The story of *er*

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1 Introduction

- The English comparative *-er* is a particular challenge for contemporary morphological analysis (see, among others, Lindquist 2000, Mondorf 2003, 2007, Hilpert 2008, Matushansky 2013, Dunbar and Wellwood 2016)

2 Background

2.1 The English comparative

1. The comparative and superlative in English are in an ABB suppletion relationship (*good*^{A}, *better*^{B}, *best*^{B}; *bad*^{A}, *worse*^{B}, *worst*^{B}), which strongly suggests a containment relationship (Bobaljik 2012).
   - This in turn suggests that *-er* and *-est* are in competition with each other; i.e., there is a common set of features that is a subset of the features they expone (e.g., COMP +, given Bobaljik 2012) and they expone a shared syntactic position.
2. Additionally, *more* and *-er* are in (mostly) complementary distribution, suggesting that they are allomorphs.
   - This again suggests that they are in competition with each other for the same position of exponence.
     - This particular competition is syntactically interesting because *more* is an independent, free form that appears to the left of the adjective, while *-er* is an affix that appears to the right of the adjective.
   - In order for *more* and *-er* to compete with each other, according to most realizational models of morphology, they must have a shared position of exponence.
     - This suggests that, e.g., *more orange* and *redder* have identical c-structures.
3. The complementary of *-er* and *more* seems to be such that phonologically-conditioned monosyllabic stems get *-er* and trisyllabic+ stems get *more* (*prettier* vs **beautifuller*).
   - Therefore this competition has to be sensitive to phonology.
4. The blocking of *-er* is not only triggered by phonology, but also by syntactic triggers, as in (1), and semantic triggers, as in (2).

   (1) The adornment is more pretty than practical ≠ The adornment is prettier than practical

   (2) De'Aaron Fox was more clutch/*clutcher than any other player last year.
5. Finally, sometimes pure complementarity fails and both *more* and *-er* are licit

   (3) I am even madder.

   (4) I am even more mad.

   - Nevertheless, the variation is structurally and semantically predictable (in contrast to true optionality).

⇒ The net of all these properties is that the appearance of *-er* is the result of a complex competition involving two competitors (*more* and *-er*) and phonological, semantic, and syntactic conditions restricting their distributions.

2.2 Theoretical desiderata

- The complex nature of this competition, which draws on mappings to multiple distinct representations, lends itself to a constraint-based, modular framework, such as LFG/L_RFG (for some recent work, and further references, see Asudeh and Siddiqi 2023, Asudeh, Bögel, and Siddiqi 2023).
- The overt competition of an affix and a free form (periphrasis) lends itself to a *lexical-realizational* (Stump 2001) approach, such as L_RFG.

  Lexical: Morphological formatives are independent listed items and these combine in complex forms.

  Realizational: Morphology *expresses* grammatical contrasts.

- Given the complexity of the competitions, the English comparative represents the ideal morphological phenomenon to showcase all the different aspects of analysis in L_RFG and to provide the basis for a 'soup-to-nuts' demonstration of the framework, which is constraint-based, modular, and lexical-realizational.
- The English comparative thus also presents an opportunity for a a step-by-step primer on L_RFG analysis.

3 Morphological analysis

3.1 Determine allomorphy

- Complementary distribution and blocking are the easiest ways to determine a suppletive allomorphy relationship (see Siddiqi 2024 for discussion).
  - In the case of regular affixal morphology, we identify a systematic phonological alternation covarying with a systematic semantic/formal alternation.
  - In the case of irregular allomorphy, we use the existence of that regular covariance to justify our assumption that a different phonological alternation is an irregular covariance with the same semantics (i.e., the irregular and the regular are in complementary distribution).
  - We accept a proposed irregular covariance specifically when it blocks the regular covariance.
- In the specific case of *-er* and *-est*, there is arguably a subsumption relationship between the comparative and the superlative, such that the superlative properly contains the comparative information and therefore blocks it (see Bobaljik 2012).
- The blocking relationship between *more* and *-er* is more controversial because it involves periphrasis (among others, Poser 1992, Embick and Noyer 2001, Kiparsky 2005, Ackerman et al. 2011), but in this case we can glean from the history of *-er* that, in contemporary English, *more* has changed from supporting *-er* to competing with it (Huddleston and Pullum 2002).
  - We assume that *-er/-est* is morphophonologically restricted, while *more/most* is the elsewhere form.

	Containment		
Morphophonologically unrestricted	*more*	$\sqsubset$	*most*
Morphophonologically restricted	*-er*	$\sqsubset$	*-est*

Table 1: English markers of comparative and superlative

3.2 Determine the v-structures for each vocabulary item

- The exponents/v-structures for *-er* (5a), *-est* (5b), *more* (5c), and *most* (5d) are listed below, where they are represented as attribute-value matrices on the right-hand side of a vocabulary item (Asudeh, Bögel, and Siddiqi 2023).
  - In the case of *more* and *most*, since they are free forms, the v-structure is limited to its phonological and prosodic form.
  - In the case of *-er* and *-est*, which are instead affixes with phonological and prosodic restrictions, the v-structures encode these restrictions in their PFRAME and PDOMAIN features.
    - They are suffixes, so they have left dependency (DEP(ENDENT) LT).
    - There are phonological and syntactic restrictions on the nature of these affixes' hosts, so they have HOST features as well.
      - In particular, [HOST [IDENT +]] specifies that the affix must be hosted by the c-structurally closest head that shares its v-structure.
      - The other HOST feature, PFRAME, restricts the prosody of candidate hosts, such that the host must be no larger than a foot.[1]

(5) a.
$$\left\langle \begin{array}{l} [\mathrm{G}],\ @\textsc{cmpr} \\ \lambda\mathcal{P}_{es}.[\mathbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle} \end{array} \right\rangle \xrightarrow{\nu} \begin{bmatrix} \textsc{phonrep} & /\text{əɹ}/ \\ \textsc{pframe} & ((\ \ )_\sigma(\ \cdot\ )_\sigma)_{ft} \\ \textsc{pdomain} & (\ \ )_\omega \\ \textsc{dep} & \textsc{lt} \\ \textsc{host} & \begin{bmatrix} \textsc{ident} & + \\ \textsc{pframe} & (\ \ )_\sigma((\ \ )_{\sigma=\mu}) \end{bmatrix} \end{bmatrix}$$

b.
$$\left\langle \begin{array}{l} [\mathrm{G}],\ @\textsc{supr} \\ \lambda\mathcal{P}_{es}.[\mathbf{supr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle} \end{array} \right\rangle \xrightarrow{\nu} \begin{bmatrix} \textsc{phonrep} & /\text{əst}/ \\ \textsc{pframe} & ((\ \ )_\sigma(\ \cdot\ )_\sigma)_{ft} \\ \textsc{pdomain} & (\ \ )_\omega \\ \textsc{dep} & \textsc{lt} \\ \textsc{host} & \begin{bmatrix} \textsc{ident} & + \\ \textsc{pframe} & (\ \ )_\sigma((\ \ )_{\sigma=\mu}) \end{bmatrix} \end{bmatrix}$$

c.
$$\left\langle \begin{array}{l} [\mathrm{G}],\ @\textsc{cmpr} \\ \lambda\mathcal{P}_{es}.[\mathbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle} \\ (\ \lambda P_{et}.[\mathbf{grade}_{\langle et,es\rangle}(P)]_{es}\ ) \end{array} \right\rangle \xrightarrow{\nu} \begin{bmatrix} \textsc{phonrep} & /\text{mɔɹ}/ \\ \textsc{pframe} & (\ \cdot\ )_\omega \end{bmatrix}$$

d.
$$\left\langle \begin{array}{l} [\mathrm{G}],\ @\textsc{supr} \\ \lambda\mathcal{P}_{es}.[\mathbf{supr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle} \\ (\ \lambda P_{et}.[\mathbf{grade}_{\langle et,es\rangle}(P)]_{es}\ ) \end{array} \right\rangle \xrightarrow{\nu} \begin{bmatrix} \textsc{phonrep} & /\text{mɔst}/ \\ \textsc{pframe} & (\ \cdot\ )_\omega \end{bmatrix}$$

[1] In general, *-er* can be safely suffixed to monosyllabic hosts, but speakers vary somewhat as to which disyllabic hosts it can be suffixed to. We have taken a first step towards capturing this, by allowing an optional, second monomoraic syllable in the host.

4 Syntactic analysis

4.1 Determine shared c-structures

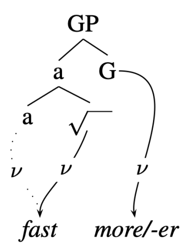
- Because of the nature of lexical-realizational morphology, the c-structure is agnostic to the particular v-structures that it maps to.

- Therefore, when two vocabulary items (VIs) are shown to be in competition, they must share a position of exponence in the c-structure.

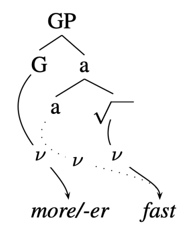
- There are two possible c-structures to consider because *more* surfaces on the left and *-er* surfaces on the right.

  - We hypothesize—for simplicity and in the spirit of the standard LFG assumption that c-structure is surface-true barring prosodic effects—that one of the two candidates surfaces in its c-structural position, so we are considering only two underlying c-structures (6a,b).[2]

(6) a.



b.



  - The VI for *more* (5c) does not have any phonological or syntactic constraints that would cause the order of its prosodic/phonological realization to differ from the order of its c-structure yield, so we would by default assume that (6a) is the shared c-structural representation.
  - Furthermore, *-er* (5a) does have HOST and DEP properties that would trigger a mismatch, so we can reject (6b) as the shared representation.

  - In short, for these reasons, when an affix and a free form are in competition, we by default assume that the free form's position is the underlying c-structural position.

- In the case of English, which is by hypothesis a head-initial language, general headedness properties would also lead us to assume that the functional/synthetic comparative head, which selects for an adjective, appears on the left.

4.2 Determine realized linear order

- We now have to identify the mechanism by which *-er* occurs on the right while *more* occurs on the left.

  - The DEP feature of *-er* (value LT) requires *-er*'s host to appear to the left of the affix.
  - The [HOST [IDENT +]] feature requires that *-er*'s host is the adjective,[3] which is the nearest head. This triggers prosodic inversion (Asudeh, Bögel, and Siddiqi 2023).

[2] Note that GP stands for *Grade Phrase*, based on *grade* from (Huddleston and Pullum 2002: 1580). We could have called this *Degree Phrase* or something else instead.

[3] It could instead be the adjectivizer, in the case of complex adjectives like *shadow-y-er*.

4.3 Determine f-structures in common

- We assume here that *more* and *-er* have identical f-structures, because their competition is never resolved via f-structural featural content.
  - The competition is resolved via phonological and semantic conditioning.
- Turning to *-er* and *-est*, these in contrast are in a straight-forward containment relationship.
  - We know this because any suppletive form that applies to the comparative also applies to the superlative (e.g, *better* and *best*; see Bobaljik 2012).
  - In L_RFG, containment relationships are captured via templates/macros (Dalrymple et al. 2004) which call other templates/macros; see, e.g., the formalization of the Ojibwe person hierarchy in Melchin et al. (2020).
  - In this case, @SUPR calls @CMPR, as in (7).

(7) a. SUPR := (↑ SUPERLATIVE) = +
@CMPR

b. CMPR := (↑ COMPARATIVE) = +

5 Semantic analysis

5.1 Determine compositional semantics

- The semantic analysis of the comparative and superlatives is not our primary aim.
  - However, we postulate that a distinction between the semantics of *-er* vs *more* (and *-est* vs *most*) accounts for *more/most*'s greater freedom of distribution.

    (8) De'Aaron Fox was more clutch/*clutcher than any other player last year.

    (9) Kudrow's performance was more wooden/*woodener than Sorvino's.
  - Therefore we need to present at least a sketch of a semantic analysis to show how the semantics can account for the distinction.
  - We adapt a basic, lexicalist degree semantics to a Glue Semantics context (Dalrymple 1999, Asudeh 2023).
- There has been much work on the semantics of comparatives, superlatives, and gradability. The standard reference for most modern approaches are Kennedy (1999, 2007) and Kennedy and McNally (2005), but see Burnett (2017) or Wellwood (2019) for recent monographs and further references therein.
- Here we build on Wellwood's (2019) characterization of a lexicalist approach.[4]
- Wellwood (2019: 23) assumes the following types:

  (10) **Semantic types**

  a. e, v, s, t are the basic semantic types.

  b. If δ, τ are semantic types, then $\langle \delta, \tau \rangle$ is a semantic type. **Notation:** $\langle \delta, \tau \rangle \equiv \delta\tau$

  c. Nothing else is a semantic type.
- The types denote entities (e), events (v), degrees (s),[5] and truth values (t).

[4]Wellwood (2019) is in fact about developing an alternative to this approach, but this is the most familiar approach and her presentation is particularly clear. Again, the aim of this paper is not to argue for or against particular analyses of the phenomenon.

[5]This s is not to be confused with Montague's use of s as the non-basic/lexicalized intensional type s.

taller

$$\dfrac{\dfrac{\dfrac{\overset{\textit{tall}}{\lambda y_e.[\textbf{tall}(y)]_s} \quad \overset{\textit{-er}}{\lambda \mathcal{P}_{es}.[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}}}{[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\lambda y_e.[\textbf{tall}(y)]_s)]_{\langle s,et\rangle}} \multimap_{\mathcal{E}} \quad [(\lambda g_{es}\lambda d_s\lambda x_e.g(x) > d)_{\langle es,\langle s,et\rangle\rangle}(\lambda y_e.[\textbf{tall}(y)])_s]_{\langle s,et\rangle}}{[\lambda d_s\lambda x_e.(\lambda y_e.[\textbf{tall}(y)])_s(x) > d]_{\langle s,et\rangle}} \text{def}_{\textbf{cmpr}}}{\lambda d_s.\textbf{tall}(x) > d} \Rightarrow_\beta$$

more intelligent

$$\dfrac{\dfrac{\dfrac{\overset{\textit{intelligent}}{\lambda y_e.[\textbf{intelligent}(y)]_s} \quad \overset{\textit{more}_1}{\lambda \mathcal{P}_{es}.[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}}}{[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\lambda y_e.[\textbf{intelligent}(y)]_s)]_{\langle s,et\rangle}} \multimap_{\mathcal{E}} \quad [(\lambda g_{es}\lambda d_s\lambda x_e.g(x) > d)_{\langle es,\langle s,et\rangle\rangle}(\lambda y_e.[\textbf{intelligent}(y)])_s]_{\langle s,et\rangle}}{[\lambda d_s\lambda x_e.(\lambda y_e.[\textbf{intelligent}(y)])_s(x) > d]_{\langle s,et\rangle}} \text{def}_{\textbf{cmpr}}}{\lambda d_s.\textbf{intelligent}(x) > d} \Rightarrow_\beta$$

Figure 1: Proofs for *taller* & *more intelligent*

- We also adopt Wellwood's notational conventions for variables:

(11) **Notation conventions**

a. $x, y, z, \ldots$ range over entities of type e (entities)
b. $e, e', e'', \ldots$ range over entities of type v (events)
c. $d, d', d'', \ldots$ range over entities of type s (degrees)

- With these in hand, let us re-examine the meaning constructors for *-er* and *more* from (5a) and (5c) above, which are respectively repeated in (5.1a) and (5.1b).

- (12) $\lambda \mathcal{P}_{es}.[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}$

  (13) $\lambda \mathcal{P}_{es}.[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}$
  $(\ \lambda P_{et}.[\textbf{grade}_{\langle et,es\rangle}(P)]_{es}\ )$

- The function **cmpr** is the following function from Wellwood's (2019: 26, (63)) approach:[6]

(14) $\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle} := \lambda g_{es}\lambda d_s\lambda x_e.g(x) > d$

  - The function **cmpr** takes three arguments: a gradable predicate (type es), a degree scale (type s), and an individual.
  - The function applies the predicate of degrees to its entity argument and returns true if the entity's degree on the scale is greater than the degree taken as an argument.

- The function **grade** maps from predicates of entities (type $\langle e, t\rangle$) to the denotation of a gradable adjective, which is type $\langle e, s\rangle$, i.e. a function that maps entities to degrees.

(15) $\textbf{grade}_{\langle es,\langle et\rangle\rangle} := \lambda P_{et}\lambda x_e.P(x) = \top|[\exists d_s.P_\delta(x)]_s$

- The Glue proofs for two basic examples are shown in Figure 1. We return to **grade** in §6.4.

[6] Wellwood (2019: 31, (84)) subsequently generalizes this function so that its type e arguments are of a type that is ambiguous between entities and events, such that all instances are either entities or events, but we do not need this extra refinement for our purposes.

6 Resolve competitions

6.1 Containment via f-structure features

- The competition between *-er* (5a) and *-est* (5b) is located in the f-structures (and is thus codified in the exponenda, which are the left-hand side of the VIs).
- In (5a), *-er* is specified as exponing the contents of the template/macro @CMPR.
- In (5b), *-est* is specified as exponing the contents of the template @SUPR, which in turn calls the template @CMPR.
- Thus, superlative f-structures contain (are subsumed by) comparative f-structures.

(16) $\begin{bmatrix}\text{COMPARATIVE} & +\end{bmatrix}$

(17) $\begin{bmatrix}\text{COMPARATIVE} & + \\ \text{SUPERLATIVE} & +\end{bmatrix}$

- For f-structures containing the contents of @SUPR, $\mathbf{MostInformative}_f$ selects *-est*, which has the most features (Asudeh and Siddiqi 2023).

(18) $\mathbf{MostInformative}_f(\alpha,\beta)$ returns whichever of α,β has the most specific f-structure in the set of f-structures returned by Φ applied to α/β's collected f-description.[7]

Intuition. Prefer portmanteau forms, whenever possible, on f-structural grounds. Choose the VI that defines an f-structure that contains the greater set of features.

Formalization. The proper subsumption relation on f-structures (Bresnan et al. 2016: chap. 5) is used to capture the intuition.

Given two VIs, α and β,

$$\mathbf{MostInformative}_f(\alpha,\beta) = \begin{cases} \alpha \textbf{ if } \exists f \forall g. f \in \Phi(\pi_2(\alpha)) \wedge g \in \Phi(\pi_2(\beta)) \wedge g \sqsubset f \\ \beta \textbf{ if } \exists f \forall g. f \in \Phi(\pi_2(\beta)) \wedge g \in \Phi(\pi_2(\alpha)) \wedge g \sqsubset f \\ \perp \textbf{ otherwise} \end{cases}$$

- Given an f-structure that contains SUPERLATIVE, as in (17), the competition proceeds as follows.

(19)
$$\mathbf{MostInformative}_f\left(\overset{\underline{\textit{-er}}}{\langle [\text{G}], @\text{CMPR} \quad \lambda\mathcal{P}_{\langle d,et\rangle}.[\mathbf{cmpr}(\mathcal{P})]_{\langle d,et\rangle} \rangle}, \overset{\underline{\textit{-est}}}{\langle [\text{G}], @\text{SUPR} \quad \lambda\mathcal{P}_{\langle d,et\rangle}.[\mathbf{supr}(\mathcal{P})]_{\langle d,et\rangle} \rangle} \right)$$

$$= \mathbf{MostInformative}_f\left(\overset{\underline{\textit{-er}}}{\begin{bmatrix}\text{COMPARATIVE} & +\end{bmatrix}}, \overset{\underline{\textit{-est}}}{\begin{bmatrix}\text{COMPARATIVE} & + \\ \text{SUPERLATIVE} & +\end{bmatrix}} \right)$$

$= \textit{-est}$

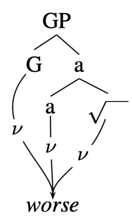
- The f-structure competition between *more* and *most* is identical.
- Given an f-structure that contains COMPARATIVE, but not SUPERLATIVE, as in (16), there is no competition, because the conditions for *-est* are not satisfied and *-er* is the only viable candidate.

[7] The function Φ is similar to the familiar ϕ from LFG, which LRFG also adopts. The difference is that ϕ maps c-structure nodes to the minimal f-structure that satisfies the mapping, whereas Φ maps f-descriptions to the minimal f-structures that satisfy them.

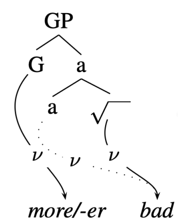
6.2 Suppletion in comparatives and superlatives

- We now turn our attention to suppletive comparatives, such as *worse*.
- The simplex suppletive form blocks both complex regular forms: *worse/*badder*[8]*/*more bad*.
- Therefore, a vocabulary item that spans multiple c-structure terminals (20a) must outcompete two vocabulary items that express equivalent information (20b).

(20) a.



b.



- In this competition, **MostInformative**$_c$ chooses the portmanteau form over the complex form.

∴ *Worse* is preferred over *badder* and *more bad*.

(21) **MostInformative**$_c(\alpha, \beta)$ takes two sets of vocabulary items α,β and returns whichever set is smaller.

Intuition. Prefer portmanteau forms, whenever possible, on c-structural grounds. Choose the set of VIs that realizes the greater span of c-structure nodes.

Formalization. We define the functions in (22) to aid the presentation, where c is a c-structure, f is an f-structure, and v is a vocabulary item.

Given a c-structure c and two sets of vocabulary items, α and β,
MostInformative$_c(\alpha, \beta) =$
$\alpha = \{x \mid x \text{ is a VI } \wedge \ \textbf{features}(x) \in \textbf{targets}(c) \wedge \forall y \exists z.[y \in \textbf{categories}(x) \wedge z \in \textbf{labels}(c) \wedge \pi_2(z) = y]\} \wedge$
$\beta = \{x \mid x \text{ is a VI } \wedge \ \textbf{features}(x) \in \textbf{targets}(c) \wedge \forall y \exists z.[y \in \textbf{categories}(x) \wedge z \in \textbf{labels}(c) \wedge \pi_2(z) = y]\}$

$$\begin{cases} \alpha \textbf{ if } |\alpha| < |\beta| \\ \beta \textbf{ if } |\beta| < |\alpha| \\ \bot \textbf{ otherwise} \end{cases}$$

(22) a. **extendedProj**$(f) := \{x \mid \phi(x) = f\}$
the set of c-structure nodes that map to f-structure f; the extended projection of f in c-structure

b. **yield**$(c) := \{n \mid n \text{ is a terminal node in } c\}$
the set of f-structures that c-structure c maps to

c. **labels**$(c) := \{\langle x, y\rangle \mid x \in \textbf{yield}(c) \wedge y = \lambda(x)\}$
a set of pairs where the first member is a node in c-structure c and the second member is the node's label/category

d. **targets**$(c) := \{f \mid f \text{ is an f-structure} \wedge \phi(c) = f \wedge \pi_1(\textbf{labels}(c)) \subseteq \textbf{extendedProj}(f)\}$
*the set of f-structures that c-structure c defines, such that the nodes in the first-coordinate of the **labels** of c are a subset of the **extendedProj** of f*

e. **categories**$(v) := \pi_1(\pi_1(v))$
the category list of v; we take the first coordinate (π_1) of the first coordinate of the VI.

f. **features**$(v) := \{f \mid f \text{ is an f-structure} \wedge \Phi(\pi_2(\pi_1(v))) = f\}$
the set of f-structures that the VI defines per its second coordinate (π_2)

[8] Note that the forms *badder* and *baddest* do exist in English, but not with the same meaning as *worse*.

[8] Recall that vocabulary items are pairs that map to a v-structure. This is equivalent to a set of pairs representing the input and the output of the function. But since the input is itself a pair and we want the first element of that pair, we take the first coordinate of the first coordinate of the VI.

[8] We now want the second coordinate of the first coordinate of the VI represented as an input/output pair; see footnote 8.

- Turning back to our example, take α to be *worse* and β to be *badder*.
  - α, β are expressing the same f-structural information and the same c-structural spans.
  - α is a set containing a single vocabulary item (the one for *worse*) and β is a set containing two vocabulary items (the ones for *bad* and *-er*).

  ∴ **MostInformative**$_c$ selects α/*worse*, since $|\{[\textit{worse}]\}| < |\{[\textit{bad}], [\textit{-er}]\}|$.
  - The same reasoning explains why *worse* is preferred by **MostInformative**$_c$ to *more bad*.
- Note that this version of **MostInformative**$_c$ essentially captures the *Minimize Exponence* principle of Siddiqi (2006, 2009).

6.3 Periphrasis versus affixation

- The phonological competition between *more* and *-er* is triggered by information in the v-structures, which are repeated in (23) and (24) respectively.

(23) $\begin{bmatrix} \text{PHONREP} & \text{/mɔɹ/} \\ \text{PFRAME} & (\cdot)_\omega \end{bmatrix}$

(24) $\begin{bmatrix} \text{PHONREP} & \text{/əɹ/} \\ \text{PFRAME} & ((\ \ )_\sigma(\cdot)_\sigma)_{ft} \\ \text{PDOMAIN} & (\ \ )_\omega \\ \text{DEP} & \text{LT} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & + \\ \text{PFRAME} & (\ \ )_\sigma((\ \ )_{\sigma=\mu}) \end{bmatrix} \end{bmatrix}$

- When two VIs have equivalent exponenda and are both phonologically licit, **MostSpecific** selects the VI with the most restricted distribution (Asudeh, Bögel, and Siddiqi 2023).

(25) **MostSpecific**(α, β) returns whichever vocabulary item has the most restrictions on its phonological context.

Intuition. Prefer affixes whenever possible.

Formalization. The proper subsumption relation on feature structures (i.e., v-structures) is used to capture the intuition.

Given two exponents (v-structures), α and β,

$$\textbf{MostSpecific}(\alpha, \beta) = \begin{cases} \alpha \textbf{ if } \beta\backslash\text{PHONREP} \sqsubset \alpha\backslash\text{PHONREP} \\ \beta \textbf{ if } \alpha\backslash\text{PHONREP} \sqsubset \beta\backslash\text{PHONREP} \\ \bot \textbf{ otherwise} \end{cases}$$

- As an affix, *-er* has a more restricted phonological environment than *more*, where the latter is the elsewhere case in this competition.

∴ According to **MostSpecific**, *bigger* is preferred to *more big*, for example.

6.4 Semantic restrictions on competition

- We return now to another question, which was initially raised in §5:

Q Why is **clutcher* ungrammatical but *more clutch* is not?

  - In particular, **MostSpecific** prefers *clutcher*, while **MostInformative**$_c$ and **MostInformative**$_f$ have no preference (they both *bork*, delivering $\bot$ as their output).
  - Foreshadowing a little, our answer is that **clutcher* simply fails semantically: there's nothing wrong with it morphosyntactically or morphophonologically.

- Recall from §5 that we take a distinction between the semantics of *-er* vs *more* (and *-est* vs *most*) to account for *more/most*'s greater freedom of distribution:

(26) De'Aaron Fox was more clutch/*clutcher than any other player last year.

(27) Kudrow's performance was more wooden/*woodener than Sorvino's.

- Gradable adjectives, like *tall* or *intelligent*, and non-gradable adjectives, like *clutch* or *wooden*, thus have different types:

(28) a. $[\![\textit{tall}]\!] = \lambda x_e.[\textbf{tall}(x)]_s$
b. $[\![\textit{intelligent}]\!] = \lambda x_e.[\textbf{intelligent}(x)]_s$

(29) a. $[\![\textit{clutch}]\!] = \lambda x_e.[\textbf{clutch}(x)]_t$
b. $[\![\textit{wooden}]\!] = \lambda x_e.[\textbf{wooden}(x)]_t$

  - In other words, *tall/intelligent*, map their entity arguments to the entity's degree of tallness/intelligence, whereas *clutch/wooden* map their entity arguments to true/false, i.e. denote whether the entity *is* clutch/wooden.

- Recall the vocabulary items from (5) above, focusing on the comparative ones to reduce clutter (the superlatives make the same point):

(5) a. $\langle$ [G], @CMPR $\lambda \mathcal{P}_{es}.[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}$ $\rangle \xrightarrow{\nu}$ $\begin{bmatrix} \text{PHONREP} & /\text{əɹ}/ \\ \text{PFRAME} & ((\ )_\sigma(\ \cdot\ )_\sigma)_{ft} \\ \text{PDOMAIN} & (\ )_\omega \\ \text{DEP} & \text{LT} \\ \text{HOST} & \begin{bmatrix} \text{IDENT} & + \\ \text{PFRAME} & (\ )_\sigma((\ )_{\sigma=\mu}) \end{bmatrix} \end{bmatrix}$

c. $\langle$ [G], @CMPR $\lambda \mathcal{P}_{es}.[\textbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}$ ($\lambda P_{et}.[\textbf{grade}_{\langle et,es\rangle}(P)]_{es}$) $\rangle \xrightarrow{\nu}$ $\begin{bmatrix} \text{PHONREP} & /\text{mɔɹ}/ \\ \text{PFRAME} & (\ \cdot\ )_\omega \end{bmatrix}$

- The **grade** function, which only *more* can contribute, maps a predicate of entities to a function from entities to degrees.

(30) $\textbf{grade}([\![\textit{clutch}]\!]) = \lambda x_e.\textbf{clutch}(x) = \top | [\exists d_s.\textbf{clutch}_\delta(x)]_s$

- In short, the optional **grade** meaning constructor in the VI for *more* (and *most*) allows composition with a non-gradable adjective, whereas *-er* (and *-est*) does not have this capacity.

- Figure 2 shows the computations.

***clutcher**

$$\dfrac{\overset{\textit{clutch}}{[\lambda y_e.[\mathbf{clutch}(y)]_t]_{et}} \quad \overset{\textit{-er}}{\lambda \mathcal{P}_{es}.[\mathbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}}}{} \not\vdash$$

more clutch

$$\dfrac{\overset{\textit{clutch}}{[\lambda z_e.[\mathbf{clutch}(z)]_t]_{et}} \quad \overset{\textit{more}_2}{\lambda P_{et}[\lambda y_e.[\mathbf{grade}_{\langle et,es\rangle}(P)(y)]_s]_{es}}}{[\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\lambda z_e.[\mathbf{clutch}(z)]_t)(y)]_{es}} \multimap_{\mathcal{E}}$$

$$\dfrac{[\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\lambda z_e.[\mathbf{clutch}(z)]_t)(y)]_{es}}{[\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y))]_{es}} \Rightarrow_\beta$$

$$\dfrac{[\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y))]_{es} \quad \overset{\textit{more}_1}{\lambda \mathcal{P}_{es}.[\mathbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}(\mathcal{P})]_{\langle s,et\rangle}}}{\mathbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}[\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y))]_{es})]_{\langle s,et\rangle}} \multimap_{\mathcal{E}}$$

$$\dfrac{\mathbf{cmpr}_{\langle es,\langle s,et\rangle\rangle}[\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y))]_{es})]_{\langle s,et\rangle} \quad [(\lambda g_{es}\lambda d_s\lambda x_e.g(x) > d)_{\langle es,\langle s,et\rangle\rangle}([\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y))]_{es})]_{\langle s,et\rangle}}{[\lambda d_s\lambda x_e.(\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y)))(x) > d]_{\langle s,et\rangle}} \text{def}_{\mathbf{cmpr}}$$

$$\dfrac{[\lambda d_s\lambda x_e.(\lambda y_e.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(y)))(x) > d]_{\langle s,et\rangle}}{[\lambda d_s.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(x)) > d]_{\langle s,et\rangle}} \Rightarrow_\beta$$

$$\dfrac{[\lambda d_s.\mathbf{grade}_{\langle et,es\rangle}(\mathbf{clutch}(x)) > d]_{\langle s,et\rangle}}{[[\lambda d_s.[\lambda P_{et}\lambda x_e.P(x) = \top | \exists d_s.P_\delta(x)]_{\langle et,es\rangle}(\mathbf{clutch}(x))]_{es} > d]_{\langle s,et\rangle}} \text{def}_{\mathbf{grade}}$$

$$\dfrac{[[\lambda d_s.[\lambda P_{et}\lambda x_e.P(x) = \top | \exists d_s.P_\delta(x)]_{\langle et,es\rangle}(\mathbf{clutch}(x))]_{es} > d]_{\langle s,et\rangle}}{\lambda d_s.[\lambda x_e.\mathbf{clutch}(x) = \top | \exists d_s.\mathbf{clutch}_\delta(x)] > d} \Rightarrow_\beta$$

Figure 2: Proofs for **clutcher* (unsuccessful) & *more clutch*

- In sum, the competition between, e.g., **clutcher* and *more clutch* as well as the putative optionality of *more red*/*redder* is a function of the gradability of the adjective, as resolved by the Glue Semantics.
- In particular, the base semantics of *more* and *-er* is the same, as indicated by the single, obligatory meaning constructor which occurs in each of their VIs in (5a) and (5c); but *more* also optionally contributes a meaning constructor that maps an ordinary property to a gradable property.
- Therefore, *more* is correctly predicted to be able to compose with non-gradables such as *clutch*, while *-er* is correctly predicted to not occur with such adjectives.

6.5 Putative optionality

- Lastly, let us turn to how overt comparative clauses interact with gradability.

(31) a. Max is more *proud* than happy.
b. *Max is prouder than happy.
c. *Max is *prouder* than happy.

(32) a. Max is more *proud* than he is happy.
b. Max is prouder than he is happy.

- In (31), the comparative complement is a simple adjective, *happy*.
  - In (31a), the analytical comparative morpheme *more* is permitted, if the adjective is stressed/focused. ‘
  - In contrast, (31b–c) show that the synthetic comparative is ungrammatical, whether or not the comparative adjective is stressed/focused.
- In (32), the comparative complement is a tensed clause, *he is happy*.
  - First, we observe that, at least on the face of it, (31a) and (32a) mean the same thing.
  - Second, we observe that (31a)/(32a) do not mean the same thing as (32b).
- We take this as evidence that *Max is proud* is ambiguous.

1. In one structure/reading, *proud* is non-gradable.
   - The lack of gradability is reflected by the required emphasis on the adjective.
2. In the second, *proud* is gradable.
   - The gradability is reflected by the fact that emphasis on the adjective makes no difference.

- We present the data again sorted accordingly.

(33) Ungradable
a. Max is more *proud* than happy.
b. Max is more *proud* than he is happy.

(34) Gradable
a. *Max is prouder than happy.
b. Max is prouder than he is happy.

- The ungradable structure/reading (33) has two properties:

1. The synthetic comparative morpheme -*er* is illicit.
   - The analytic comparative morpheme *more* is licit, which we expect in ungradable environments (see above).
2. Both the simple (adjectival) and complex (clausal) complements are licit.

- The gradable structure/reading (34) has the opposing properties:

1. The synthetic comparative morpheme -*er* is licit.
2. But it is only licit if the comparative complement is complex (clausal), not simple (adjectival).

- We now have an account of why the following examples from the introduction are both licit.

(3) I am even madder.

(4) I am even more mad.

  - It is not the case that there is true optionality here, but rather that there are two different structures/readings in play.
  - We leave the exact nature of the semantic distinction for future work, but one analysis option is to postulate an inverse function to **grade** — call it **degrade** — that takes a gradable adjective and returns a related ungradable predicate of entities.

7 Conclusion

- Now you know how to L$_{\text{R}}$FG!

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