Underspecified degree operators compare correlates

Overview. Thomas (2018) proposes the first and only compositional account that addresses the recurrent ambiguities between comparison, additivity, and continuation. The theory is couched in scale segment semantics for comparatives developed in Schwarzschild (2013). I will show that an alternative account building on the core idea that comparatives compare between a pair of correlates on a structurally derived measurement function can derive the ambiguities as well, and it comes with a better empirical coverage.
Data. CAC AMBIGUITIES. I will use *comparison*, *additivity*, and *continuation* to refer to the kind of meaning expressed by the bolded words in (1) - (3), respectively. These words and their cross-linguistic counterparts (henceforth *CAC operators*) are often ambiguous between more than one of these three meanings. For example, English *more* is ambiguous between comparison and additivity, as shown in (1) and (2). German *noch* is ambiguous between additivity and continuation. Romanian *mai* shows a three-way ambiguity between comparison, additivity, and continuation.
IMPLICATIONAL UNIVERSAL. Thomas (2018) found no language has a morpheme that is ambiguous between comparison and continuation to the exclusion of additivity.
Proposal. COMPARISON. I adopt Li's (2021) proposal for comparatives. In this analysis, the comparative marker *er* always expresses a comparison between a pair of correlates, as opposed to two degrees (cf. Heim 1985, Bhatt and Takahashi 2007), as defined in (4). This $\mathsf{er}_{d',y}$ takes parasitic scope above the would-be scope of its licensing operator Q, generating a comparison between the variable bound by Q and an alternative variable on the measurement function that is the scope of $\mathsf{er}_{d',y}$. In (5) we generate a comparison between John and Mary on their height. The licensing operator can be things other than the subject too, e.g. in *Three students danced. ... more students sang*, the comparison is between alternative predicates, so the licensing operator is the scope-taking predicate (possibly triggered by a Focus feature), as in (6). (4) is motivated by discourse anaphoric comparatives, like (5); (4) correctly predicts that these comparatives are sensitive to a larger context than an antecedent degree: (7b) is infelicitous under the intended *more than five* reading, despite that the degree *five* is still salient and accessible, as shown in (7a). This is because the negation in (7) has negated that *five* is the measurement of John (or any potential correlate), thus the prior context fails to satisfy the presupposition of $\mathsf{er}_{d',y}$; since neither is the presupposition accommodatable in the negative context, it remains unsatified, hence the infelicity of (7b). The theory handles explicit comparatives by letting *er* be bound by objects introduced in the *than*-P (8).
ADDITIVITY. Inserting ADD_y (9) above the scope position of $\mathsf{er}_{d',y}$ (10) derives the meaning of *John bought more apples* in (11). Let y be bound by *Mary* and d' be bound by the amount of apples Mary bought, this captures the additive reading in (2).
CONTINUATION. The meaning of (3) is derived using the LF in (13), where CONT intervenes between the tense operator and its would-be scope, the temporal property of being in the duration of a raining event. It returns a conjunction (14): the left conjunct is the assertion that the current time is in the duration of a raining event (15), whereas the presupposed content in the right conjunct reduces to the additive comparison in (16). Assuming the inherent ordering of times is the precedence relation and ignoring the discourse conditions on the comparison standard for now, this comparison is true as long as $\mathsf{pres} \oplus t'$ is in the duration of one raining event (i.e. the rain has continued from t' to

pres), and that the $\text{pres} \oplus t'$ is during a raining event entails a later time is during a raining event than t' is, i.e. pres is a later time than t' (16a). Part of this presupposition – that it is raining now – is already asserted in the left conjunct, so I assume it doesn't project, for the same reason that *There is a unicorn and the unicorn is pink* as a whole doesn't presuppose the existence of a unicorn; thus the entailed meaning of the whole sentence is (17). This triggers the implicature in (18), as the speaker could have, but has not, chosen an alternative tense denoting a later time, which would make the entailed meaning stronger.
GENERATING CAC AMBIGUITIES. In Distributed Morphology (Hale and Marantz 1993), terminals of syntactic structures are feature sets that can only be spelt out by the lexical item matching the most features in the set. CAC operators are spell-outs of the feature sets in (19) (in additive/continuative sentences, the lower head er/er-CONT moves up to be fused with ADD). Ambiguities arise when the language lacks a lexical item matching all the features in a set and has to choose a less specific one; e.g. English *more* matches the feature er, but because English has nothing matching {er, ADD}, this set is also spelt out as *more*. Comparison/continuation ambiguity implies the most specific item to spell out {er, CONT, ADD} is one matching {er}, so that item must also be the spell-out of {er, ADD}, hence it also has an additive use.
Benefits. **ON ADDITIVE *more*.** My analysis correctly predicts the additive *more* is sensitive to negation just like the comparative one. Thomas' (2018) analysis of *John bought three more apples* amounts to $\exists e \exists x : \text{apples}\, x \wedge \text{bought}(e, x, \text{john}) \wedge |x \oplus g_1| \geq |g_1| + 3$, with *more* being anaphoric to some contextually salient apples g_1. This wrongly predicts (20b) has a felicitous additive reading: since *those five apples* in the first sentence is still accessible and can be referred back to, as witnessed by (20a), it should be able to bind *more*, generating a felicitous additive reading. In my analysis, the infelicity of (20) is predicted in the same way as (7b): while *er* generates a comparison between John and Mary, *five* can't be the antecedent degree since it's not the amount of apples John bought.
CHANGING THE SCALE. My analysis can derive various non-temporal uses of continuative particles. In Thomas (2018), the scale of continuation is event development; it is baked into his operator generating the continuation meaning, and this scale can only generate the temporal reading of particles like *still*. Yet it is well known that these particles can be associated with various non-temporal scales (Beck 2020). In my analysis, the scale of the comparison is structurally derived, and we can generate those non-temporal meanings by adjusting the scope of CONT. For *Anthea is still tall*, when CONT takes scope over the property of being (positively) tall (21), it generates a presupposed comparison on the scale of being tall, requiring *anthea* $\oplus$ *y are tall* entails more people to be tall than *y is tall* alone. Since for any person x, *x is tall* can only entail that people who are at least as tall as x are tall, this comparison entails that there are more people who are at least as tall as Anthea or y than there are as y alone, i.e. y is taller than Anthea. That the assertion is made about Anthea but not anyone shorter than Anthea triggers the implicature that people shorter than Anthea are no longer tall, i.e. Anthea is only *marginally* tall.
Dynamicizing the proposal. In the current formulation of the proposal, er-CONT originates in a position created by another operator's abstraction, which means they have to be inserted on LF. I'll explain in the talk that that will no longer be required once we adopt a dynamic re-formulation of the comparative meaning, independently proposed for the *internal reading* (Li 2022); these operators don't have to be inserted on LF.

Examples.[1]

(1) John is **more** intelligent than Mary. (**C**omparison)

(2) Mary bought five apples. ... John bought **more** (apples).
$\rightsquigarrow$ True as long as John bought any apples in addition to what Mary bought. (**A**dditivity)

(3) It is **still** raining. (**C**ontinuation)

(4) $\mathsf{er}_{d',y} := \lambda f_{\mathsf{d}\to\mathsf{a}\to\mathsf{t}}\lambda x_{\mathsf{a}}.\partial(d' = \mathsf{max}\{d \mid fdy\}) \wedge \mathsf{max}\{d \mid fdx\} > d'$[2]

(5) (Mary^y is 6 ft$^{d'}$ tall. ...) John is taller$_{d',y}$. $\rightsquigarrow$ [John [er$_{d',y}$ $\lambda x \lambda d$ [x[is [d-tall]]]]]

(6) [sang [er$_{d',P'}$ $\lambda P \lambda d$ [d-many students P]]

(7) Mary didn't read those five^d books.
a. ✓ I never saw that$_d$ many books on her shelf. / ✓ John read more than that$_d$.
b. # John read more$_d$.

(8) [[John^x [er$_{y,d'}$ $\lambda d \lambda x$ [x is d-tall]]] [than [Op$^{d'}$ $\lambda d'$ Mary [is d'-tall]]]]

(9) $\mathsf{ADD}_y := \lambda f_{\mathsf{a}\to\mathsf{t}}\lambda x_{\mathsf{a}}.f(x \oplus y)$

(10) [John [ADD_y [$\mathsf{er}_{d',y}\lambda d \lambda x$[$x$ bought d-many apples]]]]

(11) $\partial(d' = \mathsf{max}\{d \mid y \text{ bought } d\text{-many apples}\}) \wedge \mathsf{max}\{d \mid \mathsf{john} \oplus y \text{ bought } d\text{-many apples}\} > d'$

(12) $\mathsf{CONT} := \lambda P_{(\mathsf{d}\to\mathsf{a}\to\mathsf{t})\to\mathsf{a}\to\mathsf{t}}\lambda f_{\mathsf{a}\to\mathsf{t}}\lambda Q_{(\mathsf{a}\to\mathsf{t})\to\mathsf{a}\to\mathsf{t}}\lambda u_{\mathsf{a}}.fu \wedge \partial(Q(P(\lambda n \lambda u.fu \wedge n \leq_f u))(u))$, where $n \leq_f u := fu \to fn$

(13) [Pres [[ADD_y [[$\mathsf{er}_{d',y}$ CONT] λt [t impf rain]]]]]

(14) $\mathsf{impf(rain)(pres)} \wedge \partial(\mathsf{ADD}_{t'}(\mathsf{er}_{n',t'}(\lambda n \lambda t.\mathsf{impf(rain)}t \wedge n \leq_{\mathsf{impf(rain)}} t))(\mathsf{pres}))$

(15) $\exists e : \mathsf{rain}\, e \wedge \mathsf{pres} \subseteq \tau(e)$

(16) $\partial(n'{=}\mathsf{max}\left\{n|\mathsf{impf(rain)}t' \wedge n \leq_{\mathsf{impf(rain)}} t'\right\}) \wedge$
$\mathsf{max}\left\{n|\mathsf{impf(rain)(pres} \oplus t') \wedge n \leq_{\mathsf{impf(rain)}} (\mathsf{pres} \oplus t')\right\} > n'$
a. $\rightsquigarrow \exists e : \mathsf{rain}\, e \wedge (\mathsf{pres} \oplus t') \subseteq \tau(e) \wedge t' \prec \mathsf{pres}$

(17) a. Assertion: it is raining now.
b. Presupposition: the raining has continued from an earlier time t'.

(18) Implicature: the rain might/will stop at a later time.

(19) Comparison: {er}, Additivity: {er, ADD}, Continuation: {er, CONT, ADD}

(20) Mary didn't buy those^1 five apples. ...
a. ✓ They$_1$ are too big. b. # John bought three more$_1$ apples.

(21) [Anthea [[ADD_y [[$\mathsf{er}_{d',y}$ CONT] λx [x is POS tall]]]]]

References. **Beaver, D., & Krahmer, E**. (2001). A partial account of presupposition projection. *Journal of logic, language and information*. **Beck, S.** (2020). Readings of scalar particles: *noch/still*. *Linguistics and Philosophy*. **Bhatt, R., and Takahashi, S**. (2007). Direct comparisons: Resurrecting the direct analysis of phrasal comparatives. *SALT 17*. **Halle, M., and Marantz, A**. (1993) Distributed morphology and the pieces of inflection. *The view from building 20*. **Heim, I**. (1985). Notes on comparatives and related matters. Unpublished manuscript. **Li, A**. (2021). Anaphora in Comparison: comparing alternatives. *SALT 31*. **Li, A**. (2022). Internal reading and comparative meaning. *SuB 26*. **Schwarzschild, R**. (2013) Degrees and segments. *SALT 23*. **Thomas, G**. (2018). Underspecification in degree operators. *Journal of Semantics*.

[1] I use the partiality operator ∂ in Beaver & Krahmer (2001) to indicate presuppositions ($\partial(p) = 1$ if $p = 1$, otherwise $\partial(p)$ is undefined), and a, b to indicate neutral types.

[2] To account for differentials, we can re-cast (4) to let *er* take a differential argument d'': $\mathsf{er}_{d',y} := \lambda d'' \lambda f_{\mathsf{d}\to\mathsf{a}\to\mathsf{t}}\lambda x_{\mathsf{a}}.\partial(d' = \mathsf{max}\{d \mid fdy\}) \wedge \mathsf{max}\{d \mid fdx\} = d' + d''$.