

Separate but equal: a typology of equative constructions*

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1 Introduction to degree quantifiers

Bresnan (1973) observes the following parallels in the distribution of degree words:

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|-----|----|-------------------------------------|----------------|
| (1) | a. | more people / more intelligent | comparative |
| | b. | as many people / as intelligent | equative |
| | c. | too many people / too intelligent | excessive |
| | d. | that many people / that intelligent | demonstrative |
| | e. | so many people / so intelligent | resultative |
| | f. | how many people / how intelligent | degree wh-word |

She took for granted that the quantity word *many* is an individual quantifier, so she characterized the degree words as determiners, and assigned them to a position of ‘DegP’ in the syntax.

In the decades since, both assumptions have been replaced in the degree-semantics literature. Quantity words like *many* do not behave like individual quantifiers in most respects (**too all people*, cf. (1-c)), and are better characterized as degree modifiers (Rett 2007, 2008, 2018, Solt 2009, 2015). And degree words like the comparative *-er* and the equative *as* are best characterized as degree quantifiers, binding the degree arguments introduced by gradable adjectives or associated with nominals. In this paper, I focus on the consequences for this latter analysis on the semantics of equatives.

The degree-quantifier analysis of comparatives is based on the assumption that gradable adjectives denote relations between degrees and individuals, type $\langle e, \langle d, t \rangle \rangle$, as in (2) (Cresswell 1976).¹

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¹ Initially, the main evidence for the presence of this degree argument was the fact that measure phrases (‘MPs’) like *6ft* in constructions like *Jane is 6ft tall* value an adjective’s degree argument. However, Schwarzschild (2005) convincingly argues that MPs are better analyzed as degree modifiers, type $\langle \langle d, t \rangle, \langle d, t \rangle \rangle$. This can explain why MPs – in English and other languages – appear in adjunct rather than argument position; it can also be used to derive an intuitive semantic explanation for why MPs can never modify negative antonyms, as in **Jane is 4ft short*. This analysis of MP constructions

$$(2) \quad [\![\text{tall}]\!] = \lambda x \lambda d. \text{tall}(x) \geq d$$

It also takes for granted a syntax of comparison constructions – a term I will use to jointly refer to comparative and equative constructions – in which the degree arguments of adjectives are lambda-abstracted over by some mechanism that parallels *wh*-movement (Chomsky 1977, Heim 1985).²

(3) logical forms for comparison constructions

- a. *Jane is taller than Bill is:*
 $\neg er([\text{CP Op}_d \text{ Bill is } d\text{-tall}]) ([\text{CP Op}_{d'} \text{ Jane is } d'\text{-tall}])$
- b. *Jane is as tall as Bill is:*
 $as([\text{CP Op}_d \text{ Bill is } d\text{-tall}]) ([\text{CP Op}_{d'} \text{ Jane is } d'\text{-tall}])$

In (3), each degree morpheme relates two arguments: a set of degrees (D , type $\langle d, t \rangle$) corresponding to Bill's height, and a set of degrees corresponding to Jane's height. Semantically, therefore, it is a quantifier, but one that ranges over degrees instead of individuals: type $\langle \langle d, t \rangle, \langle \langle d, t \rangle, t \rangle \rangle$.

There are a variety of ways to define the meaning of these degree quantifiers precisely. (The same is true for the syntactic analysis of these constructions, especially when taking into account the embedders *than* and *as*, which are ignored in (3), Bhatt & Pancheva 2004.) For instance, a semantic analysis could be based on the ‘at least’ definition of gradable adjectives in (2), or it could analyze gradable adjectives as associating each individual with a single, maximal degree of height.

Assuming (2), a semantic account of degree quantifiers could have them relate points derived from sets of degrees, as in (4), or just relate the degree sets themselves, as in (5) (see Schwarzschild 2008: for a nice overview of the history of the two approaches).

(4) a point-based semantics for comparison constructions,

- where $\text{MAX}(D) = \{d \in D \mid \forall d' \in D [d' \neq d \rightarrow d' < d]\}$
- a. $[\![\text{-er}]\!] = \lambda D \lambda D'. \text{MAX}(D') > \text{MAX}(D)$
 - b. $[\![\text{as}]\!] = \lambda D \lambda D'. \text{MAX}(D') \geq \text{MAX}(D)$

(5) a set-based semantics for comparison constructions

- a. $[\![\text{-er}]\!] = \lambda D \lambda D'. D' \supset D$
- b. $[\![\text{as}]\!] = \lambda D \lambda D'. D' \supseteq D$

also requires that gradable adjectives have a degree argument or output, but it suggests an $\langle e, \langle d, t \rangle \rangle$ type for gradable adjectives, which results compositionally in the degree sets manipulated by degree quantifiers in (4)–(5).

2 The lower degree operator is overt in some dialects of English, as in %*Jane is taller than what Bill is*; the upper degree operator is never overt (Rett 2013).

These options are directly parallel to the literature on individual quantifiers, in which e.g. *all* can be defined in terms of individuals or sets, as in (6).

- | | | |
|-----|---|-------------------------|
| (6) | a. $\llbracket \text{all} \rrbracket = \lambda P \lambda Q \forall x [P(x) \rightarrow Q(x)]$ | <i>individual-based</i> |
| | b. $\llbracket \text{all} \rrbracket = \lambda P \lambda Q. P \subset Q$ | <i>set-based</i> |

The equative is defined in (4-b)/(5-b) as encoding a directional relation (\geq or \supseteq), rather than an equivalence relation $=$. This is based on the long-standing observation that equatives seem to be compatible with both an ‘at least’ and an ‘exactly’ reading, depending on context; and the long-standing assumption that the latter is derivable from the former, but not vice-versa.

An equative like *Jane is as tall as Bill* is true and felicitous in a context in which Jane and Bill are both 5'10''. This context satisfies the strong, ‘exactly’ interpretation. But the sentence is also true and felicitous in contexts which only satisfy a weak, ‘at least’ interpretation. (7) is one such context.

- (7) A: Bill doesn’t want a bodyguard who is shorter than he is. Is Jane a possibility?
 B: Yes, Jane is as tall as Bill is (in fact, she’s taller).

The relationship between the ‘at least’ and ‘exactly’ interpretation is generally viewed as one of pragmatic strengthening (Horn 1972), similar to the relationship between inclusive and exclusive *or*. Analyses like those above, in which the ‘at least’ reading is assumed to be semantically primary, also assume that the stronger, ‘exactly’ reading is derived via scalar implicature, in contexts in which the hearer has reason to assume that the speaker – if she in fact knows that Jane is taller than Bill – would be motivated by Gricean principles to utter the comparative *Jane is taller than Bill* instead of the equative. See Rett (2015a) for a more in-depth presentation of this type of analysis.

Modern semantic analyses of comparatives draw heavily from a strong tradition of cross-linguistic typology to differentiate between comparatives that are formed with degree quantifiers – like the English *Jane is taller than Bill* in (3-a) – and comparatives that are likely not formed with degrees at all. These studies (discussed in §2.3) have stressed the need to look for subtle differences between different comparative strategies, and are clear indicators that synonymy in comparatives doesn’t entail semantic identity. Given the strong morphosyntactic parallel between comparatives and equatives, I argue in §4 that similar typological distinctions need to be made for equatives, and consequently that not all equative constructions can and should be analyzed as involving degree quantifiers. As a result, I provide diagnostics for a new semantic typology of equatives, and argue that a few strategies shouldn’t be analyzed as involving degree quantifiers.

There are two important distinctions covered in these typologies that I will not address here: the difference between phrasal and clausal comparatives and equatives; and the difference between specific and generic equatives. The former is addressed (for comparatives) in Pancheva (2006) and the latter is addressed in Rett (2013).

2 Comparative typologies

2.1 Descriptive classes

The first comprehensive typological studies of comparatives were conducted in Ultan (1972) and Stassen (1985). Stassen defined comparatives accordingly (p24): “A construction in natural language counts as a comparative construction if that construction has the semantic function of assigning a graded (i.e. non-identical) position on a predicative scale to two (possibly complex) objects.” This includes comparatives like *Jane is taller than Bill*, but it also includes a sentence like *Compared to Bill, Jane is tall* or *Jane exceeds Bill in height*.

Stassen’s typology classified comparative constructions into three broad categories – particle comparatives, exceed comparatives, and conjoined comparatives – each with their own subtypes (see also Kennedy 2007a). Several of these constructions are illustrated below. I will follow Stassen and others in identifying the subcomponents of a comparative with the following terms:

	Jane (is)	tall	-er	than	Bill
(8)	TARGET OF COMPARISON	PARAMETER	PARAMETER	STANDARD MARKER	STANDARD OF COMPARISON

Particle comparatives A particle comparative is one in which the standard is marked by a morpheme. These markers are often but not always homophonous with directional prepositions (see Schwarzschild 2013: for a semantic account of this polysemy). Crucially, particle comparatives may or may not include a parameter marker.

The particle comparative in (9) is a separative comparative, whose standard marker means ‘from’; other languages with separative comparatives include Amharic, Andoke, Classical Arabic, Aranda, Aymara, Bedauye, Bilin, Burmese, Burushaski, Carib, Cœur d’Alene, Eskimo, Guarani, Biblical Hebrew, Hindi, Japanese, Jurak, Kashmiri, Khalka, Korean, Lamutic, Laz, Manchu, Mandarin, Nama, Piro, Quechua, Tajik, Tibetan, Tupi, Turkish, and Vayu.

- (9) Sadom-ete hati mananga-i
 horse-from elephant big-pres.3sg
 ‘The elephant is bigger than the horse.’ *Mundari*

Allative comparatives involve standard markers that, in other constructions, introduce goal phrases (like ‘to’ or ‘for’). Other languages with allative comparatives include Basque, Breton, Dakota, Gumbainggir, Hungarian, Jacaltec, Kanuri, Latvian, Mandinka, Maori, Mapuche, Miwok, Naga, Nama, Navajo, Nuer, Salinan, Samoan, Siuslawan, Tamazight, Tamil, Tarascan, Tubu, and Ubykh.

- (10) Sapuk ol-kondi to l-kibulenkeny
big.3sg the deer to the-waterbuck
'The deer is bigger than the waterbuck.' *Maasai*

Locative comparatives involve standard markers that mean roughly ‘on’, and are found in languages like Cebuano, Chuckchee, Miwok, Navajo, Salinan, and Tamil.

- (11) A ka gya ni ma
he is big me on
'He is bigger than me.' *Mandinka*

Finally, dedicated comparatives involve a construction-specific standard marker. English falls into this category, as do most European languages, as well as Ilocano, Javanese, Sranan, and Toba Batak.

- (12) Lehibe noho ny zana-ny Rabe
tall than the son-his R
'Rabe is taller than his son.' *Malagasy*

Exceed comparatives Exceed comparatives employ a verb to impose their strict ordering; the verb typically means something like ‘exceed’. The standard is the direct object of the verb, the parameter is an adjunct. English has an exceed comparative; so does Aymara, Banda, Bari, Cambodian, Dagomba, Duala, Fulani, Gbeya, Hausa, Igbo, Jabem, Kirundi, Maasai, Margi, Nguna, Quechua, Sika, Sranan, Swahili, Tamazight, Thai, Vietnamese, Wolof, Yagan, and Yoruba.

- (13) To bi ni gao.
he exceed you tall
'He is taller than you.' *Mandarin*

Conjoined comparatives Conjoined comparatives use conjunction to associate the target and standard of comparison. They use either antonyms, as in (14) and (15), or a predicate and its negation, as in (16) and (17). Languages that do the former include Cayapo, Dakota, Mangarayi, Maori, Samoan, and Sika; languages that do the latter include Hixkaryana, Menomini, Mixtec, Shipibo, and Yavapai (see also

Kubota & Matsui 2010). Other languages in this broad category include Abipon, Ekagi, Gumbainggir, Kobon, Monumbo, Nahuatl, and Pala.

- (14) Ua loa lenei va'a, ua puupuu lena
is long this boat is short that
'This boat is longer than that boat.' *Samoan*
- (15) Yan kau tukta, man almuk
I more young he old
'I am younger than him.' *Miskito*
- (16) Kaw-ohra naha Waraka, kaw naha Kaywerye
tall-not be.3sg.masc W tall be.3sg.masc K
'Kaywerye is taller than Waraka.' *Hixkaryana*
- (17) Ina na namo herea una na dia namo
this is good more that is not good
'This is better than that.' *Motu*

There is a contrast within the pairs (14)–(15) and (16)–(17). In particular, the first member of the pair doesn't involve a comparative morpheme, while the second does: *kau* in (15) and *herea* in (17). This indicates that these morphosyntactic strategies are in principle independent from whether or not the construction involves a degree quantifier. This is the subject of the next subsection.

2.2 Theoretical classes

Based largely on Stassen's typology, recent adaptations like Beck et al. (2004) and Kennedy (2007a) have differentiated between **explicit** and **implicit** comparatives (see also Sapir 1944). Informally, explicit comparatives involve specialized morphology (e.g. *-er*) that is in complementary distribution with other degree words as well as evaluativity (i.e. norm-relatedness). Implicit comparatives, on the other hand, involve the positive form of adjectives (e.g. *tall* as opposed to *taller*), and are evaluative (or norm-related).³

³ Pearson (2010) further differentiates between strong implicit comparatives and weak implicit comparatives. Strong implicit comparatives are as Kennedy describes: they are formed with the positive form of the adjective, and generally introduce the target and standard in an adjunct (e.g. *Compared to Bill, Jane is tall* or *Of Jane and Bill, Jane is the tall one*). Weak implicit comparatives also introduce the target and standard in an adjunct, but involve the comparative form of an adjective, or a parameter marker (e.g. *Compared to Bill, Jane is taller* or *Of Jane and Bill, Jane is the taller one*). This distinction is a real and important one, but I will not address it here.

(18) IMPLICIT VS. EXPLICIT COMPARISON *(Kennedy 2007a)*

- a. Implicit comparisons establish an ordering between x and y with respect to gradable property g using the positive form by manipulating the context or delineation function in such a way that the positive form is true of x and false of y .
- b. Explicit comparisons establish an ordering between objects x and y with respect to the gradable property g using morphology whose conventional meaning has the consequence that the degree to which x is g exceeds the degree to which y is g .

[Beck et al. \(2004\)](#) and [Kennedy \(2007a\)](#) also identify another parameter along which comparative constructions can vary: **individual** and **degree** comparatives. Informally, individual comparatives strictly order two individuals with respect to a gradable property, while degree comparatives strictly order two degrees that correspond to the measure of two individuals.

These parameters interact: an implicit comparative construction can compare either individuals or degrees, although an explicit comparative construction must compare degrees. These possibilities are exemplified for English in (50).

- (19) a. explicit degree comparative: *Jane is taller than Bill.*
b. implicit degree comparative: *Compared to Bill, Jane is tall.*
c. implicit individual comparative: *Jane exceeds Bill in height.*

Kennedy's 2007a diagnostic criteria for implicit comparatives are clear and decisive. A comparative is explicit if and only if it exhibits a property called 'crisp judgment'; is acceptable with absolute adjectives; and can be modified by a measure phrase differential. I'll present these in turn (see [Pearson 2010](#), [Bochnak & Bogal-Allbritten 2015](#): for additional tests).

Crisp judgments Explicit comparatives, in contrast to implicit ones, are acceptable in 'borderline' cases: those in which the difference in measure between the target and standard is negligible. Such situations require crisp judgments, or clear opinions about small differences. Kennedy's illustrations of this difference are below.

- (20) NON-BORDERLINE CASE: Essay A is 600 words; Essay B is 200 words.
- a. *Essay A is longer than Essay B.* *explicit*
 - b. *Compared to Essay B, Essay A is long.* *implicit*
- (21) BORDERLINE CASE: Essay A is 600 words; Essay B is 590 words.
- a. *Essay A is longer than Essay B.* *explicit*
 - b. *#Compared to Essay B, Essay A is long.* *implicit*

While the explicit comparative is acceptable in either context, the implicit comparative in (21-b) is unacceptable in a context in which the differences between the target and standard are negligible. This is intuitively because the implicit comparative involves the vague, context-sensitive positive form *Essay A is long*, which attributes to Essay A the evaluative property of being longer than the salient standard in the context of utterance. (See [Sawada 2009](#) and [Bochnak 2015b](#) for formal analyses of implicit comparatives.)

Compatibility with absolute adjectives There are several subclasses of gradable adjectives. A key difference between relative adjectives (like *tall*, *long*) and absolute adjectives (like *dry*, *bent*) is the adjectives' behavior in definite descriptions ([Kennedy 2007b](#), [Syrett et al. 2010](#)). In a context in which there are several glasses, all differing in heights, a definite description formed with the relative adjective *tall* (22-a) picks out the tallest individual, regardless of whether the individual counts as tall in the context. In contrast, a definite description formed with the absolute adjective *empty* (22-b) has a referent only in a context in which a glass actually counts as empty. In a context in which there are several glasses, all containing different levels of liquid (but none empty), the definite description in (22-b) fails to refer.

- (22) a. Pass me the tall one.
 b. Pass me the empty one.

A standard formal interpretation of the difference in (22) is that absolute adjectives are associated with scales with lexicalized endpoints ([Kennedy & McNally 2005](#)), while relative adjectives are associated with open scales, and therefore have to appeal to context for an endpoint, like the one required by the definite determiner.

This independent distinction between relative and absolute adjectives is also useful as a diagnostic for the difference between explicit and implicit comparatives. In particular, explicit comparatives can be formed with both relative and absolute adjectives, while implicit comparatives can only be formed with relative adjectives. This is illustrated in (23) and (24), interpreted in a context in which both rods are bent, but Rod A is only slightly bent (from [Kennedy 2007a](#)).

- (23) a. Rod B is more bent than Rod A.
 b. ??Compared to Rod A, Rod B is bent.
(24) a. Rod A is straighter than Rod B.
 b. ?Compared to B, A is straight.

Kennedy attributes the difference in acceptability of the (b) examples to the fact that absolute adjectives with maxima (*straight* but not *bent*) are more likely to allow imprecise interpretations. This suggests that a theoretical account of the definite

description test in (22) could extend to account for this distinction between explicit and implicit comparatives with respect to absolute adjectives.

Compatibility with differential MPs Finally, explicit comparatives can be modified by a measure phrase (MP), while implicit comparatives cannot. Because the MP modifies the gap between the target and standard values, this use of an MP is characterized as a differential use. The contrast is illustrated in (25), again from Kennedy (2007a).

- (25) a. Kim is 10cm taller than Lee.
b. ??Compared to Lee, Kim is 10cm tall.

The implicit comparative in (25-b) does have an interpretation, but it's an odd one. The main clause has the form of a measure phrase construction, and attributes to Kim the implausible property of being 10cm tall, but the 'compared to' phrase suggests incorrectly that this is a subjective proposition (i.e. '10cm tall relative to'). There is no other place in the implicit comparative where the MP phrase could grammatically occur.

2.3 Interim summary of comparatives

The existence of two distinct comparative strategies has called for two distinct semantic analyses of comparative constructions.⁴ The semantics for explicit comparatives, presented in (4) and (5), involves a degree quantifier, a relation between sets of degrees.⁵

In contrast, proposals for the semantic formalization of implicit comparatives have come from the degree-free 'comparison class' account originally proposed in Klein (1980, 1982).⁶ Klein argued against the assumption that gradability should be

⁴ Although of course there are potentially much more. Bhatt & Takahashi (2008), for instance, analyze at least some phrasal comparatives as involving a 'three-place *-er*', taking two individuals and a gradable adjective denotation as arguments.

⁵ While degree quantifiers are used to model the contribution of a comparative parameter marker in explicit equatives, it's not obvious that the absence of a comparative parameter marker entails the absence of a degree quantifier. Bhatt & Takahashi (2008, 2011) have argued that Japanese comparatives are explicit comparatives and involve a degree quantifier despite only having an optional parameter marker. We will see in §4.3 that Italian *tanto* equatives also have an optional parameter marker.

⁶ For languages that only have implicit comparatives, the question remains whether the language must be modeled using degrees. A great body of recent work has argued that languages like Motu (Beck et al. 2009), Fijian (Pearson 2010), Washo (Bochnak 2015a,b, Beltrama & Bochnak 2015, Bochnak & Bogal-Allbritten 2015), and Walpiri (Bowler 2016) don't have any words that refer to, modify, or quantify over degrees, and therefore do not (and arguably should not) be formally modeled using

modeled using degrees, and his account of explicit comparatives in English is one that manipulates classes of (e.g. equally tall) individuals, rather than degrees. While there are many reasons to think this account won't work for explicit comparatives, Pearson (2010) and Bochnak (2015b) have adopted it to treat implicit comparatives in Fijian and Washo, respectively.

Effectively, in these Kleinian accounts, gradable adjectives are defined as evaluative individual properties; *tall* holds of Jane iff Jane counts as tall in the context of evaluation. Implicit comparatives modulate the comparison classes; an implicit comparative that expresses that A is taller than B presupposes that A and B are the only two individuals in the relevant comparison class, and asserts that A exceeds B in height. Due to metasemantic constraints on the calculation of the standard, the result is a comparative that strictly orders A's height above B's height while simultaneously ensuring that A counts as tall in the context of evaluation.

There are two crucial points here for the discussion of equatives to follow. First, these semantic accounts of implicit comparatives are accounts of comparative constructions that don't involve anything like a degree quantifier. There are different morphosyntactic strategies for expressing the same essential meaning – $A > B$ on some specific dimension – and there is overwhelming evidence (from Beck et al. 2004, Kennedy 2007a) that at least one does not involve a degree quantifier (and, at least in certain languages, does not even involve degrees as semantic objects).

Second, the presence of a degree quantifier cross-cuts at least to some extent the descriptive typology in from Ultan 1972 and Stassen 1985 in §2.1. Comparative degree quantifiers occur in a variety of comparative strategies listed above, including separative comparatives, allative comparatives, locative, and even conjoined comparatives, as illustrated in (15) and (17). This means that the semantic analysis of a comparative strategy is in principle independent from its syntax.

Equatives are the semantic duals of comparatives, and they exhibit the same sort of morphosyntactic variation. Consequently, it's reasonable to suspect that the degree-quantifier analysis in (4)-(5) is not appropriate for all constructions that carry the essential meaning ' $A = B$ on some dimension'. In particular, a reasonable null hypothesis is that equatives differ along the same two morphosyntactic dimensions that comparatives do: they can be explicit or implicit, and they can equate degrees or individuals directly. In the next sections, I reproduce the efforts in Ultan 1972, Stassen 1985, Beck et al. 2004 and Kennedy 2007a for equatives, and argue that some equatives should not be analyzed as involving degree quantifiers.

degrees. Beck et al. (2009) refer to this as the 'Degree Semantics Parameter'. See Bogal-Albritten & Coppock (2019) in this volume for the argument that Navajo should be analyzed as involving degree quantifiers despite having only phrasal comparatives.

3 A descriptive typology of equatives

There are two excellent typological studies of equative constructions: Haspelmath & Buchholz 1998 examines equatives across 52 languages, and Henkelmann (2006) discusses equatives in 25 European languages. I will present their descriptive morphosyntactic classes in this section, and discuss these constructions with respect to the explicit/implicit issue in §4.

Haspelmath & Buchholz (henceforth HB) characterize equatives as constructions that equate extent. They characterize similatives – a related construction – as those that equate manner. I will not address the typological observations they make about the relationship between equatives and similatives; see Rett (2013) for an overview.

In what follows, I'll focus primarily on the nature of the morphemes involved, loosely following the typology in Henkelmann (2006): relative equatives (§3.1); predicate equatives (§3.2); and conjoined equatives (§3.3). In §4, I'll address the issue of what constitutes an equative formed with a degree quantifier and what does not.

3.1 Relative equatives

A relative equative is an equative whose standard is marked by a morpheme that appears elsewhere as degree relativizer, or has plausibly descended from a degree relativizer.⁷ This is the largest and most diverse subclass of equative, and the vast majority of European languages fall into this type. See the Appendix for a list of examples of each subtype of relative equative.

SM-only relative equatives An SM-only (standard-marker only) relative equative is one whose only equative morphology is a relativizer standard marker, often a degree or manner *wh*-word in the language.⁸ These are equatives in which the parameter is not marked.

- (26) Ime motër ëstë e bukur si ti.
 my sister is DET pretty how(SM) you
 ‘My sister is as pretty as you.’

Albanian, HB 291

⁷ A degree relativizer can be independently diagnosed as the morpheme used to subordinate the relative clause in a sentence like *I make how (ever) much he makes*, although these have marginal acceptability in English. In languages whose relativizers are homophonous with *wh*-phrases, these morphemes can also be identified by their ability to head degree questions, like *How tall is Jane?* or *How much does Jane make?*.

⁸ HB (p288) characterize these standard markers as an “adverbial relative pronoun that is generally based on an interrogative pronoun”.

- (27) Sestra mi e xubava kato tebe.
 sister my is pretty how(SM) you
 ‘My sister is as pretty as you.’ *Bulgarian*, HB 291
- (28) I adhelfí mu ine ómorfi san (kj) eséna.
 the sister my is pretty as(SM) (also) you
 ‘My sister is as pretty as you.’ *Modern Greek*, HB 291⁹
- (29) Mia sorella è carina come te.
 my sister is pretty how(SM) you
 ‘My sister is as pretty as you.’ *Italian*, HB 291

HB specify that relative equatives appear to have an aerial distribution in Europe; the full list from their sample has Serbo-Croatian in addition to those exemplified above.

PM-marked relative equatives These are equatives in which the standard marker is a relativizer, but which also include a parameter marker (PM) associated with the adjective. These equatives are quite well attested in Europe; they are exhaustively listed and exemplified in the Appendix.

- (30) A minha irmã é tão bonita quanto você.
 the my sister is that(PM) pretty how(SM) you
 ‘My sister is as pretty as you.’ *Portuguese*, HB 286
- (31) Ó ónna cañgaa ai jínnaa ó daa pràà.
 he so(PM) good is how(SM) he GEN brother
 ‘He is as good as his brother.’ *Punjabi*, HB 286

As HB point out, the parameter marker and standard marker are quite clearly morphologically related and semantically correlated. I will return to discuss the semantic properties of these constructions in §4.3, where I will argue for the differentiation of the two types of PM-marked relative equatives exemplified in (30) and (31).

HB characterize the English *as...as* equative as a marginal PM-marked relative equative, claiming that its parameter and standard markers are diachronically but not synchronically related to the language’s degree demonstrative and relativizer. Certainly, the relativizers *as* and *how* are synonymous in similatives, as exemplified in (32) (Haspelmath & Buchholz 1998, Rett 2013).

- (32) a. Jane danced as Bill danced (that is, beautifully/en pointe).
 b. Jane danced how Bill danced (that is, beautifully/en pointe).

⁹ HB discuss the relationship between the Modern Greek relative equative and its correlative equative counterpart (95) on p293: “In Greek, the parameter marker is diachronically based on a relative pronoun (*san* < *hōs án*, where *hōs* ‘how’ is a relative pronoun and *án* is a modal particle)”.

3.2 Predicate equatives

Main predicate equatives Some languages have ‘equal-to’ equatives, in which the main predicate is not the gradable adjective, but rather a verb meaning roughly *equals*. In the sense that the comparison relation is encoded in a verbal predicate, this equative strategy is the analog to ‘exceed’ comparatives like (19-b) *Compared to Bill, Jane is tall*.

Other languages in this category include Indonesian, Maori, Vietnamese, and Yoruba.

Adverbial predicate equatives Some equatives are formed with adverbs or adverbial phrases meaning roughly *equally* or *to the same extent*. HB classify these adverbials as parameter markers, but they are in principle distinct from them; more about this in §4. Some examples below; languages with equatives in this category also include Danish, Dutch, Estonian, Finnish, Faroese, Norwegian, Swedish, and Swiss German (HB 294-5).

- (37) Tā gēn nǐ yíyàng gāo.
 she with you one.manner tall
 ‘She is as tall as you.’ *Chinese*, HB 284

(38) Ohxe rye naha honyko, koso yaoro.
 good same be.3sg peccary deer with(SM)
 ‘Peccary is equally good, along with deer.’ *Hixkaryana*, Henkelmann 385

(39) Systir min et jafn stór og ég.
 sister my is equally tall as(SM) I
 ‘My sister is as tall as I.’ *Icelandic*, HB 294

- (40) Anak saya se-pandai anak dia.
 child 1sg one(PM)-bright child 3sg
 ‘My child is as bright as hers.’ *Indonesian*, Henkelmann 381
- (41) I ris mem degré ki nu.
 he rich same extent SM we
 ‘He is as rich as us.’ *Seychelles Creole*, HB 284

HB characterize these standard markers, where present, as relative particles (similar to the standard markers in relative equatives).

3.3 Conjoined equatives

In direct analog to conjoined or paratactic comparatives, some languages have conjoined equatives. These involve two parallel clauses, joined together serially or with an explicit conjunction. They often include an additive particle (synonymous with English *too*, *also*) as a standard marker.

- (42) ñaya ña-balayi ñaŋgi wadij ña-balayi.
 1SG.NOM 1SG-big 2SG.NOM also 2.SG-big
 ‘I am big, you are also big.’ *Mangarayi*, Henkelmann 395
- (43) Hwara' na Xijam. Hwara' na Orowao quem ca' na.
 big T/A.3SG X big T/A.3SG O REF this T/A.3SG
 ‘Xijam is as big as Orowao.’ *Wari*', ibid.

3.4 Case-marked standards

Other languages employ a case marker or preposition as a standard marker. These strategies exist with (45) or without (46) a parameter marker. Three examples are below; other languages include Abkhaz, Arabic, Basque, Comanche, Ibabura Quechua, Japanese, Kabardian, Kalmyk, Krongo, Lezgian, Ndyuka, Tamil, Turkana, and Turkish (Haspelmath & Buchholz 1998:296, Henkelmann 2006:382-3).

- (44) Yen-ke æymen pørpør, rey-ke-kwo.
 2sg -POSS knife sharp 3sg-POSS-SM
 ‘Your knife is as sharp as his.’ *Awtuw*, Henkelmann 382
- (45) Ilit-tut utuqqaa-tiga-aq.
 thou-SM be.old-PM-3sg.IND
 ‘He is as old as you.’ *Greenlandic Eskimo*, HB 285
- (46) Pani-i-mi qam-naw shumaq.
 sister-1sg-DIR you-SM pretty

‘My sister is as pretty as you.’

Ancash Quechua, HB 285

3.5 Dedicated morphemes

Finally, some languages employ parameter markers and standard markers with “no transparent etymology,” i.e. which are construction-specific. HB identify these as the rare case. Welsh in (47) has both a dedicated PM and SM; Modern Irish and Breton have dedicated PMs but co-opted SMs (the committative and conjunction morphemes, respectively).

- (47) Mae e cyn ddued â ’r frân.
is he PM black SM the crow
‘He is as black as the crow.’ *Welsh*, HB 285
- (48) Tá Máire chomh cliste le Liam.
is M PM clever with(SM) Liam
‘Máire is as clever as Liam.’ *Modern Irish*, HB 285
- (49) Ma c’hoar a red ken buan ha c’hwi.
my sister PTL run PM fast and(SM) you
‘My sister runs as fast as you.’ *Breton*, HB 285

4 A theoretical typology of equatives

In what follows, I take for granted extant treatments of parameter-marked equatives (like the English *as...as* construction) as involving a degree quantifier, and thus instantiating an analog to explicit comparatives: explicit equatives. The questions I take up in this section are: What tests can we use to differentiate between an explicit and implicit equative strategy? And, how can we determine whether a given implicit equative strategy encodes a degree quantifier?

HB addressed these questions obliquely, by using the terms ‘comparative degree’ and ‘equative degree’ to refer to the relevant DegP heads (or degree quantifiers): “A parameter marker may be synthetic or analytic. If it is synthetic, we speak of an equative degree, which is completely analogous to the familiar comparative degree in comparative constructions. Unlike the comparative degree, the equative degree is rare in European languages. It is attested only at the margins of Europe, in Kartvelian, Celtic, and Finno-Ugric” (HB 283). This suggests that morphological dependence – whether a morpheme is free or bound – is sufficient for characterizing a parameter marker as a degree quantifier. This is unlikely to be the right distinction, even for comparative parameter markers, as the synonymy of the English *-er* and

more attests.¹⁰ I will argue in §4.3 that it is in fact wrong, and in particular that some parameter-marked relative equatives involve degree quantification, while others do not.

I will first introduce several diagnostic tests that differentiate between explicit equatives like the English *as...as* construction and other equative strategies.

4.1 Semantic tests for equative strategies

Recall that English employs more than one type of equative strategy. Many are listed below, with labels from the previous section (see Hanink 2018 for a discussion of *same* constructions, which are often also called equatives).

- | | | |
|------|---|---|
| (50) | a. Jane is as tall as Bill.
b. Jane is tall like Bill.
c. Jane is tall; Bill is tall (too).
d. Jane equals Bill in height. | <i>PM equative</i>
<i>SM-only equative</i>
<i>conjoined equative</i>
<i>predicate equative</i> |
|------|---|---|

The strong parallels between these morphological strategies and those in comparative constructions suggests that equatives, too, can be split into explicit and implicit categories. What follows are proposed diagnostics for making that distinction.¹¹

Availability of weak reading As discussed in §1, the English parameter-marked relative equative *Jane is as tall as Bill* can receive a weak, ‘at least’ interpretation in addition to the strong ‘exactly’ interpretation, depending on context. We can diagnose the ability of an equative to receive a weak reading by using the continuation ‘in fact she’s taller’. This point is reproduced in (51-a), and extended to the other English equative strategies.

- | | | |
|------|--|---|
| (51) | a. Jane is as tall as Bill, in fact she’s taller.
b. Jane is tall like Bill, in fact she’s taller.
c. Jane is tall; Bill is tall (too). In fact she’s taller.
d. Jane equals Bill in height, #in fact she’s taller. | <i>PM relative</i>
<i>SM-only relative</i>
<i>conjoined</i>
<i>predicate</i> |
|------|--|---|

10 These forms are often but not always in complementary distribution (in English as well as other languages, like Russian, with both a synthetic and an analytic comparative morpheme. As argued in Pancheva (2006), Rett (2015b), when synthetic and analytic comparatives are in free variation, the analytic version is marked and therefore evaluative, or norm-related (i.e. presupposes that the degree be significantly high in context). Compare the synthetic *Jane is taller than Bill* to the analytic *Jane is more tall than Bill*.

11 I will only use main predicate equatives to exemplify the class of predicate equatives, as the subtypes pattern together on these diagnostics.

This diagnostic clearly distinguishes between the non-predicate equatives in (51-a)–(51-d) – which can receive a weak interpretation – with the predicate equative in (51-d), which cannot. The latter observation is no surprise, as the predicate involved in these strategies is the word *equals*, which is not compatible with an ‘at least’ interpretation.

Evaluativity patterns A construction is evaluative iff it requires that a degree exceed a contextually-valued standard. The constructions in (52) differ with respect to evaluativity; one diagnostic of this difference is their (in)compatibility with the negation of the relevant antonym, as in (52).

- (52) a. Jane is as tall as Bill, but she’s short.
 b. Jane is as short as Bill, #but she’s tall.

The equative in (52-a), formed with the positive relative adjective *tall*, is not evaluative: it doesn’t presuppose that Jane or Bill is tall, so it’s compatible with Jane or Bill being short. In contrast, the equative in (52-b), formed with the negative relative adjective *short*, is evaluative: it does presuppose that Jane and Bill are short, so it is incompatible with their being tall. Not every construction displays this antonymic evaluativity contrast with respect to relative adjectives; explicit comparatives do not, but implicit comparatives are always evaluative (Rett 2015b).

The constructions in (50) differ with respect to evaluativity, even with a positive-antonym relative adjective like *tall*.¹²

- | | | |
|------|--|---|
| (53) | a. Jane is as tall as Bill, but she’s short.
b. Jane is tall like Bill, #but she’s short.
c. Jane is tall; Bill is tall (too), #but she is short.
d. Jane equals Bill in height, but she’s short. | <i>PM relative</i>
<i>SM-only relative</i>
<i>conjoined</i>
<i>predicate</i> |
|------|--|---|

The predicate equative in (53-d) is not evaluative. Within the class of non-predicate equatives, we see an additional piece of evidence that there is a clear semantic difference between explicit and implicit equatives, defined in a way that is analogous to Kennedy’s distinction in the comparative domain: equatives like (53-a) that mark their parameters are explicit equatives, and are not evaluative when formed with positive-antonym relative adjectives. But equatives that do not mark their parameters, like (53-b) and (53-c) – implicit equatives – are evaluative.

¹² In (53), the judgments should be evaluated in a context in which Jane and Bill are in the same comparison class, and therefore the hearer can take for granted that if one is tall (or short), than the other one is too.

Acceptability with factor modifiers Recall that, in (18), Kennedy characterized the difference between explicit and implicit comparative strategies in terms of the forms of their adjectives. Implicit comparatives use the positive form of adjectives – the same as in positive constructions like *Jane is tall* – and explicit comparatives use the comparative form of adjectives. In English, the comparative forms of adjectives are just ‘Adj-*er*,’ for adjectives that take synthetic comparatives, but they can also be ‘*more* Adj.’ This means, effectively, that there is a single necessary and sufficient condition for being an explicit comparative: that the construction have a parameter marker (either *-er* or *more* in English).

This seems to be a real distinction in equative strategies, as well; the ability of an equative to be modified by a factor modifier like *twice* or *half* differentiates even between equatives with parameter markers, as in (54-a), and equatives without parameter markers, as in (54-b).¹³

- | | | |
|------|--|---|
| (54) | <ul style="list-style-type: none"> a. Jane is twice as tall as Bill. b. Jane is (*twice) tall like Bill. c. Jane is (*twice) tall; Bill is tall (too). d. Jane (*twice) equals Bill in height. | <i>PM relative</i>
<i>SM-only relative</i>
<i>conjoined</i>
<i>predicate</i> |
|------|--|---|

In the case of (54-d), the incompatibility of a factor modifier with the predicate *equals* is clearly unacceptable for the same reason that predicate equatives don’t have weak, ‘at least’ interpretations: the truth conditions imposed by the equative strategy (equality of height) are semantically incompatible with the meaning encoded in the factor modifier.

But this is not true of the other equatives, in (54-b) and (54-c), the equative strategies whose subcomponents are positive constructions (*Jane is tall*). In these cases, just as with comparative strategies, the clear difference seems to be that the degree argument of the parameter *tall* is bound or valued by POS, or some other compositional mechanism that yields evaluativity (Rett 2015b). This suggests that the relevant degree of comparison is not available for degree quantification, and thus cannot be further restricted by a factor modifier.

Summary The diagnostics presented above yield roughly three different classes of equatives (shown in Figure 1): predicative equatives, formed by some version of a word like *equal*, like that in (50-d), are equatives that do not receive weak, ‘at least’ interpretations.

¹³ These factor modifiers interact differently with negative antonyms than they do with positive antonyms; see Croft & Cruse (2004) for the original observation, and Rett (2015b) pp 48, 114–115 for discussion.

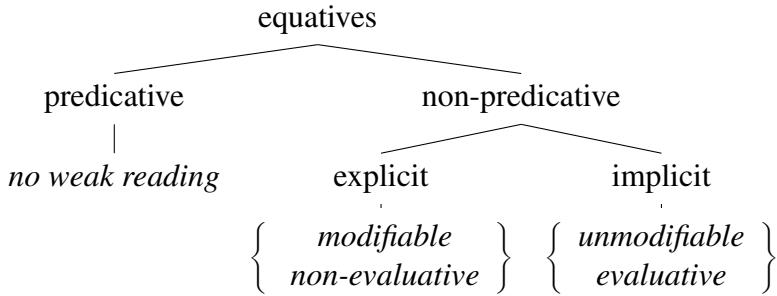


Figure 1 A typology of equatives (to be revised)

Within the equatives that do receive ‘at least’ interpretations, there are two distinct types: explicit equatives, which are modifiable and non-evaluative (when formed with a positive relative adjective); and implicit equatives, which are not modifiable, and are evaluative (regardless of what type of adjective they’re formed with). Because the explicit adjective examined here, (50-a), has a parameter marker, and the implicit ones, (50-b) and (50-c), do not, equatives seem to conform to Kennedy’s explicit/implicit distinction for comparatives: non-predicate equatives with adjectives unbound by a degree quantifier are implicit equatives; those with adjectives bound by a degree quantifier (or a parameter marker) are explicit equatives.

In the next section I offer some evidence that this typology is cross-linguistically robust but incomplete. In §5 I provide semantic analyses for two different types of relative equatives (the SM-only implicit equatives, and a second type of explicit, PM equative).

4.2 Semantic diagnostics cross-linguistically

In this section, I’ll argue that the diagnostics reviewed above support the typology in Figure 1 across languages, with one exception: cross-linguistically, equatives with a parameter marker (PM equatives) fall into two distinct categories, one patterning with English explicit equatives, and the other with a slightly different semantic profile.

Predicative equatives Predicative equatives universally receive an ‘exactly’ reading, but no ‘at least’ reading. This is a definitional characteristic; predicate equatives are formed with predicates equivalent to ‘equals’. I illustrate it below for Swedish and Dutch.

The speaker reports that the equative in (55) is a contradiction of its continuation.

Implicit equatives SM-only relative equatives in other languages, too, qualify as implicit equatives according to the diagnostics below. I present two case studies, the first in Croatian, the second in Italian.

In Croatian, relative equatives can be formed with the relativizer *kao* ('as') but no parameter marker, as in (58).¹⁴

- (58) Ivan je visok kao Petar.
John be tall as Peter
'John is as tall as Peter.' *Croatian*

SM-only relative equatives in Croatian are not acceptable with factor modifiers, but they are evaluative. This first point is demonstrated in (59); the second in (60).

Italian also has an SM-only relative equative strategy, in (61).

- (61) Gianni e alto come Marco.
 G is tall how /how.much M
 ‘Gianni is as tall as Marco.’

14 Croatian also has what appears to be a second relative equative strategy, with the *wh*-word meaning ‘how much/many’ but with a conjunction introducing the standard:

- (57) Ivan je visok koliko i Petar.
 John be tall how.much and Peter
 'John is tall as much as Peter.'

I will not discuss this strategy here because it is not a canonical instance of either a relative equative or a conjoined equative.

These equatives, too, are unmodifiable and evaluative; the former point is demonstrated below.

- (62) *Gianni e due volte alto come /quanto Marco.
 G is two times tall how /how.much M
 ‘Gianni is twice as tall as Marco.’ Italian

4.3 A closer look at explicit equatives

The diagnostics outlined in §4.1 reveal an interesting difference within the descriptive class of parameter-marked relative equatives. In particular, these diagnostics show that parameter-marked relative equatives actually fall into two distinct subclasses: those whose parameter is marked by a degree demonstrative, like *that much*; and those whose parameter is marked by a resultative or sufficientive morpheme like *so*. In §5 I will suggest that only the latter involves degree quantification of the sort demonstrated in (4) and (5).

There are languages with equative strategies that mark parameters that do behave like the English explicit equative. Some are illustrated below; others are listed in the Appendix. The Dutch PM-marking equative in (63) behaves just like the English one in that it is modifiable (64), non-evaluative (65), and receives a weak interpretation (66).

- (63) Jan is zo lang als Piet.
 J is so(PM) tall as(SM) P
 ‘John is as tall as Pete.’ Dutch
- (64) Jan is twee keer zo lang als Piet.
 J is two times so(PM) long as(SM) P
 ‘John is twice as tall as Pete.’ Dutch
- (65) Jan is zo lang als Piet, en hij is heel klein.
 J is so(PM) tall as(SM) P, and he is very small
 ‘John is as tall as Pete, and he is short.’ Dutch
- (66) Jan is zo lang is Piet. Hij is zelfs langer.
 J is so(PM) tall as(SM) P. He is in.fact taller
 ‘John is as tall as Pete, in fact he is taller.’ Dutch

The same is true for the Swedish PM-marked relative equative.

- (67) Thomas är dubbelt så lång som Christoffer.
 T is twice so(PM) tall as(SM) C.
 ‘Thomas is twice as tall as Christoffer.’ Swedish

- (68) Thomas är så lång som Christoffer, men båda är korta.
 T is so(PM) tall as(SM) C, but both are short
 'Thomas is as tall as Christoffer, but both are short.' *Swedish*
- (69) Thomas är så lång som Christoffer, han är till och med högre.
 T is so(PM) tall as(SM) C, he is even taller
 'Thomas is as tall as Christoffer, in fact he is even taller.' *Swedish*

In contrast, there are other languages whose PM-marked relative equatives do not pattern with the English explicit equative strategy. In particular, they are non-evaluative and receive a weak interpretation – like the English relative equative – but they are not modifiable.

This is exemplified in Italian. (70) shows that the Italian PM-marked relative equative is not evaluative; (71) shows that it has a weak interpretation; and (72) shows that it is unmodifiable.

- (70) Gianni è tanto alto quanto Pietro, ma è basso.
 G is that.much(PM) tall how.much(SM) P, but he.is short
 'John is as tall as Peter, but he is short.' *Italian*
- (71) G è tanto alto quanto P. Infatti, è più alto.
 G is that.much(PM) tall how.much(SM) P. In fact, he.is more tall
 'John is as tall as Peter. In fact, he is taller.' *Italian*
- (72) *Gianni è due volte tanto alto quanto Pietro.
 G is two times that.much(PM) tall how.much(SM) P
 'John is twice as tall as Peter.' *Italian*

It's possible that Spanish also patterns with Italian in this respect; (73) shows that the PM-marked relative strategy is not evaluative, and (74) shows that it can receive a weak interpretation. (75), on the contrary, shows that it cannot be modified by a factor modifier.

- (73) Juan es tan alto como Pedro, pero Pedro es bajito.
 J is that.much(PM) tall like(SM) P, but P is short.DIM
 'John is as tall as Peter, but Peter is short.' *Spanish*
- (74) Juan es tan alto como Pedro. De hecho, él es más alto.
 John is that.much(PM) tall like(SM) Peter. In fact, he is more tall
 'John is as tall as Peter. In fact, he is taller' *Spanish*
- (75) ?Juan es dos veces tan alto como Pedro.
 J is two times as tall like P
 'John is twice as tall as Peter.' *Spanish*

My consultants reported (75) as unnatural, so there is a putative contrast with Italian, in which (71) is reported to be ungrammatical. It's possible that the distinction I'm making here between these two subclasses of explicit equatives is subject to dialectical variation or morphologic or semantic reanalysis.

A comprehensive list of relative equative strategies is in the Appendix. Table 2 lists the data I've collected on these two types of PM-marked relative equatives according to their behavior on these diagnostics.¹⁵ The morphological patterns here suggest a subtypology: equatives whose parameter is marked with a morpheme meaning *so* or something similar behave one way – like the canonical English equative – and those whose parameter is marked with a demonstrative morpheme meaning *that much* behave another way. (There is a family resemblance here too, of course, with Germanic languages using one type of strategy and Romance and Slavic languages using the other.)

LANGUAGE	PARAMETER MARKER?	MODIFIABLE?	EVALUATIVE?	WEAK READING?
English	<i>as</i>	yes	no	yes
Dutch	<i>zo</i>	yes	no	yes
German	<i>so</i>	yes	no	yes
Korean	<i>mankhum</i>	yes	no	yes
Swedish	<i>så</i>	yes	no	yes
Catalan	<i>tan</i>	no	no	yes
Italian	<i>tanto</i>	no	no	yes
Romanian	<i>tot</i>	no	no	yes
Slovenian	<i>tako</i>	no	?	?
Spanish	<i>tan</i>	no?	no	yes

Figure 2 Subtypes of explicit equatives

These data suggest that a more accurate cross-linguistic typology of equative strategies is as in Figure 3, with the category of explicit equatives – those equatives with parameter markers – divided into two distinct categories: those headed by sufficientives like *so*, and those headed by degree demonstratives, meaning roughly *that much*.

This typology begs the question: if English equatives are best analyzed as involving degree quantifiers, and if English instantiates the sufficientive equative strategy, how are demonstrative equatives best analyzed semantically? What explains their inability to be modified (but their ability to receive a weak interpretation)? I take up these questions in the next section.

¹⁵ The Slovenian data are incomplete because I have drawn them from Crnič & Fox (2019), who give a very different explanation for why Slovenian equatives are not modifiable.

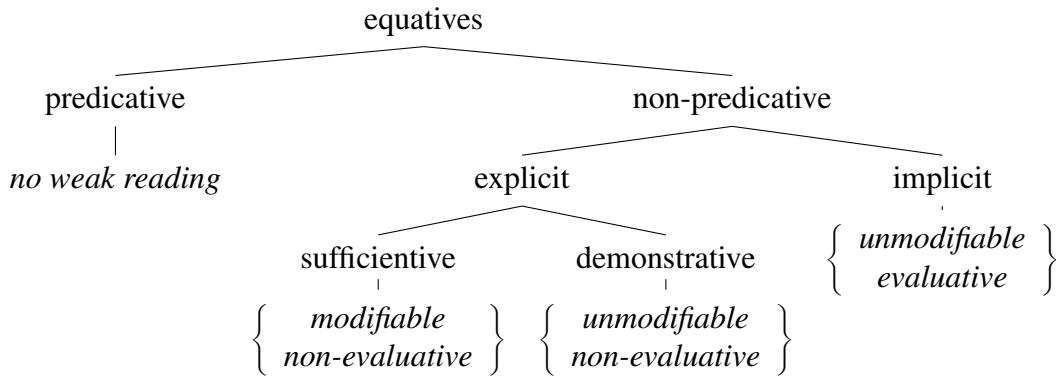


Figure 3 A typology of equatives (final)

5 The semantics of non-degree-quantificational equative strategies

In this section, I'll provide a semantic analysis for SM-only relative clauses – taken from the treatment of generic equatives in Rett (2013) – and a semantic analysis of canonical demonstrative explicit equatives like Italian, borrowing from Brasoveanu (2009). The correct semantic analysis of sufficientive explicit equatives remains the same: I suggest they are the only equative strategy that involves degree quantification (although it is of course possible for one type of parameter marker to be reanalyzed as the other).

Not explicitly addressed in this section is the semantics of predicate equatives, conjoined equatives, case-marked equatives or dedicated-morpheme equatives. The semantics for predicate equatives are straightforward; they encode their equative relationship in a lexical item. A semantic analysis for the others will require further research.

5.1 The semantics of implicit equatives

As Haspelmath & Buchholz (1998) showed, languages that have SM-only relative equatives form similatives – whose parameter is a verb, rather than an adjective, as in (76-b) – with the same relativizer. An example below is from Serbo-Croatian.

- (76) a. On je visok kao njegova sestra.
 he is tall how(SM) his sister
 'He is as tall as his sister.' Serbo-Croatian

b. On piše kao njegova sestra.
 he writes how(SM) his sister
 'He writes like his sister.' Serbo-Croatian

As Haspelmath & Buchholz also show, there is impressive cross-linguistic universality regarding these standard markers across similatives, specific equatives (the topic of this paper), and generic equatives, e.g. *Jane is white as snow* in English.

In Rett (2013), I argued that standard markers work the same way in generic equatives and similatives. They introduce relative clauses ranging over non-lexicalized arguments, associated with the parameter via a relation \mathbb{R} , encoded in some sort of type shifter ρ (Landman 2000).¹⁶ As shown in (77-a), it is strongly parallel to the null operator associating events with their runtimes, in (77-b) (Davidson 1969). In the case of similatives, this type-shifter associates verbs with their manner; in the case of generic equatives, it associates adjectives with their evaluative or canonical properties.

- (77) a. $\llbracket \rho \rrbracket = \lambda E_{\langle v, t \rangle} \lambda e. E(e) \wedge \mathbb{R}(e, m)$
 b. $\llbracket \tau \rrbracket = \lambda E_{\langle v, t \rangle} \lambda e. E(e) \wedge \mathbb{R}(e, t)$

I assume that the truth conditions in (78-a) are the denotation of a sentence without this relation, and those in (78-b) are a version that includes it. In this version, the eventuality introduced by the verb is associated with a manner m , in this case valued by context.

- (78) a. $\llbracket \text{Jane danced} \rrbracket = \exists e [\text{dance}(e) \wedge \text{agent(jane, } e)]$
 b. $\llbracket \text{Jane danced } \rho \rrbracket = \exists e [\text{dance}(e) \wedge \text{agent(jane, } e) \wedge \mathbb{R}(e, m)]$
 shorthand: $\exists e [e = \text{dance(jane)} \wedge \mathbb{R}(e, m)]$

In English specific equatives, the equation of two degrees involves a degree quantifier, denoted by the parameter marker. Similatives and generic equatives show that quantifiers aren't strictly speaking required to equate two things. We can do it using the compositional rules of Predicate Modification and Existential Closure, as demonstrated in (79).¹⁷

In (79), both the matrix and the subordinated clauses are relative clauses, and both are associated (via ρ) with a manner argument. The two clauses are combined semantically using Predicate Modification; this effectively equates the two manners. This variable is existentially bound at the end of the utterance using existential closure.

16 I think of \mathbb{R} as semantically encoding some sort of pragmatic homomorphism, akin to what happens with deferred reference (more of that in Rett 2014). Another way of conceptualizing \mathbb{R} is as a type-shifter along the lines of those in Partee & Rooth (1983) – i.e. the function from an individual to a set of her properties – but across semantic domains instead of higher types.

17 In all of these derivations, I assume that the matrix clause (including the target) forms a relative clause – just like the subordinated clause – via movement of a null operator. As discussed in Rett (2013), this is a standard assumption, although I know of no explanation for why the relativizers in subordinated clauses are sometimes pronounced, while those in matrix clauses never are.

- (79) Jane danced as Bill danced. *similative*

- a. $\llbracket \text{Jane danced} \rrbracket = \llbracket \text{Op}_\rho \text{ Jane danced } \rho \rrbracket = \lambda m \exists e [e = \text{danced(jane)} \wedge \mathbb{R}(e, m)]$
- b. $\llbracket \text{as Bill danced} \rrbracket = \llbracket \text{as Bill danced } \rho \rrbracket = \lambda m' \exists e' [e' = \text{danced(bill)} \wedge \mathbb{R}(e', m')]$
- c. *predicate modification:*
 $\lambda m \exists e, e' [e = \text{danced(jane)} \wedge \mathbb{R}(e, m) \wedge e' = \text{danced(sue)} \wedge \mathbb{R}(e', m)]$
- d. *existential closure:*
 $\exists m, e, e' [e = \text{danced(jane)} \wedge \mathbb{R}(e, m) \wedge e' = \text{danced(sue)} \wedge \mathbb{R}(e', m)]$

The same is true of generic equatives, as in (80), but in these constructions the type-shifter ρ associates the predicate with an evaluative property (in (80), the property of being significantly white). The same two mechanisms – Predicate Modification and Existential Closure – derive the equation of these two properties, so (80-d) is true if some eventuality of Jane being white shares a property with some (generic) eventuality of snow being white.

- (80) Jane is white as snow. *generic equative*

- a. $\llbracket \text{Jane is white} \rrbracket = \llbracket \text{Op}_\rho \text{ Jane is white } \rho \rrbracket = \lambda P \exists e [e = \text{white(jane)} \wedge \mathbb{R}(e, P)]$
- b. $\llbracket \text{as snow is white} \rrbracket = \llbracket \text{as snow is white } \rho \rrbracket = \lambda P' \exists e' [e' = \text{white(snow)} \wedge \mathbb{R}(e', P')]$
- c. *predicate modification:*
 $\lambda P \exists e, e' [e = \text{white(jane)} \wedge \mathbb{R}(e, P) \wedge e' = \text{white(snow)} \wedge \mathbb{R}(e', P')]$
- d. *existential closure:*
 $\exists P, e, e' [e = \text{white(jane)} \wedge \mathbb{R}(e, P) \wedge e' = \text{white(snow)} \wedge \mathbb{R}(e', P')]$

As discussed in Rett (2013), this analysis works straightforwardly on SM-only relative equatives like the Italian *come* construction. (Italian, like Serbo-Croatian in (76), employs the same standard marker in its SM-only relative equative as it does in its similative and generic equative.) In the case of specific equatives, the type-shifter associates each clause with a property argument related to the (evaluative) eventuality of the subject being significantly tall.¹⁸

- (81) Gianni e alto come Pietro. *Italian SM-only relative equative*

- a. $\llbracket \text{Gianni e alto} \rrbracket = \llbracket \text{Op}_\rho \text{ Gianni e alto } \rho \rrbracket = \lambda P \exists e [e = \exists d [\text{tall(gianni, } d) \wedge d > s] \wedge \mathbb{R}(e, P)]$

18 There are a number of ways to represent how these positive constructions come to be associated with an evaluative property; see Rett (2015b) for details.

- b. $\llbracket \text{come Pietro e alto } \rho \rrbracket = \lambda P \exists e' [e' = \exists d' [\text{tall}(\text{pietro}, d') \wedge d' > s] \wedge \mathbb{R}(e', P)]$
- c. *predicate modification:*
 $\lambda P \exists e, e' [e = \exists d [\text{tall}(\text{gianni}, d) \wedge d > s] \wedge \mathbb{R}(e, P) \wedge e' = \exists d' [\text{tall}(\text{pietro}, d') \wedge d' > s] \wedge \mathbb{R}(e', P)]$
- d. *existential closure:*
 $\exists P, e, e' [e = \exists d [\text{tall}(\text{gianni}, d) \wedge d > s] \wedge \mathbb{R}(e, P) \wedge e' = \exists d' [\text{tall}(\text{pietro}, d') \wedge d' > s] \wedge \mathbb{R}(e', P)]$

The truth conditions in (81-d) hold in any situation in which there is a property associated with the eventuality of Gianni being significantly tall and the eventuality of Pietro being significantly tall.

These constructions all share their semantic derivations with other relative clauses. They involve the association of two entities or properties by virtue of the juxtaposition of two relativized clauses, without any morphemes overtly encoding sameness, equation, or the \geq relation we associate with explicit equative degree quantification. From this perspective, all relative clauses are equative-like; e.g. *Jane met who Bill met* equates the individual Jane met with the individual Bill met. In the vast quantity of languages that employ relativization, this is a natural equative strategy.

5.2 The semantics of demonstrative explicit equatives

Demonstrative explicit equatives, too, repurpose morphology from elsewhere. In particular, the matrix clause is formed with a degree demonstrative, which is associated with the target, and the subordinate clause is formed with a relativizer, which is associated with the standard.

I propose to analyze these demonstrative explicit equatives transparently, i.e. involving the discourse introduction of a particular degree (by the degree demonstrative) and anaphora to that degree (by the relativizer). The semantic analysis will parallel in many ways the significantly more complicated analysis of degree correlatives from Brasoveanu (2009).

- (82) Pe cît e Irina de frumoasă, (tot) pe atît e de deșteaptă.
 PE how.much is I DE beautiful all PE that.much is DE smart
 ‘However much Irina is beautiful (to a certain, significant extent), she is that smart (i.e. to the same, equally significant extent.)’ Romanian

Degree correlatives like those in (82) are very similar to the demonstrative equatives we see in languages like Romanian, exemplified in (83). They differ in two ways: in degree correlatives, 1) the relative clause is left-dislocated; and 2) the

relative clause is headed by a *wh*-phrase (*cît* in (82)) instead of a relativizer (*ca* in (83)).

- (83) Irina este tot atît de înaltă ca și Maria.
 I is all that-much(PM) of tall as(SM) also M
 ‘Irina is as tall as Maria.’ Romanian

The correlative in (82) has an added layer of semantic complexity because, like other comparisons of deviation (as in (37) Kennedy 2001, Bale 2008), it compares differential degrees. Rather than directly comparing Irina’s degree of beauty to her degree of intelligence – which is arguably not semantically feasible, Kennedy (1999) – the comparison of deviation (or ‘indirect comparison’) compares the degree to which Irina’s beauty differs from the contextually relevant standard of beauty to the degree to which Irina’s intelligence differs from the contextually relevant standard of intelligence.

In contrast, the demonstrative explicit equative in (83) directly compares degrees of tallness. This obviates the need for a complicated homomorphism in the semantics, along the lines of those proposed in Bale (2008), Brasoveanu (2009). It also means that, whereas Brasoveanu’s analysis of degree correlatives involves anaphora to differentials, the analysis of demonstrative explicit equatives can involve anaphora directly to (first-order) degrees.

As before, I will treat the embedded clause introducing the standard as a degree relative, headed by a relativizer (*ca* in the case of Romanian, *quanto* in Italian), repeated in (84) from (70). As with English equatives, the logical form of the standard clause in e.g. (71) will look like (84) (cf. (3-b)).

- (84) Gianni è tanto alto quanto Pietro:
 [CP John is [CP OP_d quanto Pietro è ~~d~~—tall] that_i tall]

I assume the relative clause is extraposed at LF, as it is in English comparison constructions (3-b); I will discuss why this might be shortly.

Following Jacobson (1995), Caponigro (2004) and others since, relative clauses in many contexts are type-shifted to denote definites (and, in particular, maxima; in this case, a maximum degree).

- (85) [[quanto Pietro è alto]] = MAX($\lambda d. \text{tall}(\text{pietro}, d)$)

The entire equative, as a result, will involve degree anaphora in the matrix clause, as in (86).

- (86) [[Gianni è tanto alto quanto Pietro]] = tall(gianni, MAX($\lambda d. \text{tall}(\text{pietro}, d)$))

These demonstrative explicit equatives, especially in contrast to degree correlatives like (82), involve something much more closely resembling cataphora than traditional anaphora: the degree demonstrative linearly precedes its relativized modifier.

I have no explanation for why the correlatives have the order they do, but the extraposition of the standard-marking clause in these languages as well as languages like English seems to have a clear, non-optional discourse function. In particular, comparison constructions require their subject (or target) address the Question Under Discussion (Roberts 1996), even in equatives, in which the measure of the target provides information about the measure of the standard, and vice-versa. In Rett (2015b), I dub this the ‘Equative Argument Asymmetry,’ illustrated with data like (87) (p120): “A comparison construction with an external argument value x and an internal argument value y is felicitous iff x is relevant to the QUD.”

- (87) A: How tall/short is Doug?
B: He's as tall/short as Adam.
B': #Adam is as tall/short as he is.

In other words, demonstrative explicit equatives have the clausal syntax they do – specifically, an extra-posed relative clause – for information-structural reasons; the anaphoric phrase containing the demonstrative takes linear precedence because it addresses the QUD.

Most importantly for our purposes, the analysis of demonstrative explicit equatives in (86) correctly predicts the semantic behavior summarized in Figure 2. Two of their properties come about by virtue of the fact that they’re degree demonstrative constructions, similar to (88).

- (88) A: How tall is Jane?
B: (*gesturing*) This tall.

The degree demonstrative in (88) is not evaluative; it doesn’t entail that Jane counts as tall in the context of utterance. When demonstrative explicit equatives are formed with positive-antonym relative adjectives like *tall* they, too, are not evaluative.

Degree demonstrative constructions have a weak reading, too. This isn’t evident in the context in (88), in which B’s gesture is most naturally interpreted as setting a maximum height (arguably for Gricean Quantity reasons). But when the demonstrated height has an anaphoric link (van der Sandt 1992), as in (89), the degree demonstrative construction can receive a weak interpretation.

- (89) A: How tall is Jane? (*gesturing*) Is she this tall?
B: Yes (she’s that tall), in fact she’s taller.

In this way, too, degree demonstrative constructions parallel demonstrative explicit equatives.

Finally, a degree-demonstrative account of these equatives also predicts that they are unmodifiable by factor modifiers, in direct contrast to sufficientive explicit equatives. While sufficientive explicit equatives relate two sets of degrees, demonstrative explicit equatives are directly referring; they predicate one height of another.¹⁹

In languages like Italian and Spanish, degree demonstrative constructions cannot grammatically occur with factor modifiers, although there are some notable differences: the Italian degree demonstrative in (90) is formed with *cosí*; and (91) was marked by my Spanish consultants to be less acceptable than the equative version in (75).

- (90) *Gianni è due volte cosí alto.

G is two times that tall
‘John is twice that tall.’

Italian

- (91) ??Juan es dos veces tan alto.

J is two times that tall
‘John is twice that tall.’

Spanish

These data suggest that it’s consistent with the present analysis of demonstrative explicit equatives that these constructions cannot be modified by factor modifiers.

In sum, the semantic properties of demonstrative explicit equatives are a lot like those of sufficientive explicit equatives: they both receive weak interpretations, and are non-evaluative when formed with positive-antonym relative adjectives. But I’ve suggested that these similarities – and other superficial syntactic similarities, including the extraposition of the standard clause – belie a fundamental difference: that the parameter marker in sufficientive equatives is a degree quantifier, while the one in demonstrative equatives is a degree demonstrative. This accounts for the inability of the latter to be modified by factor modifiers like *twice* and *half*.

6 Conclusions

The main goal of this paper has been to replicate the successful descriptive and theoretical typologies of comparatives for equative constructions, the morphosyntactic and semantic siblings of comparatives. There are a number of clear descriptive parallels across the two constructions: for each, languages differ with respect to how and whether they mark the constructions’ adjectival parameter and standard, but none mark the constructions’ target of comparison. And there are a few strategies available

¹⁹ There is a slight contrast, in my dialect, between the acceptable *twice as tall as that* and the marginal *twice that tall*, but it is admittedly not a strong contrast.

for each sort of construction: both comparatives and equatives, cross-linguistically, can be formed with explicit predicates ('exceed' or 'equal') and with conjoined or juxtaposed clauses.

In terms of semantic theory, comparatives fall into (at least) two classes: explicit and implicit equatives. Explicit comparatives involve a parameter marker (something binding or modifying the adjective, like the English *-er* or *more*); implicit comparatives do not (Kennedy 2007a). While implicit comparatives may or may not need to be represented in a degree semantics, explicit equatives have been analyzed as involving degree quantifiers, type $\langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle \rangle$, and therefore must be represented in a degree semantics.

Equatives, too, differ with respect to whether they involve a parameter marker (something binding or modifying the adjective, like the first of the two *as* morphemes in the English *Jane is as tall as Bill*). Of the implicit equatives, predicative equatives are diagnosable by virtue of the fact that they can only receive a strong, 'exactly' interpretation. And relative-based implicit equatives can be diagnosed because they are evaluative regardless of which adjective they're formed with. This is due to the fact that they are formed from positive constructions like *Jane is tall*, just like their comparative counterparts (Kennedy 2007a). I've argued that predicative equatives can be analyzed quite easily based on the literal semantics of their predicates, while implicit equatives can be analyzed as degree relative clauses, as Rett (2013) does for generic equatives, their morphologic twins.

But I've also argued that, in contrast to explicit comparatives, there are two distinct strategies of explicit equatives. The first, exemplified by the English *as...as* construction, involves two markers: a parameter marker (the first *as*), diachronically related to a sufficientive morpheme like *so*; and a standard marker (the second *as*), a degree relativizer. In keeping with tradition, the parameter markers in these languages seem best analyzed as a degree quantifier, relating the sets of degrees denoted by the matrix and embedded clauses. As a result, and by design, these constructions are not evaluative; have a weak interpretation; and can be modified by factor modifiers like *twice* and *half*.

In contrast, I've identified an explicit equative strategy in a handful of languages – Catalan, Italian, Romanian, Slovenian, and Spanish – whose parameter markers are degree demonstratives (the Romance *tan-* or the Slavic *tak-*). These explicit equatives differ from the English (and broadly Germanic) explicit equative strategy in that they cannot be modified by factor modifiers. I've argued that their near-similarity can be explained compositionally: these demonstrative explicit equatives are formed quite transparently from a degree demonstrative and a degree relative clause. This explains why these constructions are non-evaluative and receive weak interpretations; it also explains, I argue, why they cannot be modified by factor modifiers.

There's an interesting question of why there are two types of explicit equative strategies, but only one type of explicit comparative strategy. This is consistent with the broader typological claim that there are a wider variety of equative strategies of any sort than there are comparative strategies of any sort. It's possible that the equative relationship is more unmarked than the comparative semantically. In addition to being lexically encoded (in predicative comparatives or equatives) or functionally encoded in a quantifier (in explicit comparatives and sufficientive explicit equatives) we know, independently of equative constructions, that two entities can be equated by coreference (as in demonstrative explicit equatives); copredication (as in implicit equatives); and by mere juxtaposition (using something like the discourse coherence relation 'parallel,' [Kehler 2002](#)). In a perspective reminiscent of the morphological work in [Bobaljik \(2012\)](#), this suggests a prospective typology in which if a language uses a degree quantifier to form an equative it uses one to form a comparative, but not necessarily vice-versa.

Appendix: Relative equatives

Below is a table of the three subtypes of relative equatives, based on that in [Haspelmath & Buchholz \(1998\)](#) (p292) and on my own data. In some places, my classification of languages into the latter two categories is speculative (i.e. a morphological decision, rather than a decision based on semantic diagnostics).

	parameter marker	standard marker
SM-ONLY RELATIVE EQUATIVES		
Albanian		<i>si</i>
Bulgarian		<i>kato</i>
Greek, Modern		<i>san</i>
Imbabura Quechua		<i>shna</i>
Italian		<i>come</i>
Serbo-Croatian		<i>kao</i>
Syrian Arabic		<i>mitl</i>
DEMONSTRATIVE RELATIVE EQUATIVES		
Armenian	<i>aynpes</i>	<i>inčpes</i>
Catalan	<i>tan</i>	<i>com</i>
Czech	<i>tak</i>	<i>jako</i>
Friulian	<i>tant</i>	<i>che</i>
Greek, Modern	<i>tóso</i>	<i>óso</i>
Hungarian	<i>annyira</i>	<i>mint</i>
Italian	<i>tanto</i>	<i>quanto</i>
Lithuanian	<i>toks/taip</i>	<i>kaip</i>
Occitan	<i>tan</i>	<i>coma</i>
Polish	<i>tak samo</i>	<i>jak</i>
Portuguese	<i>tão</i>	<i>como</i>
Romanian	<i>tot</i>	<i>ca</i>
Russian	<i>tak(oj) že</i>	<i>kak</i>
Slovak	<i>taká</i>	<i>ako</i>
Slovene	<i>tako</i>	<i>kot</i>
Sorbian	<i>tak</i>	<i>kaž</i>
Spanish	<i>tan</i>	<i>como</i>
SUFFICIENTIVE RELATIVE EQUATIVES		
Dutch	<i>zo</i>	<i>als</i>
English	<i>as</i>	<i>as</i>
Finnish	<i>niin</i>	<i>kuin</i>
French	<i>aussi</i>	<i>que</i>
Friulian	<i>oussi</i>	<i>come/tanche</i>
Georgian	<i>ise(ti)ve</i>	<i>rogorc</i>
German	<i>so</i>	<i>wie</i>
Hungarian	<i>olyan</i>	<i>mint</i>
Punjabi	<i>ónna</i>	<i>jínnaa</i>
Swedish	<i>så</i>	<i>som</i>
Yiddish	<i>azoy</i>	<i>vi</i>

Some specific examples are below.

- (92) La meva germana ès tan bonica com tú.
the my sister is so(PM) pretty how(SM) you
'My sister is as pretty as you.' *Catalan*, HB 291
- (93) Suomalaiset eivät anna kättä niin paljon kuin
Finns NEG.3sg shake hand so(PM) much how(SM)
keskieurooppalaiset.
Central.Europeans
'Finns don't shake hands as much as Central Europeans.' *Finnish*, HB 287
- (94) Čemi da isetive lamazi -a rogore šen.
my sister so(PM) pretty -is how(SM) you
'My sister is as pretty as you.' *Georgian*, HB 287
- (95) I adjelfí mu ine tóso ómorfi óso kj esí.
the sister my is so(PM) pretty how(SM) also you
'My sister is as pretty as you.' *Modern Greek*, HB 287
- (96) Claudia tam docta est quam Julius.
C so(PM) learned is how(SM) J
'Claudia is as learned as Julius.' *Latin*, HB 287
- (97) Šiandien taip šalta kaip vakar
today so(PM) cold how(SM) yesterday
'Today is as cold as yesterday.' *Lithuanian*, HB 284
- (98) A minha irmã é tão bonita quanto você.
the my sister is so(PM) pretty how(SM) you
'My sister is as pretty as you.' *Portuguese*, HB 286
- (99) Ó ónna cañgaa ai jínnaa ó daa pràà.
he so(PM) good is how(SM) he GEN brother
'He is as good as his brother.' *Punjabi*, HB 286
- (100) Moja sestra je tako čedna kot ti.
my sister is so pretty how you
'My sister is as pretty as you.' *Slovene*, HB 288

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