Equatives across categories in Germanic

Implications for the ontology of degrees and manners

Jianrong Yu

Center for Research in Syntax, Semantics, and Phonology, KU Leuven

`jianrong.yu@kuleuven.be`

The University of Manchester
15 May, 2023

Slides at: https://tinyurl.com/manchester-equatives

KU LEUVEN

CRISSP
Center for Research in Syntax,
Semantics, and Phonology

Variation in comparison constructions

- It is well known in the literature on comparisons of inequality (superiority and inferiority) that there is **significant cross-linguistic variation in their morphosyntax** (e.g., Beck et al. 2012).

(1) Kim is tall**er than** Tom (is). (comparative **-er** and **than**)

(2) Kim wa   Tom **yori kasikoi**.
     Kim TOP Tom YORI smart
     Kim is smarter than Tom. (Japanese, bare adjective, **yori**)

(3) Kim na   **lata**, to Tom na **kwadoḡi**.
     Kim TOP tall   but Tom TOP short
     Kim is taller than Tom.

(Motu, bare adjective antonym, conjunction)

Comparisons of equality across categories

- Less well-studied are comparisons of equality (**equatives**); just like comparisons of inequality, equatives show both intra-language and inter-language morphosyntactic variation across syntactic categories.

- Some basic terminology to discuss variation in comparisons of equality: **parameter markers (PM)** and **standard markers (SM)**.

  (4) Kim   is   *as* tall   *as* Tom   (is).
        comparee copula PM parameter SM standard (copula)

                                                              (Haspelmath and Buchholz, 1998)

Comparisons of equality across categories

- When the parameter is non-adjectival and verbal, English uses the same SM as with adjectival equatives but **obligatorily lack the PM** (in the absence of a quantity adjective like *much*).

    (5)   Tom   (***as**) ran   **as** Kim   ran/did.
           comparee PM   parameter SM standard parameter

- Rett (2013) observes that the presence/absence of a PM in English equatives corresponds to **the availability of degree readings**.

- (4) is interpreted as comparing only **measures of height**, whereas (5) **compares only the way(s) in which running was carried out (event properties or manners)**, not measures of, e.g., distance, time.

Typological tendencies

- In a survey of (mostly European) languages, Haspelmath and Buchholz (1998) observe that the English pattern between gradable adjectives and verbs seems to be a typological tendency.
- Languages typically **use a PM if the parameter is an adjective but not if it is a verb**. On the other hand, languages typically **use the same SM to mark the standard across both adjectival and verbal equatives**.
- In what follows, we **scrutinize this typological claim more carefully** by looking across German and Dutch (Germanic).
- In particular, we **examine how the differing morphosyntax determines what equatives can(not) mean**.

Broad objectives

- Looking across English, German, and Belgian Dutch, we demonstrate that **PMs do not exclusively mark adjectival parameters** and also **do not always correlate with exclusive degree readings**, contra Haspelmath and Buchholz (1998) and Rett (2013).

- German and Belgian Dutch in particular counterexemplify the morphosyntactic typological tendency of using PMs only for adjectival parameters, **marking both adjectival and verbal parameters with PMs** (e.g., Anderson and Morzycki 2015, Hohaus and Zimmermann 2021).

- However, German and Belgian Dutch **differ in the distribution of degree and manner readings** even if parameters of comparison are always marked with PMs.

Broad objectives

- We review previous analyses of PMs in English (Rett, 2013) and German (Hohaus and Zimmermann, 2021), assessing their suitability for Belgian Dutch, concluding that these are inadequate and suggest an **eventuality kinds-based analysis** advanced in Anderson and Morzycki (2015).

- The analysis therefore lends further support to a view where **degrees and manners can emerge as properties of eventuality kinds** rather than always being semantic primitives in the grammar (Zhang, 2020; Sun, 2021).

Variation in Germanic: English

- Recall that English marks adjectives with PMs while PMs are absent with verbs in the absence of *much*, repeated below.

  (6) Kim   is   ***as*** tall   ***as*** Tom   (is).
      comparee copula PM parameter SM standard (copula)

  (7) Tom   (****as***) ran   ***as*** Kim   ran/did.
      comparee PM   parameter SM standard parameter

- Rett (2013) observes that the presence of a PM in English equatives corresponds exclusively to **degree readings**, while its presence blocks such readings.

Diagnosing degree readings: Evaluativity

- Two ways to diagnose degree readings: first, one property of degree interpretations is **evaluativity**, i.e., **whether or not the gradable adjective is interpreted as equal to or exceeding some contextual standard** (Rett, 2015).
- When an adjective is marked with a PM in equatives, it is interpreted as **non-evaluative (degree)**; lack of a PM on the other hand requires **evaluativity (non-degree)**.

Evaluativity and PMs

(8) a. Sue is **as** tall as Bill (is), but they are both short (only 1.55m tall).

(degree reading, non-evaluative)

b. Sue is tall **like** Bill, # but they are both short (only 1.55m tall).

(no PM, 'manner' reading, evaluative)

(9) a. Sue is **as** tall as Bill (is), # that is, Sue is 1.8m and Bill is 1.82m.

(PM, 'manner' non-degree reading, evaluative)

b. Sue is tall **like** Bill (is); Sue is 1.8m and Bill is 1.82m.

(no PM, 'manner' non-degree reading, evaluative)

Diagnosing degree readings

- Second, English equatives containing a PM are **compatible with gradable adjectives like *tall*** (which can have differing measures, i.e., degrees), but are **clearly marked when replaced with a non-gradable adjective like *amphibian***.
- To the extent one can interpret equatives with non-gradable adjectives and PMs, a highly coerced reading is obtained.
- The relevant interpretation is one of **imposing a scale with multiple points on which an object can be located upon the non-gradable adjective (e.g., prototypicality)**, i.e., degrees (Rett, 2013).

Gradable versus non-gradable adjectives

(10) a. Sue is as tall as Bill, that is, they are both 1.70m tall.

b. #? Specimen A is as amphibian as specimen B.
Possible interpretation: Specimen A *looks as much of an amphibian* as specimen B (though neither of them looks very amphibian).

Verbs with equatives in English

- Recall that **English does not mark verbal parameters with PMs** in equatives.
- This leads to the **expectation that English verbal equatives never have degree readings**.
- This is indeed borne out; crucially, even with verbs that intuitively describe a change in the degree of a property that an object holds (**degree achievement verbs**) (e.g., Kennedy and Levin, 2008), degree readings are still impossible.

Verbs with equatives in English

(11)   Activity verbs
        Kim (***as***) ran as Sue did/ran.   (no PM)

        a.   That is, they both ran in circles around the field.   (manner)
        b.   #That is, they both ran 3km / for 3 hours.   (degree)

(12)   Degree achievement verbs
        Kim (***as***) cooled the pizza as Sue did.   (no PM)

        a.   Namely, by blowing on it.   (manner)
        b.   #Namely, by 10 degrees Celsius.   (degree)

PMs correspond to degree readings in English

- The overall generalization in English: presence of a PM correlates with a degree reading, absence correlates to a property/manner reading and lack of degree readings.
- This effect is **cross-categorial** and **crosscuts both gradable adjective and verbal equatives**.

Variation in Germanic: German

- It is not difficult, however, to find exceptions to Haspelmath and Buchholz's typological generalization, even within Germanic.
- German uses **a demonstrative element *so*** (similar to English *so*) as a PM, with **a *wh*-word *wie* 'how'** as a SM, **in both adjectival and verbal comparisons of equality** (Anderson and Morzycki, 2015; Hohaus and Zimmermann, 2021).

(13) Nadine ist *so* groβ *wie* Anna.
      Nadine is so tall   how Anna
      'Nadine is as tall as Anna.'   (gradable adjective)

(14) Johannes hat auch *so* getanzt *wie* Susanne.
      John   has also so danced how Susan.
      'John danced as Susan did.'   (verb)

German PMs

- The putative PM *so* in German is also used more generally **outside equative contexts**.
- For example, it can be used as **a pro-form anaphoric to contextually salient or linguistically expressed antecedents**. These antecedents can refer to **a measure of a scalar property (degree) or a property of an event (manner)** (Anderson and Morzycki, 2015; Umbach et al., 2022).

  (15) Ich bin **so** groβ.
       I   am so tall
       'I am this tall.'

  (16) **so** getanzt
       so danced
       'danced like that'

PMs do not enforce degree readings in German

- Generalization based on English: **PMs enforce degree readings, block manner readings**.
- German, on the other hand, **uniformly uses PMs for both gradable adjective and verbal equatives**.
- If the generalization based on English is right, this **should mean German equatives never have a manner reading**, regardless of whether they are built off adjectives or verbs.

German adjectival equatives have 'manner' readings

- This expectation is not borne out. Adjectival equatives can be interpreted as referring to **degrees or nominal properties ('manners')**.
- **The latter is best demonstrated with a non-gradable adjective** e.g., *x is as amphibian as y*.
- In English, such uses are either ungrammatical or have a highly coerced (degree) reading along some gradable scale of prototypicality as in (10b) (Rett, 2013).

German adjectival equatives have 'manner' readings

(17) Nadine ist **so** groβ **wie** Anna.
Nadine is so tall   how Anna
'Nadine is as tall as Anna.'   (degree)

(18) Freddie der Frosch ist **so** amphibisch **wie** Moritz der Molch.
Freddie the frog   is so amphibian how Moritz the newt
'Fred the frog is **amphibian in the same way** Moritz the newt is; they **share all relevant amphibian properties**.'   (property)

(Hohaus and Zimmermann, 2021, p. 100-101)

German verbal equatives

- German verbal equatives with *so* are **similarly ambiguous between a manner and degree reading**.
- **This is best illustrated with degree achievement verbs**, assuming a degree argument is available at some point in the semantic composition (e.g., Kennedy and Levin, 2008).
- Recall that English, which does not mark verbs in equatives with PMs, lacks a degree reading and only has manner readings with these verbs.

German verbal equatives with degree achievements

(19) Wir haben die pizza **so** abgekühlt **wie** die lasagn.
we have the pizza so cooled how the lasagne
'We cooled the pizza as we cooled the lasagne.'

    a. Nämlich durch Pusten.
      namely through blow
      'Namely through blowing on it.'

    b. Nämlich auf 21 grad raumtemperatur.
      namely to 21 degrees room.temperature
      'Namely to 21 degrees.'

(Hohaus and Zimmermann, 2021, p. 101-102)

PMs in German are ambiguous

- Unlike English PMs, **German PMs are genuinely ambiguous and can refer to degrees or properties/manners**.
- Again, this effect is **cross-categorial**, cross-cutting adjectival and verbal equatives.

Variation in Germanic: Belgian Dutch

- Similar to German, Belgian Dutch uses the related **zo**, roughly English *so*, as a PM and the SM **als** 'as' in **both adjectival and verbal equatives** (e.g., Corver 1997, 2018).

- Haspelmath and Buchholz's (1998) original survey listed Dutch in general as conforming to the typological trend of not marking verbs with PMs in equatives, since **zo and als appear to mark the standard of comparison together as a single SM zoals**.

  (20)   Jan   is **zo** groot **als** Sue.
         John is so tall   as Sue
         'John is as tall as Sue.'   (gradable adjective)

  (21)   Nadine had **zoals** Sigrid gerend.
         Nadine had so.as   Sigrid ran
         'Nadine ran like Sigrid.'   (verb)

Variation in Germanic: Belgian Dutch

- In Belgian Dutch, however, the pattern in (21) is not the only form a verbal equative can take.

- While there is variation amongst individual speakers, **the standard clause marked by *als* can also appear 'extraposed' to the right**, similar to English comparative constructions (e.g., Heim, 2000, 2006; Bhatt and Pancheva, 2004). This suggests that Belgian Dutch also constitutes a true counterexample to the typological tendency.

  (22) Nadine had ***zo*** gerend ***als*** Sigrid.
        Nadine has so ran   as Sigrid
        'Nadine ran as Sigrid ran.'

Belgian Dutch PMs

- As in German, the PM *zo* is not restricted to equatives. It is also used generally as **an anaphoric pro-form**.

- (23)   Jan   is 1.70m groot. Jane is ook *zo* groot.
  John is 1.70m tall   Jane is also so tall
  'John is 1.70m tall and Jane is 1.70m tall too.'

- (24)   Jan gedroeg zich   erg goed vandaag. Jane gedroeg zich   ook *zo*.
  John behave himself very bad today   Jane behave herself also so
  'John behaved badly today and Jane behaved so too.'

Belgian Dutch adjectival equatives

- Belgian Dutch, while **always marking parameters with PMs like German**, exhibit **only degree readings with gradable adjectives just as in English**.
- Again, exclusive degree readings can be diagnosed through evaluativity; **Belgian Dutch adjectival equatives are never evaluative**.
- In addition, unlike German, non-gradable adjectives are incompatible or receive a highly coerced reading, imposing some gradable scale of measurement instead.

Belgian Dutch adjectival equatives are non-evaluative

(25) Jan is **zo** groot **als** Sue.
John is so tall as Sue
'John is as tall as Sue.'

    a. #Jan is 1m80 en Sue 1m85.
        John is 1m80 and Sue 1m85
        'John's height is 1m80 and Sue's is 1m85.'   (evaluative)

    b. Jan is 1m68 en Sue ook.
        John is 1m68 and Sue too
        'John's height is 1m68 and Sue is 1m68 too.'   (degree)

(26) Die vlieg is **zo** dood **als** die mug.
that fly is so dead as that mosquito
'The fly looks just as dead as the mosquito (they sustained the same degree of fatal injuries).'

Belgian Dutch verbal equatives

- Again, unlike German, **Belgian Dutch verbal equatives pattern like English in never having degree readings**.
- With degree achievement verbs, **only a manner reading is available and not a degree reading**.
- This is **despite the fact that Belgian Dutch marks verbal parameters with PMs**.

Belgian Dutch verbal equatives

(27) We hebben de pizza **zo** afgekoeld   **als** de lasagne
      we have   the pizza so cooled.down as the lasagna
      'We cooled down the pizza like the lasagna.'

    a.   Namelijk door te blazen.
        namely   by   to blow
        'Namely by blowing.'

    b. #Namelijk met 21 graden.
        namely   by   21 degrees
        'Namely by 21 degrees.'

(degree achievements with *zo...als*)

PMs in Dutch are unambiguous

- **Despite the fact that Dutch marks both adjectival and verbal parameters with the PM *zo*, it neither exclusively refers to degrees nor is always ambiguous**.
- The observed readings in Dutch are **not dependent on the PM *zo*, but on the syntactic category of the parameter** that *zo* marks.

PMs and distribution of degree and manner readings

- So far, we have seen that across Germanic, **the distribution of degree and manner readings of equatives correlate with the presence of a PM in different ways**.
- **English:** PM *as* correlates with degree readings, verbal equatives do not have PMs and hence only have manner readings.
- **German:** both adjectival and verbal equatives are marked with PMs and consequently, both adjectival and verbal equatives can have degree and manner readings.
- **Belgian Dutch:** both adjectival and verbal equatives are marked with PMs and yet, adjectival equatives only have degree readings and verbal equatives only have manner readings.

Looking for an analysis

- How might we explain these different correlations? One natural way is to draw on analyses of comparative constructions, where **degrees conceived of as points on a gradable scale are directly manipulated within the gramar** (e.g., Bresnan, 1973; Cresswell, 1976; Seuren, 1984; Heim, 1985, 2000; Kennedy, 1997, *a.m.o.*).

- Degrees are **semantic objects** (formally semantic type d) representing **points on totally ordered scales** (height, width, length, etc.) (e.g., Seuren, 1984; Kennedy, 1997).

- Total order: **If d_1 and d_2 are different points on a totally ordered scale, then it must be that $d_1 > d_2$ or $d_2 > d_1$; otherwise, $d_1 = d_2$.**

Formal Analysis: Gradable adjectives and degrees

- Assuming degrees are a primitive of the grammatical/semantic system, **gradable adjectives must then relate objects to degrees**.
- Formally, gradable adjectives are **relations between degrees and individuals**, i.e., functions from degrees to individuals to truth values $<d,et>$ (Heim, 1985).
- In a simple bare 'positive' use of an adjective like *tall*, we intuitively need to **set a standard of comparison that an individual reaches or exceeds to be considered tall**, which is contextually sensitive.
- This is often assumed to be the **contribution of some null morpheme that introduces such a standard** (e.g., POS(ITIVE) in Kennedy, 1997).

  (28) $[\![tall]\!]$: $\lambda d.\lambda x.$ x is d-tall

  (29) $[\![Kim\ is\ tall]\!]^c$: $\exists d[$Kim is d-tall $\&\ d \geqslant$ STANDARD$_c$(tall)$]$

Formal Analysis: Comparatives relate two (sets of) degrees

- Against this general backdrop, **a comparative construction essentially asserts that one degree (provided by the matrix clause) is greater than another degree (provided by the standard clause)**.

- This is assumed to be the semantic contribution of the comparative morpheme, e.g., *-er* in English. The comparative SM *than* is assumed to be semantically vacuous.

  (30) $\llbracket$-er$\rrbracket$: $\lambda D.\lambda D'.$ MAX$(D) <$ MAX(D')

- In prose: **The largest degree of a set of degrees D is smaller than the largest degree of a set of degrees D'**.

Formal Analysis: Comparatives relate two (sets of) degrees

- **A comparative clause thus provides the two sets of degrees** that the comparative morpheme relates. The surface construction is obtained through **comparative deletion**, which deletes the gradable adjective in the standard clause.

(31) Kim is taller than Tom.
a. $[\![Kim\ is\ tall]\!]$: λd. Kim is d-tall
(set of degrees to which Kim's height reaches)
b. $[\![than\ Tom\ \text{is tall}]\!]$: λd. Tom is d-tall
(set of degrees to which Tom's height reaches)
c. $[\![Kim\ is\ tall\ \text{-}er\ than\ Tom\ \text{is tall}]\!]$:
MAX(λd. Tom is d-tall) < MAX(λd. Kim is d-tall)

- In prose: **the maximum degree to which Tom is tall is less than the maximum degree to which Kim is tall**, i.e., Kim's height is greater than John's height.

English PM *as* relates degrees

- The standard analysis given to comparatives in English can be **straightforwardly extended to English equatives and PM *as*.**
- For example, Rett (2013) analyzes PM *as* as analagous to comparative *-er*, **introducing the weaker less-than-or-equal-to relation** rather than the less-than relation.

(32)   a. $[\![\textit{-er}]\!]$: $\lambda D.\lambda D'. \text{MAX}(D) < \text{MAX}(D')$
       b. $[\![\textit{as}]\!]$: $\lambda D.\lambda D'. \text{MAX}(D) \leqslant \text{MAX}(D')$

English PM *as* relates degrees

- The **semantic composition of an English adjectival equative will therefore parallel that of a comparative**, modulo the precise relation between the two sets of degrees.

  (33) Kim is as tall as Tom.
      a. $[\![Kim\ is\ tall]\!]$: λd. Kim is *d*-tall

      (set of degrees to which Kim's height reaches)
      b. $[\![as\ Tom\ \sout{is\ tall}]\!]$: λd. Tom is *d*-tall

      (set of degrees to which Tom's height reaches)
      c. $[\![Kim\ is\ as\ tall\ as\ Tom\ \sout{is\ tall}]\!]$:
      MAX(λd. Tom is *d*-tall) $\leqslant$ MAX(λd. Kim is *d*-tall)

- In prose: **the maximum degree to which Tom is tall is less than or equal to the maximum degree to which Kim is tall**, i.e., Kim's height is greater than or equal to John's height.

English verbal equatives relate two (sets of) manners

- Since English verbal equatives lack PMs and degree readings, **Rett (2013) assumes that the grammar can make reference to *manners* as a semantic primitive**, here represented using a variable *m*.
- **A null morpheme attaches to these sentences and retrieves the manner in which an event was carried out**, and verbal equatives relate these two sets of manners.

English verbal equatives relate two (sets of) manners

- *p* here is the null morpheme retrieving manners, R is a relation introduced by *p* that relates an event to the manner it is carried out, i.e., ***p* introduces a free manner variable *m***.

- Equative semantics is achieved through PREDICATE MODIFICATION and EXISTENTIAL QUANTIFICATION.

  (34) John danced as Sue danced.
      a. $[\![John\ danced]\!]$: $[\![\text{OP}_m\ John\ danced\ \rho^m]\!]$ = $\lambda m.\exists e[\text{DANCED}(e,john) \wedge R(e,m)]$
      b. $[\![as\ Sue\ danced]\!]$ = $[\![as\ Sue\ danced\ \rho^{m'}]\!]$: $\lambda m'.\exists e'[\text{DANCED}(e',sue) \wedge R(e',m')]$
      c. $[\![John\ danced\ as\ Sue\ danced]\!]$: $\exists m,e,e'[\text{DANCED}(e,john) \wedge R(e,m) \wedge \text{DANCED}(e',sue) \wedge R(e',m')]$

      PREDICATE MODIFICATION, EXISTENTIAL CLOSURE
      (Rett, 2013, p. 1122-1123)

- In prose: **there is a manner that characterizes John and Mary's dancing**.

Extending the analysis to German PMs

- How well can the standard analysis be extended to the German facts?
- As it turns out, the ingredients outlined above for English adjectival and equatives can be **straightforwardly extended to German PMs** with a **slight rearrangement between the semantic ingredients and morphosyntactic elements**.
- Recall that **German marks both adjectival and verbal equatives with PMs and this can lead to both degree and proprty/manner readings**.
- Hohaus and Zimmermann (2021) therefore suggest that the **German PM *so* is systematically ambiguous**, and can make reference to both degrees and properties/manners.

German PM *so* as ambiguous

- In other words, **we merely need the same semantic primitives, degrees and manner**, but **allow the German PM *so* to *make reference to both of them***.

  (35) a. $\llbracket so_{degree} \rrbracket$: $\lambda D_{dt}.\lambda D'_{dt}.\{d: D(d) = 1\} \subseteq \{d': D'(d') = 1\}$
        b. $\llbracket so_{event-property} \rrbracket$: $\lambda R_{vt,t}.\lambda R'_{vt,t}.\{f: R(f) = 1\} \subseteq \{f': R'(f') = 1\}$
                                                    (Hohaus and Zimmermann, 2021, p. 122-125)

- For all intents and purposes, we may take $R_{vt,t}$ (event-property) to be equivalent to having manner as a semantic primitive as in Rett's analysis for English.

German degree PM

- We can illustrate the meanings of degree and manner PMs with verbal equatives. **The degree version is possible with verbs that make degree arguments available**, e.g., degree achievement verbs.

    (36) Wir haben die pizza *so* abgekühlt *wie* die lasagn.
          we   have the pizza so cooled   how the lasagne
          'We cooled the pizza as we cooled the lasagne.'

    (37) a. $[\![so_{degree}]\!]$: $\lambda D_{dt}.\lambda D'_{dt}.\{d: D(d) = 1\} \subseteq \{d': D'(d') = 1\}$
          b. $[\![(36)]\!]$: $\{d$: we cooled the lasagna by d-temperature$\} \subseteq \{d'$: we cooled the pizza by d'-temperature$\}$

- In prose: **the set of degrees which we cooled the lasagna by is a subset or an identical set of degrees to which we cooled the pizza by**, i.e., the pizza was cooled the same amount as the lasagna.

German manner PM

- On the other hand, only **the manner (event property) version is available with verbs that do not refer to degrees**, e.g., activity verbs.

(38) Beckedahl spricht *so wie* er immer spricht.
Beckedahl talks   so how he always talks
'Beckedahl talks just like he always does.'

(39) a. $\llbracket so_{event-property} \rrbracket$: $\lambda R_{vt,t}.\lambda R'_{vt,t}.\{f: R(f) = 1\} \subseteq \{f': R'(f') = 1\}$
  b. $\llbracket(38)\rrbracket$: $\exists e[\{f': \forall e'[e'$ is an event of B. talking $\rightarrow f(e')]\} \subseteq \{f: f(e)$ & e is an event of B. talking$\}]$

(Hohaus and Zimmermann, 2021, pp. 125)

- In prose: **the set of manners Beckedahl always talks in is a subset or an identical set of manners in which Beckdahl is talking now**, i.e., he is talking as he always talks.

Accounting for Dutch PM *zo*

- Given the semantic primitives postulated so far (degrees and manners), can these be used to account for the semantics of Dutch *zo* and equatives in general?

- The main difficulty: **the observed readings with Dutch are dependent on the syntactic category of the parameter that the PM is marking**.

- Simply saying *zo* can refer to both degrees and manners as in German begs the question of **why it can refer to degrees and not 'manners' with adjectives, and to manners and not degrees only with verbs**!

- With these two primitives that the grammar can manipulate, one would effectively have to stipulate in Belgian Dutch that **only degree *zo* is available with adjectives** and **only manner *zo* is available with verbs**. Is there a deeper explanation for such a correlation?

Getting degrees and manners from eventuality kinds

- Anderson and Morzycki (2015) propose a different way of understanding degrees and manners: these are **properties of *eventuality kinds***.
- The notion of a kind is familiar from the nominal domain; in English, for example, bare plurals admit a kind-generic reading (Chierchia, 1998).

  (40)   Dogs like to play.

- Central intuition: **an object kind is the totality of all its instances across worlds**, i.e., *dogs* in (40) is referring to the totality (a plurality) of dogs in a given world.

Getting degrees and manners from eventuality kinds

- Extending this intuition, Anderson and Morzycki (2015) propose that degrees are simply state kinds, i.e., they are **a particular sort of plurality of *states* of possessing some 'amount' of a property**, which corresponds to a degree measure.
- Manners are simply event kinds, i.e., they are **a particular sort of plurality of *events with the same event description* that are carried out in some similar way**, which corresponds to a manner description.
- Of course, not every case of gathering some plurality of states or events will correspond to a coherent property; **degrees and manners are in some deeper cognitive sense distinguished properties of states and events**.
- Why are degrees and manners distinguished properties and not, e.g., locations and times? This remains an open question but that seems to be the case linguistically, e.g., the readings of *zo* and similar morphemes in other languages (Anderson and Morzycki, 2015).

Getting degrees and manners from eventuality kinds

- For example, **measure phrases like *6 feet* name a particular sort of state kind, the totality of states in which an individual is tall to at least 6 feet**.
- The ordering on degrees in a degree-based framework can be reproduced with kinds. A 6-feet state kind (plurality of states of reaching 6 feet or more) is necessarily included in a 5 feet state kind, a 4 feet state kind, a 3 feet state kind etc. However, a 5 feet state kind will not be included in a 6 feet state kind since it is strictly speaking a superset of a 6 feet state kind.
- **Adverbs like *elegantly* name an event kind**, namely the **plurality of events that are carried out elegantly**.
- **An eventuality (state or event) can then be said to *instantiate* a kind**, i.e., intuitively, it is included in the plurality of eventualities that share an identical property.

Kinds in the grammar

- Armed with these assumptions, we need only make some modifications to the formal setup. Following Anderson and Morzycki (2015), we can assume **the semantic system can make reference to kinds as a distinct object**, call it *k*.

- We can indicate **an object instantiates a kind by notating it as $^\cup k$** (Chierchia, 1998).

- Further, we **need not assume degrees as a semantic primitive in the meaning of adjectives at all**; these just denote states of having some amount of a property (Wellwood, 2015).

  (41) $[\![$*Kim is 6 feet tall*$]\!]$: $\lambda s.\text{TALL}(s,kim) \wedge {}^\cup\text{SIX-FEET}(s)$
        where $^\cup\text{SIX-FEET}(s) = \lambda s.\ s \leq \text{SIX-FEET}_w\ (s) = s \leq \text{SIX-FEET}_w$

  (42) $[\![$*Kim danced elegantly*$]\!]$: $\lambda e.\text{DANCE}(e,kim) \wedge {}^\cup\text{ELEGANT}(e)$
        where $^\cup\text{ELEGANT}(e) = \lambda e.\ e \leq \text{ELEGANT}_w\ (e) = e \leq \text{ELEGANT}_w$

Dutch PM *zo* refers to kinds

- With this setup, we can now proceed to provide an analysis of Dutch PM *zo*. Following Anderson and Morzycki's analysis of similar morphemes in other languages, ***zo* compositionally introduces a kind variable *k*.**

- It further asserts that **some unspecified semantic object (what it combines with) instantiates this free kind variable that it introduces**.

- Further, this kind that the object instantiates **must count as a distinguished property of that object**.

  (43)   a. $\text{DIST}(o,P)$ is true iff P is among the distinguished properties of o.
         b. $[\![zo]\!]$: $\lambda k.\lambda o: \text{DIST}(o, {}^{\cup}k).{}^{\cup}k(o)$

  (Anderson and Morzycki, 2015, p. 811-812)

Dutch SM *als* encodes comparison semantics

- Where does equative semantics come from if *zo* is not a degree morpheme (e.g., English comparative *-er*)? We propose that **the core of equative semantics (the less-than-or-equal-to or the subset relation) is introduced by the SM *als*** instead of *zo*.

- This follows proposals in the comparatives literature that SMs contribute comparison semantics (Alrenga et al., 2012; Alrenga and Kennedy, 2014).

(44) $[\![als]\!]$: $\lambda K_{\pi t}.\lambda K'_{\pi t}.\{k:K(k) = 1\} \subseteq \{k':K'(k') = 1\}$

Composing Belgian Dutch adjectival equatives

- We take *zo* to be **categorially flexible** depending on what it combines with.
- With adjectives, ***zo* is a head in the extended adjectival projection that does not take phrasal complements**, following Corver (1997, 2018).
- Upon combining with the standard (which we take to be clausal), ***als* denotes a generalized quantifier over kinds and combines directly with the matrix clause**.

Composition: Adjectival equatives

(45) Jan is *zo* groot *als* Sue.
      John is so tall as Sue
      'John is as tall as Sue.'
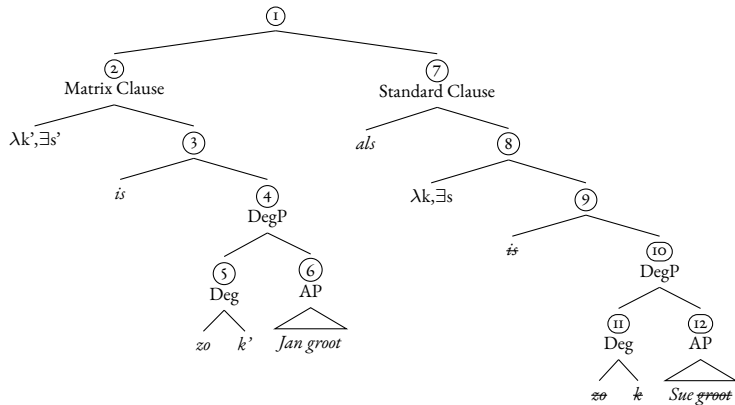
Composition: Adjectival equatives

- Matrix clause:

  (46)   a. $[\![5]\!]$: $\lambda o.^{\cup}k'(o)$ (Deg)
         b. $[\![6]\!]$: $\lambda s'.\text{TALL}(s',jan)$ (AP)
         c. $[\![3]\!]$: $\lambda s'.\text{TALL}(s',jan) \wedge {}^{\cup}k'(s')$ (identical to DegP 4, PM)
         d. $[\![2]\!]$: $\lambda k'.\exists s'[\text{TALL}(s',jan) \wedge {}^{\cup}k'(s')]$ (Existential Closure, Lambda Abstraction)

- Standard clause:

  (47)   a. $[\![11]\!]$: $\lambda o.^{\cup}k(o)$ (Deg)
         b. $[\![12]\!]$: $\lambda s.\text{TALL}(s,sue)$ (AP)
         c. $[\![9]\!]$: $\lambda s.\text{TALL}(s,sue) \wedge {}^{\cup}k(s)$ (identical to DegP 10, PM)
         d. $[\![8]\!]$: $\lambda k.\exists s[\text{TALL}(s,sue) \wedge {}^{\cup}k(s)]$ (Existential Closure, Lambda Abstraction)

- Final steps where *als* takes the two sets of kinds as argument:

  (48) $[\![7]\!]$: $\lambda K'_{\pi t}.\{k:\exists s[\text{TALL}(s,sue) \wedge {}^{\cup}k(s)] = 1\} \subseteq \{k':K'(k') = 1\}$

  (49) $[\![1]\!]$: $\{k:\exists s[\text{TALL}(s,sue) \wedge {}^{\cup}k(s)] = 1\} \subseteq \{k':\exists s'[\text{TALL}(s', jan) \wedge {}^{\cup}k'(s')] = 1\}$
         'the set of state kinds Sue's height instantiates is a subset of or equal to the set of state kinds John's height instantiates'

Composing Belgian Dutch verbal equatives

- On the other hand, *zo* is simply a (possibly) phrasal adverbial head that can take a complement clause with verbal equatives. We assume that **the standard clause in verbal equatives is the complement of *zo***.

- Since *zo* requires a kind as argument and the *als*-clause denotes a generalized quantifier over kinds, **the type-mismatch triggers the familiar rule of QUANTIFIER RAISING**, leaving behind a trace that serves as *zo*'s argument.

- This has an added advantage: if the right-peripheral position of the *als*-clause in verbal equatives is derived by QUANTIFIER RAISING, which has been proposed to be rightward movement (most notably Fox and Nissenbaum, 1999), then **the possibility of two distinct linear positions means that QR can either be covert (in-situ immediately following *zo*) or overt (right-peripheral)**.

Composition: Verbal equatives

(50) Nadine had **zo** <**als** Sigrid> gerend <**als** Sigrid>.
    Nadine has so as Sigrid ran as Sigrid
    'Nadine ran as Sigrid ran.'
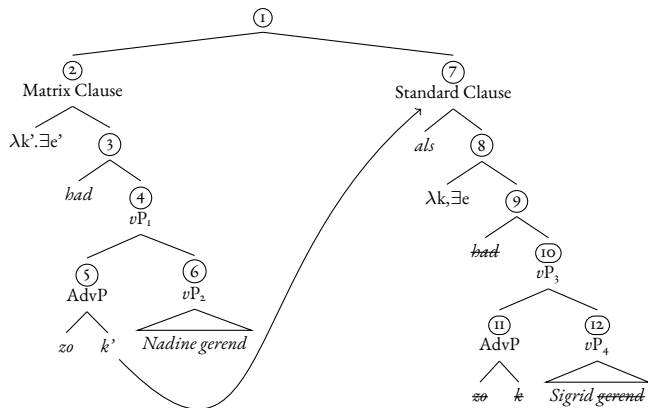
Composition: Verbal equatives

- Matrix clause:

  (51)   a. $[\![\text{⑤}]\!]$: $\lambda o.^{\cup}k'(o)$ (AdvP, standard clause trace provides k')
         b. $[\![\text{⑥}]\!]$: $\lambda e'.\textsc{run}(e',nadine)$ (vP_2)
         c. $[\![\text{③}]\!]$: $\lambda e'.\textsc{run}(e',nadine) \wedge {}^{\cup}k'(e')$ (identical to vP_1 ④, PM)
         d. $[\![\text{②}]\!]$: $\lambda k'.\exists e'.\textsc{run}(e',nadine) \wedge {}^{\cup}k'(e')$ (Existential Closure, Lambda Abstraction)

- Standard clause:

  (52)   a. $[\![\text{⑪}]\!]$: $\lambda o.^{\cup}k(o)$ (AdvP)
         b. $[\![\text{⑫}]\!]$: $\lambda e.\textsc{run}(e,sigrid)$ (vP_4)
         c. $[\![\text{⑨}]\!]$: $\lambda e.\textsc{run}(e,sigrid) \wedge {}^{\cup}k(e)$ (identical to vP_3 ⑩, PM)
         d. $[\![\text{⑧}]\!]$: $\lambda k.\exists e.\textsc{run}(e,sigrid) \wedge {}^{\cup}k(e)$ (Existential Closure, Lambda Abstraction)

- Final steps where *als* takes the two sets of kinds as argument:

  (53) $[\![\text{⑦}]\!]$: $\lambda K'_{\pi t}.\{k:\exists e.\textsc{run}(e,sigrid) \wedge {}^{\cup}k(e) = 1\} \subseteq \{k':K'(k') = 1\}$

  (54) $[\![\text{①}]\!]$: $\{k:\exists e.\textsc{run}(e,sigrid) \wedge {}^{\cup}k(e) = 1\} \subseteq \{k':\exists e'.\textsc{run}(e',nadine) \wedge {}^{\cup}k'(e') = 1 \}$
         'the set of event kinds Sigrid's running instantiates is a subset of the the set of event kinds Nadines's running instantiates'

Advantages of the analysis

- There are several upshots to the quantificational, kinds-based analysis proposed here:
    - First, we relate what looks like a PM in Belgian Dutch equatives to its **more general use as a degree or manner proform in non-equative contexts (23)-(24)**, as in many other languages observed in Anderson and Morzycki (2015).
    - Second, **the dependence of degree and manner readings on the syntactic category of the parameter falls out without additional stipulations**, assuming that degrees and manners are distinguished properties of states and events.
    - Finally, a quantificational analysis as in standard analysis of comparatives (e.g., Heim 2000) **predicts the existence of scopal ambiguities** that are well-established in the literature.
    - For example, it is well-known that **an embedded degree clause in a comparative can be interpreted above or under the scope of a matrix modal verb** leading to different interpretations (e.g., Heim 2000; Beck et al. 2012).

Scope ambiguities: Belgian Dutch adjectival comparatives

CONTEXT: My draft is 20 pages long.

(55) De definitieve versie mag exact vijf pagina's langer zijn dan de kladversie.
 the final version may exactly five pages longer be than the draft
 'The final paper is allowed to be exactly five pages longer than this draft.'

  a. Maar zelfs tien pagina's meer dan wat je nu hebt is nog oké.
   but even ten pages more than what you now have is still okay
   'But even ten pages more than what you have now will still be okay.'
   (minimum length 25 pages, modal $\gg$ DegP)

  b. Maar in geen geval langer.
   but in no case longer
   'But definitely not longer!' (maximum length 25 pages, DegP $\gg$ modal)

Scope ambiguities: Belgian Dutch adjectival equatives

CONTEXT: You just submitted your B.A. thesis and proudly show it to me. I inquire after its length and you tell me that it's 60 pages. I'm currently writing my master's thesis and I tell you...

(56) Mijn master thesis mag net   *zo* lang zijn *als* jouw bachelor paper.
     my   master's thesis may exactly so long be   as   your bachelor paper
     'My master's thesis is allowed to be exactly as long as your B.A. thesis.'

   a. Maar vijf pagina's korter dan wat je nu ingediend hebt zou   ook
      but 5   pages   shorter than what you now submitted have would also
      al   oké zijn en tot 70 pagina's is ook nog toegelaten.
      already okay be and until 70 pages   is also still allowed
      'But even 5 pages shorter would be okay and 70 pages is allowed as well.'

                                                              (modal ≫ *zo...als*)

   b. En geen pagina meer!
      and no   page   more
      'And not a single more!'   (*zo...als* ≫ modal)
                                            (based on Hohaus and Zimmermann, 2021)

Scope ambiguities: Belgian Dutch verbal equatives

- More tellingly, **the same scope ambiguity is observed with verbal equatives**, which is much less discussed in the comparatives literature with verbal comparatives.
- This is derived if the *als*-clause *must* **QR for interpretive reasons**. It can either attach to the embedded clause under the modal, or the matrix clause above the modal, **regardless of its surface linear position**.

Scope ambiguities: Belgian Dutch verbal equatives

CONTEXT: A foreign colleague can spend their research funds on equipment, books, and conference travel. She asks about how I may spend my funds and I reply...

(57) Ik mag mijn beurs exact **zo** <**als** jij> gebruiken <**als** jij>.
     I may my funding exactly so as you use   as you
     'I may spend my funds in exactly the same way as you.'

    a.   Maar ik mag ze ook gebruiken om sprekers uit te nodigen.
              but I may her also use   to speakers PRT PRT invite
              'But I may also spend it on inviting speakers.'   (modal ≫ *zo...als*)

    b.   En voor niets anders!
              and for nothing else
              'And nothing else!'   (*zo...als* ≫ modal)

(based on Hohaus and Zimmermann, 2021)

Global conclusions

- A (brief) survey of English, German, and Belgian Dutch demonstrated that there is **significant variation in the morphosyntax of equatives across categories** and these **correspond to their semantic interpretation in different ways**.

- **Belgian Dutch patterns with German in its morphosyntax**; both adjectival and verbal equatives are marked with PMs. This differs from English which has no PMs in verbal equatives.

- Conversely, **Belgian Dutch patterns with English in the distribution of degree versus manner readings**; adjectival equatives with PMs only have degree readings, verbal equatives (with or without PMs and independent of the verb class) only have manner readings. This differs from German, where degree and property/manner readings are both available depending on the parameter.

- This therefore necessitates **a non-unified analysis of equatives even within the Germanic family**. An ontology consisting of simply degrees and manners, while sufficient to account for English and German, would not account for the Belgian Dutch facts without further stipulations.

- Proposed solution: derive degrees and manners via **eventuality kinds** and Belgian Dutch equatives, like many other languages, are kind-referring.

Some loose ends: On the source of degree arguments

- Recall that English verbal equatives lack a PM and therefore never have degree readings. However, **the same PM _as_ becomes obligatory in the presence of a quantity adjective like _much_**.

- Predictably, this leads to **an obligatory degree reading**, both with activity and degree achievement verbs.

(58) Activity verbs
  Kim ran *(as) much as Sue did/ran. (PM)
  a. #That is, they both ran in circles around the field. (manner)
  b. That is, they both ran 3km / for 3 hours. (degree)

(59) Degree achievement verbs
  Kim cooled the pizza *(as) much as Sue did. (PM)
  a. #Namely, by blowing on it. (manner)
  b. Namely, by 10 degrees Celsius. (degree)

Some loose ends: On the source of degree arguments

- On the other hand, there is no issue with accessing a degree reading with verbal comparatives with *more*, so long as the measure being compared is monotonic with respect to the part-whole structure of the verbal event (Wellwood, 2015).

  (60) Activity verbs
        Kim ran more than Sue (did), that is, Kim ran 3km / 3 hours while Sue ran 2km / 2 hours.

  (61) Degree achievement verbs
        Kim cooled the pizza more than Sue (did), that is, Kim cooled the pizza 10 degrees / for 10 minutes while Sue cooled the pizza 5 degrees / for 5 minutes.

Some loose ends: On the source of degree arguments

- As Wellwood (2015) notes, this means that **degree arguments are really never lexicalized arguments of verbs**, regardless of verb class (see also Rett 2013).

- If they were, one would be hard pressed to explain why **verbal equatives simply do not have degree readings in the absence of *as much***, especially for degree achievement verbs commonly analyzed as lexicalizing such a degree argument (Kennedy and Levin, 2008).

- Rather, it is **individual degree morphemes (e.g., *more*, *much*) that lexicalize measure functions taking eventualities and returning degrees** that can then be manipulated and compared. If so, then **even gradable adjectives can be analyzed simply as eventualities (states) without the need for them to lexicalize a degree argument** (Wellwood, 2015).

- For example, *more* in English can be decomposed into *much* **introducing a measure function and *-er* encoding comparative semantics** (Bresnan, 1973; Wellwood, 2015). This straightforwardly extends to English verbal equatives that require overt *much* to access a degree reading, with the PM *as* introducing equative semantics.

Some loose ends: On the source of degree arguments

- Perhaps unsurprisingly, even though Belgian Dutch marks verbal equatives with a PM *zo*, **accessing a degree reading is also dependent on the presence of a measure word like *veel* 'much'**.

  (62) Kim heeft zoveel gerend als Sue.
       Kim has so.much run as Sue
       'Kim ran as much as Sue did.'   (activity verb)

- This likewise suggests that **degree arguments are accessed via specific morphemes that semantically introduce measure functions** and that they **need not be lexicalized in either adjectives or verbs**. For example, with adjectival equatives, degree readings would arise not via referring to degree arguments but to state kinds.

- Nonetheless, **we do need degrees independently and they do not always arise via state kinds, since *zoveel* can provide a degree of measurement along some dimension for verbs** that can then be compared (see for example Zhang 2020 and Sun 2021 for further arguments).

Some loose ends: Alternative analyses of *zo*

- This leaves an obvious question: if *veel* provides the measure function retrieving a degree of measurement for verbal equatives, **what is the role of *zo* in cases with *zoveel* like in (62)?**
- It clearly **cannot be a kind-introducer** as we proposed here in these cases since **event kinds are manners** and **the only readings available with *zoveel* are degree readings facilitated by *veel***.

Some loose ends: Alternative analyses of *zo*

- One alternative analysis is to **take *zo* as a genuine pro-form that can refer to either degrees or manners**, in the spirit of Penka (2016) and Beck (2023).

- Setting aside formal technical details, the idea is that *zo* **refers to a maximal degree *d* or event property (manner)** $<v,t>$.

- **This maximal degree or manner is furnished by the *als*-clause**, which contains some kind of definiteness operator that shifts a predicate of degrees or manners into a definite degree or manner.

- **The pro-form *zo* in the matrix clause then 'picks up' this degree or manner and feeds it into the matrix clause predicate**, either an adjective requiring a degree argument or a clause requiring a manner argument (see Beck 2023 for detailed discussion of the semantic composition).

- In other words, one way to analyze Belgian Dutch equatives is that **they are either degree or manner correlative structures**.

Some loose ends: Alternative analyses of *zo*

- This would certainly fit well in light of the *zoveel* facts; in the presence of *veel* which takes a verbal event and returns its measure, *zo* simply picks up the maximal degree denoted by the *als*-clause, which similarly contains *zoveel* deleted under identity with the matrix clause.

- In the absence of *veel*, only a manner variable is made available, plausibly through some null morpheme as in Rett (2013) and the matrix *zo* picks up the maximal manner denoted by the *als*-clause.

Some loose ends: Alternative analyses of *zo*

- Nonetheless, this analysis also runs into another obvious problem: if manner readings arise simply because of the lack of a morpheme encoding a measure function and some null morpheme freely retrieves a manner variable as in Rett (2013), **why then do adjectival equatives in Belgian Dutch never get the 'manner' reading**?
- Recall that one way to diagnose a non-degree, 'manner' reading with adjectival equatives is evaluativity. As demonstrated earlier in (25), **adjectival equatives are never evaluative in Belgian Dutch**, indicating they never have 'manner' readings.
- One would need to allow some null morpheme extracting manner variables in verbal equatives to freely apply in the absence of *veel* but **somehow disallow this with adjectival equatives, effectively another stipulative solution**.

Some loose ends: Alternative analyses of *zo*

- In light of these difficulties, we will continue to maintain **a dual ontology of degrees**, either as **degrees proper or as state kinds**.

- In the absence of *veel* with verbal equatives, *zo* is a kind-introducer, producing manner readings since it combines with an event.

- In the presence of *veel*, we will make the somewhat unsatisfactory assumption that ***zo* goes uninterpreted**. *Veel*, as a measure function, combines with the matrix predicate and produces a degree which can be abstracted over and which serves as the argument of the *als*-clause, which denotes a generalized quantifier over degrees in these cases.

- This has some precedent; for example, Gobeski and Morzycki (2017) analyze the PM *as* in English as being uninterpreted in light of the facts concerning percentage measure phrases.

- Maintaining a dual ontology of degrees would therefore make predictions in Belgian Dutch regarding the range of facts with percentage measure phrases observed in Gobeski and Morzycki (2017), which we leave for future inquiry. Comments welcome here!

Acknowledgements

References I

Alrenga, P. and Kennedy, C. (2014). *No more* shall we part: Quantifiers in English comparatives. *Natural Language Semantics*, 22:1–53.

Alrenga, P., Kennedy, C., and Merchant, J. (2012). A new standard of comparison. In Arnett, N. and Bennett, R., editors, *Proceedings of the 30th West Coast Conference on Formal Linguistics*, pages 32–42. Somerville, MA: Cascadilla Proceedings Project.

Anderson, C. and Morzycki, M. (2015). Degrees as kinds. *Natural Language & Linguistic Theory*, 33:791–828.

Beck, S. (2023). On Old English swa 'so'. *Glossa: A journal of general linguistics*, 8(1):1–42.

Beck, S., Krasikova, S., Fleischer, D., Gergel, R., Hofstetter, S., Savelsberg, C., John, V., and Villalta, E. (2012). Crosslinguistic variation in comparison constructions. *Linguistic Variation Yearbook*, 9:1–66.

Bhatt, R. and Pancheva, R. (2004). Late merger of degree clauses. *Linguistic Inquiry*, 35(1):1–45.

Bresnan, J. (1973). Syntax of the comparative clause construction in english. *Linguistic Inquiry*, 4:275–343.

Chierchia, G. (1998). Reference to kinds across languages. *Natural Language Semantics*, 6(4):339–405.

Corver, N. (1997). The internal syntax of the Dutch extended adjectival projection. *Natural Language & Linguistic Theory*, 15:289–368.

Corver, N. (2018). The freezing points of the (Dutch) adjectival system. In Hartmann, J. et al., editors, *Freezing: Theoretical approaches and empirical domains*, pages 143–194. De Gruyter Mouton.

Cresswell, M. (1976). The semantics of degree. In Partee, B., editor, *Montague Grammar*, pages 261–292. New York: Academic Press.

Fox, D. and Nissenbaum, J. (1999). Extraposition and scope: A case for overt QR. In Bird, S., Carnie, A., Haugen, J., and Norquest, P., editors, *Proceedings of WCCFL 18*, pages 132–144. Cascadilla Press.

Gobeski, A. and Morzycki, M. (2017). Percentages, relational degrees, and degree constructions. In Burgdorf, D., Collard, J., Maspong, S., and Stefánsdóttir, B., editors, *Proceedings of SALT 27*, pages 721–737.

Haspelmath, M. and Buchholz, O. (1998). Equative and similative constructions in the languages of Europe. In van der Auwera, J. and Ó Baoill, D., editors, *Adverbial constructions in the languages of Europe*, pages 277–334. Berlin: Mouton de Gruyter.

Heim, I. (1985). Notes on comparatives and related matters. Ms., University of Texas, Austin.

Heim, I. (2000). Degree operators and scope. In Jackson, B. and Matthews, T., editors, *Proceedings of the 10th Semantics and Linguistic Theory conference*, pages 40–64. Ithaca: Cornell University.

Heim, I. (2006). Remarks on comparative clauses as generalized quantifiers. Ms., Massachusetts Institute of Technology.

Hohaus, V. and Zimmermann, M. (2021). Comparisons of equality with German *so...wie*, and the relationship between degrees and properties. *Journal of Semantics*, 38:95–143.

Kennedy, C. (1997). *Projecting the Adjective: The Syntax and Semantics of Gradability and Comparison*. PhD thesis, University of California, Santa Cruz.

References II

Kennedy, C. and Levin, B. (2008). Measure of change: The adjectival core of degree achievements. In McNally, L. and Kennedy, C., editors, *Adjectives and adverbs: Syntax, semantics and discourse*, pages 156–182. Oxford: Oxford University Press.

Penka, D. (2016). Degree equatives: The same as comparatives? Presented at Equative Constructions Workshop, Universität zu Köln.

Rett, J. (2013). Similatives and the argument structure of verbs. *Natural Language & Linguistic Theory*, 31:1101–1137.

Rett, J. (2015). *On the semantics of evaluativity*. Oxford: Oxford University Press.

Seuren, P. (1984). The comparative revisited. *Journal of Semantics*, 3:109–141.

Sun, Y. (2021). Equating by degrees or state-kinds, or both. In Schlöder, J., McHugh, D., and Roelofsen, F., editors, *Proceedings of the 22nd Amsterdam Colloquium*, pages 523–532. Amsterdam: ILLC, UvA.

Umbach, C., Hinterwimmer, S., and Gust, H. (2022). German *wie*-complements: Manners, methods and events in progress. *Natural Language & Linguistic Theory*, 40:307–343.

Wellwood, A. (2015). On the semantics of comparison across categories. *Linguistics & Philosophy*, 38:67–101.

Zhang, L. (2020). Degrees as kinds vs. degrees as numbers: Evidence from equatives. In Franke, M. et al., editors, *Proceedings of Sinn und Bedeutung 24*, pages 503–520. Osnabrück University.

Appendix: Type-Shifting the Standard Clause

- While the proposed analysis largely follows Anderson and Morzycki (2015), we differ in what introduces quantificational semantics. Proposal for Belgian Dutch: the SM *als* is a quantifier over kinds.
- Anderson and Morzycki (2015) do not propose a dedicated quantifier over kinds.
- Rather, they assume that **type-shifting rules apply to the standard clause** to resolve type-mismatches with the kind-introducing PM in equatives.

Appendix: Type-Shifting the Standard Clause

- This is motivated in part by the language they investigate in detail: Polish.

- In Polish, **the PM appears to be *tak*, and the standard is marked by *jak***, which is typically translated as a *wh*-word that is ambiguous between degree and manner much like German *wie*.

  (63) Floyd jest *tak* wysoki *jak* Clyde.
        Floyd is   TAK tall   WH Clyde
        'Floyd is as tall as Clyde.'

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

                                              (Anderson and Morzycki, 2015, p. 816-817)

Appendix: Type-Shifting the Standard Clause

- Anderson and Morzycki (2015) note the **morphological similarity between *tak* and *jak* in Polish**; taking this seriously, they assume **both to be elements that introduce kinds**.

  (65) a. $[\![tak]\!]$: $\lambda k.\lambda o.^{\cup}k(o)$
        b. $[\![jak]\!]$: $\lambda k.\lambda o.^{\cup}k(o)$

- The standard clause in both adjectival and verbal equatives therefore denotes predicates of kinds.

Appendix: Type-Shifting the Standard Clause

(66) a. Floyd jest *tak* wysoki *jak* Clyde.
         Floyd is TAK tall WH Clyde
         'Floyd is as tall as Clyde.'

    b. ⟦ λk *jest* [$_{AP}$ [$_{DegP}$ *jak k Clyde* ~~wysoki~~] ⟧:
        $\lambda k.\exists s[\text{TALL}(s,\textit{clyde}) \wedge {}^{\cup}k(s)]$

(adjectival equative)

(67) a. Floyd śpiewał *tak jak* Clyde śpiewał.
         Floyd sang TAK WH Clyde sang
         'Floyd sang as Clyde sang.'

    b. ⟦ λk *jak k Clyde śpiewał* ⟧:
        $\lambda k.\exists e[\text{SING}(e,\textit{clyde}) \wedge {}^{\cup}k(e)]$

(verbal equative)

Appendix: Type-Shifting the Standard Clause

- Assuming the standard analysis in the comparatives literature that the standard clause is a complement of the degree morpheme, **the predicate of kinds denoted by the standard clauses are assumed to be complements to *tak***, which requires a kind as its first argument.

- This is the familiar type-mismatch problem; however, **the standard clause is *not* a generalized quantifier in the analysis** and therefore cannot undergo QR.

- At this point of the composition, Anderson and Morzycki (2015) assume that **type-shifting rules apply to resolve such a type-mismatch**. Two rules such rules are widely assumed in the literature: Iota Shift or Existential Closure Shift.

Appendix: Type-Shifting the Standard Clause

(68) IOTA SHIFT (from $<\tau,t>$ to τ, where τ is any atomic type):
shift $P_{\tau t}$ to $\iota x_\tau[P(x)]$

(preferred when defined)

(69) EXISTENTIAL CLOSURE SHIFT (from $<\tau,t>$ to $<<\tau,t>,t>$):
shift $P_{\tau t}$ to $\lambda Q_{\tau t}.\exists x_\tau[P(x) \wedge Q(x)]$

(dispreferred)

(Anderson and Morzycki, 2015, p. 814)

Appendix: Type-Shifting the Standard Clause

- With that much in place, Anderson and Morzycki (2015) suggest that **different type-shifting rules are employed in adjectival and verbal equatives**.
- The default Iota Shift is employed in the standard clause of adjectival equatives.
- This is because with degree state kinds, **there is indeed a unique state kind that any state instantiates**, namely, the equivalence class of states (degrees) that it is a member of.
- Iota Shift, is however, undefined with verbal equatives; **there is no unique kind or manner that an event instantiates**. Existential Closure Shift is employed for verbal equatives instead.

Appendix: Type-Shifting the Standard Clause

- Adjectival equatives:

  (70) Floyd jest **tak** wysoki **jak** Clyde.
       Floyd is   TAK tall   WH Clyde
       'Floyd is as tall as Clyde.'

       a. $\llbracket$ λk *jest* [$_{AP}$ [$_{DegP}$ *jak* k Clyde ~~wysoki~~]] $\rrbracket$:
          λk.∃s[TALL(s,*clyde*) ∧ $^\cup$k(s)]   (standard clause)
       b. $\llbracket$ SHIFT λk *jest* [$_{AP}$ [$_{DegP}$ *jak* k Clyde ~~wysoki~~]] $\rrbracket$:
          ιk[∃s[TALL(s,*clyde*) ∧ $^\cup$k(s)]]   (shift standard clause)
       c. $\llbracket$ [*tak* SHIFT λk *jest* [$_{AP}$ [$_{DegP}$ *jak* k Clyde ~~wysoki~~]]] $\rrbracket$:
          λo.$^\cup$ιk[∃s[TALL(s,*clyde*) ∧ $^\cup$k(s)]](o)   (*tak* complement)
       d. $\llbracket$*Floyd jest wysoki*$\rrbracket$: λs'.TALL(s,*floyd*)   (matrix clause)
       e. $\llbracket$ [*tak* SHIFT λk *jest* [$_{AP}$ [$_{DegP}$ *jak* k Clyde ~~wysoki~~]] [*Floyd jest wysoki*] $\rrbracket$:
          λs'.TALL(s,*floyd*) ∧ $^\cup$ιk[∃s[TALL(s,*clyde*) ∧ $^\cup$k(s)]](s')

- In prose: **Floyd's tallness state instantiates the unique degree state kind that Clyde's tallness instantiates**.

Appendix: Type-Shifting the Standard Clause

- Verbal equatives:

  (71) Floyd śpiewał **tak jak** Clyde śpiewał.
       Floyd sang   TAK WH Clyde sang
       'Floyd sang as Clyde sang.'
       a. $⟦ \lambda k \, [\, jak \, k \, Clyde \, śpiewał \,] ⟧$: $\lambda k.\exists e[\text{SING}(e,clyde) \wedge {}^{\cup}k(e)]$ (standard clause)
       b. $⟦ \text{SHIFT} \, \lambda k \, jak \, k \, Clyde \, śpiewał \, ⟧$:
          $\lambda Q.\exists k[\exists e[\text{SING}(e,clyde) \wedge {}^{\cup}k(e)] \wedge Q(k) \,]$ (shift standard clause)
       c. $⟦ \lambda k' \, [\, Floyd \, śpiewał \, tak \, k' \,] ⟧$: $\lambda k'.\exists e'[\text{SING}(e,floyd) \wedge {}^{\cup}k'(e')]$ (matrix clause
          after QR of standard clause)
       d. $⟦\text{SHIFT} \, \lambda k \, jak \, k \, Clyde \, śpiewał⟧ \, (⟦\lambda k' \, [\, Floyd \, śpiewał \, tak \, k' \,]⟧)$:
          $\exists k[\exists e[\text{SING}(e,clyde) \wedge {}^{\cup}k(e)] \wedge \exists e'[\text{SING}(e,floyd) \wedge {}^{\cup}k(e')]]$

- In prose: **there is a manner kind which both Floyd's singing and Clyde's singing
  instantiates**.

Appendix: Type-Shifting the Standard Clause

- Anderson and Morzycki's analysis involving type-shifting leads to several consequences. First, **in adjectival equatives the standard clause is effectively a degree (state kind) definite description** (see e.g., Penka, 2016 for German). That means it is **interpreted in-situ and does not undergo QR**.
- **QR is motivated only for verbal equatives**. In addition, verbal equatives involve **existential quantification over manners (event kinds)**.

Appendix: Type-Shifting the Standard Clause

- It is clear that the analysis **cannot apply to Belgian Dutch because of two predictions** (it is an empirical question if these hold in Polish).
- <u>Prediction I</u>: since the standard clause in adjectival equatives is a degree definite description interpreted in-situ, **it should not show any kind of scopal interactions with other scope-taking elements**.
- This, of course, seems to not be borne out in Dutch adjectival equatives, which exhibits scope ambiguities with matrix modal verbs (56).
- In fact, Anderson and Morzycki (2015) provide the same analysis for comparatives, where the presence of scope ambiguities is well-established (in English) since Heim (1985, 2000, 2006).

Appendix: Type-Shifting the Standard Clause

- <u>Prediction II</u>: **Verbal equatives in their analysis do involve an existential quantifier** and therefore, QR and scope-taking. This, however, predicts rather weak truth conditions for verbal equatives; **two events need only share a manner in which it is carried out** to satisfy this, e.g., (71d).

- This is, in fact, **the same prediction made by Rett's analysis for English**, which involves PREDICATE MODIFICATION of two sets of manners and then EXISTENTIAL CLOSURE of the manner variable.

- Two further consequences follow from a meaning built on existential quantifcation over manners.

Appendix: Type-Shifting the Standard Clause

- First, we expect that the context below, which makes explicit that **the two events involve just one manner in common**, to be feliciitiously described by the (English) verbal equative, which **does not seem to be borne out**.

  (72) CONTEXT: Floyd and Clyde both sang at the party last night. Floyd sang really melodically and slowly. Clyde sang melodically as well, though he sang really hurriedly.
      a. #? Floyd sang as Clyde sang.
      b. #? Clyde sang as Floyd sang.

Appendix: Type-Shifting the Standard Clause

- Rather, a stronger meaning seems to be described by the verbal equative; it requires the comparee event to have **at least all of the same manners of the standard event, if not more**.

- In other words, this is **the sub-set relation**, as has been standardly assumed for equative quantifiers and also adopted here for Belgian Dutch.

  (73) CONTEXT: Floyd and Clyde both sang at the party last night. Clyde sang really melodically and slowly. Floyd sang really melodically and slowly too, but also really goofily.
     a.   Floyd sang as Clyde sang (though Floyd also sang goofily).
     b. ??Clyde sang as Floyd sang (though Floyd also sang goofily).

Appendix: Type-Shifting the Standard Clause

- Finally, even if there is QR of the existential quantifier over kinds in Anderson and Morzycki's analysis, it is unclear if it would explain the scope ambiguity in verbal equatives, as in Dutch (57) or in German (Hohaus and Zimmermann, 2021).
- Again, this seems to be because existential quantification seems too weak to capture the relevant interpretations.

Appendix: Type-Shifting the Standard Clause

- Even with QR, **the relevant interpretations seem indistinguishable**, which is not what is observed in Belgian Dutch, where two distinct interpretations are available.

  (74) CONTEXT: A foreign colleague can spend their research funds on equipment, books, and conference travel. She asks about how I may spend my funds and I reply...

    Ik mag mijn beurs   exact   **zo** <**als** jij> gebruiken <**als** jij>.
    I   may   my   funding exactly so   as   you   use   as   you

    'I may spend my funds in exactly the same way as you.'
    a. $\exists$w'[wRw' $\wedge$ $\exists$k[colleague spends her funds in k-manner in w' $\wedge$ I spend my funds in k-manner in w'], i.e., some world where we happen to spend funds in some identical way
    b. $\exists$k[colleague uses her funds in k-manner in w $\wedge$ $\exists$w'[wRw' $\wedge$ I spend my funds in k-manner in w'] ,i.e., there is some k-manner colleague spends her funds and there is some world I spend my funds in k-manner