# Separate but equal:
# a typology of equative constructions*

Jessica Rett
University of Melbourne

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## 0  overview

(1)  a.  Amy is taller/more tall than Bill.                                    *a comparative*, >
     b.  Amy is as tall as Bill.                                    *an equative*, = or ⩾

- a robust description of cross-linguistic variation in strategies of comparison: Ultan (1972); Stassen (1985); Dixon (2008)

- a robust theoretical model of cross-linguistic variation in the semantics of comparatives: Kennedy (2005a); Beck et al. (2009); Bochnak (2015b)

- some partial descriptions of cross-linguistic variation in strategies of equation: Haspelmath and Buchholz (1998); Henkelmann (2006)

- the present paper is an attempt to propose a cross-linguistic typology of equative constructions...

- (...and, to a lesser extent, to propose a theoretical analysis of a new subspecies of equative)

- a glossary for both types of constructions:

| Amy | (is) | more | tall | than | Bill |
|-----|------|------|------|------|------|
| Amy | (is) | as | tall | as | Bill |
| TARGET OF COMPARISON | | PARAMETER MARKER | PARAMETER | STANDARD MARKER | STANDARD OF COMPARISON |

## 1  comparative typologies

### 1.1  a descriptive typology

- original descriptive typologies: Ultan (1972); Stassen (1985), and more recently Dixon (2008)

- PARTICLE COMPARATIVES mark the standard with a particle or other morpheme[1]

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

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[1]The particle comparative in (2) 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.

– ALLATIVE COMPARATIVES: standard marker elsewhere introduces goal phrases (e.g. 'to' or 'for')[2]

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

– LOCATIVE COMPARATIVES: standard marker is a locative preposition (e.g. 'on')[3]

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

– DEDICATED COMPARATIVES: involve a construction-specific standard marker[4]

(5)  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[5]

(6)  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 (7) and (8), or predicate negation, as in (9) and (10).[6]

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

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

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

(10)  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 (7)/(8) and (9)/(10) shows.

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[2]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.

[3]Additional languages: Cebuano, Chuckchee, Miwok, Navajo, Salinan, and Tamil.

[4]English exemplifies this category, as do most European languages, as well as Ilocano, Javanese, Sranan, and Toba Batak.

[5]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.

[6]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, Gumbainggir, Kobon, Monumbo, Nahuatl, and Pala.

## 1.2   a theoretical typology

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

  (11)    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. *Amy is tall*)...] 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 $g$.

- (another parameter along which they can vary: they can compare individuals or degrees)

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

- diagnostics underpinning this distinction (also Pearson, 2010; Bochnak and Bogal-Allbritten, 2015):

  - crisp judgments: truth in 'borderline' cases

    (13)    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*

    (14)    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)

    (15)    a.   Pass me the tall one.                                                                    *relative*
        b. %Pass me the empty one.                                                              *absolute*

    (16)    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

    (17)    a.   Kim is 10cm taller than Lee.                                                           *explicit*
        b. %Compared to Lee, Kim is 10cm tall.                                            *implicit*
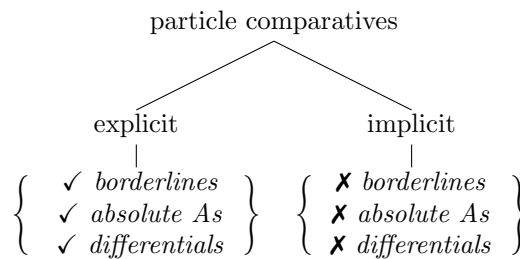
- a summary of the typology of particle comparatives:



Figure 1: A typology of comparatives

## 2   equative typologies

### 2.1   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) to mark the standard.[7] See the Appendix for an extensive list.

    - NON-PM RELATIVE EQUATIVES lack a parameter marker

    (18)   Sestra mi  e  xubava kato     tebe.
           sister  my  is  pretty  how(SM) you
           'My sister is as pretty as you.'                                        *Bulgarian*, HB 291

    (19)   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 291

    - PM RELATIVE EQUATIVES have a parameter marker

    (20)   A   minha irmã é  <u>tão</u>      bonita quanto   você.
           the my     sister is that(PM) pretty how(SM) you
           'My sister is as pretty as you.'                                     *Portuguese*, HB 286

    (21)   Ó  <u>ónna</u>   caŋgaa 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 (22)–(23) or an adverb (24)[8]

    (22)   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

    (23)   (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

    (24)   M -àsʊr  -àacì    kʊʊfi yà -nìisàa -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.

    (25)   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

    (26)   Avan aŋ ɳan      -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.

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[7]HB characterize relative equatives as having an aerial distribution in Europe.

[8]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.

(27)  ŋaya       ŋa -balayi ñaŋgi    waḍij ña  -balayi.
      1SG.NOM 1SG -big    2SG.NOM also  2.SG -big
      'I am big, you are also big.'                                    *Mangarayi\**, Henkelmann 395

(28)  Hwaraʼ na       Xijam. Hwaraʼ na        Orowao quem caʼ na.
      big    T/A.3SG X      big    T/A.3SG O      REF  this T/A.3SG
      'Xijam is as big as Orowao.'                                    *Wariʼ*, ibid.

- CASE-MARKED STANDARDS use a case marker to mark the standard; like conjoined comparatives, these may or may not have parameter markers.[9]

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

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

(31)  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 (32) has both a dedicated PM and SM; Modern Irish and Breton have dedicated PMs but co-opted SMs (the commitative and conjunction morphemes, respectively).

(32)  Mae e  cyn dded â  ʼr   frân.
      is    he PM black SM the crow
      'He is as black as the crow.'                                   *Welsh*, HB 285

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

(34)  Ma cʼhoar a    red ken buan ha       cʼhwi.
      my sister  PTL run PM fast  and(SM) you
      'My sister runs as fast as you.'                                *Breton*, HB 285

## 2.2   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?

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

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[9]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

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

     (37)   a.   Amy is as tall as Bill, in fact she's taller.                    *PM relative*
            b.   Amy is tall like Bill, in fact she's taller.                 *non-PM relative*
            c.   Amy is tall; Bill is tall (too). In fact she's taller.             *conjoined*
            d.   Amy equals Bill in height, #in fact she's taller.                  *predicate*

     – this diagnostic distinguishes between the non-predicate equatives in (37a)–(37d) – which can
       receive a weak interpretation – with the predicate equatives in (37d), which cannot.
     – the latter observation is no surprise, as the predicate involved in each of these strategies is
       the word *equals*, which is not compatible with an 'at least' interpretation.

  2. acceptability with factor modifiers

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

     (38)   a.   Amy is twice as tall as Bill.                                     *PM relative*
            b.   Amy is (*twice) tall like Bill.                              *non-PM relative*
            c.   Amy is (*twice) tall; Bill is tall (too).                         *conjoined*
            d.   Amy (*twice) equals Bill in height.                               *predicate*

  3. evaluativity patterns

     – a construction is evaluative iff it requires that a degree exceed a contextually-valued standard

     (39)   a.   Amy is as tall as Bill, but she's short.
            b.   Amy is as short as Bill, #but she's tall.

     – the same expectations regarding the 'positive forms' of adjectives as with factor modifiers
     – the judgment relies on holding fixed Amy's and Bill's comparison class, and the pattern
       exemplified in (39) holds only for relative adjectives (Rett, 2015b)

     (40)   a.   Amy is as tall as Bill, but she's short.                          *PM relative*
            b.   Amy is tall like Bill, #but she's short.                     *non-PM relative*
            c.   Amy is tall; Bill is tall (too), #but she is short.               *conjoined*
            d.   Amy equals Bill in height, but she's short.                       *predicate*
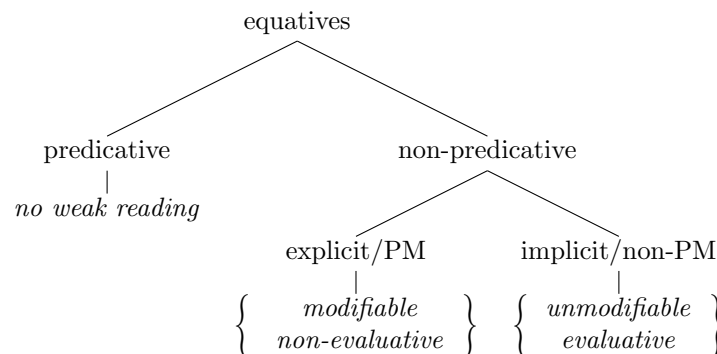
- summary of diagnostics



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

## 2.3   a (minor) cross-linguistic extension

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

(41)   ??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*

(42)   #Thomas är lika    lång som Christoffer; han är faktiskt  längre.
        T        is equal tall  as   C;          he is actually taller
        'Thomas is as tall as Christoffer; he is in fact taller.'                                         *Swedish*[10]

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

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

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

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

    (44)   ??Ivan  je  dvostruko visok kao Petar.
            John be twice       tall   as  Peter
            'John is twice as tall as Peter.'                                                                     *Croatian*

    (45)   Ivan  je  visok kao Petar, a    Petar je  nizak!
            John be tall    as  Peter, and Peter be short
            'John is as tall as Peter, and Peter is short!'                                                       *Croatian*

    - Syrian Arabic, too, has a implicit equative strategy

    (46)   Kariim ṭawiil mitl Aħmad.
            Kariim tall    like Ahmad
            'Karim is tall, like Ahmad (is).                                                                      *Syrian Arabic*

    - these equatives are also unmodifiable and evaluative.

    (47)   *Kariim ṭawiil mitl Aħmad ʕa -marrt -een.
            Karim  tall    like Ahmad on -time  -DUAL
            'Karim is tall like Ahmad twice.'                                                                     *Syrian Arabic*

    (48)   #Kariim ṭawiil mitl Aħmad, 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*

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[10]The consultant for (42) reports that the equative is a contradiction of its continuation.

- but explicit (PM relative) equatives seem to be more of a mixed bag; they actually seem to form two distinct subcategories (see the Appendix)

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

Figure 3: Subtypes of explicit equatives

- the first category is exemplified by Swedish

(49)    Thomas är dubbelt så      lång som    Christoffer.
        T     is twice   so(PM) tall as(SM) C.
        'Thomas is twice as tall as Christoffer.'                                    *Swedish*

(50)    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*

(51)    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*

- the second category is exemplified by Italian

(52)    *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*

(53)    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*

(54)    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*-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*.
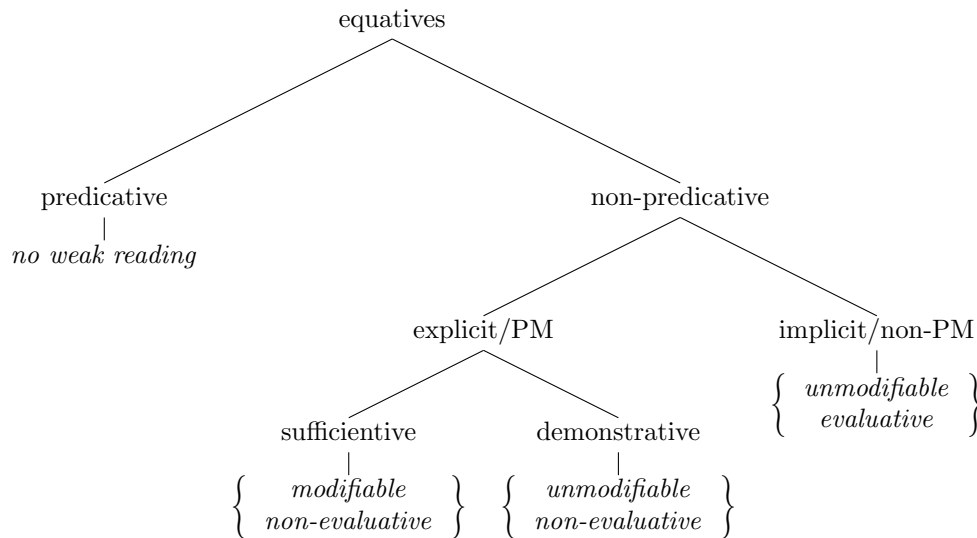
equatives

predicative non-predicative
|
*no weak reading*

explicit/PM implicit/non-PM

$\left\{\begin{array}{c} unmodifiable \\ evaluative \end{array}\right\}$

sufficientive demonstrative

$\left\{\begin{array}{c} modifiable \\ non\text{-}evaluative \end{array}\right\}$  $\left\{\begin{array}{c} unmodifiable \\ non\text{-}evaluative \end{array}\right\}$

Figure 4: A typology of equatives (final)

# 3   consequences for formal semantic theory

## 3.1   degree semantics and degree quantifiers

- gradable vs. non-gradable adjectives:

  - ability to be modified by an intensifier like *very* with a non-coerced interpretation

    (55)   a. %Amy is very Australian.                                                 *non-gradable*
           b.   Amy 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)

    (56)   a. *Amy is one and a half Vegemites Australian.                             *non-gradable*
           b.   Amy is one and a half meters tall.                                      *gradable*

- a useful way to formally differentiate between the two: non-gradable As characterize individuals (or describe sets of individuals); gradable As relate an individual to a (set of) degree(s) (Cresswell, 1976)

  (57)   a.   $[\![\text{Australian}]\!] = \lambda x.\text{australian}(x)$                           *non-gradable*
         b.   $[\![\text{tall}]\!] = \lambda x \lambda d.\text{tall}(x) \geqslant d$                  *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

  (58)   a.   Amy likes <u>some</u> Australian foods.                              *individual quantifier*
         b.   Amy is <u>more</u> tall than Bill.                                    *degree quantifier*

- individual quantifiers can be analyzed as ranging over individuals or sets...

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

- ...so too can degree quantifiers[11]

(60)  a.   $[\![\text{-er}]\!] = \lambda D \lambda D'. \text{ MAX}(D') > \text{MAX}(D)$                *degree-based*
      b.   $[\![\text{-er}]\!] = \lambda D \lambda D'. \ D' \supset D$                                        *set-based*

(61)  a.   $[\![\text{as}]\!] = \lambda D \lambda D'. \text{ MAX}(D') \geqslant \text{MAX}(D)$              *degree-based*
      b.   $[\![\text{as}]\!] = \lambda D \lambda D'. \ D' \supseteq D$                                       *set-based*

## 3.2   formalization of the comparative typology

- some correlations

(62)   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 → 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'[12]
    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 (35b) and (35d).)

  – 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)

  – whether or not a strategy involves a degree quantifier is a semantic commitment, cross-cutting
    the morphosyntactic distinctions Ultan's and Stassen's typologies, exemplified in (7)-(10)

- explicit comparatives that involve a degree quantifier are analyzed as traditional comparatives have
  been, namely with the semantics in (60).

- implicit comparatives in languages that 'don't have degrees' are typically analyzed as relating degree-
  free 'comparison classes' à la Klein (1980, 1982) (Pearson, 2010; Bochnak, 2015b)

- implicit comparatives in languages that 'have degrees' may receive either interpretation, depending
  (Bogal-Albritten and Coppock, 2019)

## 3.3   formalization of the equative typology

### 3.3.1   implicit, non-PM relative equatives

- I analyze implicit equatives the same way as I analyze similatives (63a) and generic equatives (63b) in
  English: as relative clauses ranging over manners and (evaluative) properties (Rett, 2013)

(63)  a.   Amy danced as Bill danced.                                                      *similative*
      b.   Amy is white as snow.                                                      *generic equative*

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[11]Where $\text{MAX}(D) = \iota d \in D[\forall d' \in D[d' \neq d \rightarrow d' < d]]$
[12]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 type.

- background assumptions (see Rett, 2013):

  - gradable adjectives lexicalize degrees, but verbs don't;

  - a relation $\mathbb{R}$ can introduce a free manner (or property) variable into the derivation (Landman, 2000), similar to the one that associates verbs with their times[13]

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

    (65)   a.   $\llbracket \text{Amy danced} \rrbracket = \exists e[\mathsf{dance}(e) \wedge \mathsf{agent}(\mathsf{Amy},e)]$
           b.   $\llbracket \text{Amy danced } \rho \rrbracket = \exists e[\mathsf{dance}(e) \wedge \mathsf{agent}(\mathsf{Amy},e) \wedge \mathbb{R}(e,m)]$
                *shorthand:* $\exists e[e = \mathsf{dance}(\mathsf{Amy}) \wedge \mathbb{R}(e,m)]$

  - the equation of two degrees, in English specific equatives, involves a degree quantifier (the parameter marker); the equation of two properties or manners does not

- the analysis:

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

  (67)   Gianni e alto come Pietro.                                                               *Italian relative equative*
         a.   $\llbracket \text{Gianni e alto} \rrbracket = \llbracket \text{Op}_\rho \text{ Gianni e alto } \rho \rrbracket = \lambda P \exists e[e = \exists d[\mathsf{tall}(\mathsf{gianni},d) \wedge d > s] \wedge \mathbb{R}(e,P)]$[14]
         b.   $\llbracket \text{come Pietro } \text{e alto } \rho \rrbracket = \lambda P' \exists e'[e' = \exists d'[\mathsf{tall}(\mathsf{pietro},d') \wedge d' > s] \wedge \mathbb{R}(e',P')]$
         c.   *predicate modification*:
              $\lambda P \exists e,e'[e = \exists d[\mathsf{tall}(\mathsf{gianni},d) \wedge d > s] \wedge \mathbb{R}(e,P) \wedge e' = \exists d'[\mathsf{tall}(\mathsf{pietro},d') \wedge d' > s] \wedge \mathbb{R}(e',P')]$
         d.   *existential closure*:
              $\exists P,e,e'[e = \exists d[\mathsf{tall}(\mathsf{gianni},d) \wedge d > s] \wedge \mathbb{R}(e,P) \wedge e' = \exists d'[\mathsf{tall}(\mathsf{pietro},d') \wedge d' > s] \wedge \mathbb{R}(e',P')]$

### 3.3.2   explicit, PM relative equatives

- sufficientive equatives should be analyzed as the equative counterpart of explicit comparatives, i.e. as involving degree quantifiers, as in (61)

  - this explains their weak reading (Rett, 2015a) and evaluativity pattern (Rett, 2015b);

  - it also explains, with a type-shift, their ability to occur with a factor modifier (cf. the ability of explicit comparatives to occur with measure-phrase differentials)

- demonstrative equatives (e.g. the Romanian (68)) can be analyzed by formal analogy to accounts of degree correlatives (e.g. the Romanian (69)) (Brasoveanu, 2009)

  (68)   Irina este tot <u>atît</u>              de înaltă ca      şi   Maria.
         I     is    all  that-much(PM) of tall     as(SM) also M
         'Irina is as tall as Maria.'                                                                      *Romanian*

  (69)   Pe cît          e Irina de frumoasă, (tot) pe <u>atît</u>        e de deşteaptă.
         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*

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[13]$\mathbb{R}$ could be characterized as a null type-shifter or a polysemous meaning shift, depending on your aesthetic inclinations.

[14]Lots to be said about how this positive construction comes to denote an evaluative property! But it does, in matrix sentences and elsewhere, see Rett (2015b).

- the degree correlative has an added layer of semantic complexity because it compares differential degrees (Bale, 2008)

- the analysis involves two standard assumptions:

  - the embedded clause introducing the standard is a degree relative, ultimately denoting a a degree definite via a type-shifter or other meaning transformation (Caponigro, 2004)

    (70)    ⟦ca si Maria ~~este înaltă~~⟧ = MAX($\lambda d.$tall(maria, $d$))

  - the demonstrative encodes anaphora to this maximal degree

    (71)    ⟦Irina este tot atît de înaltă ca şi Maria⟧ = tall(irina, MAX($\lambda d.$tall(maria, $d$)))

- the analysis – and the reduction to degree demonstratives – correctly predicts the behavior of demonstrative equatives shown in Figure 4:

  - they're not evaluative (neither are degree demonstratives with positive relative adjectives)

    (72)    A:  How tall is Amy?
            B:  That tall, which is to say, she's short.

  - they have a weak reading (so do degree demonstratives)

    (73)    A:  How tall is Amy? *(gesturing)* Is she this tall?
            B:  Yes (she's that tall), in fact she's taller.

  - they're unacceptable with factor modifiers because they involve direct reference rather than abstraction over degrees

    (74)    *Gianni è due volte cosí alto.
            G       is two times that tall
            'John is twice that tall.'                                                        *Italian*

# 4   summary

- equative strategies differ just as much and in just as interesting ways across languages... in fact, there seem to be 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

- lots more work needs to be done to expand this typology across languages (as has been done, in part, for comparatives)...

- and to test the extra predictions about e.g. the parallel behavior between degree demonstratives and demonstrative equatives predicted by my formal semantic account

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

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