Semantic Correlates of the NP/DP Parameter

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1.   Introduction
1.1   The NP/DP Parameter

Bošković (2008) shows a number of wide-ranging grammatical phenomena correlate with the presence or absence of articles; see the list in (1) below. These generalizations, which are syntactic and semantic in nature, indicate that there is a fundamental difference in the traditional noun phrase (TNP) of languages with and languages without articles that cannot be reduced to phonology (overt vs. null articles).[1] Furthermore, Bošković shows the generalizations can be explained if languages that lack articles lack DP altogether. (For other 'no DP' analyses of at least some such languages, see Fukui 1988, Corver 1992, Zlatić 1997, Chierchia 1998, Cheng & Sybesma 1999, Willim 2000, Baker 2003.)

(1)   **Generalizations** (see Bošković 2008 and references therein)
    a. Only languages without articles may allow left-branch extraction as in (2b)
    b. Only languages without articles may allow adjunct extraction from TNPs
    c. Only languages without articles may allow scrambling
    d. Multiple-wh fronting languages without articles do not show superiority effects
    e. Only languages with articles may allow clitic doubling
    f. Languages without articles do not allow transitive nominals with two genitives
    g. Head-internal relatives display island sensitivity in languages without articles, but not in languages with articles
    h. Polysynthetic languages do not have articles
    i. Only languages with articles allow the majority reading of MOST
    j. Article-less languages disallow negative raising; those with articles allow it

The focus of this paper is explaining generalizations (1i) and (1j), which are semantic in nature. We show that, when combined with Hackl's (to appear) semantics for MOST and

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[1] We use the term TNP to refer to noun phrases without committing to their categorical status. Note that what is important here is the presence/absence of definite articles in a language, see Bošković (2008).
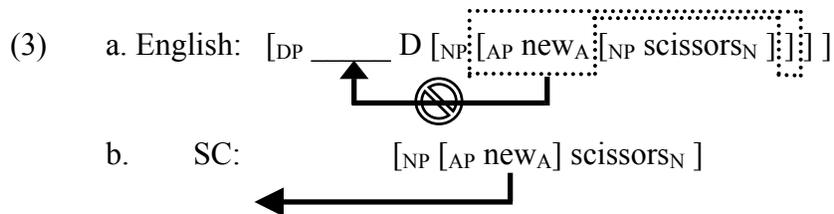
Gajewski's (2005, 2007) approach to negative raising, these generalizations also follow directly from the proposal that article-less languages lack the DP projection altogether. In the next section, we give an example of how Bošković's deductions of (1) work.

1.2   Sample of the Logic of Bošković's (2008) Approach: Explaining (1a)

English and other languages with articles do not allow extraction of adjectives from TNP; a number of article-less languages, e.g. Serbo-Croatian (SC), allow it:

(2)   a. *New$_i$ he is buying [t$_i$ scissors]
       b. Nove$_i$ on   kupuje [t$_i$ makaze]   (SC)
          new   he   buys   scissors
          'He is buying new scissors.'

Assume DP is a phase (see Svenonius 2004, Bošković 2005). As a result, given the PIC, which requires movement out of a phase to proceed via the edge of a phase, movement out of DP must proceed via SpecDP. However, movement of NP-adjoined AP to SpecDP violates anti-locality (see, e.g., Bošković 1994, 1997, Grohmann 2003, Abels 2003, Ticio 2003, Boeckx 2007), the ban on movement that is too short which requires movement to cross at least one full phrasal boundary. In (3a), the movement crosses only one segment of NP. The problem does not arise in languages that lack DP (see Bošković 2005 and Appendix 2 for an alternative account that does not appeal to phases/anti-locality).

(3)   a. English: [$_{DP}$ _____ D [$_{NP}$ [$_{AP}$ new$_A$ [$_{NP}$ scissors$_N$]]]]

       b.   SC: [$_{NP}$ [$_{AP}$ new$_A$] scissors$_N$]

This account extends to (1b) given that NP adjuncts are also NP-adjoined.

2.   MOST and the NP/DP Parameter

We now turn to (1i), which concerns the interpretation of MOST cross-linguistically. We identify MOST as the morphological superlative (-EST) of a quantity expression (MANY). Cross-linguistically the form MOST is associated with two distinct readings: the majority reading (4) and the relative reading (5).

(4)   Bill owns most Radiohead albums.
       "Bill owns <u>more than half</u> of the Radiohead albums."

(5)   BILL owns the most Radiohead albums.
       "Bill owns <u>more</u> Radiohead albums <u>than any relevant alternative</u> individual does."

The relative reading unlike the majority reading requires focus and a set of relevant alternatives. Note that the two readings are independent. If Bill owned 5 of the 9 albums

he would own most, though not the most if someone else owned 7. Similarly, in some contexts, if Bill owned 3, he might own the most but he would not own most.[2]

2.1 Availability of Majority Reading Depends on Articles

Živanovič (2007) observes that in Slovenian, a language without definite articles, the sentence (6) has the relative reading, but not the majority reading. (To express the majority reading, Slovenian uses the noun *večina* "majority." We set such cases aside, as being outside the generalization about superlative forms.)

(6)   Največ ljudi   pije PIVO.   (Slovenian)
        most   people drink beer
        'More people drink beer than drink any other beverage.'
        (Unavailable reading: 'More than half the people drink beer.')

In English, MOST gives rise to both readings, though in different contexts. In German, the same form MOST is associated with both meanings (the relative reading requires focus):

(7)   Die meisten Leute trinken Bier.
         the most   people drink   beer.
        'More than half the people drink beer.'
        'More people drink beer than any other drink.' (with focus on *beer*.)

Živanovič (2007) shows that allowing the majority reading for the superlative correlates with having articles. English, German, Macedonian, Dutch, Bulgarian, Norwegian, Hungarian, and Romanian have articles and allow the majority reading; SC, Slovenian, Czech, Turkish, Polish and Punjabi lack articles and do not allow the majority reading.

(8)   a. Every language that allows the majority reading of MOST has a definite
        determiner.
        b. Every language that has a definite determiner (and has MOST) allows the
        majority reading.

2.2 Both Readings of MOST Derive from Superlative Semantics

To understand how the presence or absence of the majority reading could be affected by cross-linguistic variation in syntax, we must understand how the majority and relative readings both derive from the superlative of MANY. The answer is provided by Hackl (to appear). Hackl shows that, if MOST is analyzed as the superlative of MANY, the majority and relative readings of most reduce to narrow and wide scope for –EST, respectively, with respect to the containing TNP. Here are the ingredients of Hackl's analysis:

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[2] We will not attempt to explain why the reading of MOST in English is controlled by the presence of the definite article *the*.

A. MANY has a modificational meaning of type $<d,<<e,t>,<e,t>>>$, unlike other gradable adjectives, like *tall*, whose denotation is type $<d,<e,t>>$:

(9) $[\![$ MANY $]\!](d)(N) = \lambda x.[N(x) \ \& \ |x| \geq d]$

B. The superlative is a degree quantifier (cf. Heim 1999). C is the set of contextually relevant alternatives and D is a relation between degrees and individuals:
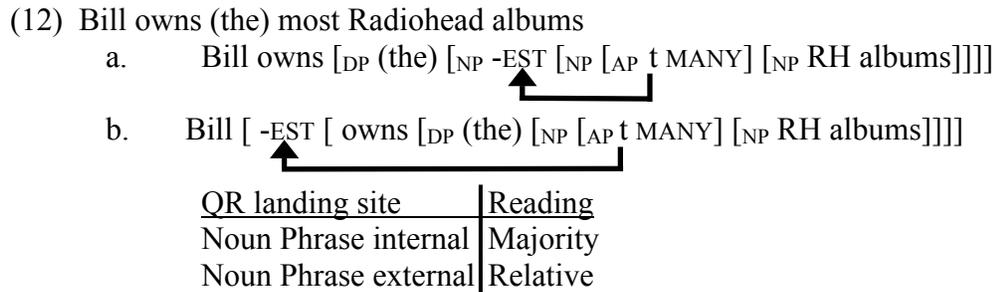
(10)   a. $[\![$-EST$]\!](C)(D)(x)$ is defined only if $x \in C \& \exists y[y \neq x \ \& \ y \in C] \& \forall y \in C[\exists d \ D(d)(y)]$
        b. $[\![$-EST$]\!](C)(D)(x) = 1$ iff
                $\forall y \in C[y \neq x \rightarrow \max\{d:D(d)(x)\} > \max\{d:D(d)(y)\}]$

C. MOST = MANY + -EST. -EST is generated in the degree argument position of MANY, namely SpecAP. Due to a type mismatch, -EST must QR.

(11)   MOST = $[_{AP}$ $[_{DegP}$ -EST$_C$ $]$ $[_{A'}$ MANY $]$ $]$
                      $<<d,<e,t>>,<e,t>>$ $<d,<<e,t>,<e,t>>$ mismatch!

When it moves, -EST must target a node of type $<e,t>$. One option is local adjunction to NP. Otherwise, -EST can move out of the TNP completely (Szabolcsi 1986, Heim 1999).

(12) Bill owns (the) most Radiohead albums
        a.   Bill owns $[_{DP}$ (the) $[_{NP}$ -EST $[_{NP}$ $[_{AP}$ t MANY$]$ $[_{NP}$ RH albums$]]]]$

        b.   Bill $[$ -EST $[$ owns $[_{DP}$ (the) $[_{NP}$ $[_{AP}$ t MANY$]$ $[_{NP}$ RH albums$]]]]$

QR landing site	Reading
Noun Phrase internal	Majority
Noun Phrase external	Relative

Movement out of TNP yields the relative reading: when –EST lands beneath the subject, this establishes that individuals will be compared on the number of albums owned. Hackl's achievement is in showing that TNP-internal scope yields the majority reading. The key to achieving this result is interpreting non-identity of pluralities as non-overlap.

(13) $[$ -EST$_i$ $[$ t$_i$ MANY$]$ RH albums $]$

Under this assumption, the constituent (13) denotes a predicate true of a plurality of RH albums if it contains more RH albums than any other non-overlapping plurality of RH albums. The pluralities of RH albums that contain more RH albums than any non-overlapping RH album are precisely those that contain more than half the RH albums. A covert existential determiner quantifies over these, yielding the majority reading.

2.3 Our Proposal

We propose to explain Živanovič's generalization through the effects of Bošković's hypothesis on Hackl's analysis of the two readings of MOST. The local movement of -EST Hackl uses to derive the majority reading is adjunction to NP. We argue the NP/DP parameter determines whether adjunction to NP is possible, the adjunction being disallowed in NP languages. This explains the lack of a majority reading in NP languages. The analysis is consistent with the anti-locality account of (1a) discussed in section 1.2.

Consider first NP languages. The setting of the NP/DP parameter has an effect on the availability of the two landing sites for the QR of -EST. In languages lacking DP, the only possible landing site that yields the majority reading is adjunction to NP.We propose such adjunction is disallowed in NP languages. Since NP languages lack DP, NP must be an argumental category. Chomsky (1986) proposes adjunction to arguments is banned (for arguments for the ban see also McCloskey 1992, Bošković 2004). This means that only long distance movement of –EST is available in NP languages. It follows, then, under Hackl's analysis that NP languages will have only the relative reading of MOST.

(14)   -EST movement in NP languages
         a. Bill owns [NP –EST [NP [AP t MANY] [NP RH albums]]]

   b. Bill [-EST [owns [NP [AP t MANY] [NP RH albums]]]
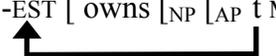
Notice that this account is consistent with our assumption that APs are NP-adjoined. Following Bošković (2005) we interpret the ban on adjunction to arguments derivationally. When AP adjoins to NP, NP has not yet been merged as an argument; however, when covert –EST movement applies, NP is already an argument.

As for DP languages, NP is always contained within DP. Hence, NP does not serve as an argument in DP languages and is available for –EST adjunction.

(15)   Local NP-adjunction available in DP languages
         Bill owns [DP D [NP –EST [NP [AP t MANY] [NP RH albums]]]
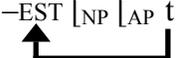
Note this movement does not violate anti-locality. We assume -EST occupies SpecAP. NP-adjunction then crosses the full AP boundary. Given Hackl's analysis, the availability of local NP-adjunction means the majority reading is available in DP languages.

The relative reading in DP languages derives from extraction via SpecDP. Once again, the local movement into SpecDP is allowed since it crosses the full AP boundary.

(16)   Extraction of –EST from DP available in DP languages
         [DP _____ D [NP [AP [DegP –EST] MANY] [NP RH albums]]]
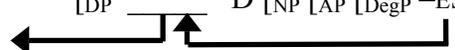
Thus, the availability of both readings in DP languages is accounted for. (It is possible to analyze these facts in a way consistent with Bošković's 2005 alternative account of (1a) based on different positions for AP in NP and DP languages; see Appendix 2.)

Above, we have treated MOST as a superlative and used the scope possibilities of -EST to derive generalization (1i). We now turn to a prediction that this analysis makes for other superlatives. In DP languages, our analysis places no restrictions on the scope of -EST. In NP languages, on the other hand, we may predict limits on the scope of -EST and the possible readings of other superlatives. (For other superlatives, the narrow scope reading, corresponding to the majority reading of MOST, is called 'absolute' cf. (17).) Whether or not we predict additional restrictions depends on the extent to which superlatives of other degree predicates, such as the one in (17), resemble MOST.

(17)   Fred climbed the tallest mountain.
        Absolute: Fred climbed the mountain that is tallest 'in the world.'
        Relative: Fred climbed a taller mountain than anyone else did.

There is reason to believe that MANY differs from other degree predicates in significant ways. Hackl (2000) argues MANY has no true predicative occurrences, as (18) shows.

(18)   a. Fred considered the students tall.   c. The students seem tall.
        b. *Fred considered the students many.   d. *The students seem many.

If, as we have proposed, MANY is modificational in type ($<d,\ll e,t>,<e,t>\gg$) and degree predicates like *tall* are predicative ($<d,<e,t>>$), it is possible that they interact differently with –EST. Type-wise, there is no reason that –EST could not compose with *tall* in situ. Given this, our analysis is compatible with local scope for –EST on $<d,<e,t>>$ degree adjectives in NP languages. The problem with this is that if –EST composes directly with the degree adjective, we have no account of why the individuals Fred is compared to in height in (19) must be students. In the LF of (19), the presupposition in (10a) only guarantees that every relevant alternative has some degree of height.

(19)   Fred is the tallest student.
        LF: [Fred is [the [-EST$_C$ tall] student]]

Such an account of absolute readings must be supplemented with rules for deriving the membership of C from context and focus.

In SC, an NP language, superlatives other than MOST do allow absolute readings. The reading, however, is only available when heavy contrastive stress is placed on the superlative adjective or in the presence of absolute-reading-forcing modification. (HIGHEST also has stronger stress when the PP is present.)

(20)   Jovan se popeo   na NAJVEĆU planinu   (na svijetu).
        John refl climbed on HIGHEST mountain   in world
        'John climbed the highest mountain (in the world).'

We hypothesize that because local QR is unavailable for –EST in SC, the only way to get the absolute reading is by composing –EST in situ with the degree predicate. But interpret-

ing –EST in this position underdetermines the contextual restriction and focus is required to help fix the value of C. We leave the details of how focus affects C for future research.[3]

To sum up, Hackl's (to appear) approach to the two interpretations of MOST and Bošković's (2008) hypothesis that article-less languages lack DP combine to explain the cross-linguistic availability of relative readings of MOST observed by Živanovič (2007).

3. Neg-Raising and the NP/DP Parameter: Generalization (1j)

In this section, we offer an explanation for the generalization (1j) concerning neg(ative) raising. Neg-raising is the phenomenon whereby a high negation is understood as negating a lower clause. For example, (21a) is typically taken to express (21b).

(21) a. Mary did not believe that Fred was smart.
      b. Mary believed that Fred was not smart.

English verbs differ regarding whether they allow neg-raising. *Believe* does, but *claim* does not. Hence, (22a) cannot be understood as implying (22b).

(22) a. John did not claim that Mary is smart.
      b. John claimed that Mary is not smart.

Following Lakoff (1969), Horn (1978), Gajewski (2007), a.o., we take the best diagnostic for neg-raising to be long-distance licensing of strict NPIs. (23) shows that the underlined items appear to require a clause-mate negation licenser. Neg-raising predicates differ from others in allowing apparent violations to this clause-mate condition, as in (24).[4]

(23) a. John didn't leave/*left <u>until yesterday</u>.
      b. John hasn't/*has visited her <u>in (at least two) years</u>.
      c. *John didn't claim [Mary would leave [NPI <u>until tomorrow</u>]]
      d. *John doesn't claim [Mary has visited her[NPI <u>in at least two years</u>]]

(24) a. John didn't believe [Mary would leave [NPI <u>until tomorrow</u>]]
      b. John doesn't believe [Mary has visited her[NPI<u>in at least two years</u>]]

This type of long-distance strict NPI licensing is not available in all languages. For example, *believe* does not allow long-distance strict NPI licensing in SC.

(25) a. *Marija ju je posjetila najmanje dvije godine.   SC
         'Mary visited her in at least two years.'
      b. Marija je nije posjetila najmanje dvije godine.   SC
         'Mary has not visited her in at least two years.'

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[3]Note that the salience of the absolute reading improves greatly with the PP 'in the world' in (20).
[4] See Gajewski (2007) for a semantic account of the contrast (23c,d) vs. (24) that does not appeal to a clause-mate condition for licensing strict NPIs.

c. *Ivan ne vjeruje [da ju je Marija posjetila najmanje dvije godine.]
'Ivan does not believe that Mary has visited her in at least two years.'

In fact, Bošković (2008) observes that there is a correlation between articles and the availability of neg-raising, where the possibility of long-distance strict NPI licensing (i.e. licensing across finite clauses) is taken as the diagnostic of neg-raising. While English, German, French, Portuguese, Romanian, Bulgarian and Spanish allow cases like (24), SC, Slovene, Czech, Polish, Russian, Turkish, Korean, Japanese, and Chinese disallow them (a partial paradigm is given in the Appendix 1). What differentiates these two groups is articles. This leads to (26) (cf. (1j)), a two-way correlation so far.

(26)   Languages without articles disallow neg-raising and those with articles allow it.

We explain (26) by highlighting a similarity in the interpretation of definite plurals and neg-raising predicates (NRPs). A common analysis of neg-raising attributes to certain predicates (NRPs) a special assumption of the Excluded Middle (EM; see Bartsch 1973, Horn 1989, Gajewski 2007). This analysis is given schematically in (27). Following Bartsch, we take EM (see (27b)) to be a presupposition. As a presupposition, EM survives negation (27c). The lower clause understanding of negation then follows from the combination of the assertion and presupposition of a negated NRP (27d).

(27)   a. F is a Neg-Raising Predicate
        b. Where p is a proposition,
              $F(p)$ presupposes: $F(p) \lor F(\sim p)$ **Excluded Middle Presupposition**
        c. $\sim F(p)$ also presupposes $F(p) \lor F(\sim p)$.
        d. Together the assertion $\sim F(p)$ and the presupposition $F(p) \lor F(\sim p)$ entail:
              $\boxed{F(\sim p)}$

We apply the scheme (27) to the NRP *believe* below. *Believe* presupposes that its subject has an opinion about the embedded clause (29). This EM presupposition together with the negated assertion (30) gives the lower-clause reading of negation, see (31).

(28) BEL_a = the world compatible with a's beliefs

(29)   **Mary believes that *p*** is defined only if
        All worlds in BEL_{Mary} are p-worlds or no world in BEL_{Mary} is a p-world.
        When defined, **Mary believes that *p*** is true if and only if
              All worlds in BEL_{Mary} are p-worlds.

(30)   **Mary does not believe that *p***
        Assertion: Not all worlds in BEL_{Mary} are p-worlds.
        Presupp: All worlds in BEL_{Mary} are p-worlds or no world in BEL_{Mary} is a p-world.

(31)   The Assertion and Presupposition of (30) together entail that
              no world in BEL_{Mary} is a p-world (i.e. Mary believes that not-p)

Distributive definite plurals also exhibit a kind of excluded middle in their interpretation. (32b) is nearly equivalent to the universal (32a); but (33b) is stronger than (33a).

(32) a. Bill shaved every patient. $\forall$
      b. Bill shaved the patients. $\forall$

(33) a. Bill didn't shave every patient. $\sim > \forall$
      b. Bill didn't shave the patients. $\forall > \sim$ ($\approx$Bill shaved no patients)

The reading (33b) exhibits is that of a universal scoping over negation. This is analogous to a lower clause reading of negation with NRPs and can be attributed to EM (see (34)) as in the case of NRPs (see Fodor 1970, Schwarzschild 1994, Löbner 2000). The assertion (35a) and the EM presupposition (35b) together entail that none of the students are blond.

(34) **The students are blond** is defined only if
      a. every student is blond or no student is blond   EM
      When defined, **The students are blond** is true if and only if
      b. every student is blond

(35) **The students are not blond**
      a. Assertion: Not all the students are blond.
      b. Presupposition: All the students are blond or none of the students are blond.

The structure of distributive definite plural predication is (36), cf. Landman 1989.

(36) [the boy –s]   [* smoke]
      iota set   PL   *   set
           set of sums   set of sums
             sum

We pin the EM presupposition on the *-operator (Löbner 2000). It takes a sum and a predicate of atoms as arguments. It presupposes that either all or none of the atomic parts of the sum satisfy the predicate. It asserts all atomic parts of the sum satisfy the predicate. We propose that all EM presuppositions – including those of NRPs – arise from the use of the *-operator (Gajewski 2005). Attitude predicates are standardly analyzed as quantifiers over worlds as in (37a). We propose that they may also denote sums of worlds and participate in distributive plural predication (37b).

(37) a. $all(BEL_a) = \lambda p.\ BEL_a \subseteq p$
      b. $the(BEL_a) =$ the sum of a's belief worlds[5]

[5] Making room for the external arguments, the lexical entries would look like this:

(i) $all(BEL) = \lambda p.\lambda x.\ BEL_x \subseteq p$
        $the(BEL) = \lambda p.\lambda x.\ p(\text{the sum of x's belief worlds})=1$

If instead of a universal quantifier (cf. (37a)) an attitude predicate is constructed with the definite determiner (cf. (37b)), distributive plural predication is triggered. Then, because of EM, such an attitude predicate creates statements that are true if the modal base (e.g. BEL_{Mary}) is a subset of the embedded proposition, but <u>false</u> only if the modal base is disjoint from the embedded proposition. This means that when such an attitude predicate is negated, the negation is interpreted as if it occurred in the embedded clause. Hence, attitude verbs that select the distributive definite plural semantics are NRPs. Those that select universal quantification are not NRPs. Thus, in English, the representation for the NRP *believe* involves the definite determiner, not universal quantification and denotes the sum of the worlds compatible with its subject's beliefs.

(38) $[\![\textbf{believe}_a]\!]$ = the(BEL_a)

There is a mismatch in type between an NRP and an embedded clause. The embedded clause denotes a predicate of singular worlds; the NRP denotes a sum of worlds. To resolve the type mismatch, a statement containing (38) must involve the *-operator applied to the embedded proposition, yielding a predicate of sums of worlds:

(39)

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         ···
          /\
         /  \
        /    \
       /    /\
      /    /  \
 believeₐ  *   p
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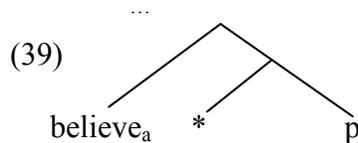
(40) $[\![*]\!]$ = λW: $\textbf{W} \subseteq \textbf{p}$ **or** $\textbf{W} \cap \textbf{p} = \varnothing$. $W \subseteq p$

Such a representation for NRPs explains the strengthening of their negations. Furthermore, Gajewski (2007) shows how attributing this presupposition to NRPs explains their behavior with respect to NPI-licensing. Gajewski argues following Zwarts (1998) that strict NPIs are licensed in semantically anti-additive environments. He shows that universal attitude predicates that carry the EM presupposition create anti-additive environments and those that do not carry EM do not.

Generalization (26) follows from this analysis of the semantics of NRPs. A language can have NRPs only if it can use a definite article to construct a world-sum denoting predicate, i.e. only if it can employ option (37b). Hence, the lack of a definite article in NP languages prevents the construction of NRPs. DP languages, on the other hand, are free to construct NRPs with their definite articles.

Interestingly, as noted in Bošković (2008) even in languages where the NPI test fails, negation is interpretable in the lower clause. Thus, SC (41) allows the atheist (i.e. non-agnostic) interpretation 'Ivan believes God does not exist'. The same holds for Korean, Japanese, Turkish, Chinese, Russian, Polish and Slovenian.

(41)   Ivan ne vjeruje   da bog postoji.
       Ivan neg believes that God exists   (SC)
       "Ivan believes God does not exist."

We suggest that in such languages the 'low' reading for negation is derived in the pragmatic way (i.e. in terms of conversational implicature) described by Horn (1989), who argues the lower clause understanding is a case of 'inference to the best interpretation'. Importantly, Horn's pragmatic principles do not suffice to account for strict NPI-licensing under NRPs, as Gajewski (2005) shows. Specifically, the pragmatic account cannot create the anti-additive environments needed for licensing. A semantic account is needed for this, as in Gajewski (2005, 2007). Since, as discussed above, NP languages lack the kind of grammaticalized neg-raising that licenses long-distance strict NPIs under this approach, they disallow strict NPI licensing under NRPs.

4.   Conclusion

We have offered explanations for two generalizations from Bošković (2008) relating the presence/absence of articles in a language to semantic phenomena under the hypothesis, adopted by Bošković, that languages that lack articles lack DP. In particular, we showed that Živanovič's (2007) generalization that languages that lack articles lack the majority reading of MOST can be explained if we adopt Hackl's (to appear) analysis of MOST, since the low QR of the superlative morpheme that is needed for this reading under Hackl's analysis is disallowed in article-less languages due to the lack of DP. Second, we offered an explanation for Bošković's (2008) generalization that languages that lack articles lack neg-raising, while languages that have articles allow it, the diagnostic for neg-raising being strict NPI licensing. We argued, following Gajewski (2005), that the presuppositions exhibited by neg-raising predicates should be tied to definite plural distributive predication. Languages that lack definite articles do not have the material to construct neg-raising predicates. Apparent cases of lower clause negation interpretation in NP languages were treated pragmatically along the lines of Horn (1989).

Appendix 1: NPI data

John didn't believe(/claim) that Mary would leave until tomorrow:	
O João não acreditou/??disse que a Maria vai sair <u>até amanhã</u>.	Portuguese
Jean ne croyait/*espérait pas que Marie parte <u>avant demain.</u> 'Jean didn't believe/*hope Mary would leave until tomorrow.'	French
*Ivan ne veril, čto Marija uedet <u>až do zavtrašnego dnja</u>.	Russian
*Jan nie wierzył, że Maria wyjedzie <u>aż do jutra</u>.	Polish
*Ivan nije vjerovao da će Marija otići <u>sve do sutra</u>.	SC
*Jon-wa [Mary-ga <u>asita made</u> syuppatu suru daroo to] sinzi-nakatta.	Japanese
??John-un [Mary-ka <u>ecey-kkaci-to</u> ttena-l kes-irako] mitci ahn-ass-ta.	Korean
*Yuehan bu/cai xiangxin Mali <u>zhidao mingtian</u> hui likai.	Chinese

Er hat *(nicht) <u>sonderlich</u> viel gegessen. he has not particularly much eaten	German
Ich glaube/*freue mich nicht dass er <u>sonderlich</u> viel gegessen hat I believe/*look.forward not that he particularly much eaten has	

John doesn't believe(/claim) that Mary has visited her in at least two years:	
Juan no cree/*dijo que María la ha visitado <u>en al menos dos años</u>.	Spanish
Ion nu crede/*spune că Maria a vizitat-o <u>de cel puţin doi ani</u>.	Romanian
Az ne vjarvam/*kazah če Meri ja e poseštavala <u>pone ot dve godini</u>. 'I don't believe/*didn't say Mary has visited her in at least two years.'	Bulgarian
*Jan nevěří, že Marie ji navštívila <u>nejméně dva roky</u>.	Czech
*Janez ne verjame, da jo je Marija obiskala <u>že najmanj dve leti</u>.	Slovenian
*John [Mary o-nu <u>en az iki yıl</u> ziyaret et-ti] san-mı-yor.	Turkish

See Bošković (2008) for additional data (the baseline data are omitted for space reasons). The NPIs from (23) (if there were no interfering factors, as in German) and *believe* were used in all examples. Under the relevant reading the NPIs are interpreted in the embedded clause. Some examples have irrelevant readings that are ignored (e.g. 'return tomorrow' for 'leave until tomorrow'). Both negative raising and non-negative raising verbs are given for negative raising languages to show that we are dealing here with strict NPIs.

Appendix 2: An Alternative Account of Generalization (1i)

Bošković (2008) proposes an alternative account of (1a). He proposes adjectives project differently in languages with and without DP. In NP languages, APs are adjoined to NP. In DP languages, by contrast, adjectives take NPs as complements, as in Abney (1987) (see Bošković 2008 for independent evidence for this distinction). This prevents extraction of AP without NP in DP languages as non-constituent movement, cf. [$_{AP}$ A [$_{NP}$_]].

(1i) is now explained as follows: Since the structure of NP languages remains the same, we rule out the majority readings in NP languages the same way as in sec. 2.3. The account of DP languages changes slightly since A now takes NP as complement. We assume this means that in DP languages MANY takes its arguments in the opposite order:[6]

(42) $[\![\text{MANY}]\!] = \lambda f_{<e,t>}.\lambda d_d.\lambda x_e. |x| \geq d \text{ and } f(x) = 1$

Notice that this has the effect that -EST – still generated in SpecAP – can be interpreted *in situ* in DP languages. This is so since, when A takes NP as complement, MANY forms a constituent with the NP that excludes the superlative marker. The output of combining MANY with the NP directly by Functional Application is a function of type <d,<e,t>>, (43). This is exactly the type that –EST wants for its argument. So, -EST can compose with its sister and, thus, be interpreted without needing to move to bind a degree variable. Thus, the majority reading, which derives from local scope for –EST under the AP-adjunction approach, comes for free here.

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[6] Predicate-type (<d,et>) gradable adjectives undergo the following type shift:
TS($[\![\text{Adj}]\!]$) = $\lambda f_{<e,t>}.[\lambda d.[\lambda x. [\![\text{Adj}]\!](d)(x)=1 \& f(x)=1]]$

(43)   [$_{AP}$ [$_{DegP}$ −EST]   MANY$_A$ [$_{NP}$ albums$_N$]]]   (English)
        <<d,et>et> (<et,<d,et>>   (<e,t>   ))

The relative reading in DP languages derives from extraction through SpecDP, as before.

(44)   English: [$_{DP}$ _____ D [$_{AP}$ [$_{DegP}$ −EST] MANY$_A$ [$_{NP}$ albums$_N$]]]

Since under this alternative, adjectives form constituents with NPs that exclude DegP, all adjectives in DP languages must be modificational in type, i.e., <<e,t>,<d<e,t>>>. In NP languages, where adjectives form constituents with DegP, adjectives may be type <d,<e,t>>. This offers a possible way of distinguishing MANY, which lacks a majority reading with -EST, from other adjectives in NP languages, which appear to allow absolute readings. If Hackl (2000) is correct that MANY has no predicative uses, then MANY cannot be type <d,<e,t>>. Other degree adjectives, however, that do have predicative uses could be type <d,<e,t>>. Since -EST is type <<d,<e,t>>,<e,t>> it could take the latter type of adjective as an argument in situ. However, when −EST is combined with higher type MANY, -EST would be forced to QR and local scope would be unavailable for the reasons discussed in section 2.3.

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