Equatives in Turkish – two ways of comparison across categories

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Equatives (including similes)

(1) a. *Anna is as tall as Berta.* — scalar

b. *Anna's dress is like Berta's.* — non-scalar

c. *Anna runs like Berta does.* — non-scalar

Terminology (Haspelmath & Buchholz 1998)

Anna	*is*	*as*	*tall*	*as*	*Berta*
comparee		parameter marker	parameter	standard marker	standard

German demonstrative *so* 'such', 'so' 'like'

German demonstrative *so:* "similarity demonstrative" – "*like this*"

(2) a. speaker points to a person:
So groß ist Anna auch.
'Anna is this tall, too.' — degree, scalar

b. speaker points to a car:
So ein Auto hat Anna gekauft.
'Anna bought a car like this.' — property, non-scalar

c. speaker points to someone running:
So läuft Anna auch.
'Anna runs like this, too.' — manner, non-scalar

Umbach & Gust (2014), Gust & Umbach (2021): *Similarity framework*
--> formally precise notion of similarity

German expression *wie* 'how', 'as'

German expression *wie* denotes similarity — *"like this"*

For example, in equative comparison

(3) a. *Anna ist so groß wie Berta.* — degree, scalar
'Anna is as tall as Berta.'

b. *Annas Kleid ist so wie Bertas.* — property, non-scalar
'Anna's dress is like Berta's.'

c. *Anna rennt so wie Berta.* — manner, non-scalar
'Anna runs like Berta does.'

Hypothesis (for German):
Scalar as well as non-scalar equatives express similarity

Plan

Data

Equatives in German and English

Equatives in Turkish

Analysis

Semantic analyses of equatives in the literature

Similarity framework

Semantic analysis for Turkish equatives

Parameter- / standardmarkers in German

(3) a. *Anna ist so groß wie Berta.*
'Anna is as tall as Berta.'

b. *Annas Kleid ist so wie Bertas.*
'Anna's dress is like Berta's.'

c. *Anna rennt so wie Berta.*
'Anna runs like Berta does.'

German	adjectival	nominal	verbal
scalar	***so – wie***	*so – wie*	*so – wie*
non-scalar	*(so) – wie*	***[so]– wie***	***[so]– wie***
coordination	*wie*		

d. *Anna ist so begabt wie Berta.*
'Anna is talented in the way Berta is.'

e. *Anna ist so ein Idiot wie Berta.*
'Anna is as much of a idiot as Berta is.'

f. *Anna rennt so wie Berta.*
'Anna ran as fast as Berta did.'

g. *Anna rennt, wie auch Berta. 'Anna runs, Berta does, too.'*

Parameter- / standardmarkers in English

(1) a. *Anna is as tall as Berta.*

b. *Anna has a dress like Berta's.*

c. *Anna runs like Berta does.*

English	adjectival	nominal	verbal
scalar	***as – as***	*such -- as*	
non-scalar	*like*	***like***	***like***
coordination	*like*		

d. *Anna is talented like Berta is.*

e. *Anna is such an idiot as Berta.*

g. *Anna is tall / has a dress / runs, like Berta.*

Equatives in Turkish: Adjectives

(4) a. *Anna Berta kadar uzun / zeki.* scalar
A. B. kadar tall / intelligent.Cop3sg
`Anna is as tall / intelligent as Berta.'

b. *Anna Berta gibi zeki.* non-scalar
A. B. gibi intelligent.Cop3sg
`Anna is intelligent in the way Berta is.'

kadar 'amount' *ne kadar?* 'how much')

gibi 'like' *Istanbul London gibi bir şehir*
'Istanbul is a city like London'

Equatives in Turkish: Nominals

(5) a. *Anna'nın elbisesi Berta'nın-ki gibi.* non-scalar
A.-Gen dress Poss3sg B.-Gen-Rel gibi.Cop.3sg

`Anna's dress is like Berta's.'
(e.g., with respect to design & color & fabric)

b. *Anna'nın elbisesi Berta'nın-ki kadar.* scalar
A.-Gen dress.Poss3sg B.-Gen-Rel kadar.Cop.3sg

`Anna's dress is as ____ as Berta's.'
(e.g., same length or price)

Equatives in Turkish: Verbs

(6) a. *Anna Berta gibi koşuyor.* non-scalar
A. B. gibi run.3sg.Prog

`Anna runs like Berta.'
(e.g. w.r.t. style and equipment)

b. *Anna Berta kadar koşuyor.* scalar
A. B. kadar run.3sg.Prog

`Anna runs as ___ as Berta.'
(e.g. speed, duration or frequency)

Equatives in Turkish: Two ways of equative comparison

Turkish	adjectival	nominal	verbal
scalar	***kadar***	***kadar***	***kadar***
non-scalar	***gibi***	***gibi***	***gibi***
coordination	*gibi*		

==> standard markers have to be accounted for in semantic interpretation

Adjectival equatives (1)

- *gibi* is compatible with gradable and non-gradable adjectives;
  kadar: only gradables

  (7) *Anna Berta gibi* evli
  'Anna is married like Berta' (e.g. fake or)

  (but see results of questionaire)

- *gibi* blocks degree modifiers like *en az* ('at least'), which are o.k. with *kadar*

  (8) *Anna en az Berta kadar zeki / *gibi zeki*
  'Anna is at least as intelligent as Berta.'

Adjectival equatives (2)

- *kadar*, but not *gibi*, can be combined with measure phrases. However, with *kadar* the sentence has only a comparative reading:

  (9) *Anna 2cm kadar /*?gibi uzun.*
  `Anna is approximately 2 cm taller (than Berta)'.

- *kadar*, but not *gibi*, can be combined with factor phrases

  (10) *Anna Berta'dan 3 kat kadar /*gibi (daha) zeki.*
  Anna is around 3 times more intelligent than Berta.

- *kadar* as well as *gibi* equatives entail the positive – *Normbezug*

  (11) *Anna Berta kadar / gibi zeki.* ==> both intelligent

Questionnaire"Which adjectives allow for *gibi* equatives?"

skip

…talented in the way …

For example, *zeki* (intelligent)

- target sentence — *Cemile Şeyma gibi zeki.*
- paraphrase 1 (specific) — *Şeyma matematiksel konularda zeki. Cemile de öyle.* Şeyma is clever in mathematical subjects. Cemile is so too.
- paraphrase 2 (generic) — *Zeki olmanın birden fazla şekli var. Şeyma hangi şekilde zekiyse, Cemile de o şekilde zeki.* There is more than one way of being clever. In whichever way Şeyma is clever, Cemile is clever in the same sense/way.

Questionnaire"Which adjectives allow for *gibi* equatives?"

skip

On-line questionniare, 22 adjectives, acceptability judgements, 1-5 scale, 2 lists

Structure of test items

1. target sentence — *Cemile Şeyma gibi zeki.*
2. conjunctive paraphrase — "Cemile is clever and Şeyma is so, too."
3a. paraphrase 1 (specific) — list 1
3b. paraphrase 2 (generic) — list 2

For each paraphrase: "Do you think this thought could be a reason to utter the sentence above?"

1 (no way) …. 5 (certainly)

Questionnaire"Which adjectives allow for *gibi* equatives?"

Selected stimuli

skip

many dimensional

1-dimensional

		grad	prediction	generic	specific
zeki	intelligent	+	+	4,00	4,00
güzel	beautiful	+	+	3,69	3,57
iyi	good	+	+	3,50	3,92
virajlı	curvy	+	+	3,92	3,79
şekersiz	sugarfree	-	-	2,00	2,57
evli	married	-	+	2.23	2,26
hızlı	fast	+	+	3,92	2,86
uzun	tall	+	-	3,38	2,57
pahalı	expensive	+	-	2,29	3,62
eski	old	+	+	2,21	3,62

==> for some adjectives, the manner reading of equatives is easily available, for others it is less available, and for some it seems not available at all

Scalar nominal equatives

Dimensions of comparison are severely restricted by the particular noun:

(12) *Anna'nın* **N** *Berta'nın-ki kadar.*

'Anna's **N** is as _____ as that of Berta.'

child: age, height, weight (for babies)
NOT smartness, intelligence, speed

house: size, price, ?age
NOT state of repair, wear

clothing: size, price
NOT style, same degree of beauty

Scalar verbal equatives

Dimensions of comparison are severely restricted by the particular verb;

(13) *Anna Berta kadar* **V** *ediyor.*

`Anna **V** as ____ as Berta does.'

dance: duration or frequency or talent
NOT ambition, agility, concentration

run: ability, distance, frequency, speed
NOT style, manner

sleep: duration
NOT manner

"Which dimensions are licensed in nominal *kadar* equatives?"

skip

Questionaire:

Anna'nin evi Berta'nin-ki kadar.

'Anna's house is as _____ as Berta's.'

Proposed dimensions: SIZE, HEIGHT, PRICE, AGE, WEIGHT, BEAUTY, …

work in progress

Intermediate summary

In Turkish, there are two standard markers in equatives which occur across categories – adjectival/nominal/verbal equatives – and indicate different meanings:

- *kadar*
  scalar comparison along one ordinal dimension
- *gibi*
  non-scalar comparison, more than one dimension, arbitrary scale levels

==> semantic analysis of equatives:
- The standard marker has to be taken into account
- A semantic framework is required that allows for scalar as well as non-scalar comparison

Plan

Data

- Equatives in English and in German
- Equatives in Turkish

Analysis

- Semantic analyses of equatives in the literature
- Equatives in the similarity framework
- Semantics for Turkish equatives

Two types of analyses of equatives

Degree-semantic analyses (e.g., Bierwisch 1987, von Stechow 1984, Kennedy 1999)
take a **scalar perspective**

- make use of ordinal dimensions
- equatives are treated close to comparatives,
  (non-strict order ≤ instead of a strict one <)
- not suitable to handle non-scalar equatives
  (but see Hohaus & Zimmermann 2020 and Rett 2020)

Kind-based analyses (e.g. Anderson & Morzycki 2015)
take a **non-scalar perspective**

- make use of kinds
- scalar equatives are included via "degree kinds"
- no link to comparatives
  (but see Luo et al. 2023 for a degree-kind based analysis of scalar equatives in Mandarin Chinese)

Hohaus & Zimmermann (2020)

German equatives express universal quantification over sets of degrees as well as sets of properties:

- equatives are like comparatives, with a slightly different ordering relation: ⊆ instead of ⊂ (von Stechow 1884)
- *so* is a quantifier taking degrees or properties

  Annas Kleid ist so lang wie Bertas Kleid / so wie Bertas Kleid

  'A's dress is as long as / like B's dress'
- degree interpretation (as usual)

  $[[so_{degree}]] = \lambda D_{<d,t>}. \lambda D'_{<d,t>}. \{d': D'(d') = 1\} \subseteq \{d : D(d) = 1\}$
- property interpretation: selected properties of Berta's dress are included in that of Anna's dress (asymmetric)

  $[[so_{property}]] = \lambda C_{<e,t,t>}. \lambda R'_{<e,t,t>}. \lambda R_{<e,t,t>} \{f' : C(f') \,\&\, R'(f') = 1\} \subseteq \{f: R(f) = 1\}$

Anderson & Morzycki (2015)

non-scalar perspective

Polish scalar as well as non-scalar equatives make use of the same parameter marker and standard marker (like German)

Taki *pies* ***jak*** *Floyd*	'such a dog as Floyd'
Tak *wysoki* ***jak*** *Clyde*	'as tall as Clyde'

- uniform analysis of *tak* and *jak* in scalar and non-scalar equatives
  $[[tak]] = [[jak]] = \lambda k. \lambda o. {}^{\cup}k(o)$ relation between kinds k and entities o
- scalar equatives included via "degree kinds", i.e. equivalence classes of states of individuals
- the meaning of scalar as well as non-scalar equatives:
  "be of the same kind"

Scalar and non-scalar equatives in parallel

Turkish data:

- The standard marker has to be taken into account
- A semantic framework is required that allows for scalar as well as non-scalar comparison – without reducing one to the other.

The similarity framework (Umbach & Gust 2014, Gust & Umbach 2021) accounts for

- non-scalar equatives: similarity in multi-dimensional spaces
- scalar equatives:
  - option 1: linear order of degrees in one ordinal dimension
  - option 2: similarity classes w.r.t one ordinal dimension

The similarity analysis

SIM(x, t, $\mathcal{F}$)

x referent of the phrase
t target of the demonstration
$\mathcal{F}$ representation, including **features of comparison**

SIM(x, y, $\mathcal{F}$) true iff
x and y are **indistinguishable** w.r.t. a given set of features

Similarity demonstratives function as modifiers

[[*so (ein) Tisch*]] = [[*table like this one*]] = λx. table(x) & **SIM(x, t, $\mathcal{F}_{table}$)**

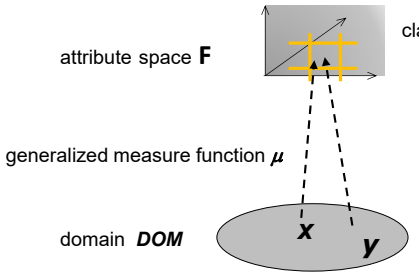
[[*so tanzen*]] = [[*dance like this*]] = λe. dance(e) & **SIM(e, t, $\mathcal{F}_{dance}$)**

[[*so groß*]] = [[*tall like this person*]] = λx. tall(x) & **SIM(x, t, {height})**

How to spell out similarity?

The similarity framework in a nutshell

- multidimensional attribute spaces F
- generalized measure functions [DOM→ F]
- set of classifiers P*: predicates on points in F (providing granularity)



Two individuals are **similar** iff their images under **μ** are indistinguishable in F, iff they cannot be distinguished by classifiers in P*

$\forall x,y \in DOM$: sim(x, y, F)

iff $\mu(x) \approx_F \mu(y)$

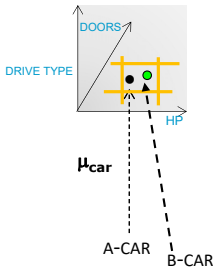
iff $\forall p \in P^*$: $p(\mu(x)) \leftrightarrow p(\mu(y))$

➢ "Generalized degree semantics"

The similarity account: non-scalar equatives

Suppose, relevant dimensions of comparison for *car* are

DRIVE_TYPE: {diesel, gasoline, natural gas, electric}
HORSEPOWER: $\Re^+$
DOORS: {1 …5}



Generalized measure function associated with *car*

μ_{CAR}: U → DRIVE-TYPE × HP × DOORS

where $\mu_{CAR}(x) = <\mu_{DRIVE\text{-}TYPE}(x), \mu_{HP}(x), \mu_{DOORS}(x)>$

Non-scalar equatives express similarity in multi-dimensional spaces

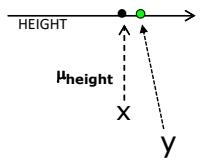
[[*A's car is like B's car*]] =1 iff SIM (μ_{car}(A-CAR) , μ_{car}(B-CAR), $\mathcal{F}_{car}$)

Non-scalar similarity classes constitute **ad-hoc kinds,** "*be like B's car*"
– subject to constraints on features of comparison found with kinds,
(see Umbach & Stolterfoht in prep)

The similarity account: scalar equatives

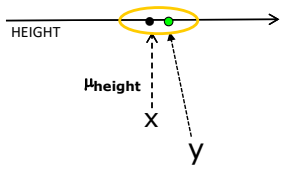
Scalar equatives:

- option 1: use the linear order ≥ of the single ordinal dimension



- option 2: use similarity classes on the single ordinal dimension

"quasi exactly" interpretation



The semantics of *gibi* / *kadar* equatives

- Adjectives, nouns and verbs are of type <e,t> or <ev, t>

  [[*uzun*]] = λx.tall(x) [[*elbise*]] = λx.dress(x)

- Adjectives, nouns and verbs are associated with dimensions, depending on context

Let *DIM* denote the set of dimensions: $DIM_{scalar} \subset DIM$

Let ***o*** be a variable over predicates (type <e,t> or <ev,t>

There are context-dependent partial ***dimension association functions***

da_{scalar}:	$o \rightarrow f_o \in DIM_{ord}$	1 ordinal dimension
$da_{nonscalar}$:	$o \rightarrow F_o \subset DIM$	n dimensions (arbitrary scale level)

The semantics of gibi / kadar in equatives

Measure functions μ_f , μ_F

μ_{fo}: $x_{<e,t>/<ev,t>} \rightarrow v \in f_o$ (degrees)

μ_{Fo}: $x_{<e,t>/<ev,t>} \rightarrow v \in F_o$ (points in n-dim spaces)

kadar: linear order in a single ordinal dimension

[[*kadar*]] = λo λy λx. ***AS*** (x, y, f_o)

where ***AS*** (x, y, f_o) iff μ_{fo} (x) $\geq_{fo}$ μ_{fo} (y)

gibi: similarity relation in a multidimensional space

[[*gibi*]] = λo λy λx. ***SIM***(x, y, F_o)

where ***SIM***(x, y, F_o) iff μ_{Fo} (x) $\approx_{Fo}$ μ_{Fo} (y)

Individual comparison

Questions to be considered / tentative answers

- individual comparison or degree comparison?

  multi-dimensional "degrees"? similarity classes

- comparative subdeletion in Turkish? NO

- phrasal or clausal standards? both

- how to combine matrix + standard?

  in non-scalar equatives? identification of similarity classes

"Degree comparison" in non-scalar equatives?

skip

individual comparison λo λy λx. ***AS*** (x, y, f_o)

degree comparison λo λd_1 λd_2. ***AS***$_{DEGREE}$ (d_1, d_2, f_o)

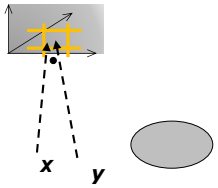
where ***AS***$_{DEGREE}$ (d_1, d_2, f_o) iff $d_1 \geq_{fo} d_2$

individual comparison λo λy λx. ***SIM*** (x, y, F_o)

"degree" comparison λo λk_1 λk_2. ***SIM***$_{CLASS}$(k_1, k_2, F_o)

where ***SIM***$_{CLASS}$ (k_1, k_2, F_o) iff $k_1 \approx_{Fo} k_2$

note:
k_1, k_2 are no genuine kinds
but instead sets of points in F,
such that $k_1 \approx_F k_2$ iff $\forall v_1, v_2$ in $k_1 \cup k_2$. $v_1 \approx_F v_2$



No comparative subdeletion in Turkish

skip

(16) a. **Kapı masanın uzun olduğundan daha geniş.* comparative
door table-Gen tall be.Abl daha wide

b. **Kapı masanın uzun olduğu kadar geniş.* equative
door table-Gen tall be kadar wide

intended: 'The desk is higher than / as high as the door is wide.'

How to express (16)?

(17) a. *Masa'nın uzunluğu kapı-nın genişliği kadar.* table-Gen
length.Poss door-Gen width.Poss kadar 'The length of the table equals the width of the door.'

b. *Masa ne kadar uzunsa, kapı da o kadar geniş.*

table what kadar tall.Cond door also that kadar wide

'Whatever much the length of the table is, the door has the same width.'

... looks like degree comparison ...

Phrasal or clausal standard?

skip

Standards in Turkish need not be phrasal (contra Hofstetter xxx)

- subordinate clauses are nominalized, but carry tense + aspect …

---> semantically not DP-like but still clause-like

- certain Turkish comparatives require clausal standards

- for *Anna Berta kadar uzun* ('A is as tall as B') both analyses are possible

Conclusion

- In Turkish, scalar as well as non-scalar equatives occur across categories (adjectival, nominal, verbal)
- The interpretation is determined by the standard marker:
  scalar equatives are marked by *kadar* ('… amount')
  non-scalar equatives are marked by *gibi* ('similar')
- The semantics proposed here for scalar and non-scalar Turkish equatives
  - takes the meaning of the standard markers gibi / kadar into account
  - makes use of a framework that allows for scalar as well as non-scalar comparison without reducing one to the other.
- What about other languages?

Outlook: Equatives across languages

skip

What about English and German?

English	adjectival	nominal	verbal
scalar	*as – as*		
non-scalar		***like***	***like***

as ≥

like SIM

German	adjectival	nominal	verbal
scalar	***so – wie***		
non-scalar		[***so***]***– wie***	[***so***]***– wie***

} *wie* SIM

Outlook: Equatives across languages

skip

German pattern (roughly) : Polish, Russian, Czech, Spanish, …

English pattern: French, Dutch, …

(but see Rett 2020)

Half of the Turkish pattern: Mandarin Chinese

two types of adjectival equatives:

gēn-constructions	"along with"	1 ordinal dimension 'extend'
xiàng-constructions	"similar / like"	multi-dimensional 'manner'

(Zhang 2020)

References

Anderson, C. and Morzycki, M. (2015) Degrees as kinds. NLLT 33:79 -821.

Beck, S. & Krasikova, S. & Fleischer, D. et al. 2010. Crosslinguistic variation in comparison constructions. In J. van Craenenbroeck & J. Rooryck (eds.) *Linguistic VariationYearbook* 2009.

Beck, Sigrid (2011), 'Comparison constructions'. In Claudia Maienborn, Klaus von Heusinger and Paul H. Portner (eds.), *Semantics: An International Handbook of Natural Language Meaning*, vol. **2**. De Gruyter. Berlin. 1341–89.

Bierwisch, M. (1987) Semantik der Graduierung. In M.Bierwisch & E. Lang (eds.) *Grammatische und konzeptuelle Aspekte von Dimensionsadjektiven*. Akademie Verlag Berlin, 91-286.

Gust, Helmar & Carla Umbach (2021) A qualitative similarity framework for the interpretation of natural language similarity expressions. In Lucas Bechberger, Kai-Uwe Kühnberger and Mingya Liu (eds) *Concepts in Action - Representation, Learning and Application*, 63-92, Language, Cognition, and Mind, Springer.

Hahnemann, Suzan (1999) *Vergleiche im Vergleich*. Niemeyer, Tübingen.

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

Hofstetter, S. (2009) Comparison in Turkish: A Rediscovery of the Phrasal Comparative. Proceedings of SuB 13, University of Stuttgart.

Hohaus, Vera & Malte Zimmmermann (2021 Comparisons of equality with German SO...WIE, and the relationship between degrees and properties. *Journal of Semantics* 38, 95-143

References

Kennedy, C. (1999) *Projecting the Adjective*. Garland Press, New York.

Luo, Q., Xie, Z. & Li , X. (2023) Degrees and grammar. An East Asian perspective. In Language and Linguistics 24:1, 121-147.

Özge, U.(accepted) Issues in the grammar of Turkish comparatives. *Journal of Linguistic Research.*

Rett, J. (2020) Separate but equal : a typology of equative constructions. In Peter Hallmann (ed.) *Interactions of degree and quantification*. Brill, Leiden ; Boston, S. 163-204

Sassoon, G. (2017) Comparisons of nominal degrees. *Language* 93(1), 153-188.

Solt S. (2015) Q-Adjectives and the Semantics of Quantity. Journal of Semantics 32 221 -273.

von Stechow, A. (1984) Comparing semantic theories of comparison. *Journal of Semantics* 3:1–77.

Umbach, C. & H. Gust (2014) Similarity demonstratives. *Lingua* 149:74-93.

Umbach, C., S. Hinterwimmer, H. Gust (2021) German 'wie'-complements: Manners, methods and events in progress. *Natural Language and Linguistic Theory* 40, 307–343,

Umbach, C. & B. Stolterfoht (in prep.) Ad-hoc kind formation by similarity.

Zhang, Linmin (2020) Degrees as kinds vs. degrees as numbers: Evidence from equatives. In *Proceedings of Sinn und Bedeutung 24*.

Zimmermann, Ilse (manuscript) Mit *wie* und *kak* eingeleitete Nebensätze.

(see also https://www.leibniz-zas.de/de/personen/details/zimmermann-ilse/publikationen/)