INHERENT EVALUATIVITY*

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1 Evaluativity and measure phrases

Two related challenges have been the focus of much research on the semantics of degree constructions (Cresswell 1976, von Stechow 1984, Bierwisch 1989, Rett 2008, among many others). The first concerns evaluativity and the second the distribution of Measure Phrases.

Evaluativity (or in Bierwisch's terms 'norm-relatedness') is the phenomenon in which the interpretation of an adjective in a given construction is dependent on a contextual standard. For example, consider the sentence *"John is tall"*, which is evaluative as it has different truth conditions in contexts concerning grade-school children compared to contexts concerning basketball players. As it turns out, evaluative readings surface in various constructions and maycut across antonym pairs, as illustrated in the examples given in(1).A theory of evaluativity ought toexplain the pattern that emerges in (1).

(1) Evaluative and unevaluative constructions (+/–E denote evaluative/unevaluative)

a. John is tall.	(+E)	e. John is short.	(+E)
b. How tall is John?	(–E)	f. How short is John?	(+E)
c. John is as tall as Mary.	(–E)	g. John is as short as Mary.	(+E)
d. John is taller than Mary.	(–E)	h. John is shorter than Mary.	(–E)
i. How late is John?	(+E)	k. How early is John?	(+E)
j. John is as late as Mary.	(+E)	l. John is as early as Mary.	(+E)

To justify the evaluativity judgments in(1)note that the bare positive form with these adjectives, e.g.(1)a, e, is evaluative. If a non-contradictory proposition entails a proposition dependent on a contextual standard, such as the positive, the entailing construction must itself be dependent on the standard. Thus, a construction entailing the positive form is itself evaluative. (1)f, g entail that *John is short* and so by the reasoning above are evaluative. Likewise,(1)i, j and(1)k, l both

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entail that *John is late/early*, respectively.(1)b, c, d, h, conversely, don't entail the positive form, and their interpretations don't depend on a contextual standard. To see this for, e.g.(1)b, replace *John* with a *giant/dwarf*, and consider the contrast between *tall* and *short* in (2). The evaluative (2)a entails the positive form and is awkward since giants aren't generally short, whereas the unevaluative (2)b doesn't depend on the standard and simply asks for the dwarf's height.

(2) Evaluativity may yield infelicitous utterances
a. #How short is the giant? b. How tall is the dwarf?

The second challenge this paper is concerned with, is that of Measure Phrase (MP) distribution. As can be seen in (3), some MPs may combine directly with gradable adjectives in the bare positive form while others may not.

(3) MPs may or may not be licensed by gradable adjectives in the bare positive form

a. John is 3 feet tall.	(–E)	b. * John is 3 feet short.	
c. John is 3 minutes early.	(+E)	d. John is 3 minutes late.	(+E)

Note that the presence of an MP may neutralize evaluativity for some adjectives, as in the unevaluative (3)a, or preserve evaluativity as in (3)c, d. In fact, MP distribution and evaluativity are tightly related. Bierwisch (1989) makes the observation that adjectives that do not license MPs in the bare positive form, are evaluative in equatives and degree questions, (4).

(4) Bierwisch's Observation (1989)
* (MP Adjective) in Positive form ⇒ Adjective is +E in equatives and questions.

(4)is exemplified by*short* which does not license MPs in the positive form, (3)b, and gives rise to evaluative readings in equatives and degree questions,(1)g,f. Further examples are given in (5)a-d, while (5)e shows this correlation is not vacuous.[1]

(5)

a. *2 CM narrow	→ How narrow is this? It's as narrow as that	(+E)
b. *100 degrees hot	→ #How hot is the ice-cream? #It's as hot as ice	(+E)
c. *3 feet short	→ #How short is the giant? #He's as short as Goliath	(+E)
d. *1 Kg heavy	→ #How heavy is the feather? # It's as heavy as helium	(+E)
e. (OK!) 6 feet tall	→(OK!) How tall is the dwarf? He's as tall as the midget	(–E)

The goal of this paper is to meet these two challenges, namely to explain the distribution of MPs and evaluative readings, and propose an account for the correlation between the two given in(4).

The structure of the paper is as follows. Section 2 presents a previous account of evaluativity, highlighting several problems for the account. Section 3 presents the current proposal according to which evaluativity is an inherent part of the semantics and applies the proposal to the bare positive form, MPs and degree questions. Section 4 takes on equatives and comparatives. Finally, section 5 explains and generalizes Bierwisch's observation (4).

[1]To foreshadow, note that Bierwisch's correlation is not a fully characterizing (if and only if) condition. To see this consider the +E equative and degree-question constructions with *late/early* in (1)i, k that nevertheless license MPs in the positive form(1)c, d. We later explain Bierwisch's observation and propose a more general, iff, correlation.

2 A previous account of evaluativity

A Commonly assumed semantics for gradable adjectives (Cresswell 1976, von Stechow 1984) is given in (6).

(6) Commonly assumed semantics for gradable adjectives
a. $[\![tall]\!] = \lambda d. \lambda x. Height(x) \geq d$ b. $[\![short]\!] = \lambda d. \lambda x. Height(x) \leq d$

Under this semantics evaluativity must be introduced independently of the adjective. Rett (2008), generalizing Cresswell and von Stehcow's approach (which employs a positive, POS, morpheme) proposes a freely occurring covert morpheme, EVAL, operating on sets of degrees.

(7) $[\![EVAL]\!]^c = \lambda D_{<d,t>}. \lambda d. D(d)\ AND\ d > Standard_c$

To account for the distribution of evaluativity as exemplified in(1), Rett proposes that evaluativity is the result of a markedness competition. According to this proposal, marked adjectives can be used in a construction only if they yield different truth conditions than the unmarked form. A marked adjective sharing the truth conditions of the unmarked adjective won't be licensed, but if its truth conditions change as a result of applying the freely occurring EVAL operator (after the entity argument raises) it may be licensed. Thus, according to Rett, evaluative interpretations are always available, but only when the marked construction without EVAL is precluded due to the markedness competition, does the forced evaluative interpretation surface.

To exemplify Rett's story, consider (8). Before EVAL is introduced the marked and unmarked forms (*short/tall*) are assumed to have equivalent meanings in the question and equative constructions:

(8) a. How tall is John? ≡ How short is John?
b. John is as tall as Mary. ≡ John is as short as Mary.

As is, without EVAL, the marked form is banned because it shares an identical interpretation with the unmarked form. However, once EVAL is introduced the truth conditions (possible answers) are no longer equivalent, (9):

(9) a. How tall is John? ≢ How [EVAL] short is John?
b. John is as tall as Mary. ≢ John is as [EVAL] short as Mary.

Since the marked forms without EVAL are equivalent they are banned, and the only surviving interpretation is the evaluative one, so we get an evaluative reading, (1)f,g.

Although Rett's approach is appealing in its simplicity, it suffers from three problems. The first problem is that Rett's account relies on the problematic choice of the *exact* reading for the equative. Explicit *at least* constructions for equatives are not truth-conditionally equivalent,(10). Therefore, according to Rett, such constructions without EVAL should not be precluded.

(10) John is at least as tall as Mary. ≢ John is at least as short as Mary.

In fact, from sentences such as (11)a, it is clear that an *at least* reading is generally available.

(11) a. To join the basketball team you must be (at least) as tall as I am.
b. #To be eligible for a free ride, you must be (at least) as short as that 7 foot sign.

So, according to Rett, and given(10), an unevaluative *at least* reading should also be available, however, this doesn't seem to be the case,(11)b.[2]

A second problem that Rett's theory suffers from is that it does not explain MP distribution. As noted by Bierwisch, these two phenomena are clearly related, and a theory which only accounts for evaluativity may be missing a generalization which one would hope to find in a unified theory. The third problem pertains to cases in which antonym pairs are both evaluative:

(12) a. # How hot is the ice-cream? b. # How cold is the fire?
c. # Icicles are as hot as snow. d. # Steam is as cold as fire.

In (12) both antonyms are evaluative which, according to Rett, would imply that both preclude the constructions lacking EVAL. But constructions lacking EVAL are banned only for marked adjectives, leaving Rett with the strange conclusion that both adjectives are marked.[3]Furthermore, even if both forms are stipulated to be marked, there is no form left to compete against, so they both should be unevaluative.[4]In what follows, I present an account that circumvents these problems and at the same time explains the full paradigm detailed in section 1.

3 Inherent evaluativity

3.1 Core idea

The proposal advocated in this paper can be seen as a mirror image to Rett's theory, one in which degree predicates begin life as evaluative (hence inherent evaluativity) and Rett'sEVAL morpheme is replaced by a new "ANTI-EVAL"morpheme. Instead of explaining how evaluativity emerges, the challenge for the current proposal will be to do away with it. This alteration turns out to have non-trivial predictions because, as we will see, "doing away" with evaluativity can lead to pathological results, whilst Rett is forced to a competition-based explanation because EVAL is always licensed in her theory.

The two underlying components of the current proposal are an "inherently evaluative" semantics for gradable adjectives in which the contextual standard is part of the denotation,(13), along with a freely occurring covert Standard Shifting Morpheme (SSM), (14).

(13) An inherently evaluative semantics for gradable adjectives
a. $[\![tall]\!]^c \quad = \lambda d.\lambda x.Height(x) \geq d\ AND\ d > standard_c$
b. $[\![short]\!]^c = \lambda d.\lambda x.Height(x) \leq d\ AND\ d < standard_c$

(14) The Standard Shifting Morpheme (SSM)

[2]Furthermore, since both *exactly* and *at least* readings are available, one would hope that one derives from the other. The *exactly* meaning can be derived from the *at least* meaning by the standard method for the computation of scalar implicatures, while it is less clear how the *at least* meaning could derive from the *exactly* meaning. So, it seems the underlying meaning of the equative is an *at least* one, leaving Rett to wrongly predict equatives are not evaluative.
[3] I thank Galit Sassoon for elucidating this point.
[4] To be fair, such pairs aren't fully predicted by this proposal either, but, as we shall see, the challenge they pose for the current proposal is by no means symmetric to the problem they raise for Rett's theory.

a. $[\![SSM\ Adj]\!]^c \quad = \quad [\![Adj]\!]^{c_0}$; *where context* $c_0 \equiv c$, *except that* $std_{c_0}(Adj) = 0$
b. $[\![SSM(tall)]\!]^c \quad = \quad \lambda d.\lambda x.Height(x) \geq\ d\ AND\ d > 0$
c. $[\![SSM(short)]\!]^c \quad = \quad \lambda d.\lambda x.Height(x) \leq\ d\ AND\ d < 0$ [False for all *d,x*]

The core idea of the current proposal is that gradable adjectives start out evaluative in all constructions, and that the only way to eliminate evaluativity is to apply SSM. The distribution of evaluative readings will be a consequence of whether or not the application of SSM yields a pathological result as determined by a suitable triviality filter which bans trivial constructions (tautologies and contradictions). The distribution of MPs will follow from the same logic once a suitable lexical entry for MPs is given.

3.2 The bare positive construction

In what follows we adopt a version of an independently motivated triviality filter, (15).

(15) Triviality Filter:
Propositions expressing a logical tautology or contradiction are ungrammatical. [5]

Using the inherently evaluative denotations of(13), and the definition of SSM,(14), we calculate the meaning of the bare positive form. Assume that in the absence of an overt degree argument, degree saturation is triggered by the copula. Applying SSM yields trivial propositions, (16)b, c. Truth conditions for the bare positive with and without SSM are given in (17).

(16) Degree saturation
a. $\exists degree(P_{de,t}) := \lambda x.\exists dP(d)(x)$
b. $[\![is\ SSM\ tall]\!]^c \overset{\exists deg.}{=} \lambda x.\exists ds.t.Height(x) \geq dANDd > 0$ [Tautology]
c. $[\![is\ SSM\ short]\!]^c \overset{\exists deg.}{=} \lambda x.\exists d\ s.t.Height(x) \leq d\ AND\ d < 0$ [Contradiction]

(17) The bare positive form
a. $[\![Johnistall]\!]^c \quad = \exists ds.t.Height(J) \geq dANDd > standard_c$
b. $[\![Johnis\ SSM\ tall]\!]^c \quad = \exists ds.t.Height(J) \geq dANDd > 0$
c. $[\![John\ is\ short]\!]^c \quad = \exists d\ s.t.Height(J) \leq d\ AND\ d < standard_c$
d. $[\![John\ is\ SSM\ short]\!]^c \quad = \exists d\ s.t.Height(J) \leq d\ AND\ d < 0$

(17)b asserts that John has some non-negative height, a tautology, and (17)d asserts that John has a negative height, a contradiction. Assuming the triviality filter,(15), (17)b and (17)d are ungrammatical, and the remaining meanings are both evaluative, (17)a and (17)d, respectively. Note that this is the same explanation that Rett proposes for the evaluativity of the bare positive form (though for her it is the absence of EVAL that is banned due to triviality). In fact up until now this is Just Rett's theory in reverse.

[5] See Gajewski(2002), Fox &Hackl (2006) for a formal explication, and Winter (2005) for related filters.

3.3 MP distribution

To explain the distribution of MPs we make use of the concept of vagueness. The basic idea will be that Measure Phrases denote quantifiers over degrees which may only apply to well-defined or rather, non-vague, sets of degrees. If contextual standards are thought of as introducing vagueness into the system, MPs will not be licensed until such vagueness is removed. To realize this idea we adopt a theory of vagueness for gradable adjectives that is based on two assumptions: (i) inherent evaluativity; and (ii) contextual standards don't denote single degrees, but rather a bounded interval of degrees (von Stechow 2008). Before proceeding, we need to define relations between intervals and degrees in order for the denotations of (13) to be well-defined, (18).

(18) Comparing a degree to an interval

$$d > std \begin{cases} True & if\ d > Sup\ (std) \\ False & if\ d < Inf\ (std) \\ Undefined & otherwise \end{cases} \qquad d < std \begin{cases} False & if\ d > Sup\ (std) \\ True & if\ d < Inf\ (std) \\ Undefined & otherwise \end{cases}$$

Where *d* is a degree, *std* a (non-empty) bounded interval of degrees, and *Sup/Inf* the supremum/infimum, i.e. the upper and lower bounds of a set, respectively.

Consider the constructions in (19) denoting the relevant compositions before degree saturation applies. A function is said to be total if it is defined for every element of its domain. Clearly (19)a, bare non-total functions on the domain of degrees, as they are undefined for degrees belonging to the interval denoted by the standard. In contrast,(19)c, d, which differ only in that SSM has applied, are well defined for every degree, and thus denote total functions.

(19) Total and non-total degree functions

a. $[\![istall]\!]^c = \lambda d.\lambda x.Height(x) \geq dANDd > std_c$ [Non-total]

b. $[\![is\ short]\!]^c = \lambda d.\lambda x.Height(x) \leq d\ AND\ d < std_c$ [Non-total]

c. $[\![is\ SSM\ tall]\!]^c = \lambda d.\lambda x.Height(x) \geq dANDd > 0$ [Total]

d. $[\![isSSMshort]\!]^c = \lambda d.\lambda x.Height(x) \leq dANDd < 0$ [Total]

Now, consider the following denotation for MPs(cf. Beck 2009).[6]

(20) MP denotation

$$[\![n\ units]\!] = \lambda D_{<d,t>}: D\ is\ not\ vague.\ |D| \geq n$$

D is not vague if D is a total function on the domain of degrees,Deg

By (20), MPs are quantifiers over degrees and must raise to their scope position as in(21). However, without applying SSM, the predicates do not satisfy the vagueness precondition in (20), and thus MPs aren't licensed (22)a, b. Applying SSM removes vagueness as the standard is shifted to zero. As a result *tall*-type adjectives may license MPs (22)c, but in doing so lose their evaluative meaning (once the standard is nullified there is no dependency on context). For s*hort*-type adjectives, on the other hand, applying SSM is not available as it results in a contradiction, (22)d. A summary of these predictions is given in(23).

[6] I am indebted to Irene Heim for suggesting this version of the denotation.

(21) $[\![John\ is\ 6\ feet\ tall]\!]^c \ = [\![6\ feet\ (\lambda d.John\ is\ d\text{-}\ tall)]\!]^c$

(22) Vagueness precludes MPs

a.$[\![John\ is 6' tall]\!]^c = [\![6']\!](\lambda d.H(J) \geq d \wedge d > std_c)$ [Not licensed]

b.$[\![John\ is 6' short]\!]^c = [\![6']\!](\lambda d.H(J) \leq d \wedge d < std_c)$ [Not licensed]

c.$[\![John\ is 6' SSM\ tall]\!]^c \ = [\![6']\!](\lambda d.H(J) \geq d \wedge d > 0)$ [Good!]

d.$[\![John\ is 6' SSM\ short]\!]^c = [\![6']\!](\lambda d.H(J) \leq d \wedge d < 0)$ [Trivially false]

(23) MP licensing and evaluativity

a.*tall*-type adjectives may license MPs by applying SSM, eliminating evaluativity

b. *short*-type adjectives cannot license MPs, as applying SSM violates triviality

A direct consequence of(23)is that evaluativity is not determined by polarity or markedness, but rather by whether or not SSM may apply without violating the triviality filter. Support for this is given in the next subsection.

3.3.1 Adjectives with a single-point standard

For adjectives discussed thus far we assumed the standard was given by an interval, allowing us to account for a plurality of borderline cases. But this isn't the case for all adjectives. Consider the contrast in (24). (24)a demonstrates that there is a range of heights that are considered neither tall nor short, whereas (24)b shows that for degrees of *lateness* such a plurality isn't available.

(24) a. John is neither tall nor short, but somewhere in between.

b. #John is neither late nor early, but somewhere in between.

Assume that for adjectives that pattern with (24)b, the standard is given by a single degree rather than by an interval. MPs should then be licensed even without SSM applying (as the relevant function is total). For example, consider *early* and *late* in (25), for which the standard is the contextually defined Expected Time of Arrival (ETA).Note that since the contextual standard, ETA_c, is a single point,(25) is defined for all degrees, so MPs may be licensed without applying SSM. In such cases, evaluativity should obtain, (26)a, b. Similar examples are given in(26)c, d, e, f (adapted from Winter 2005), supporting the closing conclusion of the previous subsection.

(25) a. $[\![late]\!]^c \ = \lambda d.\lambda x.lateness(x) \geq \ d\ \&\ d > ETA_c$

b. $[\![early]\!]^c = \lambda d.\lambda x.earliness(x) \leq \ d\ \&\ d < ETA_c$

(26) a. John was 3 minutes late. (+E) b. John was 3 minutes early. (+E)

c. The watch is 5 minutes fast. (+E) d. The watch is 5 minutes slow. (+E)

e. Your “Do” is 5 Hertz sharp. (+E) f. Your “Do” is 5 Hertz flat. (+E)

Note also that for all examples in (26), the standard (i.e. ETA, correct time, correct pitch of "DO") denotes the point from which measurements are taken as a degree of divergence. In other words, the standard serves as a neutral point, standardly associated with the scale's zero. We have then, that adjectives which do not allow a plurality of borderline cases have a single-point standard identified with the adjective's zero. Since "shifting" the contextually given standard to zero is vacuous (the standard *is* zero), SSM is itself vacuous and evaluativity always obtains. To exemplify, for *early/late,*$ETA_c = 0_c$, namely a contextually given standard/zero.

In sum, adjectives with single-point standards may license MPs and in doing so maintain evaluativity. At this point we have accounted for (3), repeated below.

(3) a. John is 3 feet tall. (–E) b. * John is 3 feet short.
c. John is 3 minutes early. (+E) d. John is 3 minutes late. (+E)

3.4 Degree questions

It is generally accepted that the interpretation of questions is closely related to the semantics of their answers (e.g. Karttunen 1977). Regarding degree questions, any approach relating the semantics of questions with their answers will look at SSM applying to the possible answers. Assume that a question is felicitous only if it can have at least one true answer. For *tall*-type adjectives the question with SSM is felicitous because there is a possible true answer (*John is d SSM tall*), while for *short*-type adjectives the question with SSM is banned as it has no possible answer (**John is d SSM short*). We thus predict that degree questions with *tall*-type adjectives are unevaluative, while questions with *short*-type adjectives are evaluative, (27).[7]

(27) a. How tall is John? (–E) (John is 6' SSM tall)
b. How short is John? (+E) (* John is 3' SSM short)

Finally, note that for *early/late*-type adjectives SSM is vacuous, so evaluativity is predicted as in (1)i,k, repeated below.

(1) i. How late is John? (+E) k. How early is John? (+E)

4 Comparatives and equatives

The straightforward zero-shifting definition of the SSM was sufficient to explain the bare positive, MP licensing and degree questions. The comparative and equative, however, pose a challenge which forces us to give the SSM a more general definition. The problem is that, as defined, the SSM, being banned for *short*-type adjectives, correctly predicts that they are evaluative in the equative, but incorrectly predicts that they will also be evaluative in the comparative. In what follows the SSM is given a more general definition which allows us to capitalize on two essential differences between the comparative and the equative: (i) comparatives measure differences, while equatives measure quotients; and (ii) comparatives

[7]To formalize this, consider the analysis in (25), which assumes the Karttunen denotation for questions, namely sets of propositions, given by the operator Q below.(25)c, shows that applying SSM to short-type adjectives yields the empty set for every d.

(25) a. $[\![\text{how}]\!]^{w} = \lambda\gamma_{<d,<st,t>>}.\lambda p_{st}.[\exists d_w\ \gamma(d)(p)]$
b. $\text{how}(\text{Q (SSM)tall is John?}) =$
$\lambda\, p_{st}.[\exists\ d{:}\ p\ = \lambda\, w.\,\text{height}_w(\text{John}) \geq d \text{ and } d > (0)\ std\ ] =$
$\{\lambda w.\,\text{height}_w(\text{John}) \geq d \text{ and } d > (0)\ \text{std}|\text{d a degree}\}$
c. $\text{how}(\text{Q (SSM)short is John?}) =$
$\lambda\, p_{st}.[\exists\ d{:}\ p\ = \lambda\, w.\,\text{height}_w(\text{John}) \leq d \text{ and } d < (0)\ std\ ] =$
$\{\lambda w. height_w(John) \leq dandd < (0)std|dadegree\}$

license MPs, while equatives license ratios. Instead of defining the SSM as shifting the standard to zero only, we'll allow it to shift the standard to any contextually salient degree, (28).

(28) A generalized version of the Standard Shifting Morpheme (SSM)
a. $[\![SSM_d\ Adj]\!]^c = [\![Adj]\!]^{c_d}$;$where\ c_d \equiv c,\ except\ std_{c_d}(Adj) = d\text{: }a\ salient\ degree$

For our purposes salient degrees will include zero as well as the degrees associated with entities appearing in the relevant construction. For example, the degree *Height(John)*is salient in *How tall is John?* and both *Height(John)* and *Height(Mary)*are salient in *John is as tall as Mary*. Crucially, note that given this notion of salience, the generalized version of the SSM, (28), makes the same exact predictions as the original zero-shifting SSM, (14), did for all cases examined thus far. This is true since the only salient degrees available were zero and the respective measurement of the single entity in the cases we examined, and shifting the standard of an adjective modifying an entity to the degree associated with that same entity will yield the empty set, and thus a contradiction, (29). For the comparative and equative, however, the situation is different as there are now two contextually salient degrees available, giving rise to non-trivial options, as we shall shortly see. We adopt the semantics in (30) for the comparative and the equative.[8]

(29) Applying $SSM_x$to an adj. composed with an entity measuring x, yields a contradiction
$[\![John\ isSSM_{H(J)}tall]\!]^c \quad = \exists d\text{: }H(J) \geq d \wedge d > H(J)$ [Contradiction]

(30) Comparative and Equative Semantics
a.$[\![-er]\!] = \lambda B_{<d,t>}.\lambda\mu_{<dt,t>}.\lambda A_{<d,t>}.\mu(A\backslash B)$ $[A\backslash B \coloneqq \{x|x \in A \wedge x \notin B\}]$
b.$[\![as]\!] \quad = \lambda B_{<d,t>}.\lambda\rho_d.\lambda A_{<d,t>}.\ \frac{|A|}{|B|} \geq \rho$ [|A| denotes the measure of a set A]

In the next subsections our strategy will be as follows. For evaluative readings we will show no unevaluative constructions are available. For clearly unevaluative readings we will remain agnostic regarding the availability of an evaluative reading, showing only that an unevaluative construction is available. Note that this is just what Rett does, and for good reason, as showing that an evaluative reading could not exist can prove quite elusive.[9]

4.1 Comparatives

Given the generalized definition of the SSM, (28), there are three cases to consider: (i) SSM doesn't apply; (ii) SSM shifts to 0 (SSM_0); and (iii) SSM shifts to the degree made salient by the*than*-clause (SSM_{than}). Note that we need not consider a fourth case of SSM_{matrix} as such a shift would render the set *A* associated with the matrix clause in (30)a empty (as it does in (29)),yielding a contradiction.

In the calculations below we assume an existential closure of a non-trivial degree quantifier (type <dt,t>), more formally a Non-trivial Upward Monotone (NUM) quantifier, i.e. a well-behaved non-constant quantifier satisfied by some non-empty set. We further assume that SSM

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[8] For an independent motivation for this comparative semantics, see Breakstone, Cremers, Fox &Hackl (2011).
[9] For example, consider *How tall/short is John?* For *short* it's quite straightforward to show that unevaluative readings do not exist (# How short is the giant?), but for *tall* such tricks won't work. In fact it is quite feasible that an evaluative reading does exits: *How tall is John? Oh… John isn't tall at all.*

must apply uniformly on both the matrix and the *than*-clause, which can be attributed to a parallelism condition on ellipsis:*[-er [than Mary <is SSM_x tall>]] [John is SSM_x tall]*. The semantics for these three cases are given in (31). The left diagram in (33) illustrates the sets compared before SSM applies.

(31) Comparative-*tall*

$$[\![John\ is\ taller\ than\ Mary]\!]^c = [\![-er[than\ M\ is\ (SSM)tall][J\ is\ (SSM)tall]]\!]^c \overset{\exists clos.}{=}$$

(i) $\exists \mu_{NUM}: \mu\,(\{d|h(J) \geq d \wedge d > Std\} \setminus \{d|h(M) \geq d \wedge d > Std\} = T$ [No SSM]

(ii) $\exists \mu_{NUM}:\ \mu\,(\{d|h(J) \geq d \wedge d > 0\} \setminus \{d|h(M) \geq d \wedge d > 0\} = T$ [SSM_0]

(iii) $\exists \mu_{NUM}:\ \mu\,(\{d|h(J) \geq d \wedge d > h(M)\} \setminus \{d|h(M) \geq d \wedge d > h(M)\} = T$ [$SSM_{h(M)}$]

(31)(i) is true iff John's height is greater than Mary's height and also greater than the standard, giving rise to an appropriate, if evaluative, interpretation. On the other hand, both (31)(ii) and (31)(iii) are true iff John's height is greater than Mary's height, with the contextual standard no longer playing a role, so they both yield an unevaluative interpretation. In sum, for comparatives with *tall*-type adjectives, unevaluative readings are made available by applying SSM. Additionally, if SSM applies, MPs are licensed because the measured set (the difference between the two sets of John's and Mary's tallness-degrees) no longer refer to a contextual standard. The semantics for the analogous cases with *short*-type adjectives are given in (32).

(32) Comparative-*short*

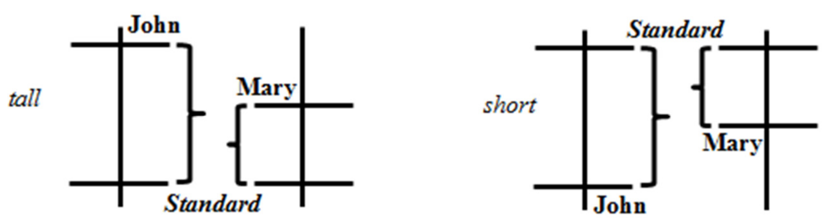
$$[\![John\ is\ shorter\ than\ Mary]\!]^c = [\![-er[than\ M\ is\ (SSM)short][J\ is\ (SSM)short]]\!]^c \overset{\exists clos.}{=}$$

(i) $\exists \mu_{NUM}: \mu\,(\{d|h(J) \leq d \wedge d < Std\} \setminus \{d|h(M) \leq d \wedge d < Std\} = T$ [No SSM]

(ii) $\exists \mu_{NUM}:\ \mu\,(\{d|h(J) \leq d \wedge d < 0\} \setminus \{d|h(M) \leq d \wedge d < 0\} = T$ [SSM_0]

(iii) $\exists \mu_{NUM}:\ \mu\,(\{d|h(J) \leq d \wedge d < h(M)\} \setminus \{d|h(M) \leq d \wedge d < h(M)\} = T$ [$SSM_{h(M)}$]

(33) *tall* and *short* comparatives before SSM applies



(32)(i) is true iff John's height is less than Mary's height and less than the standard (see the right diagram of (33)).(32)(ii) is a contradiction as both sets associated with John and Mary, respectively, are empty, so their difference is also empty. (32)(iii), however, gives the appropriate truth conditions, namely it is true iff John's height is less than Mary's height, which is unevaluative. In sum, for comparatives with *short*-type adjectives, an unevaluative reading is made available by applying $SSM_{h(M)}$. As before, if $SSM_{h(M)}$ applies, MPs are licensed because the measured set is no longer vague. Thus, the overall predictions for the comparative are that unevaluative readings are always available, and MPs are always licensed.

4.2 Equatives

For equatives, just as for comparatives, there are the samethree cases to consider for SSM application. Here too we assume that SSM applies uniformly on matrix and subordinate clauses. In the absence of an overt ratio, we assume an existential closure of a ratio greater or equal to 1. The semantics for the three cases are given in (34).

(34) Equative-*tall*

$$[\![John\ is\ as\ tall\ as\ Mary]\!]^c = [\![as[\ M\ is\ (SSM)tall][J\ is\ (SSM)tall]]\!]^c \overset{\exists clos.}{=}$$

(i) $\exists\rho_d \geq 1: \frac{|\{d|h(J)\geq d \wedge d>Std\}|}{|\{d|h(M)\geq d \wedge d>Std\}|} \geq \rho$ [No SSM]

(ii) $\exists\rho_d \geq 1: \frac{|\{d|h(J)\geq d \wedge d>0\}|}{|\{d|h(M)\geq d \wedge d>0\}|} \geq \rho$ [SSM_0]

(iii) $\exists\rho_d \geq 1: \frac{|\{d|h(J)\geq d \wedge d>h(M)\}|}{|\{d|h(M)\geq d \wedge d>h(M)\}|} \geq \rho$ [$SSM_{h(M)}$]

(34)(i) is true iff John's height is greater or equal to Mary's height, and Mary's height is greater than the standard (avoiding division by zero). This is an appropriate, if evaluative, interpretation of the equative. (34)(ii)is true iff John's height is greater or equal to Mary's height, giving rise to the appropriate, unevaluative interpretation for the equative. (34)(iii) is not defined as the denominator represents an empty set, and division by zero is undefined. In sum, for *tall*-type adjectives an unevaluative reading is made available by applying SSM_0 and ratios are always available (even ratios less than 1). The three cases for *short*-type adjectives are given in (35).

(35) Equative-*short*

$$[\![John\ is\ as\ short\ as\ Mary]\!]^c = [\![as[\ M\ is\ (SSM)short][J\ is\ (SSM)short]]\!]^c \overset{\exists clos.}{=}$$

(i) $\exists\rho_d \geq 1: \frac{|\{d|h(J)\leq d \wedge d<Std\}|}{|\{d|h(M)\leq d \wedge d<Std\}|} \geq \rho$ [No SSM]

(ii) $\exists\rho_d \geq 1: \frac{|\{d|h(J)\leq d \wedge d<0\}|}{|\{d|h(M)\leq d \wedge d<0\}|} \geq \rho$ [SSM_0]

(iii) $\exists\rho_d \geq 1: \frac{|\{d|h(J)\leq d \wedge d<h(M)\}|}{|\{d|h(M)\leq d \wedge d<h(M)\}|} \geq \rho$ [$SSM_{h(M)}$]

(35)(i) is true iff John's height is less or equal to Mary's height which is less than the standard, giving rise to an appropriateand, crucially, evaluative, interpretation. However, (35)(ii) and (35)(iii) are not defined as in both cases the shift renders the set associated with the denominator empty, leading to an undefined division by zero. Hence for *short*-type adjectives SSM is not licensed and the welcome prediction is that the only surviving reading is evaluative.

4.3 Summary and further predictions

We have shown that for the comparative, SSM is always licensed, and so (unless SSM is vacuous as for *early/late*) an unevaluative reading is always available. MP licensing follows from the denotation, since once SSM applies, vagueness is eliminated. As was noted earlier, an interpretation not involving SSM is not precluded, but this not a worry(such interpretations may indeed be available).For equatives, on the other hand, applying SSM_0 for *tall*-type adjectives eliminates evaluativity but for *short*-type adjectives, both SSM_0 and $SSM_{h(M)}$ are banned as they would lead to an undefined division by zero.

Following are a few additional predictions given before closing this section. Firstly, note that for equatives we assumean existential closure of a ratio greater or equal to one, however this in no way precludes explicit ratios less than 1, indeed *John is half as tall as Mary* seems fine. Secondly, note that evaluativity in equatives behaves like a presupposition, surviving negation in e.g*John is not as short as Mary* which seems to entail that *Mary is short*. This is predicted by the equative's denotation (30)b, assuming a nonzero denominator is a precondition for division. Finally, consider the sentences in(36). Somehow, although grammatical, they do not seem to mean that *the handbag costs half the price of the jacket* or that *the girl is half the height of the boy*, respectively. Instead they seem to simply mean that the handbag is cheaper, to some unknown extent, than the jacket, and that the girl is shorter, to some unknown extent, than the boy. These strange interpretations are actually predicted by the system presented above, since SSM is banned for such adjectives in equatives, and thus the vague standard remains part of the denotation leading to a vaguely defined quotient, with incalculable results. It has elsewhere been claimed (e.g. Beck 2011) that examples such as (36)are ungrammatical. Our system can accommodate such judgments by simply banning vague quotients.

(36) a. The handbag is twice as cheap as the jacket.
b. The girl is twice as short as the boy.

5 A Predicted Generalization

Having accounted for the challenges regarding the distribution of MPs and evaluative readings as presented in (1) and (3), we are now in a position to generalize Bierwisch's observation, (4), repeated below.

(4) Bierwisch's Observation (1989)
* (MP Adjective) in Positive form ⇒ Adjective is +E in equatives and questions.

We already know that the converse of(4) doesn't generally hold. For example, adjectives such as *early/late* license MPs and yet are evaluative in degree questions and equatives (*How late is John?*). However, if an adjective does give rise to evaluative readings in equatives and degree questions, the proposal advocated in this paper says it's either because SSM was blocked or because SSM has applied vacuously. If SSM was blocked, MPs are also blocked, so what's left is to account for the vacuous application of SSM, namely those adjectives with a single-point, zero-standard.

(37) Generalization of Bierwisch's Observation (GBO)
Adjectives do not license MPs in the positive form <u>if and only if</u> they are:
(i) Evaluative in equative and degree-question constructions; <u>and</u>
(ii) Have originally non-zero standards

Table (38) illustrates GBO across a wide range of gradable adjectives. The fact that GBO holds throughout is an embodiment of the principle that evaluativity is inherent and may be eliminated iff SSM applies non-vacuously.

(38) Examples of GBO

	+/– MP	**+/– E**	**Std.**	**MP example**	**Equative/Degree questions examples**
tall	+MP	–E	≠0	He is 3 inches tall	How tall is the midget? This midget is as tall as that one
short	–MP	+E	≠0	*He is 3 feet short	#How short is the giant? #This giant is as short as that one
early	+MP	+E	0	The train was 2 seconds early	How early is the train? This train is as early as that one
late	+MP	+E	0	The train was 2 seconds late	How late is the train? This train is as late as that one
full	–MP	+E	≠0	*The can is 3 liters full	#How full is the (empty) can? #This empty can is as full as…
empty	–MP	+E	≠0	*The can is 3 liters empty	#How empty is the (full) can? #This full can is as empty as…
hot	–MP	+E	≠0	*A stove is 300° hot	#How hot is the ice cream? #This ice is as hot as that ice
cold	–MP	+E	≠0	*A fridge is -5° cold	#How cold is the fire? #This heater is as cold as…
expensive	–MP	+E	≠0	*A ring is $800 expensive	#How expensive is the cheap gum? #This cheap gum is as expensive as…
beautiful	–MP	+E	≠0	No scale units	#How beautiful is the beast? #This beast is as beautiful as …

6 Summary

In this paper we've shown how the distribution of MPs and evaluative readings can be explained if contextual standards are inherent to the semantics of gradable adjectives. A principled and explanatory account of the correlation between the two phenomena was given, embodying the idea of inherent evaluativity. Furthermore, assuming a correlation between syntactic and morphological complexity, inherent evaluativity may indeed be the natural way to think about the denotation of adjectives, given that only the simplest bare positive forms are uniformly evaluative. Of course, it would be nice to find a language for which SSM is overtly realized in non-positive constructions, but the same can be said about the converse proposals which assume some sort of covert POS (or, for Rett, EVAL) morpheme.[10]

Clearly, unanswered questions remain. One such question regards *tall*-type adjectives that should be able to license MPs but do not, e.g. *hot, heavy* (*1000 degrees hot*; * 2 pounds heavy*). It's important to understand that we propose no explanation for these, but we assume that there

[10] But see Bogal-Allbritten (2011) where POS is thought to be overtly marked in certain Navajo constructions. I thank Rajesh Bhatt for bringing this to my attention.

might be independent reasons for banning SSM, for example a scale with no well-defined zero (as is the case for *hot*, which doesn't have a cognitively-salient zero). In the same vein, some adjectives are obligatorily evaluative, e.g. *ugly* (*John is uglier than Mary* +E). Perhaps, such cases also exemplify SSM-banning for independent reasons (e.g. no well-defined zero) allowing the underlying evaluative reading to surface. In any event, whatever the reasons for SSM-banning are, GBO is still correctly predicted to hold, (38). Finally, both Dutchand German have *short*-type adjectives which license MPs and retain evaluativity (see Doetjes, 2011 andHofstetter, 2011, respectively). Such data are not expected under the current proposal, and their explanation remains for future cross-linguistic research on evaluativity.

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