

# A typology of equatives\*

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*This lecture series presents a case study with the aim of providing more insight into different morphosemantic strategies for comparison and similarity across languages, as well as formal analyses of several of these strategies. The specific goals are to:*

- *better understand the nature of degree relations and degree relatives, by looking at how equatives are formed across languages (Lecture 1)*
  - *better understand the nature of as-relatives and the semantic features of verbs and propositions, by looking at different types of similatives (Lecture 2)*
  - *better understand the role of degree quantification in the semantics of similarity, by investigating the semantics of quantifier-based equatives in contrast to comparatives and measure phrases (Lecture 3)*
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## 1 overview: as and its cognates

- as is everywhere, assimilating all sorts of things

- (1)
- |    |   |   |
|----|---|---|
| a. | A is as tall <u>as</u> B.                                       | specific equative, <i>degrees</i>             |
| b. | A is white <u>as</u> snow.                                      | generic equative, <i>properties</i>           |
| c. | A danced <u>as</u> B sang.                                      | verbal similative <i>times or manners</i>     |
| d. | I've had to quit my job, <u>as</u> you know.                    | propositional similative, <i>propositions</i> |
| e. | {She is the same person / Think of her} <u>as</u> your teacher. | <i>individuals</i>                            |

- crosslinguistically, this polysemy is common (Haspelmath and Buchholz, 1998)

- (2) as in Hungarian
- |    |  |                                 |
|----|--|---------------------------------|
| a. | A olyan magas, <u>mint</u> B.  |                                 |
|    | A so tall, as B  |                                 |
|    | 'A is as tall as B.'   | <i>specific equative</i>        |
| b. | A villamos idöben érkez-ett, <u>mint</u> (ahogy) Mari is meg-mond-t-a. |                                 |
|    | the tram time-IN arrive-PST as in.the.way Mari also TEL/PF-say-PST-DEF |                                 |
|    | 'The tram arrived, as Mary said.'                                      | <i>propositional similative</i> |

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	EQUATIVE SM	SIMILATIVE SM
Bulgarian	<i>kato</i>	<i>kato</i>
Czech	<i>yako</i>	<i>yako</i>
Finnish	<i>kuin</i>	<i>kuin</i>
Lithuanian	<i>kaip</i>	<i>kaip</i>
Norwegian	<i>som</i>	<i>som</i>
Portuguese	<i>como</i>	<i>como</i>

Table 1: Equative and similative standard markers in European languages

- a glossary for these types of constructions (including the comparative):

A	(is)	more	tall	than	B	
A	(is)	as	tall	as	B	
A			danced	as	B	(did)
TARGET OF COMPARISON		PARAMETER MARKER	PARAMETER	STANDARD MARKER	STANDARD OF COMPARISON	

- Haspelmath and Buchholz (1998) claim that if a language uses a morpheme to mark standards in equatives, it uses the same morpheme to mark standards in similatives<sup>1</sup>
  - Henkelmann (2006) rightly criticizes this claim, as H&B's evidence for it came exclusively from European languages
  - but, as we'll see today, it's a pretty solid generalization *for certain types of equative constructions*, ones which are more prevalent in, but not exclusive to, (Indo-)European languages
- so what is *as* doing in (1)?
  - there's a pretty large consensus that it's a relativizer (Lee-Goldman, 2012; Hanink, 2021)
  - but it differs from *wh*-relativizers in that it's not moved from a lower position (Stowell, 1987)<sup>2</sup>
  - *as* creates a relative clause by  $\lambda$ -abstracting over an unbound or unfilled variable (either lexicalized by the parameter, or provided contextually)
  - I'll eventually argue that there are several ways to use *as* to form an equative:
    1. via relativization, using simple property conjunction (Lectures 1 and 2);
    2. via correlativization, with a degree demonstrative (Lecture 1); and
    3. via a degree quantifier, taking the relative clause as an argument, and explicitly introducing the equation relation (Lecture 3)
- with this launch pad, we can look at how similarity constructions behave, morphologically, syntactically, and semantically, to learn more about degree quantifiers; (cor)relatives; and cross-domain parallels
  - there are many ways to form comparatives and equatives, incl. conjoined and predicative constructions
  - but, in contrast to assimilating two things, strict comparison can be made using only one of the three options above (Option 3)

<sup>1</sup>More on this tomorrow!

<sup>2</sup>Stowell's (1987) syntactic arguments won't bear on the discussion today, but he argues that *as* is potentially associated with a null *A'* operator, while *so* is itself an *A'* operator. Evidence comes from the inability of *as* to be interpreted in its plausible base position.

- (i) a. Bill is a liar, as Mary already knows \_\_\_\_.
- b. Bill is a liar, and so he has claimed \_\_\_\_ himself.
- (ii) a. \*Bill is a liar, Mary already knows as.
- b. Bill is a liar, and he has claimed so himself.

- today, we'll first examine the main phenomenon in more morphosyntactic detail before moving on to compositional semantic analyses
- tomorrow, we'll see a universal correlation between similarity strategies that use a quantifier (Option 3) and those that use relativization strategies (Option 1)

## 2 overview: today's talk

- (3) a. A is taller/more tall than B. *a comparative, >*  
 b. A is as tall as B. *an equative, = or ≥*
- there is, already, a robust description of cross-linguistic variation in strategies of comparison: Ultan (1972); Stassen (1985); Dixon (2008)
  - there is also, already, a robust theoretical model of cross-linguistic variation in the semantics of comparatives: Kennedy (2005a); Beck et al. (2009); Bochnak (2015b)
  - there are some partial descriptions of cross-linguistic variation in morphological strategies of equation: Haspelmath and Buchholz (1998); Henkelmann (2006)
  - today's talk is an attempt to propose a cross-linguistic typology of equative constructions...
  - and provide a semantic analysis of relative-clause-based equative strategies that will be the foundation of the next two lectures
  - the take-home message: there are a few different equative strategies (Rett, 2020):
    - some (predicative equatives, conjoined equatives) clearly don't (or need not) involve degrees;
    - some equatives equate degrees using a quantifier,
    - others equate degrees in the absence of a degree quantifier

## 3 comparative typologies

### 3.1 a descriptive or morphological typology

- original descriptive typologies: Ultan (1972); Stassen (1985), and more recently Dixon (2008)
- PARTICLE COMPARATIVES mark the standard with a particle or other morpheme<sup>3</sup>

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

- ALLATIVE COMPARATIVES: standard marker elsewhere introduces goal phrases (e.g. 'to' or 'for')<sup>4</sup>

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

<sup>3</sup>The particle comparative in (4) is a 'separative comparative', with a standard marker meaning '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.

<sup>4</sup>Other languages with allative comparatives include Basque, Breton, Dakota, Gumbainggir, Hungarian, Jacalteco, Kanuri, Latvian, Mandinka, Maori, Mapuche, Miwok, Naga, Nama, Navajo, Nuer, Salinan, Samoan, Siuslawan, Tamazight, Tamil, Tarascan, Tubu, and Ubykh.

- LOCATIVE COMPARATIVES: standard marker is a locative preposition (e.g. 'on')<sup>5</sup>

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

- DEDICATED COMPARATIVES: involve a construction-specific standard marker<sup>6</sup>

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

- EXCEED COMPARATIVES employ a verb (e.g. 'exceed') to impose strict ordering<sup>7</sup>

(8) To bi ni gau.  
he exceed you tall  
'He is taller than you.'  
*Mandarin*

- CONJOINED COMPARATIVES use conjunction to associate the target and the standard of comparison, using either antonyms, as in (9) and (10), or predicate negation, as in (11) and (12).<sup>8</sup>

(9) Ua loa lenei va'a, ua puupuu lena  
is long this boat is short that  
'This boat is longer than that boat.'  
*Samoan*

(10) Yan kau tukta, man almuk  
I more young he old  
'I am younger than him.'  
*Miskito*

(11) Kaw -ohra naha Waraka, kaw naha Kaywerye  
tall not be.3sg.masc W tall be.3sg.masc K  
'Kaywerye is taller than Waraka.'  
*Hixkaryana*

(12) Ina na namo herea una na dia namo  
this is good more that is not good  
'This is better than that.'  
*Motu*

- a note: the constructions in these descriptive categories might vary with respect to whether they involve a parameter marker, as the contrast between (9)/(10) and (11)/(12) shows.

### 3.2 a theoretical or semantic typology

- differentiation between **explicit** and **implicit** comparatives (Beck et al., 2004; Kennedy, 2005a, 2007a)

(13) IMPLICIT VS. EXPLICIT COMPARISON (Kennedy, 2005b)  
a. Implicit comparisons establish an ordering between  $x$  and  $y$  with respect to gradable property  $g$  using the positive form [(e.g. *A is tall*)...] in such a way that the positive form is true of  $x$  and false of  $y$ .

<sup>5</sup>Additional languages: Cebuano, Chuckchee, Miwok, Navajo, Salinan, and Tamil.

<sup>6</sup>English exemplifies this category, as do most European languages, as well as Ilocano, Javanese, Sranan, and Toba Batak.

<sup>7</sup>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.

<sup>8</sup>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 and Matsui, 2010). Other languages in this broad category include Abipon, Ekagi, Gumbaingir, Kobon, Monumbo, Nahuatl, and Pala.

- 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  $g$ .
- (another parameter along which they can vary: they can compare individuals or degrees)
- (14)
  - a. explicit degree comparative: *A is taller than B.*
  - b. implicit individual comparative: *Compared to B, A is tall.*
  - c. implicit degree comparative: *A exceeds B in height.*
- diagnostics underpinning this distinction (also Pearson, 2010; Bochnak and Bogal-Allbritten, 2015):
  - crisp judgments: truth in 'borderline' cases
    - (15) 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*
    - (16) 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*
  - interpretation/compatibility with absolute adjectives (Kennedy, 2007b; Syrett et al., 2010)
    - (17)
      - a. Pass me the tall one. *relative*
      - b. %Pass me the empty one. *absolute*
    - (18)
      - a. Rod B is more bent than Rod A. *explicit*
      - b. ??Compared to Rod A, Rod B is bent. *implicit*
  - compatibility with measure-phrase differentials
    - (19)
      - a. Kim is 10cm taller than Lee. *explicit*
      - b. %Compared to Lee, Kim is 10cm tall. *implicit*
- a summary of the typology of particle comparatives:

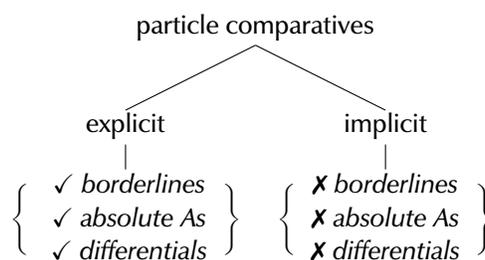


Figure 1: A typology of comparatives

## 4 equative typologies

### 4.1 a descriptive typology

- original descriptive typologies: Haspelmath and Buchholz (1998) ('HB'; 47 European languages, 52 languages total) and Henkelmann (2006) (25 languages)

- RELATIVE EQUATIVES use a relativizer (usually a degree or manner *wh*-word, more in Lecture 2) to mark the standard.<sup>9</sup> See the Appendix for an extensive list.
  - NON-PM RELATIVE EQUATIVES lack a parameter marker
    - (20) Sestra mi e xubava kato tebe.  
sister my is pretty how(SM) you  
'My sister is as pretty as you.'  
*Bulgarian, HB 291*
    - (21) I adhelff 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 291*
  - PM RELATIVE EQUATIVES have a parameter marker
    - (22) 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*
    - (23) Ó ónna caṅṅaa 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*
- PREDICATIVE EQUATIVES are formed with a predicate meaning roughly 'equals', either as a main predicate (24)–(25) or an adverb (26)<sup>10</sup>
  - (24) M -toto wa -ngu ni hodari sawa na wa -ko.  
I.sg -child I.sg -poss.1sg be clever equal with(SM) I.sg -poss.2sg  
'My child is as clever as yours.'  
*Swahili, Henkelmann 386*
  - (25) (I) rite tonu te nunui o oona wae ki ooku.  
TNS like indeed the big GEN PL.GEN.3SG foot to PL.GEN.1SG  
'His feet are just as big as mine.'  
*Maori, Henkelmann 392*
  - (26) M -àssur -àacì kʊʊfì yà -niisàa -tì kúdùkú  
F -be.long -IMPERF stick COM -arm -POSS.1SG together  
'The stick and my arm are equally long.'  
*Krongo, Henkelmann 387*
- CONJOINED EQUATIVES are a direct analog to conjoined comparatives; they too may or may not have a parameter marker.
  - (27) Dana eu cecela eu odi we ija ha cecela.  
man that tall that like.that like 1.sg also tall  
'That man is as tall as I.'  
*Amele, Henkelmann 384*
  - (28) Avan aṅṅan -e poola -vee avan -um oyaram -aa irukkaraan.  
his elder.brother -ACC like -EMPH he -too tallness -ADVL is.3sg.m  
'He is as tall as his elder brother.'  
*Tamil, ibid.*
  - (29) ṅaya ṅa -balayi ñaṅgi wadij ña -balayi.  
1SG.NOM 1SG -big 2SG.NOM also 2.SG -big  
'I am big, you are also big.'  
*Mangarayi, Henkelmann 395*

<sup>9</sup>HB characterize relative equatives as having an aerial distribution in Europe.

<sup>10</sup>Languages with main predicate equatives include Indonesian, Maori, Vietnamese, and Yoruba; and those with adverbial predicate equatives include Danish, Dutch, Estonian, Finnish, Faroese, Norwegian, Swedish, and Swiss German.

(30) 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.*

- CASE-MARKED STANDARDS use a case marker to mark the standard; as with comparatives, these may or may not have parameter markers.<sup>11</sup>

(31) Yen -ke æymen pərpər, rey -ke -kwo.  
 2sg -POSS knife sharp 3sg -POSS -SM  
 'Your knife is as sharp as his.' Awtuw, Henkelmann 382

(32) Ilit -tut utuqqaa -tiga -aq.  
 thou -SM be.old -PM -3sg.IND  
 'He is as old as you.' Greenlandic Eskimo, HB 285

(33) Pani -i -mi qam -naw shumaq.  
 sister -1sg -DIR you -SM pretty  
 'My sister is as pretty as you.' Ancash Quechua, HB 285

- DEDICATED EQUATIVES involve standard markers with “no transparent etymology,” identified by HB as the rare case. As above, these may or may not have parameter markers. Welsh in (34) has both a dedicated PM and SM; Modern Irish and Breton have dedicated PMs but co-opted SMs (the commitative and conjunction morphemes, respectively).

(34) Mae e cyn ddued â 'r frân.  
 is he PM black SM the crow  
 'He is as black as the crow.' Welsh, HB 285

(35) Tá Máire chomh cliste le Liam.  
 is M PM clever with(SM) Liam  
 'Máire is as clever as Liam.' Modern Irish, HB 285

(36) 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

## 4.2 a theoretical typology based on English

- a morphosyntactic perspective: “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” (HB 283).
- a semantic one: can we differentiate between explicit and implicit equatives?

(37) a. A is as tall as B. *PM relative equative*  
 b. A is tall like B. *non-PM relative equative*  
 c. A is tall and B is tall (too). *conjoined equative*  
 d. A equals B in height. *main predicate equative*  
 e. A and B are equally tall. *adverbial predicate equative*  
 f. A's height equals B's. *nominal predicate equative*

- in this section, I motivate an explicit / implicit distinction for equatives between non-predicative equatives that do / do not have a parameter marker (PM)

<sup>11</sup>Other languages include Abkhaz, Arabic, Basque, Comanche, Ibabura Quechua, Japanese, Kabardian, Kalmyk, Krongo, Lezgian, Ndyuka, Tamil, Turkana, and Turkish (Haspelmath and Buchholz 1998:296, Henkelmann 2006:382-3).

- some tests

1. availability of the weak reading: = vs.  $\geq$

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

- (39) a. A is as tall as B, in fact she's taller. *PM relative*  
b. A is tall like B, in fact she's taller. *non-PM relative*  
c. A is tall and B is tall. In fact she's taller. *conjoined*  
d. A equals B in height, #in fact she's taller. *predicate*

- this diagnostic distinguishes between the non-predicate equatives in (39-a)–(39-d) – which can receive a weak interpretation – with the predicate equatives in (39-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.

2. acceptability with factor modifiers<sup>12</sup>

- reminiscent of Kennedy (2005a) on explicit/implicit comparatives: the latter involve positive constructions, which are incompatible with factor modifiers

- (40) a. A is twice as tall as B. *PM relative*  
b. A is (\*twice) tall like B. *non-PM relative*  
c. A is (\*twice) tall and B is tall (too). *conjoined*  
d. A (\*twice) equals B in height. *predicate*

3. evaluativity patterns

- a construction is **evaluative** iff it requires that a degree exceed a contextually-valued standard (Rett, 2015, more in Lecture 3)
- we usually associate positive constructions (e.g. *A is tall*) with evaluativity, and it's true positive constructions are universally evaluative...
- ...but there are other constructions with relative adjectives that demonstrate 'antonym-sensitive' evaluativity (Bierwisch, 1989), including equatives and degree demonstratives (e.g. *A is 5ft tall and B is that short too*)

- (41) a. A is as tall as B, but she's short.  
b. A is as short as B, #but she's tall.

- we can thereby expect that equatives formed from positive constructions are evaluative for both positive and negative adjectives, while those that aren't are not evaluative for positive antonyms
- the judgment relies on holding fixed A's and B's comparison class

- (42) a. A is as tall as B, but she's short. *PM relative*  
b. A is tall like B, #but she's short. *non-PM relative*  
c. A is tall; B is tall (too), #but she is short. *conjoined*  
d. A equals B in height/tallness, but she's short. *predicate*

- (side note: while synthetic comparatives are canonically non-evaluative for either antonym, other comparative strategies that are evaluative, across languages (Pancheva, 2006; Rett, 2015))

- (43) a. A is shorter than B, but she's tall. *synthetic comparative*  
b. A is more short than B, #but she's tall. *analytic comparative*<sup>13</sup>  
c. A is more intelligent than she is devious. *comparison of deviation*

<sup>12</sup>English equatives can be modified by *exactly* and *at least*, as well. But I focus on factor modifiers, to the exclusion of *exactly* and *at least*, because the latter have a precisification use that makes cross-linguistic and -syntactic comparison a little messier. If we control for those factors, I expect the distribution of factor modifiers to be the same as *exactly* and *at least*.

<sup>13</sup>This is reported to be evaluative only when the synthetic strategy is available, so we wouldn't expect evaluativity for a morphologically clumsy relative adjective like *fortuitous*.

- summary of diagnostics

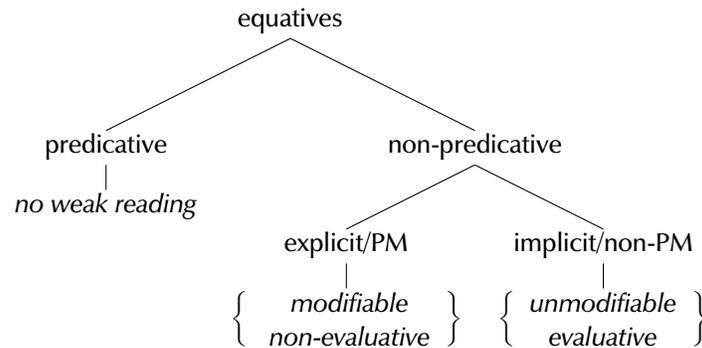


Figure 2: A typology of equatives (to be revised)

### 4.3 a cross-linguistic extension

- predicative equatives universally receive only a strong, ‘exactly’ interpretation, definitionally

(44) ??Jan is even lang als Piet. Hij is zelfs langer.  
 J is equally tall as P. He is in.fact taller  
 ‘John is as tall as Pete. He is in fact taller.’

*Dutch*

(45) #Thomas ar lika lång som Christoffer; han ar faktiskt langre.  
 T is equal tall as C; he is actually taller  
 ‘Thomas is as tall as Christoffer; he is in fact taller.’

*Swedish*<sup>14</sup>

- implicit (non-PM relative) equatives also seem to be unacceptable with factor modifiers, and evaluative

- in Croatian, relative equatives are formed only with the relativizer *kao* (‘as’)

(46) Ivan je visok kao Petar.  
 Ivan be tall as Peter  
 ‘Ivan is as tall as Peter.’

*Croatian*

- they’re unacceptable with factor modifiers, and they’re evaluative

(47) ??Ivan je dvostruko visok kao Petar.  
 Ivan be twice tall as Peter  
 ‘Ivan is twice as tall as Peter.’

*Croatian*

(48) #Ivan je visok kao Petar, a Petar je nizak!  
 Ivan be tall as Peter, and Peter be short  
 ‘Ivan is as tall as Peter, and Peter is short!’

*Croatian*

- Syrian Arabic, too, has a implicit equative strategy

(49) Kariim ṭawiil mitl Aḥmad.  
 Kariim tall like Ahmad  
 ‘Karim is tall, like Ahmad (is).’

*Syrian Arabic*

<sup>14</sup>The consultant for (45) reports that the equative is a contradiction of its continuation.

- these equatives are also unmodifiable and evaluative.

(50) \*Kariim ṭawīil mitl Aḥmad ʕa -marrt -een.  
 Karim tall like Ahmad on -time -DUAL  
 'Karim is tall like Ahmad twice.'

*Syrian Arabic*

(51) #Kariim ṭawīil mitl Aḥmad, bas itneenaat -un ktiir ʔiṣaar.  
 Karim tall like Ahmad, but two -them very shortPL  
 'Karim is tall like Ahmad, but both of them are very short.'

*Syrian Arabic*

- but explicit (PM-marked) equatives seem to be more of a mixed bag; they actually seem to form two distinct subcategories
  - (see the Appendix for a full classification of languages surveyed)

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 3: Subtypes of explicit equatives

- the first category is exemplified by Swedish (and English)

(52) Thomas ar dubbelt så lång som Christoffer.  
 T is twice so(PM) tall as(SM) C.  
 'Thomas is twice as tall as Christoffer.'

*Swedish*

(53) Thomas ar så lång som Christoffer, men båda ar korta.  
 T is so(PM) tall as(SM) C, but both are short  
 'Thomas is as tall as Christoffer, but both are short.'

*Swedish*

(54) Thomas ar så lång som Christoffer, han ar 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*

- the second category is exemplified by Italian

(55) \*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*

(56) 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*

(57) Gianni è tanto alto quanto Pietro. 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*

- does it make sense to differentiate between *so*-like parameter markers and *tak/tan*-like parameter markers?
  - *so*, elsewhere in English: a ‘resultative’ (Meier, 2003) or ‘sufficientive’ (cf. an ‘excessive’ like *too*)
  - *tan/tak*, elsewhere: a degree demonstrative
- these data suggest that a more accurate cross-linguistic typology of equative strategies is as in Figure 4, with explicit relative equatives divided into two categories: those whose PMs are sufficientives like *so*, and those whose PMs are degree demonstratives, meaning roughly *that much*.

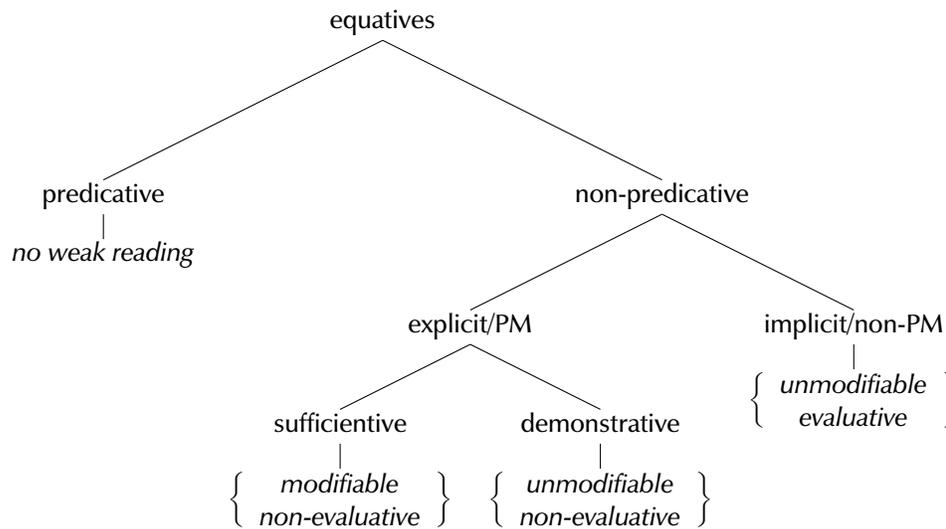


Figure 4: A typology of equatives (final)

## 5 a baseline semantics for equatives

### 5.1 degree semantics and degree quantifiers

- gradable vs. non-gradable adjectives:
  - ability to be modified by an intensifier like *very* with a non-coerced interpretation
 

(58) a. %A is very Australian. *non-gradable*  
 b. A is very tall. *gradable*
  - (ability to occur in an explicit comparative construction with a non-coerced interpretation)
  - ability to be modified by a measure phrase (sufficient but not necessary for being gradable)
 

(59) a. \*A is one and a half Vegemites Australian. *non-gradable*  
 b. A is one and a half meters tall. *gradable*
- guiding intuition: the relationship between a gradable and non-gradable adjective is one of valence, i.e. just like the difference between a transitive and intransitive verb
  - we have an intuition that e.g. *eat* is transitive, but it occurs quite naturally without an object, in which case the object is retrieved from context
  - we have an intuition that e.g. *walk* is intransitive, but it occurs with an object in certain proscribed, coerced uses

- accordingly, starting with Cresswell (1976): non-gradable As characterize individuals (or denote sets of individuals); gradable As relate an individual to a (set of) degree(s)

(60) a.  $\llbracket \text{Australian} \rrbracket = \lambda x. \text{australian}(x)$  *non-gradable*  
 b.  $\llbracket \text{tall} \rrbracket = \lambda x \lambda d. \text{tall}(x) \geq d$  *gradable*

- beginning with Bresnan (1973) and Heim (1985): comparative and equative morphemes (= parameter markers) are **degree quantifiers**, they quantify over the degree associated with the gradable parameter

(61) a. A likes some Australian foods. *individual quantifier*  
 b. A is more tall than B. *degree quantifier*

- individual quantifiers can be analyzed as relating individuals or sets...

(62) a.  $\llbracket \text{all} \rrbracket = \lambda P \lambda Q \forall x [P(x) \rightarrow Q(x)]$  *individual-based*  
 b.  $\llbracket \text{all} \rrbracket = \lambda P \lambda Q. P \subset Q$  *set-based*

- ...so too can degree quantifiers<sup>15</sup>

(63) a.  $\llbracket \text{-er} \rrbracket = \lambda D \lambda D'. \text{MAX}(D') > \text{MAX}(D)$  *degree-based*  
 b.  $\llbracket \text{-er} \rrbracket = \lambda D \lambda D'. D' \supset D$  *set-based*

(64) a.  $\llbracket \text{as} \rrbracket = \lambda D \lambda D'. \text{MAX}(D') \geq \text{MAX}(D)$  *degree-based*  
 b.  $\llbracket \text{as} \rrbracket = \lambda D \lambda D'. D' \supseteq D$  *set-based*

- wherever a weak reading is available for an equative, it's generally assumed to be the base meaning, with the strengthened, 'exactly' interpretation arising via scalar implicature; more in Lecture 3

## 5.2 semantic analyses of the comparative typology

- whether or not a strategy involves a degree quantifier is a semantic commitment, cross-cutting the morphosyntactic distinctions in Ultan's and Stassen's typologies, exemplified in (9)-(12)

(65) THE IMPLICIT/EXPLICIT COMPARISON PARAMETER *(Kennedy 2005:7)*  
 Languages differ in their inventory of degree morphemes. Some have no explicit comparison morphology (and possibly no 'true' degree morphology at all...); in which case they have implicit comparison.

- assumption, effectively: explicit  $\rightarrow$  degrees
  1. if a language has an explicit comparative strategy, it has in its lexicon a degree quantifier (= the comparative parameter marker)
  2. if a language has in its lexicon a degree quantifier, it 'has degrees'<sup>16</sup>
  3. if a language has an implicit comparative strategy, it may or may not have degrees (it might relate individuals, or degrees, or both, as in (37-b) and (37-d).)
- some languages that have been argued to not have degrees at all:
  - \* Motu (Beck et al., 2009);
  - \* Fijian (Pearson, 2010);
  - \* Washo (Bochnak, 2015a,b; Beltrama and Bochnak, 2015);
  - \* Navajo (Bochnak and Bogal-Allbritten, 2015);
  - \* Walpiri (Bowler, 2016)

<sup>15</sup>Where  $\text{MAX}(D) = \text{id} \in D[\forall d' \in D[d' \neq d \rightarrow d' < d]]$

<sup>16</sup>I follow many others in using the phrase 'has degrees' to mean something like: has lexical items whose semantic contribution can only be modeled using a semantics that employs degrees as a separate entity or (sub)type.

- in very few of these accounts have equatives been discussed
- each of the types of comparative strategies has a separate semantic analysis
  1. explicit comparatives that involve a degree quantifier are analyzed as comparatives traditionally have been, namely with the semantics in (63)
  2. implicit comparatives in languages that ‘don’t have degrees’ are typically analyzed as relating degree-free ‘comparison classes’ of individuals à la Klein (1980, 1982) (Pearson, 2010; Bochnak, 2015b)
- implicit comparatives in languages that ‘have degrees’ might have either interpretation, depending (Bogal-Albritten and Coppock, 2020)
- today’s argument: there are at least two more strategies available for equation as there are for comparison
  1. degree relativization (free relatives, §5.3.1)
  2. degree correlativization (§5.3.2)

### 5.3 equatives qua degree relatives

- in addition to the innovation of degrees as a basic type we need a few formal ingredients:

FORMAL TOOLBOX
<ol style="list-style-type: none"> <li>1. a formal analysis of <i>as</i> as a relativizer (ideally one that doesn’t require it be base-generated in its argument’s position)</li> <li>2. a type-general notion of predicate modification</li> <li>3. existential closure, a way to bind variables that aren’t overtly bound</li> <li>4. (in Lecture 2: a way to associate e.g. verbs with optional non-arguments, like times and manners)</li> </ol>

- they’re all independently motivated, and will give us (at the end of this section) a semantics for implicit equatives (qua degree relatives) and demonstrative-based explicit equatives (qua degree correlatives)

#### 5.3.1 implicit equatives

- implicit equatives involve relative-clause predication (Rett, 2013)
- a notion of relativization:
  - the formalization of the semantic contribution of a relativizer in Heim and Kratzer (1998) is syncategorematic and quite syntactically proscribed:

(66) **Predicate Abstraction** (Heim and Kratzer, 1998)  
 If  $\alpha$  is a branching node whose daughters are a relative pronoun and  $\beta$ , then  
 $\llbracket \alpha \rrbracket = \lambda x \in D. \llbracket \beta \rrbracket^x$ .

- but we’ll assume the relativizer is a) potentially farther away from its argument; and b) not necessarily associated with its argument via movement (Rett 2013; see fn. 2)

(67)  $\llbracket \text{relativizer } S \rrbracket = \lambda y. \llbracket S \rrbracket^{[y/x]}$ , for any free variable  $x$  in  $S$

- this gives us the following quite natural analyses for relative clauses:

(68)  $\llbracket \text{who } [A \text{ likes } t_x] \rrbracket = \llbracket \text{who} \rrbracket (\text{likes}(a,x)) = \lambda x. \text{likes}(a,x)$

(69)  $\llbracket \text{come Pietro è } t_d \text{ alto} \rrbracket = \llbracket \text{come} \rrbracket (\text{tall}(p,d)) = \lambda d. \text{tall}(p,d)$  *Italian ‘how tall Pietro is’*

- supporting evidence: similatives, like FRCs, are universal/existential ambiguous (Jacobson, 1995)<sup>17</sup>
- (70) A: I told Sue to use the same products as John when she washed the dishes. Did she?  
B: Yes, Sue washed the dishes (just) as John did. (They both used a sponge.)
- (71) A: I told Sue to mimic John's dish-washing method completely. Did she?  
B: No, Sue didn't wash the dishes as John did. (She worked too quickly.)
- (type-)Generalized Predicate Modification (after Heim and Kratzer, 1998):
- (72) If  $\alpha$  is a branching node, and  $\{\beta, \gamma\}$  the set of its daughters, then, for any assignment  $a$ , if  $\llbracket \beta \rrbracket^a$  and  $\llbracket \gamma \rrbracket^a$  are both functions of type  $\langle \sigma, t \rangle$ , then  $\llbracket \alpha \rrbracket^a = \lambda x \in D_\sigma. \llbracket \beta \rrbracket^a(x) \wedge \llbracket \gamma \rrbracket^a(x)$
- a compositional derivation of an implicit equative:
- (73) Gianni è alto come Pietro. *Italian*  
  - a.  $\llbracket \text{come Pietro è alto} \rrbracket = \lambda d. \text{tall}(p, d)$  *from (69)*
  - b.  $\llbracket \text{Gianni è alto} \rrbracket = \lambda d'. \text{tall}(g, d')$
  - c. *predicate modification*:  $\lambda d. \text{tall}(g, d) \wedge \text{tall}(p, d)$
  - d. *existential closure*:  $\exists d[\text{tall}(g, d) \wedge \text{tall}(p, d)]$   
'There is a degree to which Gianni and Pietro are both tall.'
- an additional consideration (from Schwarzschild, 2005): when Italian measure adjectives are modified, they are modified to their right
- (74) pesante quasi due tonnellate *Italian*  
heavy [almost two tons]  
'weighs almost two tons' (lit. 'almost two tons heavy')
- a note on existential closure:
  - it's a form of unselective binding, generally employed at the end of a derivation
  - it's a useful way to deal with variables that are modified but not overtly bound or valued
  - it was first introduced in Heim (1982)...
  - ...and extended quite productively into (neo-)Davidsonian event semantics (Krifka, 1989)
- a note on evaluativity (more in Lecture 3):
  - implicit equatives are evaluative; they entail that the subject is  $P$
  - they do this by virtue of the fact that the equative is formed, in part, from a positive construction of the form 'x is  $P$ '
  - the distribution of evaluativity is complicated, but arises as a conversational implicature in one of two contexts (Rett, 2015):
    1. when a degree construction is otherwise uninformative (a Quantity implicature)
    2. when a degree construction is unnecessarily marked (a Manner implicature)
  - I will thus not derive the evaluativity compositionally, but if you'd like to, you can throw a POS in (73-b) to achieve the same effect
- this account predicts that implicit equatives have a weak reading, because it characterizes the equative as placing a lower bound (but not an upper bound) on the subject's measure
- this account predicts that implicit equatives are unmodifiable by a factor modifier simply because there is no comparison of two degrees in this construction, and factor modifiers are relational

<sup>17</sup>Verbal similatives like these will be the topic of tomorrow's lecture. I use them here, instead of implicit equatives, to keep the argument to English. But in the degree domain, where members of sets are strictly ordered, this universal/existential ambiguity amounts to an ambiguity between the denotation of a set and the maximum degree of that set, as we'll see below.

### 5.3.2 demonstrative-based explicit equatives

- in this section, I analyze demonstrative-based explicit equatives as a type of degree correlative
  - a correlative is a construction with a relative clause that isn't adjacent to its modified argument, but instead typically involves a demonstrative (Srivastav, 1991; Izvorski, 1996)

(75) [jo laRkii khaRii hai] vo lambii hai.  
 REL girl standing is DEM tall is  
 'The girl [who is standing] is tall.'

Hindi

- a degree correlative (Brasoveanu, 2009)

(76) Pe cît e Irina de frumoasă, (tot) pe atît e de de steaptă.  
 PE how.much is I DE beautiful (all) PE that.much is DE smart  
 'However much Irina is beautiful, she is that smart.'

Romanian

- claim here: like degree correlatives, demonstrative-based explicit equatives involve the introduction of a particular degree (by the relativizer) and anaphora to that degree (by the demonstrative)
- compare the degree correlative in (76) to the demonstrative-based explicit equative:

(77) 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

- in degree correlatives like (76), the relative clause is left-dislocated
- in degree correlatives, the relative clause is headed by a *wh*-phrase (*cît*) instead of a relativizer (*ca*)
- the degree correlative also has an added layer of semantic complexity because it's a comparison of deviation, while the equative in (77) directly relates degrees of height
- the same sort of analysis as in the previous section, switching back to Italian:

(78) Gianni è tanto alto quanto Pietro.  
 G is that-much tall how-much Pietro  
 'Gianni is as tall as Pietro is.'

Italian

- but here we crucially have a semantic shift, in which a relative clause goes from denoting a set to a definite (Jacobson, 1995), and in particular (for degree relatives) a maximum (see fn. 17)
- the degree demonstrative *tanto* is anaphoric to that degree

(79) [<sub>CP</sub> Gianni è tanto<sub>i</sub> alto [<sub>CP</sub> quanto Pietro è ~~alto~~<sup>i</sup> ]  
 a. [[quanto Pietro è ~~alto~~] =  $\lambda d.tall(p, d) \rightsquigarrow \max(\lambda d.tall(p, d))$   
 b. [[Gianni è tanto alto] =  $tall(g, \max(\lambda d.tall(p, d)))$   
 'Gianni is tall to the maximum degree to which Pietro is tall.'

cf. (73-a)<sup>18</sup>

- this account predicts what we know about demonstrative-based explicit equatives:
  1. they have a weak reading; as with implicit equatives, the correlative sets a lower bound (Pietro's maximum height) on Gianni's height
  2. they are unmodifiable by factor modifiers; as with implicit equatives, there are not two degrees being related, but a single degree that is an argument to two predicates
  3. they are not evaluative with positive antonyms, because degree demonstratives are not evaluative with positive antonyms; *A is that tall too* is compatible with A being short (although not vice-versa)

<sup>18</sup>The variation between *quanto* and *come* – both *wh*-pronouns that can range over degrees – is interesting here, and will be relevant in tomorrow's discussion about the confluence of degrees and manners.

## 6 summary

- equative strategies differ just as much and as interestingly across languages as comparative strategies... in fact, there are even more ways to equate two things than there are to strictly compare them!
- while the descriptive typologies tend to focus on morphosyntax, there are some correlated semantic properties that seem to be universal:
  - predicative equatives lack a weak reading (i.e. always mean ‘exactly’)
  - implicit equatives (relative equatives without a parameter marker) are evaluative and unacceptable with factor modifiers
  - explicit equatives (relative equatives with a parameter marker) seem to fall into two distinct categories
    - \* those with degree demonstrative PMs are non-evaluative and unacceptable with modifiers
    - \* those, like English, with sufficientive PMs are non-evaluative and acceptable with modifiers
  - it seems as though the nature of the difference between comparative strategies and equative strategies boils down to important differences between contrast vs. analogy: the former seems to be more semantically marked, and so we have more equative strategies at our disposal, cross-linguistically
  - this makes equative constructions an important consideration for degree-semantic typologies, arguably more so than comparatives, because there are several different equative constructions that require degrees (not just ones that involve degree quantifiers)
- I’ve provided semantic analyses of implicit equatives and demonstrative-based explicit equatives
  - both involve degree relatives like *how tall A is*
  - in implicit equatives, this relative clause is conjoined with the degree property introduced by the main clause, in a version of Predicate Modification
  - in demonstrative-based explicit equatives, this relative clause is type-raised to refer to a particular (maximum) degree, and has an anaphoric link to the degree demonstrative in the main clause

## 7 a preview of tomorrow’s lecture

- there are other constructions in English that use *as* as a standard marker, with no overt parameter marker:
  - generic equatives (e.g. *It was white as snow*)
  - verbal similatives (e.g. *A danced as B sang*), with time or manner interpretations
  - propositional similatives (e.g. *As you know, I quit my job*)
  - so-called ‘hypothetical comparatives’ (Bucking, 2017) (e.g. *A danced as if B were singing*)
- tomorrow we’ll extend the simple relativization story from today to these constructions, with some discussion of their cross-categorial variation
- we’ll have to incorporate:
  - the ability to associate different types of parameters with a variable that isn’t one of their lexicalized argument (e.g. adjectives with properties, verbs with manners)
  - some semantics for *if* and/or the subjunctive to explain the behavior of *as-if* constructions
- and we’ll have to look at relativizers used for similative constructions in other languages

## appendix: Relative equatives

Below is a table of the three subtypes of relative equatives, based on that in Haspelmath and 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
IMPLICIT 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-BASED EXPLICIT EQUATIVES		
Armenian	<i>aynpes</i>	<i>incpes</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) ze</i>	<i>kak</i>
Slovak	<i>taká</i>	<i>ako</i>
Slovene	<i>tako</i>	<i>kot</i>
Sorbian	<i>tak</i>	<i>kaz</i>
Spanish	<i>tan</i>	<i>como</i>
SUFFICIENTIVE-BASED EXPLICIT 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>jlnnaa</i>
Swedish	<i>så</i>	<i>som</i>
Yiddish	<i>azoy</i>	<i>vi</i>

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