Located vectors and bare comparatives

The Hindi example in (1) below from [a] has three features of interest here:

(1) John Bill-se lambaa hai
    John Bill-se tall.M.SG be.PRES.SG
    ‘John is taller than Bill’

(i) The standard marker -se is a spatial postposition. The PP Bill-se could be used to translate ‘the arrow goes from Bill to John’. (ii) There is no comparative morpheme on lambaa that would correspond to the –er on ‘taller’ – so (1) is a bare comparative. (iii) The postposition -se governs a DP – there is no underlying clause – so (1) is a phrasal comparative.

My proposal addresses (1) and other recently discussed examples with the features just mentioned. At its heart is an analysis of degrees as located vectors ([d][g]). The idea is that a scale is a set of points with a direction. A vector points upward if its endpoint is above its origin on the scale. “from Bill” describes vectors that point upwards, whose origin includes Bill. “John tall” describes vectors on the height scale whose endpoint includes John. The combination in (1) describes the existence of a vector on the height scale that goes upward from Bill to John.

(2) A degree is a four-tuple consisting of: a field, an ordering, an endpoint and an origin, represented as: \( \langle \text{FIELD}(d), \succ_d, \text{END}(d), \text{ORIG}(d) \rangle \).

\( \text{FIELD}(d) \) is a set of entities that are ordered by \( \succ_d \). \( \text{END}(d) \) and \( \text{ORIG}(d) \) are equivalence classes ordered by \( \succ_d \).

(3) \[ \text{tall}(x,d) = 1 \text{ iff } \ \text{FIELD}(d) \text{ is the set of entities with a height; } \text{ORDER}(d) \text{ orders entities by height; } \text{END}(d) \text{ includes } x. \]

If John is 5ft tall, tall pairs him with any height vector whose endpoint includes all and only 5ft tall individuals.

(4) \[ [\text{from}] = \lambda x \lambda d. \ x \in \text{ORIG}(d) \land \text{END}(d) \succ_d \text{ORIG}(d) \]

Assuming an \( \exists \)-type shift applied to the PP we get:

(5) \[ \exists \text{ from Bill} = \lambda P \exists d. \ \text{Bill} \in \text{ORIG}(d) \land \text{END}(d) \succ_d \text{ORIG}(d) \land \text{P}(d) \]

(6) LF: John \( \lambda x \) [from Bill] \( \lambda d \) [x is d-tall]

(7) There is an upward vector whose origin includes Bill. It’s a height vector and its endpoint includes John.

Since (3) says nothing about \( \text{ORIG}(d) \), tall pairs John with both upward pointing and downward pointing vectors. The Navajo version of (1) uses a postposition meaning ‘beyond’. There is another postposition used to express ‘less tall than Bill’. We can capture this by assigning the less-than postposition a meaning like (4) except that the vectors point downwards (\( \text{ORIG}(d) \succ_d \text{END}(d) \)). A similar analysis may apply to hoo ([f]) which can mark ‘John’ in the Japanese version of (1) and which also has a spatial ‘towards’ use (hidari no hoo ‘to the left’)

This analysis differs from [d] and[g]’s analyses of full comparatives by assigning the standard-PP a meaning just like the one [h] assigns to above the house. [h] appeals to measure phrase modification as a key argument for a vector analysis. Similarly, differentials in bare-comparatives (eg [b]: (33) ‘Bill 6 in. with him.beyond’ for ‘6 inches taller than Bill’) may describe the length of the vectors introduced by the PP.

[d] leaves for future work cases like (8) below which differs from (1) in the role of the standard. In (8), the degree predicate ‘many’ assigns cardinalities, but the cardinality of SS itself is not at issue (contrast Bill’s height in (1)). Following [a], I assume the bracketed PP moves to take parasitic scope, indicated in pseudo-English in (9):
(8) LGB-οι, [SS-yori] ooku-no hito-ga tì yonda (from [a], ex 58)
LGB-ACC SS-from many-GEN people-NOM read-PAST
‘More people read LGB than SS’

(9) LGB SS-from λd λx d-many people read x

The resulting <d,<et>> expression in (9) is improper: books are paired with vectors that encode not their cardinality, but the cardinality of the people who read them. I propose a Derived Degree Relation Rule (DDRR) that can apply to an improper degree relation to produce a proper one. Here’s the intuition: If we think of the popularity of a book as measured in terms of number of readers, then we are moving from a relation between a book and a cardinality-degree that its readers have, to a relation between a book and a popularity-degree that it has. Once we make that move, the rest of (9) can be interpreted as in previous examples, crucially employing the meaning in (4) for the standard marker yori ‘from’.

(10) If α is type <d,<et>>, then DRRR(α) = α’

α’(x,d) = 1 \iff FIELD(d) = \{y: \exists d’ α(y,d’) = 1\}

\alpha >_d \beta \iff \forall d_1 \forall d_2 (\alpha(a,d_1) = \alpha(b,d_2) = 1 \rightarrow END(d_1) >_{d_1} END(d_2))

x \in END(d)

Once DRRR applies in (9) (and the PP is moved for type reasons), we get (11):

(11) There is a vector that originates with SS and goes upward. It is on a scale that orders entities that are read by people, with higher points corresponding to higher readership. LGB is at the end of the vector.

Before \exists-type shifting in (5) above, the PP is a predicate of degrees (<d,t>). This fact leads to an analysis of a Navajo phenomenon seen in (12):

(12) John [Bill bi láah ‘át’eego] nineez

John [Bill 30-BEYOND 3S-be-SUBORD niABSOLUTE.ASPECT-3S-CLASS-tall

‘John is tall and he is taller than Bill’

[c] demonstrates that when the root for tall is marked with absolute aspect, the PP+copula is an adverbial adjunct (when tall has comparative aspect, the PP is an argument) and a positive operator is present, accounting for the evaluativity in the gloss in (12). If POS has a domain restriction represented as C, the PP can function as a Davidsonian adverb predicated distributively of C:

(13) John [Bill-BEYOND be-SUBORD][C] POS C tall

(14) [POS C tall] = λx∃d. d \in C \land END(d) >_d s_e \land x \in END(d) \land >_d is height based

(15) [Bill-BEYOND be-SUBORD][C] \sim \forall d (d \in C \rightarrow d \in [Bill BEYOND])

(12) says: There is a vector on the height scale, its endpoint is above the contextual standard for tallness in c, its endpoint includes John and it is a vector that points upward from Bill.

The analysis in (13)-(15) improves on one mentioned in [c], addressing problems noted there and, with (10), it might cover an example meaning “I earned less money than you”. [c]’s analysis of Ulwa independently motivates deriving a comparative meaning by restriction of the domain of POS.

[a] Bhatt Takahashi 2011 NLLT
[b] Bogal-Allbritten 2008 thesis
[d] Faller 2000 CSLI pub
[e] Francez Koontz-Garboden 2011 ms under review
[f] Matsui Kubota FAJL5 proceedings
[g] Winter 2005 Linguistics and Philosophy
[h] Zwarts 1997 Journal of Semantics