Additivity, scalarity and the interactions between them:
Beyond *also* and *even*

ESSLLI 2021 Introductory level course
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Class 1:

The landscape of additive, scalar and scalar additive particles

About this course

- additive particles: *also, too*
- scalar particles *only*

- scalar additive particles *even*

  German *noch,* Hebrew *'od'* ('still', 'in addition', 'more')

occur cross-linguistically – Hebrew, German, Russian, …
subtle differences in meaning / usage

"Beyond *also* and *even*"

- what does it mean to be additive – what is additivity good for?
- what does it mean to be scalar – what is scalarity good for?
- how do scalarity and additivity combine?

About this course

Yael Greenberg www.researchgate.net/profile/Yael_Greenberg
Carla Umbach www.carla-umbach.de

Participants? background, native language?

Introductory course: - present basics
- hightlight different lines of argumentation

Organizational issues:

- unmute + mute yourself
- in-between questions are o.k. (though we might ask you to postpone them)
- QA break between part 1 and part 2, and after part 2
- please turn your video on – no black windows or fotos

- mail subject: **[esslli] …..**
- web www.carla-umbach.de/ESSLLI2021/ESSLLI 2021 Additivity and Scalarity.html

Schedule

Class # 1: The landscape of additive, of scalar and of scalar additive particles

Class # 2: *Even*-like particles

Class # 3:. *noch*-like particles – two varieties & two perspectives

Class # 4: The two types of scalar-additives combined with comparatives

Berta is even taller than Adam
Berta ist noch größer als Adam

Class # 5: Additive particles in the context of expressions of sameness, similarity, and difference

Summary and outlook: What types of additivity are encoded in natural language? And what types of scalarity? How do they interact?

Plan for today

- Basic notions of information structure
- Prototypical additives: *too/also , auch*
- Broaden the view:

  1. *more, noch*

  2. *additional, other, similar, and – weitere, andere, ähnlich, und*

Q&A

- Prototypical scalars: *only*

  non-scalar and scalar readings, types of scales

- Two types of scalar additives:

  even-like particles and *noch / more*$_{ADD}$ -like particles

Basic notions

- Communication: continuous change of the **common ground**

  Krifka (2007):

CG **content**	propositions taken by the participants in a conversation as being true (Stalnaker 1979)
CG **management**	the way how the CG content may develop (Farkas & Bruce 2009, Krifka 2015)

- **Focus** indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions (Krifka 2007)

  pragmatic uses of focus --> CG management

  question-answer congruence Ann: *Who stole the cookie?* Ben: *CHRIS stole the cookie*

  semantic uses of focus --> CG content.

  focus sensitive expressions, e.g., *only*, operate on sets of alternatives

Alternative semantics

Hamblin (1973), Rooth (1985, 1992, 2016), Kratzer & Shimoyama (2002), a.o.

> "Alternative semantics is a semantic framework that finds application in the analysis of questions, focus, disjunction, negative polarity, presupposition triggering, and implicature. The unifying idea is one of semantic, pragmatic, or discourse structural operations or constraints referring to “alternative” phrasal meanings." Rooth (2016), p.1

- Question-answer congruence

Ann: *Who stole the cookie?* *What did Chris steal ?*

Ben: *CHRIS stole the cookie.* *Chris stole the COOKIE*

Alternative semantics

- Correction

  Ann: *Newton discovered calculus.*

  Ben: *No, LEIBNIZ discovered calculus.*

  Ben': # *No, Leibniz discovered CALCULUS.*

- "Farmer sentences"

  (1) *An AMERICAN farmer told a CANADIAN farmer a joke.*

  (2) # *A tourist told a CANADIAN farmer a joke.*

- Association with only

  (3) *John only introduced BILL to Sue.* --> John introduced no one else to Sue.

  (4) *John only introduced Bill to SUE.* --> John introduced Bill to no one else.

Alternative semantic value

(*Who stole the cookie?*) *CHRIS stole the cookie.*

- Ordinary semantic value

  $[[Chris_F \text{ stole the cookie}]]^0$ = steal-cookie (chris)

- Alternative sematic value

  $[[Chris_F \text{ stole the cookie}]]^A = \{p \mid p = \text{steal-cookie}(x) \text{ for } x \in D_e\}$

- Compose alternatives recursively

  if α is a non-focused lexical item $[[\alpha]]^A = \{[[\alpha]]^0\}$

  if α is a focused phrase of type τ $[[\alpha_F]]^A = D_\tau$ e.g. $[[Chris_F]]^A = D_e$

  if $\alpha\beta$ is a complex phrase semantically combined by functional application

  then $[[\alpha\beta]]^A = \{f(x) \mid \text{for } f \in [[\alpha]]^A \text{ and } x \in [[\beta]]^A\}$

  e.g. $\{f(x) \mid f \in \{\text{steal-cookie}\} \text{ and } x \in D_e\}$

Restrictions on alternative sets

Distinctness: $[[\alpha_F]]^A \supset \{[[\alpha]]^0, a, \ldots\}$ e.g. $[[Chris_F]]^A \supset$ {chris, bill, …}

with *a* of the appropriate type

the contrasting alternative *a* is frequently anaphoric

An AMERICAN farmer told a CANADIAN farmer a joke.

$[[a \text{ canadian farmer}_F]]^A$ = {can-farm, am-farm}

Restriction of alternative sets:

contextual variable $\boldsymbol{C} \subset [[\alpha]]^A$ $[[Chris_F]]^A = \boldsymbol{C} \subset D_e$

Where does ***C*** come from?

- contrast (Farmer ex.)
- current question (QUD) *Who stole the cookie?* **C** ⊂ PERSON
- preceding discourse *Ann, Bill and Chris were in the kitchen.* *Who stole the cookie?* **C** = {Ann, Bill, Chris}

Question-based discourse structure

- Meaning of a constituent question: set of propositions such that the position of the wh-pronoun is open (Hamblin 1973)

  $[[Who \text{ stole the cookie?}]]$ {p | p = steal-cookie(x) for x∈person}

- Question meaning ⊂ alternative sematic value

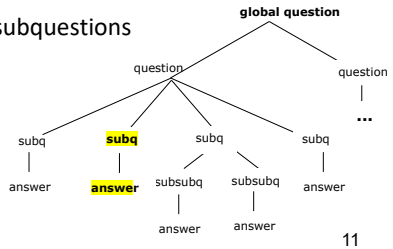
  $[[Chris_F \text{ stole the cookie}]]^A = \{p \mid p = \text{steal-cookie}(x) \text{ for } x \in D_e\}$

Roberts (1998)

- answer the global question by answering subquestions
- congruence:

  [[answer]]^A ⊃ [[direct subquestion]]
- focus directs accommodation of CQ /QUD

  (current question / question under discussion)



What is the status of alternatives?

- Alternative semantics includes two components

  ordinary semantic value $[[\alpha]]^0$

  alternative sematic value $[[\alpha]]^A$

- Alternatives: possibilities

  $[[CHRIS \text{ stole the cookie.}]]^A$ "Who could have stolen the cookie?"

- Alternative semantics is **NOT** a two-level semantics like, e.g.,

  AT-ISSUE MEANING • NON-AT-ISSUE MEANING (Potts 2005)

- The *alternative semantic value* is no additional meaning component, – it is the space of possible solutions – "Other solutions are not available"

- Particles may use this space, but they may also affect it, thereby changing the space of possible solutions "on the fly"

Additive particles

- Prototypical additives: *too/also, auch, …*
  also is focus-sensitive
  a. *Chris also stole [a BOOK]$_F$ from Ann.*
  --> Chris stole something else from Ann.
  b. *Chris also stole a book from ANN$_F$.*
  --> Chris stole a book from someone else.

- Traditional analysis: *also* p

  presupposition: there is a <u>true</u> alternative to p in C that is not identical to p
  assertion: p is true

  [[*also/too*]]^{g,c} = λC.λp.λw. **∃q∈C q≠p. q(w)=1**. p(w)=1

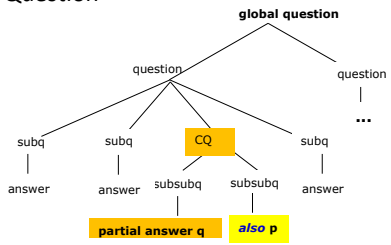
Additive particles

- Existence is too weak
  (1) *Sam is having dinner in New York tonight, too.* (Kripke, 1991/2009)
  presupposition could easily be accomodated

  --> the contrasting alternative must be anaphoric,
  --> additive particles are **anaphoric**

Beaver & Clark (2008)
Additive particles indicate that the Current Question has already been <u>partially</u> answered

CQ: *What did Chris steal from Ann*?
q (*Chris stole a painting from Ann.*)
p *Chris also stole [a book]$_F$ from Ann.*



Distinctness

- "Non-identity" is too weak

  be ecstatic subsumes *be happy*:

  (1) *Sam is [happy]$_F$. #He is also [ecstatic]$_F$.*
  --> prejacent must not entail antecedent (Beaver & Clark 2008)

  (2) *Sam is [ecstatic]$_F$. #He is also [happy]$_F$.*
  --> antecedent must not entail prejacent (Theiler 2019)
  antecedent and prejacent must be logically independent

(see also Lang 1984 and Umbach 2004)

Broaden the view

Additives beyond *also/too – auch*
more, German *noch* ('still', 'in addition'), Hebrew *od* (--> part two)

Adjectival additives
English: *other, additional, further, similar*
German: *anders, zusätzlich, weiter, ähnlich*

adverbial *Additionally, Chris stole a book from Ann*

attributive *Chris stole an additional book from Ann*

Are they simply two place relations? [[*additional*]] = λy λx additional(x,y)

Do adjectival additives operate on alternative sets?
Are there different types of additives?

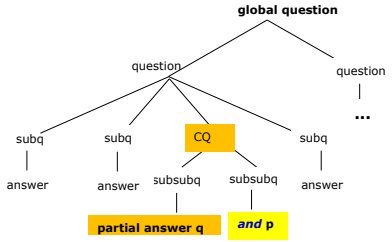
Coordination particles

Zeevat & Jasinskaja (2007), Jasinskaja & Zeevat (2009)

- Additive markers, such as *also* and *and* in English, signal that the semantic objects they connect pertain to the same discourse topic, i.e. the same question under discussion, but give distinct answers to that question

- Additivity is a property of a clause to give a distinct answer to a question that was already addressed before.

CQ: *What did Chris steal from Ann*?
q *Chris stole a painting from Ann*
p *and he stole a book from Ann.*



--> What is the difference between *also* and *and* ?

Plan for today

- Basic notions of information structure
- Prototypical additives: *too/also , auch*
- Broaden the view:

    1. *more, noch*

    2. *additional, other, similar, and – weitere, andere, ähnlich, und*

end of part 1

questions? comments?

Part 2: Scalar particles

- A non additive scalar particle: *only*

    non-scalar and scalar readings,

    types of scales

    Cross linguistic variabilities

- Two types of scalar additive partices:

    even-like particles

    noch / od / $more_{ADD}$ -like particles

The case of *only*

Traditionally, the semantics of *only* was **not** analyzed as scalar:

(1) *John only danced with* $[Mary]_F$

- Presupposition: John danced with Mary

- Assertion: John danced with no other individual (= with no individual distinct from Mary)

(2) *John only* $[danced]_F$ *with Mary*

- Presupposition: John danced with Mary

- Assertion: John didn't do anything else (distinct from dancing) with Mary

The traditional, non-scalar, entry for *only*

E.g. Horn 1969, Karttunen & Peters 1979, Rooth 1992, Krifka 1992:

$[[only_{non\text{-}scalar}]]^{g,c} = \lambda C.\lambda p.\lambda w: p(w)=1.\ \forall q \in C\ q \neq p \rightarrow q(w)=0$

In prose: *Only (C)* (p) (w)

- Presupposes that *p* is true in w
- Asserts that all alternatives *q* in C **which are distinct from *p*** are false in w

- E.g. *John only danced with* $[Mary]_F$

{ John danced with Mary, ~~John danced with Susan, John danced with Bill~~...}

But – there are also 'scalar' uses of *only*

(1) a. *John is only a* $[clerk]_F$.
(He doesn't have a more prestigious profession, e.g. he is not a manager.)

b. *I only wanted to* $[speak]_F$ *with John*
(I didn't want to do anything more intimate with John, e.g. kiss him)

- In these cases *only* does not seem to reject **all alternatives distinct from *p***
- Rather, it seems to reject **all alternatives** which are – in some sense **'stronger' / higher on the scale** than *p*

Do the two uses reflect a lexical ambiguity of *only*?

- Horn 1969: Yes.
- Other theories (e.g. Klinedinst 2005, Beaver & Clark 2008, Roberts 2011, Coppock & Beaver 2014): **No!**
  - **There is only one *only* – A scalar one**
  - What seem to be 'non-scalar' uses are a special case of the scalar ones

$[[only_{scalar}]]^{g,c} = \lambda C.\lambda p.\lambda w: p(w)=1.\ \forall q \in C[q \neq p \wedge q >_C p] \rightarrow q(w)=0$

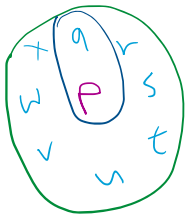
In prose: *Only (C)* (p) (w)

- Presupposes that *p* is true in w
- Asserts that all alternatives *q* in C **which are distinct and stronger than *p*** on a scale are false in w

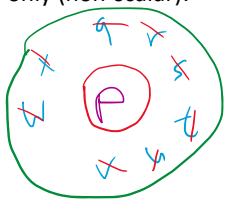
Non-scalar and scalar focus sensitive particles

All focus sensitive particles regulate the relationship between *p* and its alternatives in C:

Also:



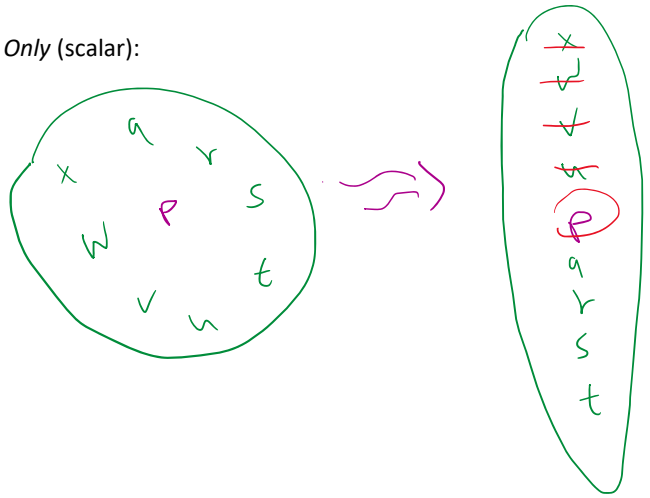
only (non-scalar):



Non-scalar and scalar focus sensitive particles

But scalar particles also impose an order on the set of alternatives:

Only (scalar):



How to derive the two uses of *only* from a single entry?

The difference between the 'scalar' and apparently 'non-scalar' uses of *only* lies in the nature of the scale $>_c$:

- With 'scalar uses' *only* operates over a 'rank order' scale
- With apparently non-scalar uses *only* operates over an 'entailment-based' scale

In 'scalar' uses of *only* we operate over 'rank order' scales:

- For example:
- A scale of intimacy:
  - *I only wanted to [speak with]$_F$ John*

    {I wanted to speak with John < I wanted to hug John < I wanted to kiss John….}
- A scale of prestige:
  - *John is only [a clerk]$_F$*

    {*John is a* clerk < John is a manager < John is the president of the companey}

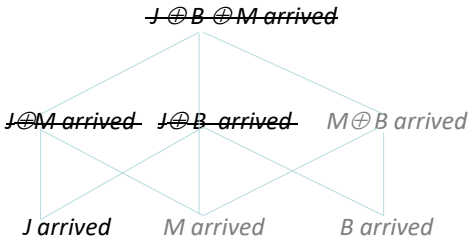
How to derive the apparently 'non-scalar' use of *only* from the scalar entry?

In this case *only* operates over entailment-based scales

I.e. it negates all alternatives entailing *p*

Only $[John]_F$ *arrived* = 'Nobody else arrived'

- We negate all sum-based alternatives entailing *p* –
- So we indirectly end up with *John arrived and no-one else arrived*



The difference in type of scales can help explain variability in families of exclusive particles

English: ***only, merely, just, sole…***

Hebrew: ***rak, stam, kula, bilvad / yexidi***

	Unspecified – Fine with both scales	Can only operate on rank order scales	Can only operate over entailment-based scales
	Only	*Merely (just)*	*Sole*
	rak	*stam / kula*	*Bilvad / yexidi*

(1) *John #merely / ??just / only won [the Nobel prize]* $_F$.

(2) *The only / sole prize that John won was [the Nobel prize]* $_F$.

- Cf. also Liu 2017 on Mandarin Chinese *jiu* (operating on sum-based vs. atom-based alternatives)

One last thing to note about *only:*

In addition to impose an order on the set of alternatives C, it seems to constrain it as well:

- It cuts out alternatives from C which are weaker than *p* on the scale
- So *p* ends up being the weakest alternative in C.

Support: when there is a salient alternative weaker than *p* in C, *only* is infelicitous (cf. Orenstein 2016, Greenberg 2021):

(1) *Two years ago John won the gold medal. Last year he won bronze, and this year he (#**only**) won* $[silver]_F$

C = {*John won gold, John won bronze, John won silver*}

(2) Two years ago I interviewed John, Mary and Sue, Last year I interviewd Mary, and this year I (#only) interviewed $[Mary\ and\ Sue]_F$

C ={I interviewed John, Mary and Sue, I interviewed Mary, I interviewed Mary and Sue}

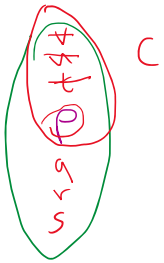
So, there is another component to the scalarity of *only:*

- In addition to presupposing that *p* is true
- and to asserting the negation of all alternatives in C stronger than *p*
- ➢ *Only* also presupposes that *p* is the weakest alternative in C:

(*) $\forall q\ [q \in C \wedge q \neq p] \rightarrow q >_s p$

(1) *John only won the* $[silver]_F$ *medal.*

C= { John won the gold medal, John won the silver medal}



Taking stock: *only* is inherently a scalar particle

- It imposes an order on the set of alternatives ('rank' or 'entailment' scale)
- It presupposes that *p* is the weakest element in the set
- And it asserts that all alternatives in C stronger than *p* are false

- This makes *only* very different from additives like *also* / *auch*:
  - These are not scalar – i.e. do not impose any ordering on the set of alternatives

Q&A ----------

- So – we looked at additives
- And we looked at scalars
- We will now turn to look at two types of particles whose semantics involves BOTH properties, **I.e. SCALAR ADDITIVES:**
  - *Even*
  - *Noch / od /* additive *more*

Even as a scalar additive

Compare *also* and *even*:

(1) *Mary **also** invited [John]$_F$.*
(2) *Mary **even** invited [John]$_F$.*

Classical claim (e.g. Rooth 1985, 1992):

even is just like *also* in terms of additivity:

E.g. (2) presupposes that Mary invited at least one other individual (besides John)

But it adds a scalar presupposition:

E.g. (2) also presupposes that Mary's inviting John was the most unlikely / unexpected proposition (in the set of contextually relevant alternatives)

The classical entry for *even* as a scalar additive:

Horn (1969), Kartunnen & Peters (1979), Rooth (1985, 1992):

$[[\textit{even}]]^{g,c} = \lambda C.\ \lambda p.\lambda w: \exists q\ q \neq p \wedge q(w) = 1 \wedge \forall q \in C\ q \neq p \rightarrow p >_{\text{unlikely}} q.\ p(w) = 1$

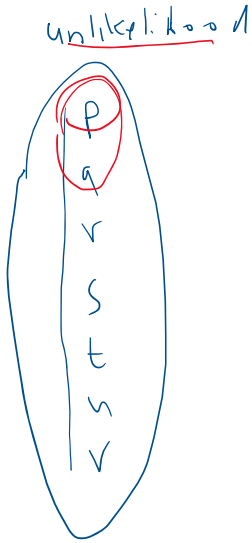
In prose: *even (C)(p)(w):*

- Triggers an additive presupposition (= *also*):
  At least one distinct alternative in C is true in w

- Triggers a scalar presupposition:
  p is less likely than any other distinct alternative in C

- Asserts: That *p* is true in w

Even as a scalar additive



Debated components in the traditional entry

[[*even*]]^{g,c} = λC. λp.λw: **∃q q≠p ∧ q(w) = 1 ∧∀q ∈C q≠p → p >$_{unlikely}$ q**. p(w) = 1

- The 'superlative' semantics of *even:*
  - Is *p* indeed presupposed to be the strongest / most unlikely alternative in C? Isn't this requirement too strong?

- The presence of the additive presupposition:
  Is *even* indeed (as) additive like *also*?

- The nature of the scalar presupposition (based on comparative unlikelihood)
  Is *even* indeed about being less likely / less expected?
  Does *even* just compares *p* to other alternatives on the scale?

We will talk about (some of) these debates in the next class
Q&A ----------

Another scalar additive particle: *noch*$_{ADD}$ (German) / od (Hebrew) / *more*$_{ADD}$ (English)

The primary use of German *noch* is 'aspectual' / 'temporal':

(1) *Es regnet* ***noch****. /* ***Noch*** *regnet es.*
'It is still raining.'

But *noch* has other uses, e.g. an 'additive' use (König 1991, Umbach 2012) :

(2) Otto bestellte **noch** einen SCHNAPS (zusätzlich zu seinem Bier).
'Otto ordered a schnaps (in addition to his beer).'

This use seems very similar to the one we get with *auch* ('also' / 'too'):

(3) Otto bestellte **auch** einen SCHNAPS (zusätzlich zu seinem Bier).
'Otto ordered a schnaps (in addition to his beer).'

Is *noch* the same as *auch*?

We saw that *also* ('auch') is an **additive** particle
- König (1991) takes *noch* to be '**scalar additive**':

It is **additive**: "adding up to a larger whole"
- e.g. ending up with a longer event of raining
- e.g. ending up with a higher number of drinks

and **scalar: "**ranking elements along a scale"

Questions: **What is the scale…? Are 'additivity' and 'scalarity' distinct here?**

We can see a similar phenomena in Hebrew

The aspectual / temporal *still* can be expressed in Hebrew by ***adayin*** or ***od***:

(1) *Dani* ***adayin / od*** *yashen*
'Danny is still asleep.'

But *od* has an additive use as well, similar to *gam* ('also):

(2) `etmol dibarti im morim le-anglit. hayom adaber im **OD** morim leanglit.
'Yesterday I spoke with English teachers. Today I will speak with some more (English teachers).'

(3) `etmol dibarti im morim le-anglit. Hayom **GAM** adber im morim leanglit.
'Yesterday I spoke with English teachers. Today I will also speak with English teachers.'

- - These two particles are very similar! But we will talk about differences between them as well.

This 'additive' use of *od / noch* can be many times translated to English as *more*

But - let's be careful here!

English *more* is actually **ambiguous** between the **comparative** and the **additive** use:

(1) *Yesterday I spoke with 3 teachers. Today I spoke with 2 more.*

- **Comparative use:**
  I spoke with 2 more teachers than I spoke with yesterday
  Yesterday I spoke with 3. Today I spoke with 3+2 (5). Altogether I spoke with 8.

- **Additive use:**
  I spoke with 2 additional teachers:
  Yesterday I spoke with 3. Today I spoke with 2. Altogether I spoke with 5.

We will mainly concentrate here on the **additive** use of *more*!

Additive *more* in English

As with *noch / od*, the effect of additive *more is* very similar to *also*:

(1) *(In the morning John ran for 4 hours / 4 kilometers / 4 times).*
In the afternoon he ran 4 ***more*** *hours / 4* ***more*** *kilometers / 4* ***more*** *times.*

(2) *(In the morning John ran for 4 hours / 4 kilometers / 4 times).*
In the afternoon he ***also*** *ran 4 hours / kilometers / times*

- In both John ran 8 hours / kilometers / times altogether
- In both cases there is a presupposed eventuality

Question: **Is additive *more* the same as *also*?**
Answer: **No!**

There are differences between additive *more* and *also / too*:

Here is one example of such a difference:

(1) Yesterday John sold beer to 4 students. Today he sold beer to 4 more students.
(2) Yesterday John sold beer to 4 students. Today he also sold beer to 4 students.

➢ With additive *more* John sold beer to two distinct sets of 4 students = 8 students altogether

➢ With *also* the sets can overlap

A question: Why? What is it about the additivity of *also* and that of *noch / od / more* which leads to this difference?

There are differences between additive *more* and *also / too*:

Here is another difference between additive *more* and *also*:

(John and Mary are dating for the first time, telling each other about their lives):
John: *I have 3 white cats.*
Mary: *Oh! How interesting! I also have 3 white cats !*
Oh! How interesting! # I have 3 more *white cats!*

A question: Why? What is it exactly which makes additive *more* infelicitous and *also* felicitous here?

Q&A ----------

Taking stock:

We looked at some basic notions of information structure, focus as introducing sets of alternatives, focus sensitive particles

We looked at **additive** expressions: ***also, too, auch*** *- John also drank beer*

- and saw that they trigger an anaphoric presupposition

We looked at a **scalar** expression: ***only*** *- John only drank beer*

- and saw that it can operate over two types of scales (rank-order / entailment)
- and that cross linguistically *only*-like particles vary in the type of scale they can operate over.

Taking stock:

We then looked at two types of **scalar additive** expressions

- ***Even*** *- John even drank beer*
- Additive ***noch*** / ***od*** / ***more***
  - John ate noch / od two apples, - John ate two more apples

and we gave some examples showing that both are different from additives like *also*

- **We are left with some open questions:**
- Is it justified to call BOTH ***even*** and additive ***noch*** / ***od*** / ***more*** **scalar additives?**

John even drank beer

John drank noch / od (some) more beer.

- At least on the surface both their **additivity** and their **scalarity** feel different!

Some open questions:

Plan ahead:

- In the second class we will take a closer look at ***even***
- In the third class we will take a closer look at ***noch*** / ***od*** / **additive** ***more***
- In the fourth class we will look at a case where these two types of particles seem to give a similar effect:
  - *Berta is even taller than Adam*
  - *Berta ist noch größer als Adam* ('Berta is still taller than Adam.')

➢ In both cases the presence of the particle leads to the 'evaluative' inference that both Adam and Berta are tall. Why is that?

Questions? / Comments? ----------

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