

The importance of having a degree: A semantic approach to short and long form adjectives in BCMS

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The data

- Long form (LF) vs. short form (SF) adjectives (As) in attributive position in Bosnian/Croatian/Montenegrin/Serbian (BCMS)
 - (1)
 - a. plav kaput
blue.SF coat
 - b. plav-i kaput
blue-LF coat
- Descriptively observed tendency: Correlation with nominal (in)definiteness (2) (Maretić, 1963; Stevanović, 1986)
 - (2)
 - a. jedan velik kaput
one big.SF coat
 - b. taj velik-i kaput
this big-LF coat

Previous (syntactic) analyses

- LF/SF as **evidence for** a syntactic **DP** layer in BCMS
 - Nominal (in)definiteness [\pm DEF] (Progovac, 1998; Leko, 1999)
 - Nominal (non-)specificity [\pm SPEC] (Aljović, 2002)
- **No-DP analyses** (e.g. Zlatić, 1997; Trenkic, 2004; Bošković, 2005):
 - Adjectives are optional (+ other evidence against a DP)
 - SF/LF distinction still signals nominal \pm DEF (e.g. Despić, 2011) or \pm SPEC (e.g. Talić, 2017)

Problems for nominal $\pm_{\text{DEF}}/\pm_{\text{SPEC}}$ accounts

- LFs in indefinite and/or non-specific contexts

e.g. in existential constructions (3-a) (after Trenkic, 2004)

e.g. with non-specifically interpreted indefinite pronouns (3-b)

- (3) a. Kad uđeš u sobu, na sredini je okrugl-i sto.
 when enter.2SGPRS in room on middle is round-LF table
 'As you enter the room, there is a round table in the center.'
- b. Treba mi neki velik-i kaput.
 needs me some big-LF coat
 'I need a big coat.'

- SFs in definite and/or specific contexts, e.g. with demonstratives (4)

- (4) Volim taj velik kaput.
 love.1SGPRS that big.SF coat
 'I love that big coat.'

Stanković (2015)

	definite	specific	unique	stage-level	subsective	restrictive
LF	±	±	±	±	±	±
SF	–	–	–	–	–	–

- Stanković's analysis:

- LF: unmarked / SF: marked
- Split DP (following Giusti, 2005): [NumP [PartP ... [NP]]]
- Each layer subdivides into Spec(ific)P and Def(inite)P where heads carry either + or – values for the respective categories.
- LF: agreement with a + valued head in any of these projections
- SF: agreement with – valued heads

Problematic data in, e.g., (4) (SF in +DEF/SPEC contexts)

- Stipulation: L(ogical)F(orm) movement of the AP outside the domain of both DP layers, escaping syntactic agreement

Our alternative proposal

- LF/SF distinction signals **Definiteness of Degree** (DoD).
 - **Precedent**: Marušič and Žaucer's (2014) analysis of the particle *ta* in colloquial Slovenian
 - **Syntactic implementation** [**left aside in this talk**]: functional Degree projection above AP, following Corver (1997)
 - **Semantic implementation** [**this talk**]: LF morphology as definiteness marking for degrees (in analogy to definite articles with nominals)

Advantages of this account

- explains data left unaccounted for by nominal \pm DEF/SPEC accounts
- explains (some) gaps in adjectival paradigms, where certain adjectives (in some contexts) lack or disprefer SFs or LFs
- is supported by linear models on quantitative corpus data (Kovačević et al., 2025) [**see appendix**]

Standard assumptions about gradable As

(e.g. Kennedy and McNally, 2005)

- involve **scale structure**
- express a relation between an entity x and a **degree** d (a point on the scale), e.g. (5) (K&McN: 349)

$$(5) \quad \llbracket \text{expensive} \rrbracket = \lambda d \lambda x. \text{expensive}(x) = d$$

- K&McN: The degree argument gets **existentially closed** in the further derivation.

Standard assumptions about gradable As (K&McN)

- 2 options for existential closure of d :

- by a **null degree morpheme** *pos*, which locates d on the scale with respect to a contextually determined standard (6-a) (K&McN: 350) (**C**: comparison class)
- by **degree modification** (incl. comparatives etc.) (6-b) (K&McN: 367) (**R**: some restriction on the degree argument of the adjective, specific to the individual degree modifier)

$$(6) \quad \begin{array}{l} \text{a. } \llbracket pos \rrbracket = \lambda G \lambda x \exists d [\mathbf{standard}(d)(G)(\mathbf{C}) \wedge G(d)(x)] \\ \text{b. } \llbracket \text{Deg}(P) \rrbracket = \lambda G \lambda x \exists d [\mathbf{R}(d) \wedge G(d)(x)] \end{array}$$

e.g. (7), (8), where d_c is the degree introduced by the comparative clause (cf. K&McN: 368f.)

$$(7) \quad \begin{array}{l} \text{a. } \llbracket \text{two meters} \rrbracket = \lambda G \lambda x. \exists d [d \succeq \mathbf{two\ meters} \wedge G(d)(x)] \\ \text{b. } \llbracket \text{two meters tall} \rrbracket = \lambda x. \exists d [d \succeq \mathbf{two\ meters} \wedge \mathbf{tall}(x) = d] \end{array}$$

$$(8) \quad \llbracket \text{er/more than } d_c \rrbracket = \lambda G \lambda x. \exists d [d \succ d_c \wedge G(d)(x)]$$

Our modifications to this system

- The degree (the point on the scale) can be (in)definite (unique or anaphoric), and (epistemically and/or scopally) (non)specific.
- Also non-gradable As involve scale structure. (following Sassoon, 2013)
 - Gradability is a reflex of vagueness resolution.
 - Less vague or sharp/crisp predicates appear less or non-gradable because they involve a trivial 2-point scale ($[0,1]$).
- We dissociate degree modification from existential closure of d .
(following Bierwisch et al., 2024)
 - Degree modification adds further conditions on d .
 - Existential (or other) import does not depend on this.

Our proposal for LFs in BCMS

- **Existential closure** is just one way of binding d .
 - This is the standard way in languages that lack definiteness marking in the degree domain, such as English.
 - BCMS has a **definite marker** in the degree domain: adjectival LF morphology; tentatively formalised as in (9)

$$(9) \quad \llbracket pos + LF \text{ morphology} \rrbracket \\ = \lambda G \lambda x. \iota d [\mathbf{standard}(d)(G)(\mathbf{C}) \wedge G(d)(x)]$$

NB Direct parallels to nominal definiteness in article- vs. articleless languages (Heim, 2011; Šimík and Demian, 2020; Seres and Borik, 2021)

- In the absence of (in)definite articles, languages like, e.g., Russian, always involve existential closure of x .
- Definiteness effects are due to context and/or world knowledge.
- **Prediction** [of the general idea]: When d is determinate, (contextually) unique (incl. anaphoric to another degree in the context) and/or specific, we get the LF, and the SF should be banned.

Argument #1: Paradigmatic gaps

- **Missing SFs** with relational and spatial As:

- (10) a. $\{*\textit{seo-sk-}\emptyset / \textit{seo-sk-i}\}$ *put* 'village road'
 b. $\{*\textit{glav-an-}\emptyset / \textit{glav-n-i}\}$ *istraživač* 'head/main researcher'
 c. $\{*\textit{pred-nj-}\emptyset / \textit{pred-nj-i}\}$ *točak* 'front wheel'

These As are also **non-gradable** (11)

- (11) a. $*\textit{seo-sk-ij-i}$ 'village-ADJ-COMP-LF'
 b. $??\textit{glav-n-ij-i}$ 'head-ADJ-COMP-LF'
 c. $*\textit{pred-nj-ij-i}$ 'front-ADJ-COMP-LF'

→ **Our explanation:** These are crisp predicates, which involve definite/specific points on the scale (1; nothing in between 0 and 1).

NB In some cases, non-gradable As can be coerced into gradable predicates, by moving to a typicality scale (e.g. (11-b)).

The gaps cannot (always) be explained phonologically

- Some of the most frequent suffixes that derive As lacking SFs introduce phonological structures that are not attested word-finally (e.g. suffix *-sk*), so the SF would require a phonological repair (Simonović, 2016).

→ Possible phonological explanation of the gap for these

BUT There are also minimal pairs, and the phonological explanation cannot be extended to those; e.g. suffix *-(a)n*:

- (12) a. {rad-n-i / rad-an-∅ / rad-n-iji} čovek
 work-AN-LF work-AN-SF work-AN-COMP man
 'a/the (more) diligent/hardworking man'
- b. {rad-n-i / *rad-an-∅ / *rad-n-iji} dan
 work-AN-LF work-AN-SF work-AN-COMP day
 'a/the work day'

Further paradigmatic gaps that we set aside

- Missing SFs with deverbal As:

(13) a. $\{*\textit{let-eć-}\emptyset / \textit{let-eć-i}\}$ *objekt* 'flying object'
 b. $*\textit{leteć-ij-i}$ 'flying-COMP-LF' [active participle]

(14) a. $\{*\textit{umr-l-}\emptyset / \textit{umr-l-i}\}$ *čovek* 'deceased man'
 b. $*\textit{umrl-ij-i}$ 'deceased-COMP-LF' [attributive *l*-participle]

- Can probably be integrated into our proposal; additional future research: event/scale structure underlying the verbal predicates

Argument #2: LF with specific degree modifiers

- Strong preference for LFs over SFs with **specific measure phrases**:

(15) dva metra {??visok- \emptyset / visok-i} čovek
 two meters tall-SF tall-LF man
 'a/the two-meter tall man'

- BCMS **comparative (and superlative) forms** always appear in LF:

(16) a. {novij-i / bolj-i / plavlj-i} kaput
 newer-LF better-LF bluer-LF coat
 '(a/the) newer / better / bluer coat'
 b. *{novij- \emptyset / bolj- \emptyset / plavlj- \emptyset } kaput

Argument #2: LF with specific degree modifiers

- **Assumption:** Both measure phrases and comparatives/superlatives operate on degree intervals, following Bierwisch et al. (2024).
 - Measure phrases like '2 meters': The relevant endpoint on this interval is specified and thus requires definiteness marking.
 - Comparatives/superlatives involve anaphoric definiteness.

Recall analysis in Kennedy and McNally (2005, 368f.):

- (17) a. $\llbracket \text{two meters} \rrbracket = \lambda G \lambda x. \exists d [d \succeq \text{two meters} \wedge G(d)(x)]$
 b. $\llbracket \text{two meters tall} \rrbracket = \lambda x. \exists d [d \succeq \text{two meters} \wedge \text{tall}(x) = d]$
- (18) $\llbracket \text{er/more than } d_c \rrbracket = \lambda G \lambda x. \exists d [d \succ d_c \wedge G(d)(x)]$

Argument #3: SF with non-specific degree modifiers

- **Non-specific degree modifiers** like *veoma* 'very' disprefer LFs:

(19) *veoma* {*mlad-∅* / ??*mlad-i*} *čovjek*
 very young-SF young-LF man
 'a/the very young man'

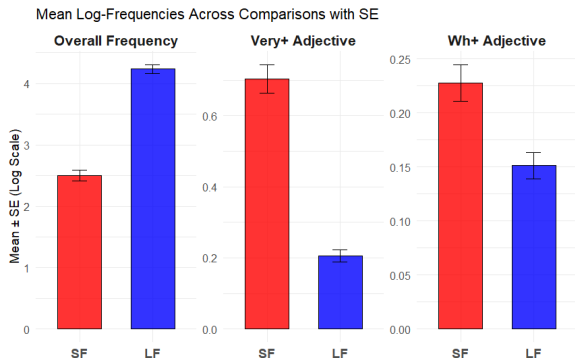
→ These are mere standard boosters, which still only involve an indefinite degree on the scale.

- **Wh-degree words** like *kolik* 'how much' disprefer LFs:

(20) *Koliko* {*značajan-∅* / **značajn-i*} *faktor si*
 how-much significant-SF significant-LF factor AUX.2SG
otkrio?
 discovered
 'How significant a factor did you discover?'

Quantitative support (more in the appendix)

- SF frequency is strongly associated with the frequency of comparatives.
- LF is significantly more frequent overall ($t = 16.745$, $p < 2.2 \times 10^{-16}$).
- SF is significantly more frequent in combination with:
 - *veoma* 'very' ($t = -14.256$, $p < 2.2 \times 10^{-16}$)
 - *koliko* 'how-much' ($t = -3.6678$, $p < 0.0003$)



Argument #4: SF-LF-co-occurrence

- **Co-occurring SFs and LFs** within the same NP challenge nominal \pm DEF/ \pm SPEC accounts; for example (21) (attested online):

(21) Treba mi [običn-i jeftin-i pouzdan quartz sat].
 need me regular-LF cheap.LF reliable.SF Quartz watch
 'I need a regular reliable cheap Quartz watch.'

- LF *obični* 'regular': relational A, non-gradable (crisp predicate, lacks comparative form: ??*običniji*)
- LF *jeftini* 'cheap': discourse-unique (native speakers' intuition)
- SF *pouzdan* 'reliable': The degree is not unique in the context of (Quartz) watches.

Revisiting the problems for nominal $\pm_{\text{DEF}}/\pm_{\text{SPEC}}$ accounts

- LFs in indefinite and/or non-specific contexts

- (22) a. Kad uđeš u sobu, na sredini je okrugl-i sto.
 when enter.2SGPRS in room on middle is round-LF table
 'As you enter the room, there is a round table in the center.'
- b. Treba mi neki velik-i kaput.
 needs me some big-LF coat
 'I need a big coat.'

- SFs in definite and/or specific contexts

- (23) Volim taj velik kaput.
 love.1SGPRS that big.SF coat
 'I love that big coat.'

- Our explanation:

(22-a) Crisp predicate (lacks comparative form: ??*okrugliji*)

(22-b) Speaker needs a coat of a specific degree of bigness (known size)

(23) The degree of 'big' is not specified or discourse-unique.

Summary and implications

- If correct, the analysis presents a case for a cross-linguistically rare **morphological category of definiteness**, DoD, which sheds new light on both definiteness and degree in natural language.

Open issues within the scope of this proposal:

- **(In)definiteness** (uniqueness / anaphoricity / familiarity) **and/or** **(non)specificity** (epistemic / scopal / partitive / determinate)?
 - Explore the parallels to the nominal domain further (incl. Maximize Presupposition, anti-presupposition etc. when a language has grammaticalised definiteness marking)
- **Participles?** (require LFs)
 - Explore the potential role of the event/scale structure underlying the verbal predicates

Open issues outside the scope of the proposal

- Missing LFs with possessives:

- (24) a. $\{Petr-ov-\emptyset / *Petr-ov-i\}$ *auto* 'Peter's car'
 b. $*Petrov-ij-i$ 'Peter's-COMP-LF'

- Simonović and Kovačević (2022): *-ov* attaches to a referential, gender-marked N (a full phasal *n* head); prosodic faithfulness to N, full productivity, semantic transparency
 → Such As contain too much (independent) nominal structure to allow additional adjectival structure responsible for LF?

NB Relational As are different: non-referential N, “true” adjectives (see, e.g., McNally and Boleda, 2004; Boleda et al., 2012; Arsenijević et al., 2014)

- Ignored in this talk:** Tendency to replace attributive SFs by LFs in some dialects, potential loss of attributive SFs overall.
 - Corpus data: With some (highly frequent) As, which display a lexically determined preferences for LFs, this process might be more advanced.

Hvala!

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Quantitative corpus study

- Sample: 1100 most frequent adjectival lemmas in the Serbian Web Corpus srWaC (Ljubešić and Klubička, 2016)
- Drawing frequency data (number of attestations) for:
 - the lemma itself (in the first 100 million tokens)
 - nominative singular masculine form of the lemma (SF and LF)
 - nominative singular masculine comparative form
 - nominative singular masculine form (SF and LF) preceded by the indefinite modifier *veoma* 'very'
 - nominative singular masculine form (SF and LF) preceded by the wh degree modifier *koliko* 'how-much'

Data Collection

- Procedure
 - Dedicated CQL queries automatically generated for each of the targeted measures for each of the 1100 adjectival lemmas (function REGEXREPLACE in MS Excel).
 - Customized Python script (Kovačević, 2025a) developed to execute the queries automatically via API calls and output a spreadsheet with frequency data replacing CQL expressions (Kovačević, 2025b).

Data Processing and Analysis

- Raw frequency data were log-transformed to comply with Zipf's law and stabilize the variance.
- 2 linear models:
 - Model 1 predicts LF frequency based on overall lemma frequency and the frequency of the comparative form.
 - Model 2 predicts SF frequency based on overall lemma frequency and the frequency of the comparative form.
- Means comparisons
 - t-test comparing overall frequencies of LF and SF
 - t-test comparing frequencies of LF and SF in combination with the degree modifier *veoma* 'very'
 - t-test comparing the frequencies of LF and SF in combination with the *wh*- degree modifier *koliko* 'how-much'

LF frequency unaffected by COMP frequency

The frequency of LF is purely a function of the overall frequency of the lemma.

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-5.12860	0.72975	-7.028	3.68e-12***
log_frequency	1.11375	0.08789	12.672	<2e-16***
log_COMPfreq	0.01401	0.03486	0.402	0.688

Residual standard error: 2.28 on 1096 degrees of freedom
 Multiple R-squared: 0.1391, Adjusted R-squared: 0.1375
 F-statistic: 88.55 on 2 and 1096 DF, p-value: <2.2e-16

Table 1: Linear regression results predicting $\log(\text{LFfreq})$ from $\log(\text{frequency})$ and $\log(\text{COMPfreq})$.

Note: Signif. codes: 0***, 0.001**, 0.01*, 0.05, 0.1, 1.

SF frequency strongly associated with COMP frequency

The frequency of SF is primarily a function of the frequency of the comparative form of the lemma and only secondarily the overall frequency of the lemma.

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.0008565	0.6022461	0.001	0.9989
log_frequency	0.1425999	0.0725317	1.966	0.0495*
log_COMPfreq	1.0072073	0.0287682	35.011	<2e-16***

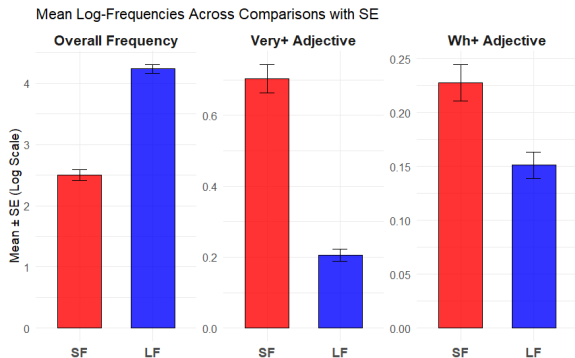
Residual standard error: 1.882 on 1096 degrees of freedom
 Multiple R-squared: 0.556, Adjusted R-squared: 0.5552
 F-statistic: 686.3 on 2 and 1096 DF, p-value: <2.2e-16

Table 2: Linear regression results predicting $\log(\text{SFfreq})$ from $\log(\text{frequency})$ and $\log(\text{COMPfreq})$.

Note: Signif. codes: 0***, 0.001**, 0.01*, 0.05, 0.1, 1.

Means Comparison

- LF is significantly more frequent overall ($t = 16.745$, $p < 2.2 \times 10^{-16}$).
- SF is significantly more frequent in combination with:
 - the indefinite/non-specific degree modifier *veoma* 'very' ($t = -14.256$, $p < 2.2 \times 10^{-16}$)
 - the degree modifier *koliko* 'how-much' ($t = -3.6678$, $p < 0.0003$)



Discussion

- LF v. SF distinction is heavily influenced by the gradability of the adjective.
- This link is unexpected on any account that ties it to nominal definiteness or specificity.
- It is, however, predicted if the distinction signals DoD.

Statistic	Value
t-value	-14.256
Degrees of Freedom (df)	1098
p-value	$< 2.2 \times 10^{-16}$
95% CI Lower Bound	-0.5658610
95% CI Upper Bound	-0.4289378
Mean Difference	-0.4973994

Table 3: Paired samples t-test comparing `log_deg[very]_LFfreq` and `log_deg[very]_SFfreq`.

Results

Statistic	Value
Test Type	Paired t-test
Data	log_LFfreq vs log_SFfreq
t-statistic	16.745
Degrees of Freedom (df)	1098
p-value	< 2.2e-16
Alternative Hypothesis	True mean difference $\neq 0$
95% Confidence Interval	(1.534832, 1.942261)
Mean Difference	1.738546

Table 4: Paired t-test results comparing log_LFfreq and log_SFfreq

Paired t-Test: Wh+ Adjective

Paired t-test Results

Statistic	Value
Data	<i>df\$log_wh_LFfreq vs. df\$log_wh_SFfreq</i>
t-statistic	-3.6678
Degrees of Freedom (df)	1099
p-value	0.0002564
Alternative Hypothesis	True mean difference $\neq 0$
95% Confidence Interval	(-0.1173, -0.0355)
Mean Difference	-0.0764