

Degrees and manners as kinds

Evidence from Dutch equatives

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We examine equative constructions in Dutch, comparing it to their counterparts in two other Germanic languages, namely English and German. We observe that there is significant variation in the morphosyntax of equative constructions based on whether what is being compared is a gradable adjective or a verb (e.g. *Kim is as tall as Sue* and *Kim ran as Sue (did)*) across the three languages and that the morphosyntax corresponds to meaning differences, determining what exactly can be compared in these constructions. Based on these observations, we propose an account for Dutch equative constructions based on eventuality kinds, which has implications for the semantics of comparison constructions in general in relation to the ontological status of degrees and manners in the grammar.

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1. Introduction

Haspelmath & Buchholz (1998) observe in a survey of 47 languages, the bulk of which European, that equatives comparing gradable adjectives tend to be marked with parameter markers (PMs), whereas equatives comparing verbal parameters are not. Standards, on the other hand, are uniformly marked with a standard marker (SM). English is representative of this contrast. In (1) John and Mary are compared with respect to their height. The parameter of the comparison is thus the gradable adjective *tall*, which is marked by the PM *as*. In (2) the parameter of comparison is the verb *ran*. This verbal equative cannot be marked with a PM, hence the ungrammaticality of the first *as*. The standard Sue is introduced by a standard marker *as* in both (1) and (2).

(1) *John is as tall as Sue (is).*
 comparee copula PM parameter SM standard copula

(2) *John *(as) ran as Sue ran/did.*
 comparee PM parameter SM standard parameter

(Haspelmath & Buchholz, 1998)

Rett (2013) observes that the absence of a PM in (2) versus its presence in (1) correlates with a meaning difference. While (1) uncontroversially equates measures of tallness (points on a scale of height or *degrees*), (2) can only equate the *manner* in which the two running events are carried out. It cannot equate degrees on a gradable dimension along which the two running events can be measured, such as distance or time. This reading is only possible if a quantity adjective like *much* is added, in which case the PM obligatorily reappears (e.g. *John ran as much as Mary ran/did*).¹

We show here that Dutch does not follow the typological tendency proposed by Haspelmath & Buchholz (1998), as well as the correlation between the presence of PMs and availability of a degree reading, proposed by Rett (2013). Dutch marks both adjectival and verbal parameters of equatives with the PM *zo* ‘so’ and introduces the standard with the SM *als* ‘as’, as can be seen from (3) and (4).²

1. Such dimensions can be accessed and compared directly with comparatives like *John ran more than Mary (ran/did)* so long as the measure respects the part-whole structure of the event, i.e., distance or time ran are permitted since these monotonically increase as the event progresses. Speed, on the other hand, is ruled out since the speed of running does not necessarily increase as the running event progresses. This restriction on what can be compared applies not just to comparatives but also the degree-measuring verbal equative *John ran as much as Sue did/ran*, which can never equate the speed of their running. See Wellwood (2015) for further discussion and a detailed analysis. We return to this issue later, specifically with degree achievement verbs.

2. In verbal equatives, the PM *zo* and the SM *als* can also be adjacent. The following linear orders are possible for verbal equatives besides (4).

(i) *Nadine had zoals Sigrid gerend.*
 Nadine has so.as Sigrid ran
 ‘Nadine ran as Sigrid ran.’

(ii) *Nadine had gerend zoals Sigrid.*
 Nadine has ran so.as Sigrid
 ‘Nadine ran as Sigrid ran.’

Speakers generally prefer one of the linear orders over the other, but all Belgian speakers find the order in (4) acceptable. That is the linear order we focus on in this paper, leaving an account of the linear flexibility for future work. For present purposes, all that matters is that regardless of linear order, a degree reading is never available with verbal equatives built with *zo* (and also *net zo*) and only manner readings are available.

- (3) *Jan is zo groot als Sue.*
 John is so tall as Sue
 ‘John is as tall as Sue.’
- (4) *Nadine had zo gerend als Sigrid.*
 Nadine has so ran as Sigrid
 ‘Nadine ran as Sigrid ran.’

Note that there appears to be variation in whether speakers accept *zo* alone as a PM. We observe that Dutch speakers from the Netherlands prefer to combine *zo* with *net* ‘just’ (e.g. *net zo*), whereas Belgian speakers are more accepting of simply *zo*. Furthermore, speakers who prefer *net zo* (regardless of region) get an ‘exactly’ reading with these equatives, whereas an ‘at least’ reading is available for Belgian speakers without *net*, with the stronger ‘exactly’ reading being a cancellable implicature (Rett, 2013). That is, with *net zo*, (3) must mean that John and Sue are the exact same height, whereas the version without *net* allows for John to possibly be taller than Sue. In (4), *net zo* will require that Nadine ran in the exact same manner(s) as Sigrid; it is insufficient that they happen to just run in one similar manner, which is a possible reading with simply *zo*. The intuition is that *net* strengthens the ‘at least’ interpretation to an ‘exactly’ interpretation. We will not pursue this issue further here, focusing on the judgments of Belgian speakers and on the availability of a degree or manner reading. Speakers who strongly prefer *net zo* may augment all the examples presented here with *net* without impacting the overall argument. The main empirical generalization is that Dutch adjectival equatives exclusively equate degrees, while verbal equatives exclusively equate manners just as in English, despite the presence of the PM *zo* on both gradable adjectives and verbs. This means that previous analyses like Rett’s (2013), which ties the (un)availability of a degree reading to the presence or absence of a PM, cannot account for the Dutch data. Instead, we provide a formal analysis in which Dutch equatives refer to *eventuality kinds*, which are introduced by the PM *zo*. Degrees fall out as properties of state-kinds while manners fall out as properties of event-kinds (Anderson & Morzycki 2015). If so, then the distribution of readings as being dependent on the syntactic category of the parameter of comparison *zo* modifies naturally follows, since gradable adjectives denote predicates of states while eventive verbs denote predicates of events.

The rest of the paper is structured as follows. Section 2 provides the empirical background of Dutch equatives, showing that the distribution of degree versus manner readings is strictly dependent on the syntactic category of the parameter of comparison based on well-established diagnostics. Section 3 situates Dutch in a Germanic typology by comparing it to English and German, showing that the mapping between PMs and degree and manner readings differs across the three

languages. This therefore rules out applying existing analyses of the morphosemantics of PMs in these languages to Dutch. Section 4 provides a formal analysis of the Dutch data, arguing that the PM *zo* in equatives is kind-referring. Section 5 concludes and points out further directions of inquiry.

2. Degrees and manners in Dutch equatives

As shown in (3)–(4), Dutch marks both adjectival and verbal parameters with PMs in equatives. Adjectival equatives receive only degree readings, whereas verbal equatives receive only manner readings. To demonstrate degree readings with adjectival equatives, Rett (2013) proposes two diagnostics. First, equatives referring to degrees never require *evaluativity*; that is, the two entities being equated are not interpreted as holding some degree of a gradable property *P* that equals or exceeds some contextual standard for being considered *P*. Second, if adjectival equatives equate degrees on a gradable scale of holding a property, then only gradable adjectives should be allowed in the construction and non-gradable adjectives should either be ruled out, or be coerced into a gradable interpretation.

Based on these diagnostics, we conclude that Dutch adjectival equatives only ever equate degrees. First, they are interpreted non-evaluatively, as indicated by the continuations in (5). Example (5a) sets up a context where both John and Sue can be considered tall (1.8m being a contextual standard for being tall), though not to the same degree. Note further that (5a) sets up a context where John is in fact *shorter* than Sue even if he is considered tall; this is to control for the ‘at least’ interpretation, since if John is 1.85m and Sue is 1.8m then (5) is intuitively true given that this satisfies the ‘at least’ interpretation of the equative independently of evaluativity. Therefore, making John shorter than Sue but with both of them being considered tall (i.e. evaluative) would test for the non-degree evaluative interpretation of (5). On the other hand, (5b) sets up a context where neither of them is considered conventionally tall but they have the same heights. As demonstrated here, only (5b) is felicitous.

(5) *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 1 m80 and Sue’s is 1 m85.’³ (evaluative)

3. Note that the context indicated by this continuation is compatible with an English equative built with the SM *like* which is evaluative, i.e. *John is tall like Sue; John is 1.8m tall and Sue is*

- b. *Jan is 1m60 en Sue ook.*
 John is 1m60 and Sue too
 ‘John’s height is 1 m60 and Sue is 1 m60 too.’ (non-evaluative degree)

Second, when non-gradable adjectives like *dead* serve as the parameter of comparison, they receive a coerced reading whereby some gradable scale is imposed upon the non-gradable adjective (Rett 2013). The relevant reading of (6) concerns not the property of being dead; both the fly and the mosquito are asserted to be dead and what is being equated involves a gradable scale, e.g. the degrees of severity their injuries.

- (6) *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).’

Verbal equatives, on the other hand, only ever equate manners and not degrees. Consider (7) involving an activity verb. A reading equating a measure of some aspect of the event that can be located on a gradable scale, such as time or distance is unavailable, as indicated by the infelicity of (7b). In contrast, only a continuation that makes reference to the manner in which the running was carried out, as in (7a), is felicitous.⁴

- (7) *Kim heeft zo gerend als Sue.*
 Kim has so ran as Sue
 ‘Kim ran as/like Sue.’
- a. *Namelijk in cirkels.*
 namely in circles
 ‘Namely in circles.’ (manner)
- b. *#Namelijk, gedurende 2 uur*
 namely during 2 hour
 ‘Namely for 2 hours.’ (degree)

1.85m tall, but not with *John is as tall as Sue* which is non-evaluative. This confirms that we are testing for evaluativity and therefore, a non-degree reading of the equative construction in question. We return to the English facts in a Section 3.1.

4. Accessing a degree reading requires the addition of *veel* ‘much’ to *zo*, deriving *zoveel*, e.g. *Kim heeft zoveel gerend als Sue* ‘Kim ran as much as Sue (did/ran)’. This can be followed by clauses specifying, for example, the distance ran, e.g. *They both ran 3 km*. Equating the speed of their running is disallowed as it is not a measure monotonic to the part-whole structure of the running event (see again footnote 1). We set *zoveel* aside here and concentrate on bare cases of Dutch *zo*. This will become significant in light of the German facts to be discussed in Section 3.2.

One possible explanation for the lack of degree readings with activity verbs is that they do not compositionally provide a degree argument which can be compared (Rett 2013, contra Wellwood 2015). If so, it is unsurprising that they only have manner readings. However, further evidence that degree readings are not available with verbal equatives in general come from verbs that are expected to lexicalize a degree argument. One such class are deadjectival degree achievement verbs. Kennedy & Levin (2008) propose that degree achievement verbs denote *measure of change functions* built out of the measure function denoted by the verb's underlying adjectival core. They argue that these verbs measure the degree of change in a gradable property held by an object between the start and end of an event. In (8), the degree achievement verb *warm* measures the degree of change in temperature held by the pizza between the start and the end of the warming event, as indicated by the measure phrase *by 10 degrees*.

(8) We warmed the pizza by 10 degrees.

We might therefore expect that this degree of change in a gradable property could be accessible for comparison by an equative construction. This expectation is, however, not borne out; even with a degree achievement verb like *opwarmen* 'to warm', only a manner reading is available and degree readings remain unavailable as in (9).⁵

- (9) *We hebben de pizza zo opgewarmd als de lasagne*
 we have the pizza so warmed as the lasagne
 'We cooled down the pizza like the lasagne.'
 a. *Namelijk in de oven.*
 namely in the oven
 'Namely by putting them in the oven.'

5. An anonymous reviewer suggests the following continuation specifying the amount of time and the temperature at which the pizza and lasagne were put in the oven is more natural than (9a), though we did not encounter further native speaker objections to its naturalness.

- (i) *Namelijk door ze 20 minuten op 180 graden in de oven te zetten.*
 namely by them 20 minutes at 180 degrees in the oven PRT put
 'Namely by putting them in the oven at 180 degrees for 20 minutes.'

Nonetheless, this continuation *could* indicate that there is in fact a degree reading whereby both the pizza and lasagne were warmed by the same amount of time at the same temperature in the oven. Crucially, however, both *must* be warmed in the oven. Native speakers agreed that a continuation whereby both were warmed at 180 degrees for 20 minutes but *via different means*, such as one being in the oven and the other in a temperature controlled outdoor barbecue, is infelicitous. This underscores the fact that only a manner reading and not degree reading is available with verbal equatives.

- b. #*Namelijk met 10 graden.*
 namely by 10 degrees
 ‘Namely by 10 degrees.’

Notably, degree readings *are* possible with degree achievement verbs in other comparison constructions. Comparatives marked with *meer* ‘more’, for example, permit degree readings of the sort we would expect. The felicitous continuation in (10) refers to a differential degree, i.e. the pizza was warmed 10 degrees more than the lasagna was warmed, exactly as expected if degree achievements measure degrees of change and two degrees of change are being compared in the comparative. The lack of a degree reading in (9) is thus equative-specific, speaking to a difference between *zo* and *meer*.

- (10) *We hebben de pizza meer opgewarmd dan de lasagne, namelijk met 10 graden.*
 we have the pizza more warmed than the lasagna namely by 10 degrees
 degrees
 ‘We warmed the pizza more down than the lasagna, namely by 10 degrees.’

These observations suggest that whether a degree achievement’s degree argument is available for comparison cannot be attributed to the degree achievement verb itself. Rather, it is *zo* and the syntactic category of what it combines with that determines whether degrees can be accessed or not.⁶ In particular, *zo* in equatives can only access degrees with gradable adjectives and not with verbs, regardless of the verb class. In the next section, we consider two analyses for equatives in English and German respectively, which exhibit a different alignment between PMs and degree and manner readings. We argue that both analyses cannot account for the morphosyntax and meaning distribution of Dutch equatives, setting the stage for a formal analysis of *zo* in Section 4.

3. Previous analyses of degrees and manners across Germanic

3.1 English

As previously mentioned, Rett (2013) observes that in English, adjectival equatives are always marked with the PM *as* and this correlates with an obligatory degree reading and non-evaluativity. In (11a), denying that John and Sue are considered

6. By extension, the morpheme *meer* must therefore be able to access degrees by itself, regardless of the syntactic category of the parameter of comparison. See Wellwood (2015) for detailed discussion and an analysis of the equivalent *more* in English.

tall is felicitous, indicating that the PM-marked equative is non-evaluative. Removing the PM *as*, coupled with a corresponding change in the form of the SM to *like* in (11b), requires evaluativity, as indicated by the infelicity of the same continuation.

- (11) a. John is *as* tall *as* Sue, but they are both really short (at only 1.55m).
(degree)
b. John is tall *like*/?**as* Sue, #but they are both really short (at only 1.55m).
(non-degree)

In addition, non-gradable adjectives like *amphibian* are either judged as unacceptable or receive a coerced gradable interpretation. To the extent (12) is interpretable, it is two degrees on a prototypicality scale that are being compared, i.e. both Fred and Todd are amphibian but they are *prototypically amphibian* to the same degree.

- (12) *?Fred the frog is as amphibian as Todd the toad.

Verbal equatives, on the other hand, are never marked with the PM *as* in the absence of a quantity or measure word *much* as in (13).⁷

- (13) a. Kim (**as*) ran *as* Sue did/ran.
b. Kim ran *as much as* Sue did/ran.

Without a PM, verbal equatives only receive a manner reading. Only (14a) referring to the manner of the running event, and not (14b) which refers to a conventional measure of some aspect of the running event (distance), is felicitous.

- (14) 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 3 km. (degree)

Recall that degree achievement verbs like *warm* are one class of verbs that could plausibly provide a degree argument for comparison. Nevertheless, degree readings remain unavailable in English in (15). Degree achievement verbs pattern exactly like activity verbs that are presumed to not make a degree argument available. This shows that it is the presence of a gradable adjective or *much* that provides a degree argument, rather than the verb itself providing it for comparison.

- (15) Kim (**as*) warmed the pizza *as* Sue did. (no PM)
a. Namely, by putting it in the oven. (manner)
b. #Namely, by 10 degrees Celsius. (degree)

7. As might be expected, (13b) receives a degree reading and can be followed by clauses specifying, for example, the distance to which Kim and Sue ran, e.g. *They ran 3 km*, as with Dutch.

These observations are straightforwardly accounted for if we assume degrees to be a semantic object that the grammar can manipulate (Heim 1985; Kennedy 1997, *a.m.o.*). Formally, degrees are semantic objects of type d ; under this view, gradable adjectives denote relations between individuals and degrees (16a) (Heim 2000, 2006; Rett 2013, *a.m.o.*). The role of degree morphemes is therefore to manipulate the degree argument of gradable adjectives; for example, degree morphemes like the PM *as* in English is analyzed as a degree quantifier on par with the comparative suffix *-er*, ultimately returning a truth-evaluable statement. In example (16b), we provide the denotation of the PM *as* according to Rett (2013). *As* takes two sets of degrees and asserts that the maximum of one set is greater than or equal to the maximum of the other.⁸ The sets of degrees are provided by the matrix clause (16c) and standard clause (16d) respectively. Note that in both the matrix and standard clause, we assume a covert degree variable saturating the first argument of a gradable adjective, which is then lambda-abstracted over to form the two sets of degrees serving as arguments to *as* (Bresnan 1973; Chomsky 1977).

(16) John is as tall as Sue.

- a. $\llbracket \text{tall} \rrbracket : \lambda d. \lambda x. x \text{ is } d\text{-tall}$
- b. $\llbracket \text{as} \rrbracket : \lambda D. \lambda D'. \text{MAX}(D) \leq \text{MAX}(D')$
- c. $\llbracket \text{John is } d \text{ tall} \rrbracket : \lambda d. \text{John is } d\text{-tall}$ (set of degrees to which John's height reaches)
- d. $\llbracket \text{as Sue is } d \text{ tall} \rrbracket : \lambda d. \text{Sue is } d\text{-tall}$ (set of degrees to which Sue's height reaches)
- e. $\llbracket \text{John is as tall as Sue is } d \text{ tall} \rrbracket : \text{MAX}(\lambda d. \text{Sue is } d\text{-tall}) \leq \text{MAX}(\lambda d. \text{John is } d\text{-tall})$

Since verbal equatives lack the degree quantifier *as*, degree readings are straightforwardly ruled out. We provide Rett (2013)'s analysis of English verbal equatives in (17). Manner readings with verbal equatives arise via referring to manner variables (here m) as in (17a) and (17b). Rett (2013) assumes these to be semantic primitives, extracted via a null operator like ρ^m that introduces the relation R relating an event to a manner variable m . She further postulates that the operator OP_m as well as the SM *as* serve the function of abstracting over the free manner variables, much as with degree adjectival equatives in (16). Verbs (even degree achievement verbs) are thus simple predicates of events without degree arguments and no equative relation is introduced via quantifiers like *as*. Predicate Modification of the two sets of manners followed by existential quantification

8. Note that the stronger 'exactly' reading is not entailed by the \leq relation and is instead derived via pragmatic reasoning through competition with the stronger comparative (Rett 2013).

means that the verbal equative in (17c) therefore simply asserts that there is a manner in which John's dancing and Sue's dancing were carried out.

(17) John danced as Sue danced.

- a. $\llbracket \text{John danced} \rrbracket = \llbracket \text{OP}_m \text{ John danced } \rho^m \rrbracket : \lambda m. \exists e [\text{DANCED}(e, \text{john}) \wedge \text{R}(e, m)]$
 - b. $\llbracket \text{as Sue danced} \rrbracket = \llbracket \text{as Sue danced } \rho^m \rrbracket : \lambda m. \exists e' [\text{DANCED}(e', \text{sue}) \wedge \text{R}(e', m)]$
 - c. $\llbracket \text{John danced as Sue danced} \rrbracket : \exists m, e, e' [\text{DANCED}(e, \text{john}) \wedge \text{R}(e, m) \wedge \text{DANCED}(e', \text{sue}) \wedge \text{R}(e', m)]$ (Predicate Modification, Existential Closure)
- (Rett 2013, p. 1122–1123)

To sum up, if the PM *as* in English is analyzed as a degree quantifier, the distribution of degree and manner readings between adjectival and verbal equatives falls out naturally since verbal equatives lack *as* and therefore, has no way of comparing degrees. Nonetheless, a crucial difference between Dutch and English concerns the presence of a PM. While the distribution of readings patterns exactly as in English, both adjectival and verbal equatives are marked with the PM *zo*. Attributing degree quantifier semantics to *zo* to account for adjectival equatives as in English *as* will leave unexplained the fact that verbal equatives only have manner and not degree readings. On the other hand, assuming that manner readings arise via null operators extracting manner variables leaves unexplained the role of the PM *zo* in verbal equatives. An analysis that attributes degree semantics to *zo* in Dutch therefore seems unviable.

3.2 German

As noted by Hohaus & Zimmermann (2021) (see also, e.g. Umbach et al. 2022), German patterns like Dutch in the morphosyntax of equatives. Both adjectival and verbal equatives are marked with the PM *so* and the SM *wie*, a *wh*-word translated as 'how'.

- (18) *Nadine ist so groß wie Anna.*
Nadine is so tall how Anna
'Nadine is as tall as Anna.' (gradable adjective)
- (19) *Johannes hat auch so getanzt wie Susanne.*
John has also so danced how Susan.
'John danced as Susan did.' (verb)

Unlike Dutch and English, German equatives marked with *so* are ambiguous between degree and manner readings across adjectives and verbs. For example, non-gradable adjectives readily appear in German equatives marked with *so* and allow a non-degree reading. In (20), the frog and the newt are asserted to be

amphibian *in the same way*, e.g. they share all the salient defining characteristics of amphibians like absorbing water through the skin (Hohaus & Zimmermann 2021).

(20) *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.**’ (non-degree)

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

Hohaus & Zimmermann (2021) note further that verbal equatives marked with *so* are equally ambiguous between degree and manner readings. As shown below with degree achievements, both continuations making reference to manners and degrees are felicitous in German, meaning that the verbal equative is amenable to both a degree and manner reading.

(21) *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. *Namlich durch Pusten.*

namely through blow

‘Namely through blowing on it.’

b. *Namlich auf 21 grad raumtemperatur.*

namely to 21 degrees room.temperature

‘Namely to 21 degrees.’⁹ (Hohaus and Zimmermann, 2021, p. 101–102)

Hohaus & Zimmermann (2021) conclude that the presence of a PM does not correlate with degree readings exclusively in German as suggested by Rett (2013). Rather, the German PM *so* should be treated as genuinely ambiguous, being able to refer to degrees or manners so long as the predicate it appears with makes either of these available. The semantics of the two versions of *so* is provided in (22) (switching to set-theoretic semantics), being a quantifier over either properties of degrees or properties of events (manners). How they combine with verbs to

9. Note that under Kennedy & Levin’s (2008) analysis of degree achievement verbs, a continuation using *by* referring to differential degrees would be a more appropriate way of detecting a degree reading, as we have done with Dutch in (9). We reproduce the data in Hohaus & Zimmermann (2021) here for exposition’s sake, but observe that we have encountered some variation in the acceptability of measure phrases both with *auf* ‘to’ and the German equivalent of *by* with native speakers.

return degree or manner readings is suggested in (23)–(24), building off Hohaus & Zimmermann (2021).¹⁰

- (22) 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 & Zimmermann, 2021, p. 122–125)

- (23) *Wir haben die pizza so abgekühlt wie die lasagn.*
 we have the pizza so cooled how the lasagne
 We cooled the pizza to the same temperature as we cooled the lasagne.
 a. $\llbracket so_{degree} \rrbracket : \lambda D_{dt} \lambda D'_{dt} \{d: D(d)=1\} \subseteq \{d': D'(d')=1\}$
 b. $\llbracket (23) \rrbracket : \{d: \text{we cooled the lasagna to } d\text{-temperature}\} \subseteq \{d': \text{we cooled the pizza to } d'\text{-temperature}\}$

- (24) *Beckedahl spricht so wie er immer spricht.*
 Beckedahl talks so how he always talks
 Beckedahl talks just like he always does.
 a. $\llbracket so_{event-property} \rrbracket : \lambda R_{vt,t} \lambda R'_{vt,t} \{f: R(f)=1\} \subseteq \{f': R'(f')=1\}$
 b. $\llbracket (24) \rrbracket : \exists e[\{f': \forall e'[e' \text{ is an event of B. talking} \rightarrow f'(e')] \subseteq \{f: f(e) \text{ \& } e \text{ is an event of B. talking}\}]$
 (Hohaus & Zimmermann, 2021, pp. 125)

One possible explanation for the distribution of readings in Dutch is therefore to assume that the PM *zo* is ambiguous like German *so*, quantifying over degrees or manners. This, however, raises two challenges. The first challenge of an ambiguity analysis of Dutch equatives is to ensure that degree *zo* appears *only with adjectives*, whereas manner *zo* appears *only with verbs*. Perhaps all verbs are simple event predicates making no degree argument available and a degree quantifier version of *zo* can never be used with verbal equatives in Dutch. This becomes questionable once we look beyond equative constructions and at comparatives. As shown in (10), a degree reading is readily available in a comparative with degree achievements. However one analyzes *meer* ‘more’, it is clear that degree arguments *can* be accessed with degree achievement verbs in comparatives. If *zo* can quantify over degrees, one would have to stipulate that degree achievements do not make

10. We omit the detailed compositional steps as presented for English due to space limitations. Nonetheless, for present purposes, the reader may note that so long as we have degrees and manners as primitives, we may simply assume German *so* manipulates them and introduces an equative relation between two degrees or manners. These two primitives, combined with standard tools and compositional rules familiar from the comparatives literature, are therefore sufficient to account for the equative facts in German. Note as well that Hohaus & Zimmermann (2021) assume manners to be built out of the type of events (type $\langle vt, t \rangle$, where v is the type of events); for our purposes, we may take that to be equivalent to postulating manner as a distinct type represented by distinct variables like m as in Rett (2013).

a degree argument available *only in equatives*, which seems undesirable since it is unlikely degree achievement verbs should receive separate analyses in different constructions. Second, if *zo* is truly ambiguous between a degree and manner quantifier, one would have to explain why the non-degree evaluative reading of adjectival equatives is never observed, even with non-gradable adjectives as in (6) which receives only a coerced degree reading unlike in German (20). The right analysis of the Dutch facts should therefore specify how *zo* accesses degrees and manners in a way that is dependent on the syntactic category of the parameter of comparison and not an ambiguity analysis as in German.

4. Degrees and manners as kinds

The challenge with Dutch equatives is that the same PM produces a degree or manner reading with adjectives and verbs respectively. This pattern of referring to degrees or manners with the same linguistic element is, in fact, observed across a wide variety of languages. Anderson & Morzycki (2015) show that in languages like Polish, the same morpheme *tak* is used as an anaphoric pro-form to refer to nominal kinds, manners, or degrees in non-equative contexts depending on whether it modifies a noun, verb, or gradable adjective respectively.

(25) *tak-i pies*
 such-MASC dog
 ‘a dog of that kind’

(26) *tak się zachowywać*
 such REFL behave
 ‘behave that way’

(27) *tak wysoki*
 such tall
 ‘that tall’

(Anderson & Morzycki, 2015, p. 793)

Tellingly, the same morpheme is also used in equative constructions. Here, both degree-comparing adjectival equatives and manner-comparing verbal equatives use the morpheme *tak*.

(28) *Floyd jest tak wysoki jak Clyde.*
 Floyd is such tall WH Clyde
 ‘Floyd is as tall as Clyde.’

(29) *Floyd śpiewał tak jak Clyde śpiewał.*

Floyd sang such WH Clyde sang

'Floyd sang as Clyde sang.'

(Anderson & Morzycki, 2015, p. 815–816)

The pattern in (28)–(29) is exactly what is observed in Dutch, where the same PM *zo* marks both adjectival and verbal equatives with the corresponding degree and manner readings. Dutch *zo* also exhibits the exact same anaphoric use outside of equative contexts as in Polish, referring to nominal kinds, degrees, and manners.

(30) *zo'n hond*

zo.a dog

'such a dog'

(31) *zich zo gedragen*

REFL zo behave

'behave that way'

(32) *zo groot*

zo tall

'that tall'

Anderson & Morzycki (2015) conclude that this recurring pattern across languages should not be treated simply as an accident. They propose that degrees and manners should be seen as derived semantic objects, specifically as *eventuality kinds*, explaining why only certain syntactic categories give rise to degree and manner readings. In much the same way that kinds in the nominal domain are an (intensionalized) plurality of all 'instances' of a particular nominal property (e.g. *dogs* in *Dogs bark* is the plurality of all entities that are dogs) (Chierchia 1998), so too are degrees and manners. Degrees can be conceived of as pluralities of states of individuals holding some amount of a particular property (cf. Wellwood 2015), while manners are pluralities of events with the same event description but carried out in a particular way independent of their event participants and spatio-temporal location. Furthermore, degrees and manners seem to be 'distinguished' properties; these are the only properties picked out by kind modifiers like Polish *tak* and Dutch *zo* when they modify adjectives and verbs respectively, while never targeting other properties like spatio-temporal locations.

Given these assumptions, Anderson & Morzycki (2015) propose a relatively simple way of introducing kinds into the semantic composition, namely to take them as semantic objects in their own right. There is a domain of kinds, which is a sortal subtype of the type of individuals (Chierchia 1998). Further, they follow Chierchia (1998) in assuming that kinds are manipulated using type-shifting operators like \cap and \cup . \cap applies to a property and derives the corresponding kind, whereas \cup applies to a kind and derives the corresponding property. Degrees and

manners are then *names of kinds* in the state and event domain respectively, and eventualities are said to instantiate these kinds, i.e., a event or a state are atomic subparts of the plurality of states or events that name some degree or manner, notated $\cup_{\text{KIND-NAME}}(e)$. For example, the measure phrase *6 feet* names the plurality of all states of an individual measuring exactly 6 feet in height, while the adverb *elegantly* names the plurality of all events carried out elegantly, as demonstrated below.

- (33) a. $\llbracket \text{Kim is 6 feet tall} \rrbracket : \lambda s.\text{TALL}(s, \text{kim}) \wedge \cup_{\text{SIX-FEET}}(s)$ where $\cup_{\text{SIX-FEET}}(s)$ is equivalent to $s \leq \text{SIX-FEET}$, i.e., s is a subpart of the plurality of states named by *SIX-FEET* at a world w
- b. $\llbracket \text{Kim danced elegantly} \rrbracket : \lambda e.\text{DANCE}(e, \text{kim}) \wedge \cup_{\text{ELEGANT}}(e)$ where $\cup_{\text{ELEGANT}}(e)$ is equivalent to $e \leq \text{ELEGANT}$, i.e., e is a subpart of the plurality of events named by *ELEGANT* at a world w

It is now easy to provide a semantics for modifiers like Dutch *zo*. Following Anderson & Morzycki (2015), we propose *zo* is a modifier that compositionally introduces a kind, asserting that the constituent it combines with instantiates this kind, presupposed to be a distinguished property of what it combines with. In (34), k is a kind variable and o is a type-neutral variable ranging over either states or events.

- (34) $\llbracket zo \rrbracket : \lambda k.\lambda o:\text{DIST}(o, \cup k).\cup k(o)$ where $\text{DIST}(o, P)$ is true iff P is among the distinguished properties of o .

Upon combining with a kind free variable, *zo* will denote a predicate of objects. Depending on what it combines with via Predicate Modification, it can either be a predicate of individuals (nouns), states (adjectives), or events (verbs) (Anderson & Morzycki, 2015). We demonstrate this here with (31) and (32), assuming verbs and adjectives are simple predicates of events and states with their arguments introduced via functional heads (though this is not crucial) (Wellwood 2015). The free variable k will be mapped to a name of a kind either via the assignment function or be provided with content via linguistic antecedents.

- (35) a. $\llbracket \text{zich zo gedragen} \rrbracket : \lambda e.\text{BEHAVE}(e) \wedge \cup k(e)$
- b. $\llbracket zo groot \rrbracket : \lambda s.\text{TALL}(s) \wedge \cup k(s)$

The null hypothesis is that the same *zo* is involved in equatives as well. This will explain how *zo* picks out degrees or manners based on what it modifies in both equative and non-equative contexts. *Zo* has exactly the same function as in non-equative contexts as in (35), namely introducing a kind variable compositionally. The intuition is that the standard clause provides the first kind argument of *zo*, defining the kind that the eventuality instantiates (Anderson & Morzycki, 2015).

We assume that the standard in equatives is clausal (e.g. Rett 2013; Hohaus & Zimmermann, 2021), with another copy of *zo* and the parameter of comparison that undergoes Comparative Deletion, with extraposition of the standard clause remnant (Bresnan 1973). The standard clauses are assumed to contain a copy of *zo* in (36) and a free kind variable saturates its first argument. This free variable is abstracted over to produce a property of kinds in (39a) and (40a) (cf. for example Chomsky 1977, *a.m.o.*).

- (36) a. [[Jan is [*zo t* groot] [*als* Sue is ~~*zo k*~~ groot]_t] (adjective)
 b. [[Nadine had [*zo t* gerend] [*als* Sigrid had ~~*zo k*~~ gerend]_t] (verb)
- (37) a. [*als* Sue is ~~*zo*~~ groot] : $\lambda k. \exists s[\text{TALL}(s, sue) \wedge \cup k(s)]$ (set of kinds (degrees)
 Sue's tallness state instantiates)
 b. [*als* Sigrid had ~~*zo*~~ gerend] : $\lambda k. \exists e[\text{RUN}(e, sigrid) \wedge \cup k(s)]$ (set of kinds
 (manners) Sigrid's running instantiates)

So far, nothing in the account provides the equative semantics; also, note that the standard clauses cannot serve as arguments to *zo*, which requires a kind argument whereas the standard clauses are predicates of kinds. Anderson & Morzycki (2015) assume the standard clauses undergo type-shifting operations, which render them able to serve as arguments to *zo*. These type-shifting operations are available generally throughout natural language, namely Iota Shift, which shifts from a property to the unique individual that satisfies that property, and Existential Closure Shift, which shifts a property to a generalized quantifier. Iota Shift produces a stronger interpretation while Existential Closure Shift produces a weaker one. Therefore, Iota Shift is to be preferred if defined over Existential Closure Shift.¹¹

- (38) a. Iota Shift (from $\langle \tau, t \rangle$ to τ , where τ is any atomic type): shift P to $\iota_{\tau}[P(x)]$
 b. Existential Closure Shift: (from $\langle \tau, t \rangle$ to $\langle \langle \tau, t \rangle, t \rangle$, where τ is any atomic type): shift P to $\lambda Q_{\tau, t}. \exists x_{\tau}[P(x) \wedge Q(x)]$
 (Anderson & Morzycki 2015, p. 814)

The two type-shifting rules apply after existentially closing the state and event variables and abstraction over the kind variable. For gradable adjectives, there is always a unique degree (state-kind) that an individual holds of a gradable property, since a degree is a plurality of states of individuals holding the *exact* same amount of that property. Iota Shift applies, producing a definite description of

11. There are multiple ways to introduce the semantics of comparison. We follow Anderson & Morzycki (2015) here for concreteness but as an anonymous reviewer points out, it is not clear under their implementation how the 'at least' interpretation of adjectival equatives in general would be derived. We discuss other implementations that can capture this fact as well as other observations to close the paper.

kinds (39b) that serves as *zo*'s first argument in the matrix clause in (39c). This then combines with the gradable adjective via Predicate Modification in (39d). The adjectival equative therefore asserts that an individual's state of holding some amount of tallness instantiates the unique state-kind that another individual's state of holding some amount of tallness instantiates, i.e. they have the same degree of height.

- (39) a. $\llbracket \text{als Sue is } \cancel{\text{zo}} \text{ groot} \rrbracket : \lambda k. \exists s [\text{TALL}(s, \text{sue}) \wedge \text{!}k(s)]$ (set of kinds (degrees) Sue's tallness state instantiates)
- b. $\llbracket \text{Iota Shift } \text{als Sue is } \cancel{\text{zo}} \text{ groot} \rrbracket : \text{!}k. \exists s [\text{TALL}(s, \text{sue}) \wedge \text{!}k(s)]$ (the unique kind (degree) Sue's tallness state instantiates)
- c. $\llbracket \text{zo [Iota Shift } \text{als Sue is } \cancel{\text{zo}} \text{ groot}] \rrbracket : \lambda o. \cup \text{!}k. \exists s [\text{TALL}(s, \text{sue}) \wedge \text{!}k(s)](o)$
- d. $\llbracket [\text{Jan is [} \text{zo [Iota Shift } \text{als Sue is } \cancel{\text{zo}} \text{ groot}]] \text{ groot}] \rrbracket : \lambda s'. \text{TALL}(s', \text{jan}) \wedge \cup \text{!}k. \exists s [\text{TALL}(s, \text{sue}) \wedge \text{!}k(s)](s')$ (Predicate Modification)
 'John's state of tallness instantiates the unique kind that Sue's state of tallness instantiates, i.e. they have the same degree of height'

With verbal equatives, the intuition is that there is no unique manner that an event instantiates. A dancing event instantiating an *ELEGANT* event-kind does not preclude it from instantiating another event-kind property like *BEAUTIFUL*, whereas a state instantiating the exact *SIX-FEET* state-kind precludes it from instantiating the exact *FIVE-FEET* state kind. This rules out Iota Shift and therefore, Anderson & Morzycki (2015) assume that Existential Closure Shift applies with verbal predicates. This produces a generalized quantifier (40b), creating a type-mismatch with *zo*, triggering Quantifier Raising and leaving a trace over kinds in a way familiar from the comparatives literature (Heim 2000, 2006). The trace from Quantifier Raising, being of the type of a kind, serves as first argument to *zo* in the matrix clause in (40c). Upon lambda abstraction triggered by Quantifier Raising of the standard clause, the matrix clause serves as argument to the standard clause. The verbal equative therefore asserts that there is an event-kind (manner) that both Sigrid and Nadine's running events instantiate in (40d).

- (40) a. $\llbracket \text{als Sigrid had } \cancel{\text{zo}} \text{ gerend} \rrbracket : \lambda k. \exists e [\text{RUN}(e, \text{sigrid}) \wedge \text{!}k(s)]$ (set of kinds (manners) Sigrid's running instantiates)
- b. $\llbracket \text{Existential Closure Shift } \text{als Sigrid had } \cancel{\text{zo}} \text{ gerend} \rrbracket : \lambda Q. \exists k [\exists e [\text{RUN}(e, \text{sigrid}) \wedge \text{!}k(e) \wedge Q(k)]]$ (generalized quantifier over kinds)
- c. $\llbracket \text{Nadine had [} \text{zo } k_i \text{] gerend}] \rrbracket : \lambda e'. \text{RUN}(e', \text{nadine}) \wedge \text{!}k_i(e')$

- d. $\llbracket \text{Existential Closure Shift } \textit{als} \text{ Sigrid had } \textit{zo} \text{ gerend} \rrbracket$ ($\llbracket \lambda k_i \text{ Nadine had } [\textit{zo} \text{ } k_i] \text{ gerend}] \rrbracket$): $\exists k[\exists e[\text{RUN}(e, \textit{sigrid}) \wedge \textit{ }^U k(e)] \wedge \exists e'[\text{RUN}(e', \textit{nadine}) \wedge \textit{ }^U k(e')]]$
 ‘Sigrid’s running instantiates a kind that Nadine’s running also instantiates, i.e., there is a manner in which they both ran’

Summing up, the approach of Anderson & Morzycki (2015) attributes the distribution of degree versus manner readings in Dutch to the way in which the PM *zo* accesses them, namely, through eventuality kinds. This straightforwardly predicts the availability of each reading to be tied to the syntactic category of the parameter of comparison, which is borne out by the empirical facts. Furthermore, we also tie the fact that the same pro-form element *zo* is used in both equative and non-equative contexts. In contrast, attempting to account for the Dutch facts simply by postulating degrees and manners in the grammar would require undesirable stipulative conditions that restrict a degree-referring version of *zo* to gradable adjectives and a manner-referring version to verbs, assumptions that have no further motivation. We therefore conclude that an approach tying degree and manner readings to the syntactic category of the parameter of comparison through eventuality kinds is to be preferred.

5. Conclusion

We examined in this paper Dutch equatives marked with the PM *zo*. Contrary to typological tendencies, both adjectival and verbal equatives are marked with a PM. However, unlike other Germanic languages, the distribution of degree versus manner readings of equatives depends on the syntactic category of the parameter of comparison and not the presence of a PM. We propose that Dutch equatives involve reference to eventuality kinds, with degree and manner readings emerging as derived properties of state- and event-kinds respectively, and adopted a semantics of equative constructions that equate kinds following Anderson & Morzycki (2015). More broadly, this provides further support for viewing degrees and manners as emergent properties based on semantic primitives like states and events.

Several questions remain unexplored. For one, the semantics of equatives, adopted here from Anderson & Morzycki (2015), bears no relation to the semantics of comparatives, where the comparative morpheme is standardly viewed as a generalized quantifier over degrees (Heim 2000, 2006). Dutch equatives, while kind-referring, could plausibly involve a generalized quantifier over kinds. Positive evidence would come from standard diagnostics in the literature, such as licensing negative polarity items in the standard clause as well as scope ambi-

guities with modal elements in equatives (Heim 2006; Rett 2013; Hohaus & Zimmermann, 2021). A further advantage, assuming a semantics of the generalized quantifier over kinds based on the subset relation as in Hohaus & Zimmermann (2021), would also straightforwardly capture the ‘at least’ interpretation of equatives in general, with the ‘exactly’ reading strengthened based on standard pragmatic reasoning Rett (2013). The semantics of Anderson & Morzycki (2015) adopted here, however, would be unable to account for the ‘at least’ interpretation specifically with gradable adjectives, since they assume that a degree corresponds to a plurality of states of individuals holding an *exact* ‘amount’ of a property. Further, they predict that only verbal equatives will show scopal ambiguities and not gradable adjectives, since only verbal equatives involve a generalized quantifier. This would be unintuitive, given the well-documented scope ambiguity facts observed with degree-comparing comparatives.

A further prediction arises from tying the distribution of degree and manner readings to gradable adjectives and verbs based on the assumption that gradable adjectives denote states while verbs denote events: verbs that denote predicates of states, namely stative verbs of emotion or perception, are predicted to only have degree readings in equatives built with *zo*. It is not clear this prediction is borne out or straightforwardly testable within Dutch. For example, a stative verb like *hate* in English shows the same basic contrast with other eventive verbs; it receives only a manner reading in the absence of *as much*, which degree readings obligatorily require.

- (41) a. Mary hates John as she hates her brother. (manner)
 b. Mary hates John as much as she hates her brother. (That is, she actually likes both of them.) (degree)

It is not clear, however, that this is straightforwardly testable in Dutch. Using *haten* ‘to hate’ in equatives built with (*net*) *zo* as an example, comparison is in fact marked with (*net*) *zo* on an adverbial element like *erg* ‘badly’, which inherently has scalar semantics in the same way gradable adjectives do, instead of on the verb

itself.¹² This therefore means that we are unable to determine if *zo* will only produce degree readings with stative verbs in general with a verb like *hate*.

- (42) *Ze haat slecht eten net zo erg als slechte wijn.*
 she hates bad food just so badly as bad wine
 ‘She hates bad food just as much as she hates bad wine.’

Future work will therefore need to consider a range of stative verbs within Dutch, specifically those whereby comparison in the equative is marked directly on the verb. Preliminary investigations have revealed a wide range of variation in terms of how stative verbs as a class are marked with PMs in equatives, including whether they are marked on adverbs or marked on verbs but with PMs apart from (*net*) *zo* (e.g. some verbs prefer *even veel* ‘as much’). A full investigation and discussion of this is clearly beyond what we can accomplish here and we leave exploration of stative verbs as well as the compositional issues mentioned above for future work.

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12. An anonymous reviewer provides the following example with *bemind*, a translational equivalent of the verb *love*, noting that it is not clear whether a degree or manner reading arises here.

- (i) *Hij heeft goed eten net zo bemind als vrouwen.*
 he has good food just so love as women
 ‘He loves good food as much as he loves women.’ or ‘He loves good food in the way he loves women.’

As the reviewer notes, the grammaticality of the sentence is somewhat questionable. Further consultations with native Dutch speakers indicate that *bemind* as a verb meaning *love* is in fact archaic and not commonly used in modern varieties of Dutch. Given this consideration, we will set it aside as a test case and focus on using stative verbs that are more widely attested in modern day usage like *haten* ‘to hate’.

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