of being manifested in different ways. This characterization of Davidsonian states rather resembles how Maienborn characterizes Kimian states. Maienborn explicitly proposes that Davidsonian states can vary precisely in how they are manifested. So long as tropes and Davidsonian states à la Maienborn both provide us with a representation rich enough to support this kind of variation, it's not clear how our facts could bear on the choice.

The possibly-metaphysical puzzle we are most vexed by, however, is the one we've quarantined off with the notion of 'distinguished properties' of an eventuality. Is there a way of constructing objects in the ontology that would deliver, in an insightful way, the result that states are closely associated with degrees and events to manners? It doesn't seem out of the question. It seems to us, however,

[10]One avenue left unexplored here is the idea that different levels of structure above AP might be properties of different varieties of states.

that this question may constitute grounds for soliciting the assistance not just of philosophers, but also cognitive scientists of other descriptions. Some of the answers—or at least some relevant observations—may lie in the psychological representation of eventualities.

One ontological point which we have not resolved is whether degree state-kinds are the only representation of degree in the model, as we have proposed, or whether the model also includes degrees of the more traditional sort in addition. On this view, degree state-kinds would simply be an alternative means of achieving readings that are normally attained via degrees of the more traditional sort. Certainly, it is a more conservative hypothesis, but it is also in light of that a less interesting one. It would raise the question of why language might come to have these two systems existing side-by-side, different means to the same end.

7 Further directions

7.1 *Manner modification of adjectives*

An issue with normal conceptions of degrees noted previously is of what to do with manner modifiers of adjectives of the sort noted in section 3.1, such as in those in (68):

(68) a. Floyd is strangely tall.
b. ??Floyd is tall to a strange degree.
c. Floyd is tall in a strange way.

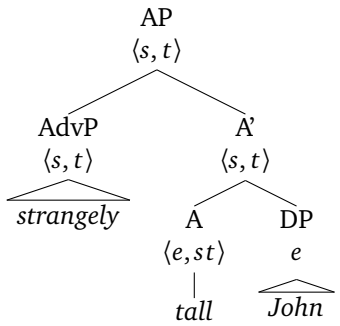
Trying to paraphrase these to say that an individual holds of, say a strange degree is odd. This suggests that, whatever it is that manner modifiers of adjectives are, they are not properties of degrees. A better way to paraphrase these is using *in an X way*, where *X* is the manner modifier. We don't have a fully satisfactory account of these uses, but a state-kinds semantics for adjectives is a step toward a natural analysis.

Our basic assumption will be that these modifiers are type $\langle s, t\rangle$, properties of states. These modifiers can be thought of as modifying the adjective intersectively:

(69) a. $[\![\textit{strangely}]\!] = \lambda s\,.\,{}^{\cup}\textsc{strange}(s)$
b. $[\![\textit{Floyd is strangely tall}]\!] = \exists s[{}^{\cup}\textsc{strange}(s) \wedge \textbf{tall}(\textbf{Floyd})(s)]$

This makes possible a simple syntax is in line with our assumptions about the syntax of *such* and *as*. Our analysis of the syntax of manner modifiers is that they are inserted into the specifier of an AP, as in ((70)):

(70)



Inserting the adverb in the specifier of AP makes it parallel to our analysis of degree structures, which are also in the specifier of AP. Two pieces of evidence suggest that this analysis is correct.

First, manner modifiers of adjectives appear to be in complementary distribution with degree morphology, including measure phrases, degree adverbs such as *completely*, and comparative morphology:

(71) a. *Floyd is strangely six feet tall.
b. *Floyd is strangely very/really tall.
c. ??Floyd is strangely taller than Clyde.

Given that DegP is also inserted into SpecAP, this complementary relationship makes sense, as they are competing for the same syntactic slot.

Second, there is a generalization that manner adverbs with adjectives must appear on the left of the adverb in order to receive the manner interpretation. When appearing on the right, they get a distinct interpretation on which they express a propositional attitude of the speaker:

(72) a. Floyd is strangely tall.
b. Floyd is tall, strangely. (no manner interpretation available)

This pattern also accords with the assumption that these adverbs are inserted in SpecAP. As specifiers are uniformly on the left edge of phrases in English, the fact that manner modifiers of adjectives only receive manner interpretations when on the left suggests that they are in fact in a specifier position.

What this analysis doesn't quite provide in the general case is an account of why such modifiers license entailments to the positive form:

(73) Floyd is strangely tall.
entails: Floyd is tall.

To say that Floyd has a state of having some height, and this state is strange, may reflect on the strangeness of Floyd's height, but it doesn't on its own ensure that it is above the contextual standard for tallness.

7.2 *Degree readings of* such

Another point we have not addressed extensively is degree readings of *such*, as in (74):

(74) Floyd is such an idiot.

Constantinescu (2011) provides an extensive discussion of such cases, and argues that they can be reduced to a special case of the kind interpretation. If that's right, not much more needs to be said. But on the current proposal, in some sense the choice need not be made: a kind interpretation and a degree interpretation become inherently rather similar. If, however, one were inclined to grammaticalize the distinction between the two readings more deeply, an interesting consequence might follow. If degrees are a particular variety of state-kinds, achieving a degree reading in (74) might require access to *states* of idiocy. We assumed that nouns have no state argument. Perhaps (74) is an indication that this is misguided, and that somewhere inside the extended NP there is a level at which there are properties of states of idiocy to be modified.

7.3 *The* so . . . that *construction*

As noted in section 2, *so* and *such* systematically license *that* complements:

(75) a. such a tall man that he might not fit in the car
b. so tall a man that he might not fit in the car
c. abuse him so much that he might not get in the car

Similar data can be found in other languages. Neither the readings involved here nor the syntax underlying them is obviously perfectly parallel. Nevertheless, the pattern seems important, and perhaps the present analysis might allow one to make some headway toward an analysis. It would not be easy going, however. The standard assumption about at least the adjectival instances of this construction is that are essentially modal (Meier 2003). This wouldn't follow straightforwardly from our proposal.

7.4 *Concluding remark*

We have argued that a variety of constructions in a variety of languages point to a deep connection between Carlsonian kinds, manners, and degrees, and have articulated a way of thinking about degrees as kinds of states (and secondarily, manners as kinds of events, following previous work). This enabled us to provide a cross-categorial semantics for both for kind modifiers and for their clausal complements, which involve abstraction over degree state-kinds. On this view, equatives emerged as a special case of a cross-categorial phenomenon, one that parallels what have previously been analyzed as kind relatives or free relatives. The analysis we proposed builds on an independently-motivated semantics for free-relatives (Caponigro 2003, 2004). Taking this overall perspective may place

a several difficult empirical puzzles in a new light. It also converges on a common conclusion with Moltmann (2009), who arrived at it on mostly independent grounds: that our usual ontology of degrees needs to be considerably enriched.

Although we have focused on the compositional semantics of several specific constructions, the driving force behind the analysis was an aspect of the enterprise Bach (1989) famously characterized as 'natural language metaphysics'. But substantively, we have been quite conservative in this regard. In one respect, we have expanded the ontology: the notion of degree state-kinds is novel. But in another, we have actually streamlined it: if we are on the right track, degrees can actually be derived from an independently-expected interaction of well-established elements int he model. If states and events exist, and if kinds can be constructed in the Chierchia way, it would actually require some independent, extrinsic stipulation to avoid the conclusion that state-kinds and event-kinds should exist as well. Certainly, if one accepts event-kinds, one should accept state-kinds, too. To be sure, given all the independent evidence for taking degrees to be primitives and the years of progress in degree semantics that has been achieved based on that idea, it would be unwise to cast it overboard too readily. But, just as linguistic facts led us all to the usual contemporary conception of degrees, it is linguistic facts—and a robust, crosslinguistic set of them, manifested in a variety of ways—that here has lead us away from it. Over the past several decades, a number of different conceptions of degrees have been proposed, and viewed from that perspective, where we have wound up is not particularly radical. Indeed, it echoes an old an influential idea (Cresswell 1976).

Whatever the merits of these ideas are, though, the best-grounded theoretical point here isn't about the ontology of degrees or even the particular analysis proposed. It is, rather, that the correspondences among expressions involving kind, manner, and degree are systematic and deep—and that they cry out for explanation.

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