

DEGREES AS KINDS

Marcin Morzycki
joint work with Curt Anderson
Michigan State University

Ohio State University
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INTRODUCTION

Some accidental homophonies:

- (1) a. **manner:** How did he do it?
b. **degree:** How tall is he?

- (2) a. **kind:** such a dog as this
b. **manner:** Clyde behaved as I did.
c. **degree:** Clyde is as tall as Floyd.

The received view: Meh.

The empirical argument:

- not an accident
- reflects a deep connection among degrees, manners, & kinds
- there is evidence for this connection in a number of languages

Theoretical issues:

- adjectives probably have degree arguments
- adjectives possibly have state arguments
- do we need both?
- what's exactly is a 'degree', anyway?

Proposal:

- no need for a separate degree argument
- degrees are Carlsonian kinds of Davidsonian states
(building on Landman & Morzycki 2003, Landman 2006)
- this explains the cross-categorial parallels

- cross-categorial parallels
- how can degrees be kinds?
- semantics of cross-categorial kind modifiers
- semantics of their clausal complements
- final remarks

Anaphors:

(3) 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'

Same *wh*-word across domains:

(4) 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?’

Combined, *tak* and *jak* abstract over the three domains:

(5) 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’

Same word for 'same':

(6) 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'

Least appealing account possible:

- *tak*, *jak*, and *sam* are each 3-ways ambiguous
- ambiguity happens to be precisely the same for all of them

But on standard assumptions, what's the alternative?

German anaphor *so*:

- (7) 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.'

As in Polish, a corresponding *wh*-word, *wie*:

(8) 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.'

English *as*:

- (9) a. **kind:** such a dog as this
- b. **manner:** Clyde behaved as I did.
- c. **degree:** Clyde is as tall as Floyd.

Deeper similarity to Polish & German facts: *so*.

- (10) a. **degree:** so tall (as this)
b. **manner:** stand so as not to block your view

Cognate with German *so*.

No kind use...

But wait. English *such*, cognate with *so*:

(11) such a dog

Best-studied kind anaphor (Carlson 1977, Landman & Morzycki 2003, Landman 2006, Constantinescu 2011; cf. Siegel 1994).

Such and *so* are very similar:

- Bresnan (1973): *such* derived from *so* via transformation
- Carlson (1977): same
- Landman (2006): *such* is *so-like*

Such, like *so*, has a degree(-like) reading:

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

Such, like *so*, triggers DP-internal fronting (Abney 1987, Matushansky 2002):

(13) a. *a $\left\{ \begin{array}{l} \text{so} \\ \text{such} \end{array} \right\}$ tall man
 b. $\left\{ \begin{array}{l} \text{so} \\ \text{such} \end{array} \right\}$ a tall man

Apparently AP-modifying use of *so* is obligatorily pronounced *such* with mass nouns:

(14) $\left\{ \begin{array}{l} *so \\ such \end{array} \right\}$ fine food

Both *such* and *so* license *that*-phrases (in addition to *as*-phrases):

- (15) 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

Therefore:

- *such* is a superficial variant of *so*
- English only narrowly missed having a three-way parallel

English also has some two-way parallels (Landman 2006, Anderson 2010):

- (16) a. **kind:** a dog like this
b. **manner:** behave like this
- (17) a. **degree:** how tall is he?
b. **manner:** how did he behave?

Also:

(18) He's $\left\{ \begin{array}{l} \text{kind of} \\ \text{sort of} \end{array} \right\}$ tall.

Even:

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

Title of a movie and 3 distinct songs:

(20) Some Kind of Wonderful

THE BROADER VIEW

Lots of other potential examples. French (Desmets & Moline 2007):

(21) 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!'

Japanese:

(22) 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?’

Best-documented and most important two-way parallel (Haspelmath & Buchholz 1998, Rett 2011): homophony in morphemes that mark. . .

- equative clauses (same degree: *as tall as Clyde is*)
- similitive clauses (same manner: *die as Clyde did*)

Languages with this parallel (in Europe alone, but not all Indo-European):

- (23)
- a. Romance: Spanish, Portuguese; Catalan; Occitan; Italian
 - b. Balto-Slavic: Slovene; Russian; Slovak; Lithuanian
 - c. Germanic: Dutch; Yiddish; Danish, Swedish; Icelandic; Faroese
 - d. Romani
 - e. Modern Greek
 - f. Finnish
 - g. Georgian
 - h. Armenian
 - i. Turkish
 - j. Lezgian
 - k. Abkhaz
 - l. Kabardian

Of 43 they examined, 27 had identical morphemes.

SUMMARY

Overall picture:

- similar expressions for kinds, manners, & degrees in lots of places in lots of languages
- too systematic and too widespread to be an accident
- suggests a profound connection among these domains

- ✓ cross-categorial parallels
 - **how can degrees be kinds?**
 - semantics of cross-categorial kind modifiers
 - semantics of their clausal complements
 - final remarks

NATURE OF DEGREES

Different ideas about what degrees are:

- nothing (Kamp 1975, Klein 1980, 1982)
- equivalence classes (Cresswell 1976)
- points on an abstract scale (Seuren 1973, von Stechow 1984)
- intervals on an abstract scale (Kennedy 1997, Schwarzschild & Wilkinson 2002)

Problems for any typical view (Moltmann 2007, 2009):

- nominalizations
- non-degree modification

Problem of nominalizations:

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

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

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

b. ??We were amazed at six feet.

Problem of non-degree modification (Katz 2003, Geuder 2005, Mittwoch 2005, Maienborn 2007, Katz 2008, Ernst 2011):

- (26) a. Clyde is $\left\{ \begin{array}{l} \text{visibly happy} \\ \text{happy in a visible way} \\ \text{strangely beautiful} \\ \text{beautiful in a strange way} \end{array} \right\}$.
- b. The talk was $\left\{ \begin{array}{l} \text{oddly unnerving} \\ \text{fatally flawed} \end{array} \right\}$.
- c. These examples might be misleadingly exceptional.

Moltmann's alternative is **TROPES** (or 'accidents' or 'modes'):
concrete particular instantiations of a property.

Moltmann (2009) informs us that she is looking at a red box.



The particular redness of this box is a trope. It has:

- a precise shade
- a spatial location: here, on this slide
- a temporal location: now
- no other box has its redness



The particular redness of this box is a trope. It has:

- a precise shade
- a spatial location: here, on this slide
- a temporal location: in the past
- no other box has its redness



Useful! But:

- on its own, doesn't get us connection to kinds
- Davidsonian states are more familiar
- if we can get away with those, we should
- will focus here on compositional issues here

NATURE OF KINDS

- model needs to include kinds anyway (*bears, the grizzly bear*; Carlson 1977)
- will adopt Chierchia (1998) representation of kinds

The plurality of actual rabbits:

ACTUAL
WORLD:



Might be the denotation of *all the rabbits* (more or less).

Chierchia: The kind RABBIT consists of all possible rabbits:

ACTUAL
WORLD:



WORLD 1:



WORLD 2:



WORLD 3:



Denotation of kind-denoting *rabbits*.

Kinds of states and events come for free.

Then:

- Event-kinds (can) represent manners (Landman & Morzycki 2003, Landman 2006, Gehrke 2011).
- State-kinds (can) represent degrees.

To get there, start with a Cresswell-style equivalence class of people who are precisely 6 feet tall:

**ACTUAL
WORLD:**

Floyd + Clyde + Bertha + Edna

To get there, start with a Cresswell-style equivalence class of people who are precisely 6 feet tall. Then intensionalize it:

**ACTUAL
WORLD:** Floyd + Clyde + Bertha + Edna

WORLD 1: Floyd + Clyde + Gertrude

WORLD 2: Bugs + Bertha + Daffy + Tweety

WORLD 3: Sam + Sylvester

This is a Chierchia-style individual kind (possibly denotation of *?the six-foot tall*).

Davidsonian spin on this: the kind SIX-FEET-TALL consists of all possible **STATES** of being six feet tall:

ACTUAL WORLD: $\left(\begin{array}{c} \text{Floyd's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Clyde's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Bertha's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Edna's-6'} \\ \text{tallness} \end{array} \right)$

WORLD 1: $\left(\begin{array}{c} \text{Floyd's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Clyde's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Gertrude's-6'} \\ \text{tallness} \end{array} \right)$

WORLD 2: $\left(\begin{array}{c} \text{Bugs's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Bertha's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Daffy's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Tweety's-6'} \\ \text{tallness} \end{array} \right)$

WORLD 3: $\left(\begin{array}{c} \text{Sam's-6'} \\ \text{tallness} \end{array} \right) + \left(\begin{array}{c} \text{Sylvester's-6'} \\ \text{tallness} \end{array} \right)$

All possible ways of being 6 feet tall.

Not all state-kinds are degree state kinds:

- There is a state-kind BEAUTIFULLY-TALL.
- It's not ordered with respect to 6-FEET-TALL.

Assumptions:

- $\cup k$ is the property correlate of the kind k (Chierchia)
- so $\cup k(x)$ is true iff x realizes the kind k
- I will use type k for kinds (individuals, states, events) and variables k, k', \dots
- I will use type o for non-kind objects (individuals, states, events) and variables o, o', \dots

(27) Floyd is six feet tall.

(28) $\llbracket tall \rrbracket = \lambda x \lambda s . \mathbf{tall}(s, x)$

NB: $\mathbf{tall}(s, x)$ means s is a state of x having a certain tallness, not necessarily of being tall.

(29) $\llbracket six\ feet \rrbracket = \lambda s . \cup_{SIX-FEET}(s)$

(30) $\llbracket [six\ feet] [Floyd\ tall] \rrbracket = \lambda s . \mathbf{tall}(s, \mathbf{Floyd}) \wedge \cup_{SIX-FEET}(s)$

(31) Floyd is tall.

A version of Rett (2008)'s EVAL:

(32) $\llbracket \text{EVAL} \rrbracket = \lambda s . \exists k \in \text{degree-state-kinds}(s) [\cup k(s) \wedge$
 $k \succ_s \text{standard}_{s,c}]$

(33) $\llbracket \text{EVAL} [\textit{Floyd tall}] \rrbracket$
 $= \lambda s . \exists k \in \text{degree-state-kinds}(s) [\cup k(s) \wedge$
 $k \succ_s \text{standard}_{s,c}] \wedge \text{tall}(s, \text{Floyd})$

- ✓ cross-categorial parallels
- ✓ how can degrees be kinds?
 - **semantics of cross-categorial kind modifiers**
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SIMPLE VERSION

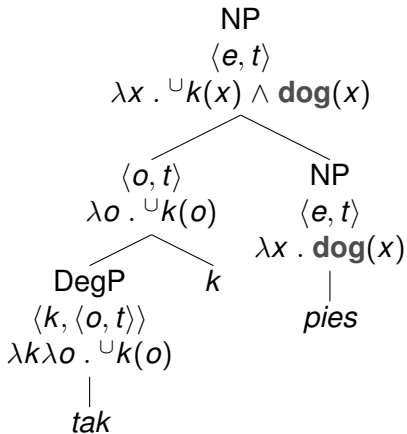
Tak takes a kind argument:

$$(34) \quad \llbracket tak \rrbracket = \lambda k \lambda o . \cup k(o)$$

Often, supplied by context:

$$(35) \quad \llbracket tak k \rrbracket = \lambda o . \cup k(o)$$

(36)



$$\begin{aligned}
 (37) \quad \llbracket [_{VP} \textit{Floyd mówił}] \rrbracket &= \lambda e . \mathbf{spoke}(e, \mathbf{Floyd}) \\
 \llbracket [_{VP} \textit{Floyd mówił}] [tak\ k] \rrbracket & \\
 &= \lambda e . \mathbf{spoke}(e, \mathbf{Floyd}) \wedge \cup k(e)
 \end{aligned}$$

$$\begin{aligned}
 (38) \quad \llbracket [_{AP} \textit{Floyd wysoki}] \rrbracket &= \lambda s . \mathbf{tall}(s, \mathbf{Floyd}) \\
 \llbracket [tak\ k] [_{AP} \textit{Floyd wysoki}] \rrbracket & \\
 &= \lambda s . \mathbf{tall}(s, \mathbf{Floyd}) \wedge \cup k(s)
 \end{aligned}$$

If only it were so simple.

THE MISSING-READINGS PROBLEM

Can event-kinds be degrees? Should be possible:
RUN-SIX-MILES.

Impossible for similatives to get degree readings (Rett 2011):

- (39) 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.

Can state-kinds be manners? Should be possible:
FATALLY-WOUNDED.

Impossible for AP-modifying kind anaphors to get manner readings:

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

Problem in a nutshell:

- Why can't event kind modifiers get degree readings?
- Why can't state kind modifiers get manner readings?

A compositional answer?

- consequence of interaction between kind modifiers & degree heads
- but how would this block degree readings for event kind modifiers?

Morphological blocking (also or instead)?

- degree readings for VP kind modifiers impossible because blocked by e.g. *(ran) as much as*
- but how would this block manner readings for state kind modifiers?

This approach seems to miss something:

- degrees have a special status with respect to states
- manners have a special status with respect to events

What does 'special status mean'?

CROSS-CATEGORIAL KIND MODIFIERS: DISTINGUISHED PROPERTIES

Maybe degree state-kinds are natural kinds or well-established kinds?

Fishy.

Why are degree state-kinds special, intuitively?

- for tallness, kinds involving height are more fundamental than kinds involving manner of manifesting height (beautifully, disconcertingly, etc.)
- principal reason we talk about such states is to compare them in a scalar way to others

Why are manner event-kinds special, intuitively?

- a core part of what it is to be an event is to be realized in some manner
- for **SOME** events, we might care a great deal about e.g. temporal extent
- but for **EVERY** event, we care about how it took place
- we don't talk about events chiefly to measure them

Embracing the problem:

- don't know precisely 'special' actually means
- do know language cares about it
- as linguists, we should ask above all, **HOW** language cares
- deeper question of **WHY** it cares may be one to discuss with philosophers, psychologists, etc.

A way of thinking about(/quarantining) the problem:

- manners are **DISTINGUISHED PROPERTIES** of events
- ... and degrees of states

In symbols:

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

So:

- **dist**($s, \cup k$) is true iff k is a degree state-kind
- **dist**($e, \cup k$) is true iff k is a manner event-kind

A presupposition:

$$(42) \quad \llbracket tak \rrbracket = \lambda k \lambda o : \mathbf{dist}(o, {}^{\cup}k) . {}^{\cup}k(o)$$

Compositionally, this changes little:

$$(43) \quad \begin{array}{l} \text{a. } \llbracket [_{VP} \textit{Floyd m\u00f3wi\u0142}] [tak k] \rrbracket \\ \quad = \lambda e : \mathbf{dist}(e, {}^{\cup}k) . \mathbf{spoke}(e, \mathbf{Floyd}) \wedge {}^{\cup}k(e) \\ \text{b. } \llbracket [tak k] [_{AP} \textit{Floyd wysoki}] \rrbracket \\ \quad = \lambda s : \mathbf{dist}(s, {}^{\cup}k) . \mathbf{tall}(s, \mathbf{Floyd}) \wedge {}^{\cup}k(s) \end{array}$$

Will omit **dist** from now on.

- ✓ cross-categorial parallels
- ✓ how can degrees be kinds?
- ✓ semantics of cross-categorial kind modifiers
 - **semantics of their clausal complements**
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FIRST STEPS

What I mean: in English, *as* clauses.

Important, because:

- a major part of the parallelism
- in degree case, a basic degree construction: the equative
- a connection to free relatives (Rett 2011)
- nominal version, connection to ordinary(-ish) relatives

Adnominal use:

- (44) taki pies jak Floyd
 TAK-MASC dog WH Floyd
 'such a dog as Floyd.'

With elided clause:

- (45) taki [λk Floyd jest jak ~~k~~]
 TAK-MASC Floyd is WH

Wh word *jak* is identical to *tak*:

$$(46) \quad \llbracket jak \rrbracket = \lambda k \lambda x . \cup k(x)$$

Clause denotes property of kinds:

$$(47) \quad \llbracket \lambda k \text{ Floyd } \textit{jest} \textit{jak} \textit{k} \rrbracket = \lambda k . \cup k(\mathbf{Floyd})$$

... which causes a type clash, because *tak* expects a kind.

INTERLUDE ON FREE RELATIVES

Resembles how Caponigro (2003, 2004) treats free relatives:

- denote properties
- often trigger type clash
- type shifts systematically rescue them

Two standard(-ish) type shifts (Partee 1987):

(48) **Iota Shift** (from $\langle \tau, t \rangle$ to τ):
 shift P to $\iota x_{\tau}[P(x)]$

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

Caponigro: Iota preferred over Existential Closure.

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

To wants an individual-denoting complement. Gets a property.

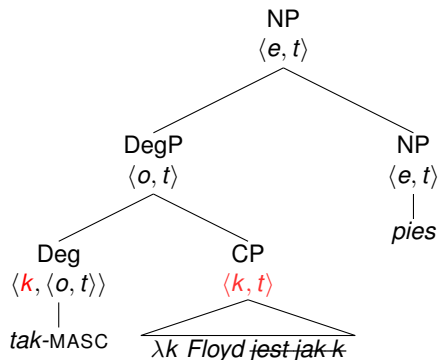
It's not possible here, so Existential Closure applies:

(51) $\exists x \left[\begin{array}{l} \text{Captain Kirk went to } x \wedge \\ \text{no man had gone to } x \text{ before} \end{array} \right]$

CLAUSAL COMPLEMENTS OF KIND MODIFIERS: ADNOMINAL USES CONTINUED

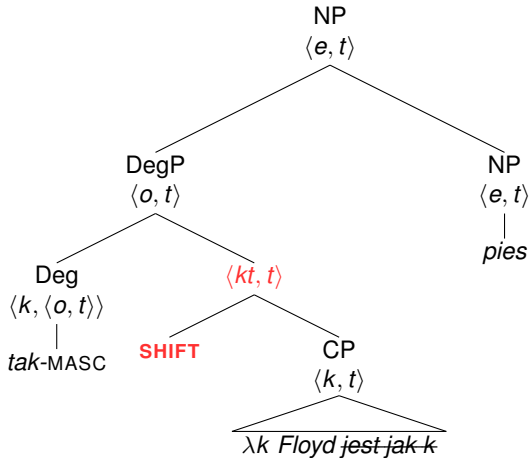
Type shift necessary to avoid a type clash:

(52)



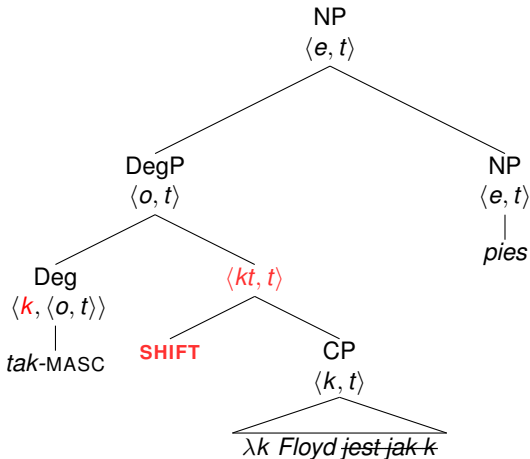
Ita not possible, so Existential Closure applies:

(53)



Iota not possible, so Existential Closure applies:

(53)



... and then QR.

(54)

$$\left[\begin{array}{c} \langle kt, t \rangle \\ \text{SHIFT } \lambda k \text{ Floyd jest jak } k \end{array} \right] \quad \left[\begin{array}{c} \langle k, t \rangle \\ \lambda k' [\text{tak-MASC } k' \text{ pies szczekał}] \end{array} \right]$$

$$= \exists k \left[\cup k(\mathbf{Floyd}) \wedge \exists x \left[\cup k(x) \wedge \mathbf{dog}(x) \wedge \mathbf{barked}(x) \right] \right]$$

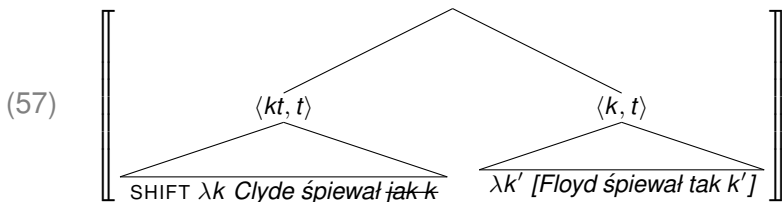
A dog barked that realizes a kind Floyd also realizes.

MANNER USES

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

Again, Existential Closure shift and QR:

- (56) a. [Floyd sang tak [SHIFT λk Clyde sang jak κ]]
b. [SHIFT λk Clyde sang jak κ] [$\lambda k'$ Floyd sang tak k']



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

There's a kind that is realized by both an event of Clyde singing and an event of Floyd singing.

DEGREE USES

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

With elided clause:

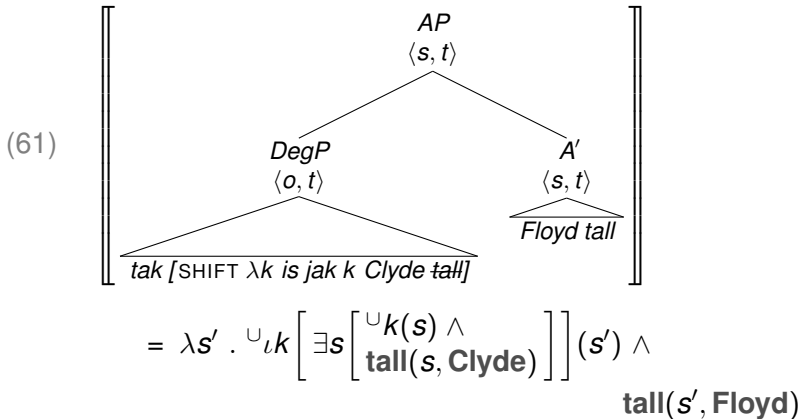
- (59) tak [λk is [_{AP} [_{DegP} jak k] Clyde tak ~~k~~]]

Equative clause denotes property, but complement to *tak*, which needs a kind.

Here, Iota Shift **IS** possible. So:

$$(60) \quad \llbracket \text{SHIFT } \lambda k \text{ is } [_{AP} [_{DegP} \text{ jak } k] \text{ Clyde tall }] \rrbracket \\ = \iota k [\exists s [\cup k(s) \wedge \text{tall}(s, \text{Clyde})]]$$

The degree state-kind which Clyde's height realizes.



A property of states of Floyd's tallness that also realize the degree state-kind Clyde's height realizes.

SUMMARY

Assuming degrees and manners are kinds made possible cross-categorial semantics for complement clauses that are normally analyzed differently.

Addressed a tricky issue:

- kind & manner complement clauses make existential claims
- degree complement clauses (equatives) don't
- follows independently from Caponigro's assumptions

- ✓ cross-categorial parallels
- ✓ how can degrees be kinds?
- ✓ semantics of cross-categorial kind modifiers
- ✓ semantics of their clausal complements
- **final remarks**

Summary:

- deep connection between kinds, manners, and degrees
- in multiple places in multiple languages
- understandable if degrees are state-kinds
- makes possible cross-categorical analysis of kind modifiers
- . . . and of their complement clauses
- equatives emerge as a special case of a more general phenomenon

Big-picture points:

- Moltmann's right: there may be more to degrees than we think.
- This need not complicate the ontology.

Some questions:

- How to make sense of 'distinguished properties'?
- How might this help/hurt with other constructions?
- After all this: maybe state-kinds simply 'reconstruct' degrees?
- What does this tell us about Davidsonian eventualities?
- Do we need tropes?

Thanks!

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coauthor:
**Curt
Anderson**

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