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 <u>from Bill </u>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: $\langle$FIELD(d), $>_d$, END(d), ORIG(d)$\rangle$.

       FIELD(d) is a set of entities that are ordered by $>_d$.   END(d) and ORIG(d) are equivalence classes ordered by $>_d$.

(3)   tall(x,d) = 1 *iff*   FIELD(d) is the set of entities with a height;   ORDER(d) orders entities by height; END(d) includes x.

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

(4)   ⟦*from*⟧ = λx λd. x $\in$ ORIG(d) $\wedge$ END(d) $>_d$ ORIG(d)

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

(5)   ⟦$\exists$ *from Bill*⟧ = λP $\exists$d. Bill $\in$ ORIG(d) $\wedge$ END(d) $>_d$ ORIG(d) $\wedge$ P(d)

(6)   LF: John λx [from Bill] λd [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 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 (ORIG(d) $>_d$ 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-o$_i$, [SS-yori] ooku-no   hito-ga   t$_i$ 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 DDRR(α) = α′

        α′(x,d) = 1 *iff*   FIELD(d) = {y: ∃d′ α(y,d′) = 1}

                         a >$_d$ b *iff* ∀d$_1$ ∀d$_2$ (α(a,d$_1$) = α(b,d$_2$) = 1 → END(d$_1$) >$_{d1}$ END(d$_2$))

                         x ∈ END(d)

Once DDRR 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 ∃-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 lááh   'át'éego]   nineez
       John [Bill 3O-BEYOND 3S-be-SUBORD ni$_{ABSOLUTE.ASPECT}$-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*⟧^{c} = λx∃d. d ∈ C ∧ END(d) >$_d$ s$_c$ ∧ x ∈ END(d) ∧ >$_d$ is height based

(15)   [Bill-BEYOND be-SUBORD](C) ↝ ∀d (d ∈C → d ∈ ⟦*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". [e]'s analysis of Ulwa independently motivates deriving a comparative meaning by restriction of the domain of POS.

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