

Scalarity and additivity in natural language: (V) cross-linguistic siblings / cousins of *even* and how some of them are used in comparatives

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Recapitulation

- Day 4 and Day 5: *Even* and its cross-linguistic siblings
 - How a scalarity-based perspective improve our understanding of additivity-related phenomena?
- Yesterday: the case study of English *even*:
 - scalarity and scale-based additivity of *even*
 - degree QUD and maximal informativeness

Today

- Day 1: Basics of scales and degrees; how they are relevant to natural language
 - What are scales? What are their formal properties? What operators do they support?
- Day 2 and Day 3: Comparatives and *-er/more*
 - How an additivity-based perspective improve our understanding of scalarity-related phenomena?
 - What is additivity?
- Day 4 and Day 5: *Even* and its cross-linguistic siblings
 - How a scalarity-based perspective improve our understanding of additivity-related phenomena?
featuring
 - ★ Chinese *gèng*
 - ★ Chinese *hái*
 - ★ Chinese *dōu*
 - ★ German *noch*
 - ★ and their use in comparatives

Outline

- 1 Cross-linguistic siblings and cousins of English *even*
- 2 Chinese comparatives: comparatives in an *-er*-less language
- 3 The presence of Chinese *gèng* in comparatives and beyond
- 4 Chinese *gèng* vs. Chinese *hái* in comparatives
- 5 Concluding remarks

Translational equivalence at the sentence level: in Chinese

- What does English *even* correspond to in other languages?
This question does not have a short answer.
- E.g., Chinese *gèng*, *hái*, and *dōu* can all be used in comparatives, leading to some translational equivalence with the use of English *even*

(1) (Mary is tall.) Lucy is *even* taller (than Mary is).

(2) 'Lucy is even taller than Mary.'

- a. Lucy *bǐ* Mary *gèng* gāo.
Lucy COMPARED-TO Mary *EVEN_{CH1}* tall/taller
- b. Lucy *bǐ* Mary *hái* gāo.
Lucy COMPARED-TO Mary *EVEN_{CH2}* tall/taller
- c. Lucy *bǐ* Mary *dōu* gāo.
Lucy COMPARED-TO Mary *EVEN_{CH3}* tall/taller

- There are subtle differences among these *even*-like particles wrt interpretations, intonation patterns (stress on the particle vs. on a focused item), dialectal differences (some are preferred in a dialect), etc.

Translational equivalence at the sentence level: in Chinese

- Chinese *gèng*, *hái*, and *dōu* can even be used together in the same sentence, (with a stress on the focused item, Mary).

(3) ‘Lucy is even taller than Mary.’

Lucy bǐ Mary_F dōu hái gèng gāo.
Lucy COMPARED-TO Mary EVEN_{CH3} EVEN_{CH2} EVEN_{CH1} tall/taller

Translational equivalence at the sentence level: in German

(4) (Adam is taller than Chris.)

Berta ist noch größer als Adam.

Berta be.3SG EVEN_{GE} tall-er than Adam

‘Berta is even taller than Adam.’ (*noch*: stressed: see [Umbach 2009](#))

Cross-linguistic family of additive particles

- **English:** *-er/more, another, other, even, also, too, again, furthermore, moreover, still, and, ...*
 - ▶ the family of *even*: *even if, even though*, ‘*even* + a minimal value’ (NPI)
- **Chinese:** *gèng* (‘*more, even*’), *hái* (‘*still, even*’), *dōu* (‘*all, even*’), *yě* (‘*also*’), *yòu* (‘*again*’), *zài* (‘*again*’), *ér* (‘*and, but*’), *hé* (‘*and, with*’), *líng-wài* (‘*other*’), *qí-tā* (‘*other*’), ...
 - ▶ the family of *gèng*: *gèng-jia*, *gèng-hé-kuàng*
 - ▶ the family of *hái*: *hái-yǒu*, *hái-shì*, *hái-yào*
- **German:** *mehr* (‘*more*’), *auch* (‘*also*’), *noch* (‘*still, even*’), *wieder* (‘*again*’), *weiter* (‘*further*’), *und* (‘*and*’), ...
- **French:** *plus* (‘*more*’), *aussi* (‘*also*’), *encore* (‘*still*’), *autre* (‘*other*’), *et* (‘*and*’), ...
- **Korean:** *te* (‘*more, even*’), *te-uk* (‘*more*’), *ta* (‘*all, even*’), *to* (‘*also, too, and, even*’), *tto* (‘*again*’), *hako* (‘*and*’), ...
- **Japanese:** *to* (‘*and, too, also*’), *motto* (‘*more, even*’), *moo*, *ato* ...
- ... (anti-additive particles: *just, only, simply, ...*)

Cross-linguistic family of additive particles

- How to make sense of all these words?
 - Translational equivalence is just a starting point.
 - Contextual information is crucial in understanding their felicity.
- Which additive particles patterns with which additive particles in which ways?
 - e.g., used in which domains? (e.g., entities, events, scalar values)
 - e.g., whether additive meaning leads to an end point (or maximal informativeness)
 - ★ Sigrid Beck, Mingming Liu: *měi+dōu* ('every + even/all')
 - ★ Yael Greenberg: *even*
 - ★ Osamu Sawada: *ato* vs. *moo*
 - ★ Guillaume Thomas: typology on 'Comparison – Incrementality – Continuation'
 - ★ Carla Umbach: *noch*
 - ★ Linmin Zhang: *even*, maximality in cumulative reading
 - ...
- Why natural language has additive particles?
 - to enhance discourse coherence: helping with information integration (see e.g., David Hume, Roberts 1996/2012, Kehler 2002)

Case study of today's lecture: *gèng*

- What is *gèng*?
(In which domain can it be used? With vs. without an end point?)
 - ≈ English *even*? (see [Chen 2023](#))
 - ≈ English *even more*? (see [Liu 2010](#))
- What's the role of *gèng* in comparatives? Is it obligatory?
 - Does Chinese require the presence of an additive morpheme like *-er/more* in comparatives?
 - If not, how is comparison performed?
- What do various *even*-like particles do in a comparative?

Take-home messages

- What is *gèng*?
(In which domain can it be used? With vs. without an end point?)
 - ▶ ~~≈ English *even*?~~ (see [Chen 2023](#))
 - ▶ ~~≈ English *even more*?~~ (see [Liu 2010](#))
 - ▶ reminiscent of English implicit comparison
 - ▶ *gèng* can be used in domains of entities and scalar values; no end point involved in additivity
- What's the role of *gèng* in comparatives? Is it obligatory?
 - ▶ *gèng* can optionally appear in a comparative; and in some cases, its presence is strongly preferred / obligatory
 - ▶ but comparison is not performed by *gèng*, but by gradable adjectives, which encode a comparison with a direction
 - ▶ *gèng* marks an update of the threshold for the positive use of a gradable adjective
- What do various *even*-like particles do in a comparative?
 - ▶ *gèng* vs. *hái* (~~vs. German *noch*~~)

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Languages with morphemes like *-er/more*

- Many languages (e.g., English, French) **require** the use of a comparative / additive morpheme in the comparative use of gradable adjectives:

- (5) a. Lucy is **tall**. Positive: **tall**
b. Lucy is **taller** than Mary is. Comparative: **taller**
- (6) a. Lucy has **many** books. Positive: **many**
b. Lucy has **more** books than Mary does. Comp.: **more**
- (7) **French data**
- a. Jean est **grand**.
John be.3SG tall
'John is tall.' Positive: **grand** 'tall'
- b. Jean est plus grand que Pierre.
John be.3SG more tall what Peter.
'John is taller than Peter.' Comp.: **plus+grand** 'taller'

Languages without morphemes like *-er/more*

- However, many other languages (e.g., Chinese, Japanese, Korean) don't have this requirement, i.e., there is no morphological distinction between the comparative vs. non-comparative form:

(8) Chinese data

a. Lèlè gāo ma?

Lèlè tall Q

'Is Lèlè tall?'

Positive: gāo 'tall'

b. Lèlè bǐ Mǐmǐ gāo ma?

Lèlè STDD Mǐmǐ taller Q

'Is Lèlè taller than Mǐmǐ?'

Comp.: gāo 'taller'

(9) Japanese data

a. Rika-wa (se-ga) taka-i.

Rika-TOP back-NOM tall-PRES

'Rika is tall.'

Positive: taka- 'tall'

b. Rika-wa Makoto-yori (se-ga) taka-i.

Rika-TOP Makoto-STDD back-NOM tall-PRES

'Rika is taller than Makoto.'

Comp.: taka- 'taller'

Evidence for the view that comparison is performed by gradable adjectives

- All uses of gradable adjectives involve comparison (i.e., *-er/more* is not a necessary component of comparison):

(10) a. $\llbracket \text{Lucy is POS tall} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \geq d_{\text{POS}}^c$

Positive use

b. $\llbracket \text{Lucy is } 5'8'' \text{ inches tall} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \geq 5'8''$ **Measure**

c. $\llbracket \text{how tall is Lucy} \rrbracket \Leftrightarrow \lambda d. \text{HEIGHT}(\text{Lucy}) \geq d$ **Degree Q.**

d. $\llbracket \text{Lucy is as tall as Bill (is)} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \geq \text{HEIGHT}(\text{Bill})$ **Equative**

e. $\llbracket \text{Lucy is taller than Mary (is)} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{L}) > \text{HEIGHT}(\text{M})$ **Comparative**

More evidence: minimal pairs; antonyms

- Minimal pairs indicate that the use of *-er/more* does not bring comparison, but rather affects (i) what constitutes the comparison standard and/or (ii) the size of the differential.

- (11) a. Mary is not tall. Lucy is tall. $\leadsto \text{HEIGHT}(\text{Lucy}) \geq d_{\text{POS}}^c$
b. Mary is not tall. Lucy is taller. $\leadsto \text{HEIGHT}(\text{L}) \geq \text{HEIGHT}(\text{M})$
- (12) a. Compared to Mary, Lucy is tall. **Implicit comparison**
 $\leadsto \text{HEIGHT}(\text{Lucy}) \geq d_{\text{POS}}^c$
b. Compared to Mary, Lucy is taller. **Explicit comparison**
 $\leadsto \text{HEIGHT}(\text{L}) \geq \text{HEIGHT}(\text{M})$

- Antonyms encode inequalities of different directions: e.g., *tall* vs. *short*.

(See Kennedy 2007 on crisp judgment; see Li 2023 on the felicity requirement in using *-er/more*)

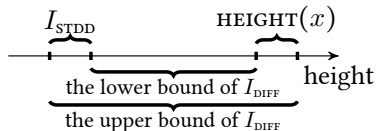
English comparatives vs. Chinese comparatives

- (13) a. Lucy is **taller** than Mary is. $\text{HEIGHT}(L) > \text{HEIGHT}(M)$
b. Lèlè bǐ Mǐmǐ **gāo**.
Lèlè STDD Mǐmǐ taller
'Lèlè is taller than Mǐmǐ.' $\text{HEIGHT}(L) > \text{HEIGHT}(M)$

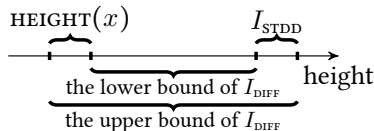
- (14) a. $\llbracket \text{Lucy is POS tall} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \geq d_{\text{POS}}^c$
Positive use
b. $\llbracket \text{Lucy is } 5'8'' \text{ inches tall} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \geq 5'8''$ Measure
c. $\llbracket \text{how tall is Lucy} \rrbracket \Leftrightarrow \lambda d. \text{HEIGHT}(\text{Lucy}) \geq d$ Degree Q.
d. $\llbracket \text{Lucy is as tall as Bill (is)} \rrbracket \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \geq \text{HEIGHT}(\text{Bill})$
Equateive
e. $\llbracket \text{Lucy is taller than Mary (is)} \rrbracket \Leftrightarrow \text{HEIGHT}(L) > \text{HEIGHT}(M)$
Comparative

- Zhang and Zhang (2024): comparison is always performed by **gradable adjectives**
 - ▶ English gradable adjectives encode a **non-strict inequality**, and with the use of *-er/more*, comparatives express a strict inequality.
 - ▶ Chinese gradable adjectives directly encode a **strict inequality**.

Lexical semantics of gradable adjective *tall/gāo*



The meaning of *tall/gāo*



The meaning of *short/ǎi*

$$(15) \quad \llbracket \text{tall} \rrbracket^{\text{def}} = \lambda I_{\text{DIFF}}. \lambda I_{\text{STDD}}. \lambda x. \underbrace{I_{\text{DIFF}} \subseteq [0, +\infty)}_{\text{non-negative presup.}}. \text{HEIGHT}(x) \subseteq \iota I [I - I_{\text{STDD}} = I_{\text{DIFF}}] \quad \text{English}$$

(i.e., the height of x **reaches** the comparison standard, I_{STDD} .)

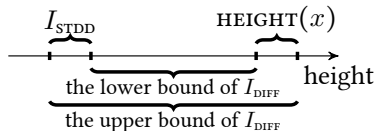
\leadsto the difference between them, I_{DIFF} , is **non-negative**)

$$(16) \quad \llbracket \text{gāo} \rrbracket^{\text{def}} = \lambda I_{\text{DIFF}}. \lambda I_{\text{STDD}}. \lambda x. \underbrace{I_{\text{DIFF}} \subseteq (0, +\infty)}_{\text{positive presup.}}. \text{HEIGHT}(x) \subseteq \iota I [I - I_{\text{STDD}} = I_{\text{DIFF}}] \quad \text{Chinese}$$

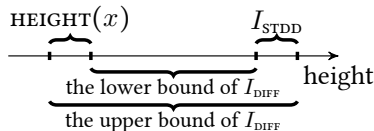
(i.e., the height of x **exceeds** the comparison standard, I_{STDD} .)

\leadsto the difference between them, I_{DIFF} , is **positive**)

Lexical semantics of gradable adjective *short/ǎi*



The meaning of *tall/gāo*



The meaning of *short/ǎi*

$$(17) \quad \llbracket \text{short} \rrbracket^{\text{def}} = \lambda I_{\text{DIFF}}. \lambda I_{\text{STDD}}. \lambda x. \underbrace{I_{\text{DIFF}} \subseteq [0, +\infty)}_{\text{non-negative presup.}}. \text{HEIGHT}(x) \subseteq \iota I [I_{\text{STDD}} - I = I_{\text{DIFF}}] \quad \text{English}$$

(i.e., the height of x **does not exceed** the comparison standard, I_{STDD} .)

\leadsto the difference between them, I_{DIFF} , is **non-negative**)

$$(18) \quad \llbracket \text{ǎi} \rrbracket^{\text{def}} = \lambda I_{\text{DIFF}}. \lambda I_{\text{STDD}}. \lambda x. \underbrace{I_{\text{DIFF}} \subseteq (0, +\infty)}_{\text{positive presup.}}. \text{HEIGHT}(x) \subseteq \iota I [I_{\text{STDD}} - I = I_{\text{DIFF}}] \quad \text{Chinese}$$

(i.e., the height of x **is below / does not reach** the comparison standard, I_{STDD} .)

\leadsto the difference between them, I_{DIFF} , is **positive**)

The positive use of gradable adjectives

- In the positive use, neither I_{STDD} nor I_{DIFF} is overtly uttered (though I_{DIFF} can be restricted by degree modifiers like *very*, *quite*, *a bit*, *extremely*). Thus the subtle truth-conditional difference between ‘reaching a threshold’ and ‘exceeding a threshold’ cannot be explicitly detected.

(19) English

[[Lucy is POS tall]]

$$\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq \iota I \left[I - \underbrace{[d_{\text{POS}}^c, d_{\text{POS}}^c]}_{I_{\text{STDD}}} = \underbrace{[0, +\infty)}_{I_{\text{DIFF}}} \right]$$

$$\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq [d_{\text{POS}}^c, +\infty)$$

(i.e., the height of Lucy **reaches** the contextual threshold of being tall)

(20) Chinese

[[Lucy hěn POS gāo]]

$$\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq \iota I \left[I - \underbrace{[d_{\text{POS}}^c, d_{\text{POS}}^c]}_{I_{\text{STDD}}} = \underbrace{(0, +\infty)}_{I_{\text{DIFF}}} \right]$$

$$\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq (d_{\text{POS}}^c, +\infty)$$

(i.e., the height of Lucy **exceeds** the contextual threshold of being tall)

Measurement sentences

- In measurement sentences, there is always a numerical expression specifying I_{DIFF} , leading to the same truth conditions for these sentences in English and Chinese.

- (21) $\llbracket \text{Lucy is 5 feet 8 inches tall} \rrbracket$ English
 $\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq \iota I[I - [0, 0] = [5'8'', +\infty) \cap [0, +\infty)]$
 $\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq [5'8'', +\infty)$
- (22) $\llbracket \text{Lucy (yǒu) 1.7272 m gāo} \rrbracket$ Chinese
 $\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq \iota I[I - [0, 0] = [1.7272m + \infty) \cap (0, +\infty)]$
 $\Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq [1.7272m, +\infty)$

Comparatives

- English comparatives need the use of *-er/more* to turn a non-negative I_{DIFF} into a positive one, while in Chinese, I_{DIFF} is already positive by default.

$$\begin{aligned}
 (23) \quad & \llbracket \text{Lucy is tall } \underbrace{\text{er}}_{(0, +\infty)} \underbrace{\text{than Mary is}}_{I_{\text{STD}}} \rrbracket \\
 & \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq \iota I [I - \text{HEIGHT}(\text{Mary}) = \underbrace{(0, +\infty)}_{\llbracket \text{er} \rrbracket} \cap [0, +\infty)] \\
 & \Leftrightarrow \text{HEIGHT}(\text{Lucy}) \subseteq \iota I [I - \text{HEIGHT}(\text{Mary}) = (0, +\infty)] \\
 (24) \quad & \llbracket \text{Lèlè bǐ Mǐmǐ gāo} \rrbracket \\
 & \Leftrightarrow \text{HEIGHT}(\text{Lèlè}) \subseteq \iota I [I - \text{HEIGHT}(\text{Mǐmǐ}) = (0, +\infty)]
 \end{aligned}$$

Comparison in English vs. Chinese

- Within our proposed view,
 - For languages that require the use of *-er* in comparatives (e.g., English):
gradable adjectives encode a non-strict inequality
 - ★ In terms of I_{DIFF} , there is a non-negative requirement
 - For languages that use the same form for the comparative and non-comparative uses (e.g., Chinese):
gradable adjectives encode a strict inequality
 - ★ In terms of I_{DIFF} , there is a positive requirement

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Observation 1: The optional presence of *gèng* in Chinese *bǐ* comparatives

- (25) Lèlè bǐ Mǐmǐ (*gèng*) gāo.
Lèlè STDD Mǐmǐ tall
'Lèlè is taller than Mǐmǐ.'

- The presence of *gèng* is **optional**.
 - ▶ Some scholars ([Liu 2010](#), [Chen 2023](#)) claim that the semantic contribution of *gèng* is similar to English *even*, and the above sentence means that Lèlè is even taller than Mǐmǐ, indicating that Mǐmǐ is already tall.
 - ▶ Others (e.g., [Guo 2022](#)) claim that there is no obvious meaning distinction between the sentence with vs. without *gèng*.

Observation 2: The obligatory vs. optional presence of *gèng* in comparatives without a *bǐ*-phrase

- (26) Mǐmǐ hěn gāo. Lèlè **gèng** gāo.
Mǐmǐ very tall Lèlè tall
'Mǐmǐ is tall. Lèlè is taller.' **the use of *gèng* is required.**
(Some scholars (Liu 2010, Chen 2023) claim that the semantic contribution of *gèng* is similar to English *even*)
- (27) Mǐmǐ bù gāo. Lèlè (**gèng**) gāo (yī-diǎn).
Mǐmǐ not tall Lèlè tall (a bit)
'Mǐmǐ is not tall. Lèlè is (a bit) taller.' **the use of *gèng* is optional.**
Others (e.g., Guo 2022) claim that there is no obvious meaning distinction between the sentence with vs. without *gèng*.
- (28) a. Mary is tall. Lucy is (even) taller. (*even* is optional)
b. Mary is not tall. Lucy is *(even) taller. (*even* is forbidden)

The obligatory vs. optional presence of additive particles

- There might be other factors on the obligatory/optional presence of additive particles: e.g., wrt ‘maximizing presupposition’ (Heim 1991), different languages and different items in a language can vary.

(29) **English: (an)other is obligatorily required; also is optional**

- *A girl came. A girl also came.
- A girl came. Another girl (also) came. (also: optional)

(30) **Chinese: (an)other is optional; again is obligatory**

lái-le yí-gè rén, yòu lái-le (lìng)-yí-gè rén.
come-ASP one-CL person again come-ASP (other)-one-CL person

‘A person came. Another person also came.’

- the obligatory absence of *even* in (28b) vs. the optional presence of *gèng* in (27))
 - even* requires positive inference; the existence of positive inference does not require the presence of *even*
 - gèng* does not require positive inference; a standard with positive inference requires the presence of *gèng*

Observation 3: The use of *gèng* is incompatible with numerical differentials

- The use of *gèng* is incompatible with numerical differentials (see [Ma 2019](#), [Zhang 2023](#)).

- (31) * Lèlè bǐ Mǐmǐ **gèng** gāo wǔ límǐ.
Lèlè STDD Mǐmǐ taller five cm
Intended: 'Lèlè is 5 cm taller than Mǐmǐ.'
- (32) * (Mǐmǐ hěn gāo.) Lèlè **gèng** gāo wǔ límǐ.
Mǐmǐ very tall Lèlè tall
Intended: 'Mǐmǐ is tall. Lèlè is 5 cm taller.'
- (33) * (Mǐmǐ bù gāo.) Lèlè **gèng** gāo wǔ límǐ.
Mǐmǐ not tall Lèlè tall (a bit)
Intended: 'Mǐmǐ is not tall. Lèlè is 5 cm taller.'

Observation 4: *gèng* also has an additive use

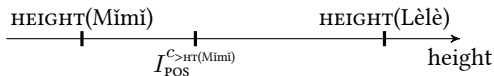
- *gèng* also has an additive use (see also [Chen 2023](#)):

(34) Jīnqián mǎi-bú-dào yǒu-yì, **gèng** mǎi-bú-dào àiqíng
money buy-NEG-get friendship MOREOVER buy-NEG-get love
'Money cannot buy friendship. Moreover, it cannot buy love.'

Summary of the empirical data

- The use of *gèng* in comparatives (Japanese *motto* is similar):
 - *gèng* does not require positive inference
 - a standard with positive inference requires / prefers the presence of *gèng*
 - The use of *gèng* is incompatible with numerical differentials.
- *gèng* also has an additive use.

Proposal: the semantic contribution of *gèng*



[[Lèlè bǐ Mǐmǐ *gèng* gāo]]: Compared to Mǐmǐ, Lèlè is tall.

- (35) a. Lèlè bǐ Mǐmǐ *gèng* gāo.
Lèlè STDD Mǐmǐ MOREOVER tall
'Lèlè is taller than Mǐmǐ.'
- b. Compared to Mǐmǐ, Lèlè is tall. **Implicit comparison**
 \leadsto Lèlè's height reaches a threshold that Mǐmǐ's height doesn't.

- The use of *gèng* in a comparative is reminiscent of **implicit comparison**, involving an update of the threshold for the positive use.
- With the use of *gèng*, the use of a gradable adjective is a **positive use**.
- $[[\textit{gèng}]](p)$
 - asserts the prejacent p
 - presupposes that the prejacent p and alternatives are associated with scalar values on a scale, and compared with alternatives, p exceeds a **positive level that alternatives don't**.

Proposal: the semantic contribution of *gèng*



Compared to friendship, love is more precious.

- The additive use of *gèng* involves a contextually salient scale, and the prejacent and its alternatives are mapped onto this scale (see also the meaning of *even* in [Greenberg 2018](#), [Zhang 2022](#)).

- (36) a. Jīnqián mǎi-bú-dào yǒu-yì, **gèng** mǎi-bú-dào àiqíng
money buy-NEG-get friendship MOREOVER buy-NEG-get love
'Money cannot buy friendship. Moreover, it cannot buy love.'
- b. **Money cannot buy friendship. Moreover, it cannot buy love.**
 \leadsto The preciousness of love reaches a threshold that the
preciousness of friendship doesn't.

How the empirical data are accounted for

- The use of *gèng* in comparatives:

With the use of *gèng*, the sentence is no longer a genuine comparative, but rather like an **implicit comparison** in English, i.e., a positive use

- ▶ *gèng* does not require positive inference
With an update of the threshold, a previous / out-of-context threshold becomes obsolete anyway.
- ▶ a standard with positive inference requires / prefers the presence of *gèng*
An update of the threshold relies on the presence of *gèng*
- ▶ The use of *gèng* is incompatible with numerical differentials.
A *gèng*-sentence is a positive use, not a genuine comparative.

- *gèng* also has an additive use.

Just like in the use of *even*, the use of *gèng* maps entities / events onto a salient scale.

Outline

- 1 Cross-linguistic siblings and cousins of English *even*
- 2 Chinese comparatives: comparatives in an *-er*-less language
- 3 The presence of Chinese *gèng* in comparatives and beyond
- 4 Chinese *gèng* vs. Chinese *hái* in comparatives
- 5 Concluding remarks

Contrast 1: metaphorical / hyperbolic use

- Only the use of *hái*, but not the use of *gèng*, is felicitous for a comparison with metaphorical or hyperbolic meaning.

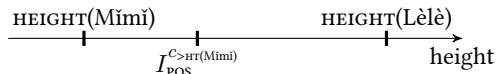
- (37) a. Lèlè bǐ shīzi **hái** yǒnggǎn.
Lèlè STDD lion STILL brave
'Lèlè is even braver than lions.'
- b. #Lèlè bǐ shīzi **gèng** yǒnggǎn.
Lèlè STDD lion MOREOVER brave
Intended: 'Lèlè is braver than lions.'
(According to the proposal on *gèng*, this sentence means
'compared to lions, Lèlè is brave.' \leadsto there is a threshold of
courage such that Lèlè's courage reaches, but lions don't)

Contrast 2: the compatibility with a numerical differential in the comparison

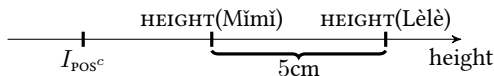
- Only the use of *hái*, but not the use of *gèng*, is compatible with the presence of a numerical differential (Ma 2019).

- (38) a. Lèlè bǐ Mǐmǐ **hái** gāo wǔ límǐ.
Lèlè COMPARED-TO Mǐmǐ STILL tall five centemeter
- b. * Lèlè bǐ Mǐmǐ **gèng** gāo wǔ límǐ.
Lèlè COMPARED-TO Mǐmǐ MOREOVER tall five centemeter
Intended: 'Lèlè is 5cm taller than Mǐmǐ.'

Chinese *gèng* vs. Chinese *hái*



[[Lèlè bǐ Mǐmǐ *gèng* gāo]]: Compared to Mǐmǐ, Lèlè is tall.



[[Lèlè bǐ Mǐmǐ *hái* gāo (5cm)]]: Lèlè is even (5 cm) taller than Mǐmǐ.

- (39) Lèlè bǐ Mǐmǐ_F hái gèng gāo.
 Lèlè COMPARED-TO Mǐmǐ EVEN_{CH2} EVEN_{CH1} tall/taller
 roughly meaning ‘Even compared with Mǐmǐ, Lèlè is tall.’
 (implicit comparison + the use of *even*)

Wrt whether there is an end point

- Neither *gèng* nor *hài* involves an end point.

(40) yì shān **gèng/hái** bǐ yì shān gāo.
one mountain MOREOVER/STILL STDD one mountain tall
'For every mountain, there is a taller one.'

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Summary of today's discussion

- Additive particles like Chinese *gèng* and *hái* are often translated as English *even*, but these particles are not exactly the same.

| | <i>even</i> | <i>gèng</i> positive use | <i>hái</i> |
|---|-------------|-----------------------------|------------|
| involving a comparative or a positive use? | | | |
| compatible with numerical differentials? | (yes) | no | yes |
| positive inference for the comparison standard or not? | yes | no | yes |
| involving a contextually salient scale for an additive use? | yes | yes | yes |
| involving a temporal scale for a temporal use? | yes | no | yes |
| involving an end point? | yes | no | no |
| ... | | | |

- *even*: signaling maximal informativeness (with a degree exceeding the positive threshold) in addressing a contextual degree QUD
 - invoking a contextually salient scale (wrt the degree QUD)
- *hái*: marking an increase that leads to a higher level of informativeness
 - increases are in the domains of entities, events, differences along a scale
- *gèng*: marking an update of the threshold (towards a higher value)
 - working with an explicit gradable expression

What we have done in this course

- Conceptually,
 - What are scales?
What are their formal properties?
What mathematical operations do they support?
 - What is additivity?
- Empirically,
 - How does an additivity-based perspective improve our understanding of scalarity-related phenomena (e.g., comparatives)?
 - How does a scalarity-based perspective improve our understanding of additivity-related phenomena (e.g., *even* and other additive particles)?
- Featured empirical phenomena:
 - Various uses of gradable adjectives
 - Variations of comparatives
 - *-er/more* and additive particles like *another*
 - *Even*-like particles

Take-home messages of this course

- Scalarity and additivity are highly related and should be studied together.
 - QUD provides a unified perspective on scalarity and additivity.
 \leadsto towards a higher value / informativeness along a scale (in addressing a degree QUD)
- There is a large family of cross-linguistic phenomena worth further investigation.
 - To account for cross-linguistic variation, we need to consider parameters both at the language level and at a more fine-grained construction level.

Thank you!

For the slides of this ESSLLI course, please see

<https://ling.auf.net/lingbuzz/008297>

<https://ling.auf.net/lingbuzz/008301>

<https://ling.auf.net/lingbuzz/008302>

<https://ling.auf.net/lingbuzz/008305>

<https://lingbuzz.net/lingbuzz/008312>

Questions and puzzles cannot be more welcome!

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