Squibs and Discussion

A Null Pronominal in the Noun Phrase

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1 Common Noun Phrases and Conditions B and C

A common noun phrase (CNP) is subject to Condition C, in that it must fail to corefer with a c-commanding NP. A CNP may, however, refer to an element or subset of the referent of a c-commanding NP in a higher clause, as long as they do not corefer; that is, nondisjoint reference is possible. This possibility is illustrated in (1), where I provide a preceding context to make the nondisjoint interpretation easier to obtain.[1]

(1) I went to talk to [the students in Jones's class]$_K$ yesterday.
  a. They$_K$ told me that [one student]$_{k\in K}$ had aced the exam.[2]
  b. They$_K$ told me that only [the smart students]$_{J\subset K}$ had passed the exam.
  c. *They$_K$ told me that [the students]$_K$ had aced the exam.

In (1a–b) a CNP in an embedded clause refers to an element or subset of the set denoted by *they;* in (1c) the CNP *the students* corefers with *they* and is ruled out by Condition C.

However, a CNP must be disjoint from a c-commanding NP that is within its local binding domain.

(2) I went to talk to [the students in Jones's class]$_K$ yesterday to show a film.
  a. *They$_K$ saw [one student]$_{k\in K}$ in the film.
  b. *They$_K$ saw [the smart students] $_{J\subset K}$ in the film.

Portions of this work were presented at the annual meeting of the Linguistic Society of America in New Orleans in January 1995. I would like to thank two anonymous *LI* reviewers for their helpful comments; any remaining errors and inconsistencies are my own, however.

[1] Here and below I will use capital-letter indices to indicate sets, and lowercase indices to indicate singular individuals.

[2] The CNPs in (1) and (2) are specific, in the sense of Enç (1991), since they refer to an element or subset of a familiar set. Following Milsark (1974), Enç notes that the specific interpretation is easiest to obtain if a prenominal numeral or adjective bears primary emphasis.

c. Their$_K$ teacher saw [one student]$_{k\in K}$ in the film.
d. Their$_K$ teacher saw [the smart students]$_{J\subset K}$ in the film.

In (2a–b) a CNP is nondisjoint from the locally c-commanding NP *they*, and the result is ungrammatical. Examples (2c–d) are included to show that the ungrammaticality of (2a–b) depends on there being a c-command relation with the antecedent, hence that the binding theory is involved.

CNPs thus appear to be subject to Condition B, rather than Condition C, when nondisjointness is considered. It seems odd that a CNP would be subject to Condition B, since it is clearly not a pronominal; this is especially so given that CNPs are subject to Condition C with respect to strict coreference, as shown by (1c). In this squib I propose a solution to the problem posed by the contrast between (1) and (2). The proposed solution has implications for the theory of the internal structure of the noun phrase, suggesting that CNPs contain small clauses.[3]

2 A Parallel with Partitive NPs

To see what might be the explanation for the apparent Condition B effects with CNPs, consider the behavior of partitive NPs (PNPs). A PNP contains another NP that denotes a set, an element or subset of which is the denotation of the PNP; I will refer to the NP internal to

[3] An anonymous *LI* reviewer points out that names behave like CNPs, needing only to be disjoint from a local c-commanding NP. Consider for example (i)–(ii), given the same preceding context as in (1)–(4).

(i) They$_K$ told me that Smith$_{k\in K}$ had aced the exam.
(ii) *They$_K$ saw Smith$_{k\in K}$ in the film.

Contra Lasnik (1991:9), it seems that Condition C does not impose nondisjointness, even on names. Although this state of affairs is consistent with the analysis of CNPs proposed in sections 2 and 3, it raises the possibility of a different kind of explanation. Defining *bound* as 'coreferential with a c-commanding NP' and *free* as 'disjoint in reference from a c-commanding NP' (Lasnik 1991), we might reformulate the binding theory as in (iii).

(iii) A. An anaphor is bound in its local binding domain.
B. A nonanaphor is free in its local binding domain.
C. An r-expression (name, CNP, or PNP) is not bound.

From (iii), it follows that a name or CNP is subject to Condition C for coreference, but subject to Condition B for overlapping reference; the facts in (1), (2), and (i)–(ii) would follow.

Whatever the workability of this solution, however, it is not the most parsimonious analysis of the facts: partitive NPs, which contain range nominals subject to Condition B or Condition C (see (3) and (4)), will never show the effects of being themselves subject to Condition B for overlapping reference.

Moreover, it is not even clear that this proposal would work: reformulating the binding theory so that names are subject to Condition B for overlapping reference will not explain anything if, as argued by Berman and Hestvik (1994), Condition B does not constrain overlapping reference for pronouns. In that case (iii) would have to be augmented by a stipulation that r-expressions are free in a local domain.

the PNP as the *range nominal.* As an example, the referent of *one of them* is necessarily an element of the set denoted by its range nominal *them.*

The range nominal in a PNP is itself subject to the binding conditions. If the range nominal is a pronoun, as in (3), then it is subject to Condition B; if it is an r-expression, as in (4), then it is subject to Condition C.

(3) I went to talk to [the students in Jones's class]$_K$ yesterday (to show a film).
  a. They$_K$ told me that [one of them$_K$] had aced the exam.
  b. *They$_K$ saw [one of them$_K$] in the film.
  c. Their$_K$ teacher saw [one of them$_K$] in the film.

(4) I went to talk to [the students in Jones's class]$_K$ yesterday (to show a film).
  a. *They$_K$ told me that [one of [the students]$_K$] had aced the exam.
  b. *They$_K$ saw [one of [the students]$_K$] in the film.
  c. Their$_K$ teacher saw [one of [the students]$_K$] in the film.

In (3) and (4) the (a) examples show a PNP in an embedded clause whose range nominal is bound by the subject of the matrix; in (3a) the pronominal *them* is licit, since it is subject to Condition B, whereas the r-expression *the students* in (4a) is impossible, because of Condition C. The (b) examples show the PNP in a position where the range nominal is too close to its antecedent, so both Conditions B and C are in effect; and the (c) examples show again that c-command (and hence binding) is a relevant factor.

The data in (3) and (4) are entirely accounted for by the assumption that the range nominal is subject to the relevant binding condition; there is no need to assume that the PNP itself is subject to either Condition B or Condition C, with respect to nondisjointness. Condition C does apparently constrain the coreference possibilities of a PNP, however, as illustrated by (5).

(5) *She$_k$ told me that [one of them]$_k$ had aced the exam.

The relevance of the paradigm for PNPs to the discussion of CNPs is that the binding behavior of a CNP is exactly parallel to that of a PNP containing a pronominal range nominal: it is subject to Condition C with respect to strict coreference, as shown by (1c) for CNPs and by (5) for PNPs; with respect to nondisjointness, it exhibits Condition B–like effects, as shown for example by (1a) versus (2a), for CNPs, and by (3a) versus (3b) for PNPs. The unity in their behavior calls for a unified explanation.

The obvious explanation for the Condition B–like effects of a PNP with a pronominal range nominal is that it is the range nominal itself that is subject to Condition B. A parallel treatment of CNPs would entail that a CNP contains a covert pronominal range nominal, denoting a set that contains the referent of the CNP itself. The data

in (2) are not consistent with the covert range nominal being PRO; Giorgi and Longobardi (1991) show that NP-internal PRO (for example, in genitive position) is subject to control. If the covert range nominal in a CNP were subject to control, we would expect the reverse of the paradigm in (2), since presumably only a c-commanding antecedent could control PRO. The covert range nominal in a CNP must therefore be pro.

The two most immediate issues raised by this conclusion concern (a) where the covert range nominal (pro) is located within the noun phrase, and (b) how pro is licensed. I address these issues briefly in the following sections.

3 Internal Small Clauses

The common noun head of a CNP serves semantically as a predicate; if predicates always head small clauses (see Stowell 1983), then a CNP contains a small clause headed by the common noun. I propose that the null range nominal in a CNP is the subject of the DP-internal small clause, as illustrated in (6).[4]

(6) $[_{DP}$ the $[_{SC}$ pro $[_{Pred}$ smart students]]]

In (1) and (2) it is not DP, but pro, that is subject to Condition B.

That CNPs are DPs containing nominal small clauses is argued on independent grounds by Holmberg (1993), who also proposes that the internal subject is pro, and by Campbell (1996). Additional evidence in support of this hypothesis can be adduced from the existence of adjectives, such as *likely*, that semantically denote properties of propositions, but syntactically appear to modify nonpropositional common nouns. Such adjectives can generally occur attributively with nonpropositional nouns (7a), but cannot head predicates with such an NP as subject (7b). They may occur as predicates, however, if the subject denotes a proposition (7c). In (7d) the adjective is predicated of a proposition-denoting expression (CP) that is extraposed.

(7) a. a likely thief [= '*x*: it is likely that *x* is a thief']
b. *The thief was likely.
c. That John was a thief is likely.
d. It is likely that John is a thief.

Other adjectives that behave similarly include *alleged, certain, clear, false, known, probable, proven,* and *true;* I will refer to these as *propositional* adjectives.

The descriptive problems posed by propositional adjectives are interesting. They cannot be described as adjectives that can only be used attributively (like *mere* and *utter*), since they are predicative in certain contexts, such as (7c–d). Nor can we escape the problem by assuming that there are two homophonous adjectives, one that occurs

[4] Here I adopt the DP analysis of noun phrases (Abney 1987).

in (7a) and is attributive only, and one that occurs in (7c–d) and is predicated of propositions. In both the attributive and predicative uses, propositional adjectives have the same semantics and enter into the same entailment relations. Consider for example the predicative sentences in (8).

(8) a. It is known that John was a thief.
b. It is true that John was a thief.
c. It is false that John was a thief.

Sentence (8a) entails (and presupposes) (8b), and the truth value of (8c) must be different from that of (8b); these truth-conditional relations clearly follow from the meanings of the propositional adjectives involved. The noun phrases in (9) use the same adjectives attributively.

(9) a. John is a known thief.
b. John is a true thief.
c. John is a false thief.

As in (8), (9a) entails (and presupposes) (9b), and (9b) and (9c) must have opposite truth values. More generally, a known thief is necessarily a true thief, and a false thief is necessarily not a true thief. Clearly, the same logical relations obtain among propositional adjectives used attributively as among such adjectives used predicatively, which indicates that the same adjectives are being used in each construction.

A close examination of their interpretation, as well as the contrast between (7b) and (7c), indicates that propositional adjectives denote properties of propositions and that they must be predicated of proposition-denoting expressions. The fact that many can also occur attributively, as in (7a) and (9), therefore indicates that CNPs, even those headed by nonpropositional nouns such as *thief*, contain proposition-denoting expressions.[5] The DP-internal small clause hypothesis, illustrated in (6), predicts that state of affairs.

4 Identification of Pro

A full analysis of how pro is licensed and identified in the internal subject position will have to await a more detailed examination of the structure of the small clause itself in (6); however, a reasonable hypothesis is that pro in the internal subject position is formally licensed and identified by D. Though this hypothesis needs to be investigated further, it has the virtue of allowing pro in DP-internal subject

[5] To say that a CNP contains a proposition-denoting expression is not to say that it denotes a proposition itself. I assume (7b) is ruled out because the DP *the thief* does not denote a proposition, though it contains a small clause that does. As an anonymous *LI* reviewer points out, D and C evidently have distinct semantic properties, despite their apparent structural similarities: D relates its small clause complement to a referent, whereas C relates its clausal complement to a proposition.

position, while not allowing it as the subject of a finite clause in English, where identification presumably fails.

The hypothesis that pro is identified by D finds support in the frequent syncretism between determiners and pronominal elements. In French, for example, the accusative pronominal clitics are standardly assumed to identify pro in object position. If D identifies pro in the subject position of the internal small clause, then the definite determiners, which are fully syncretic with the third person accusative clitics, perform exactly the same function.

Interestingly, although a PNP can contain a covert range nominal, it cannot be pro. Any numeral or quantifier that can occur with an overt range nominal in a PNP can also occur by itself; some examples are given in (10).

(10) a. John bought two (of them), and Mary bought three (of them).
b. I want some (of the money) too.
c. Each (of the boys) had his favorite.

A straightforward analysis of this is that the bare quantifiers in (10) are PNPs with covert range nominals. Unlike the covert range nominal in CNPs, the null partitive range nominal is subject to Condition C, not Condition B.

(11) a. *The students$_K$ told me that three [e]$_K$ had aced the exam.
b. The boys'$_K$ sister told me that both [e]$_K$ had passed the class.

In (11a) a covert partitive range nominal in an embedded sentence is bound by the matrix subject, and the result is ungrammatical; this example contrasts with (1a) and with (3a). Example (11b) shows again that c-command, and hence binding, is a relevant factor.

Evidently, a covert range nominal is not automatically licensed as pro, since pro is not licensed in partitives. When a PNP has a null range nominal, it must be a null epithet (to use the terminology of Lasnik and Stowell (1991)), rather than a null pronoun.[6] If D licenses and identifies pro, then the impossibility of pro in PNPs suggests that PNPs are not DPs. This is a plausible conclusion: *the* and *every*, which cannot occur in partitives, are apparently Ds, whereas numerals and other quantifiers such as *some* and *each* belong to a different category, Q (Quantifier). The structure of a PNP is therefore something like (12).

[6] Lasnik and Stowell (1991) argue however that null epithets must be locally $\bar{A}$-bound; the null range nominal in PNPs like those in (10) and (11) thus appears to be problematic for their theory. A possible solution to this problem would be to propose that PNPs (and perhaps CNPs as well) contain operator positions from which the null range nominal is bound. For an analysis along these lines, see Campbell 1996.

(12) $[_{QP}$ Q *(of)* DP]

DP in (12) cannot be pro, under this analysis, because only D can license and identify pro in English. CNPs, on the other hand, are projections of D, in which case indefinite CNPs are headed by a phonetically null determiner.[7]

5 Summary and Conclusion

I have argued that CNPs contain nominal small clauses, the subject of which is (or at least, can be) pro. The DP-internal pro hypothesis accounts for the fact that CNPs appear to be subject to Condition B with respect to c-commanding potential antecedents from which they are not disjoint in reference. Like a PNP, a CNP derives its reference in part from an internal range nominal.

The hypothesis that CNPs have covert range nominals is reminiscent of Enç's (1991) analysis of specificity as covert partitivity. The current analysis goes beyond Enç's analysis in some important respects, however. First, whereas Enç proposes that specific CNPs are interpreted as partitives, I propose that CNPs are syntactically similar to PNPs in containing a range nominal. There are important differences in the structure of CNPs and PNPs as well, one consequence of which is that the range nominal in a CNP, but not in a PNP, is (or can be) pro. Thus, a specific CNP is not merely a covert partitive, but is analogous to a partitive with a pronominal range nominal.

Finally, although all the CNPs considered are specific, in Enç's sense, the analysis has implications for nonspecific CNPs, as well. According to the theory sketched in section 4, all CNPs contain small clauses, and hence covert subjects, because common nouns are predicates. Nonspecific CNPs must also contain covert internal subjects, therefore; I know of no evidence bearing on this issue, however, so the hypothesis must remain unproven in this domain.

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[7] Note that DP can contain QP, as for example in *the two students.*

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Bare X-Bar Theory and Structures Formed by Movement

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Within the principles-and-parameters framework, the categorial type of structures formed by movement and the matching of phrasal status between moved elements and targets of movement have traditionally been determined by primitives of X-bar theory combined with some version of Emonds's (1976) Structure Preservation Hypothesis. Much of this theoretical apparatus has recently been abandoned in the version of the Minimalist Program outlined in Chomsky 1995, which revives generalized transformations and develops a ''bare'' X-bar theory. Assuming this approach, questions arise about how the label of a bare phrase structure formed by movement can be determined and how the effects of the Structure Preservation Hypothesis can be derived.

Chomsky (1995) proposes an answer to these questions based on a phrasal uniformity condition for chain links. Assuming the general framework outlined in Chomsky 1995, this squib shows that there is no need to postulate such a condition. Rather, optimality considerations combined with the standard c-command condition on chain links (see Chomsky 1981:333, 1995:253) suffice to derive the correct results. This alternative analysis is also shown to be more successful in dealing with instances of head adjunction, which are exceptional in Chomsky's (1995) system.

1 The Role of the Uniformity Condition in Chomsky 1995

Following ideas of Muysken (1982), Chomsky (1995:242) takes the notions of minimal, maximal, and intermediate projections to be derivationally and relationally defined: a category that does not project any further is a maximal projection; a category that is not a projection at all is a minimal projection (a lexical item); any other projection is an intermediate projection. Under this view, a complement can be defined as a sister of a minimal nonmaximal projection, and a specifier as a sister of an intermediate projection.

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The label of structures formed by movement and the effects of the Structure Preservation Hypothesis are then determined by the interaction between the independently motivated requirement that every movement operation be licensed by a checking relation (Last Resort (LR)) and the condition in (1) (see Chomsky 1995:253).

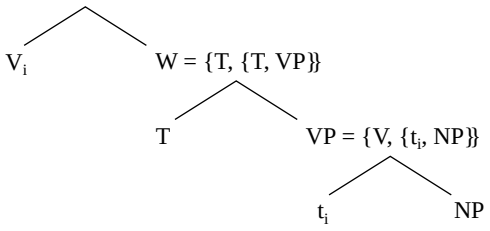
(1) *Uniformity Condition*
A chain is uniform with regard to phrase structure status.

Leaving aside cases where it is redundant with LR, the Uniformity Condition (UC) in (1) is uniquely responsible for the following:

(2) a. It blocks movement of a minimal nonmaximal projection to a specifier;
b. It blocks covert movement of a given set of formal features FF to a specifier (if the notion of projection is extended to FFs); and
c. It prevents a moved nonminimal projection from projecting after it merges with its target.

Let us examine some concrete examples of the effects listed in (2). Consider, for instance, a derivational step in which the syntactic object K in (3) is formed after the verb moves overtly and merges with W.

(3) K = {γ, {V, W}}



Before moving, V is a minimal nonmaximal projection; after movement, the phrasal status of V depends on the label γ of K. If V projects so that K = {V, {V, W}}, the moved V remains a minimal nonmaximal projection and the chain CH = (V_i, t_i) satisfies the UC. However, this instance of movement is not allowed because it violates LR; if the moved V projects, W becomes the complement of the moved V and no checking relation can be established, given that no checking relation can take place in a head-complement configuration.[1] On the other hand, if T projects in (3) so that K = {T, {V, W}}, W becomes an intermediate projection and, consequently, the moved V becomes

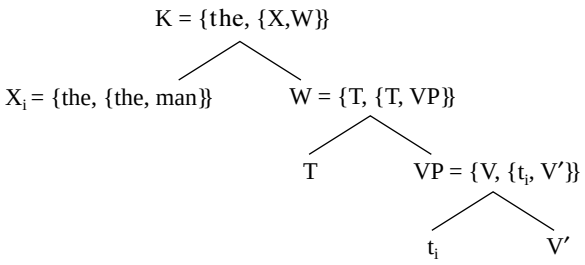
[1] Chomsky (1995:319) restricts the version of checking domain explored in Chomsky 1993 by proposing that an element adjoined to a nonminimal category X (that is, a maximal or an intermediate projection) is not in the checking domain of the head of X. With this revision, only the head(s) and FF(s) adjoined to a given head H and the specifier(s) of H are in the checking domain of H.

the specifier of T. Although V can enter into a checking relation with T in this scenario, the chain CH = (V_i, t_i) violates the UC: the moved V is a minimal maximal projection and its trace is a minimal nonmaximal projection.[2]

Similar results obtain if the set of formal features FF of V raises covertly and merges with W. If the notion of projection extends to FFs and FF projects, forming L = {FF, {FF, W}}, W becomes the complement of FF; given that no checking relation can take place in a head-complement configuration, LR is violated. If T projects so that L = {T, {FF, W}}, FF becomes a minimal maximal projection while its trace is a minimal nonmaximal projection, and the UC is violated. The interaction between LR and the UC therefore prevents minimal nonmaximal heads and sets of formal features from moving to a specifier position (see (2a–b)).

Consider now the structure in (4), where the subject X moves overtly from within VP and projects after merging with W, forming K = {the, {X, W}}.

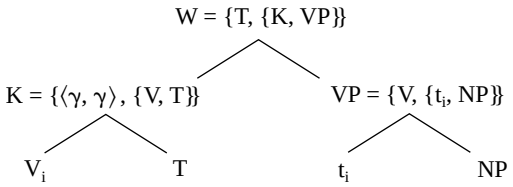
(4)



In (4) the moved X becomes an intermediate projection and W becomes the specifier of *the*. Since this is a specifier-head configuration, W could in principle enter into a checking relation with *the* and satisfy LR. This movement operation is however barred by the UC: X is an intermediate projection, but its trace is a nonminimal maximal projection. To put it in general terms, the UC prevents nonminimal maximal projections from projecting after moving (see (2c)).

However, the UC has the undesirable consequence that it rules out every instance of head movement. Consider cases such as (5), for instance, where a verb moves and adjoins to T, forming the two-segment category K = {⟨γ, γ⟩, {V, T}}.

(5)



[2] Notice that according to this reasoning, this verb movement could in principle be allowed if the verb had no complement, because both the verb

If V projects so that K = {⟨V, V⟩, {V, T}}, the label T of W will be determined by neither of its immediate constituents (K or VP). Assuming that one such set is not a licit syntactic object (see Chomsky 1995: 260), this possibility is excluded. On the other hand, if T projects, forming K = {⟨T, T⟩, {V, T}}, W is a well-formed syntactic object because its label is determined by K. Since V is adjoined to T, it may enter into a checking relation with T and satisfy LR. However, the chain CH = (V_i, t_i) violates the UC: V is a minimal maximal projection and its trace is a minimal nonmaximal projection (see fn. 2).

Similar problems arise if the set of formal features of the verb adjoins covertly to T in (5). If FF projects so that K = {⟨FF, FF⟩, {T, V}}, W is not a licit syntactic object because its label is not determined by one of its immediate constituents. If T projects, W is well formed, but the chain CH = (FF_i, t_i) violates the UC.

This state of affairs leads Chomsky (1995:322) to make the assumption in (6), which exempts chains headed by elements adjoined to heads from the UC.

(6) At LF, X^0 is submitted to independent word interpretation processes WI, where WI ignores principles of the computational system within X^0.

Apart from the fact that (6) is stipulative, introducing it with the purpose of voiding some of the effects of the UC is at odds with Minimalist Program guidelines regarding the optimality of the mapping from the initial array to LF. Let us then consider an alternative approach that relies neither on the UC nor on the assumption in (6).

2 Checking Domains Revisited

As reformulated in Chomsky 1995, the checking domain of a head H includes two different structural configurations: the specifier(s) of H and the head(s) or features adjoined to H (see fn. 1). This however constitutes a departure from optimality, since minimalist considerations would lead us to expect only one configuration to be relevant for checking. Furthermore, the elements adjoined to H a priori form the most natural configuration for the checking domain of H; a given element moves to enter into a checking relation with the features of H, not with the projection formed by H and its complement. Thus, as opposed to what the conjunction of the UC and the assumption in (6) implies, adjunction to heads should be the unmarked case, rather than the exception.[3]

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and its trace would be minimal maximal projections. Although the approach I pursue in section 2 also excludes this possibility, it is probably the case that there are no such verbs (see Hale and Keyser 1993 for relevant discussion).

[3] One reviewer points out that the most natural configuration for a checking relation between a syntactic object X and the head H should be the one resulting from adjoining X to the relevant feature of H. For concreteness, I

Given Minimalist Program assumptions concerning the optimality of the mapping from the initial array to LF, we should expect that the departure from optimality regarding checking domains should find its roots in the morphological subcomponent of the phonological component. I propose that the need for a checking configuration other than the one expected under minimalist assumptions indeed arises from a morphological conflict. On the one hand, maximal projections may be pied-piped when a feature F is moved in the overt syntax in order for the morphological requirement banning features external to X^0 elements to be satisfied (see Chomsky 1995:263). On the other hand, maximal projections cannot adjoin to the head with which they enter into a checking relation (the optimal option), because Morphology presumably cannot operate with nonminimal maximal projections within X^0 elements (see Chomsky 1995:319). In order for overt checking relations involving nonminimal maximal projections to be obtained in compliance with both morphological requirements, Universal Grammar must then resort to the specifier-head relation in addition to the optimal checking configuration established by adjunction to a head.

Given that this conflict only arises in the overt syntax, covert movement realizes the optimal option: FF adjoins to the head with which it enters into a checking relation. Under this perspective, one need not resort to the UC to exclude movement of a nonmaximal head or FF to a specifier position. Movement to the specifier of a head H is triggered only if the optimal option of adjunction to H is not available.

As pointed out to me by *LI* reviewers, it seems that the analysis proposed here incorrectly predicts that overt movement of a minimal maximal projection should always target a head rather than a specifier. In order to check the strong D-feature of T in English, for instance, a minimal maximal projection such as the pronoun *he* should adjoin to T instead of moving to the specifier of TP. I assume that this possibility is also excluded by Morphology. Presumably, the derived complex *he*-T cannot be interpreted as a word in the morphological component because the subject pronoun (in English) is not a cliticlike or affixlike element; thus, the derivation should crash or be canceled (see Chomsky 1995). The computational system must therefore resort to the specifier-head configuration in this case, as well. It should be noted that an assumption along these lines is also required in Chomsky's (1995) system to block adjunction of *he* to T, because this movement would satisfy both LR and UC.

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follow Chomsky (1995:270), who assumes that a given feature cannot be itself the target of a movement operation because the resulting object would not have a label. However, if it turns out that adjunction to heads is actually adjunction to features, the proposal developed here remains basically unchanged: movement to the specifier of H should be resorted to only when adjunction to a feature of H is not allowed.

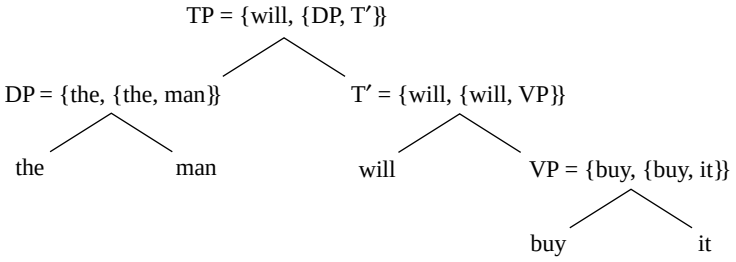
General considerations regarding optimality of movement from a Minimalist Program perspective thus suffice to prevent movement of nonmaximal heads or FFs to specifier positions (see (2a–b)), with no need to resort to the UC. By not invoking the UC to ensure that (2a–b) hold, the approach proposed here has the advantage of making it possible to eliminate the conceptually problematic assumption in (6).[4]

3 The C-Command Condition Revisited

Given the discussion in section 2, the only remaining independent role of the UC is to prevent maximal projections from projecting after they merge with their targets (see (2c)). This instance of movement can also be independently ruled out, however, if we make the standard assumption that the links of a chain must be in a c-command relation (see Chomsky 1981:333, 1995:253). To see this, let us first consider how the structure in (8), for instance, is to be linearized in accordance with Kayne's (1994) Linear Correspondence Axiom (LCA), which is defined in (7) (from Kayne 1994:33).

(7) *LCA*
Let X, Y be nonterminals and x, y terminals such that X dominates x and Y dominates y. Then if X asymmetrically c-commands Y, x precedes y.

(8)



In (8) DP asymmetrically c-commands *buy* and *it* and dominates *the* and *man;* hence, according to (7), *the* and *man* should precede *buy* and *it.* On the other hand, if the intermediate projection T′ were allowed

[4] Notice that under Chomsky's (1995:356) definition of equidistance/closeness, movement to the specifier of H is not longer than adjunction to H because in both cases the moved element ends up in the minimal domain of H; thus, Chomsky's (1995:311) Minimal Link Condition (whether or not it is conceived of as part of the definition of Move) plays no role in choosing between these two possibilities. However, movement to the specifier of H is longer if *length* is determined by the number of terms that dominate the trace but not the moved element (see Collins 1994:56 for a definition of length along these lines). If this notion of length is taken to be an independent economy criterion, adjunction to H will again outrank movement to the specifier of H, in case both operations yield convergent derivations. Thanks to a reviewer for bringing the relevance of this issue to my attention.

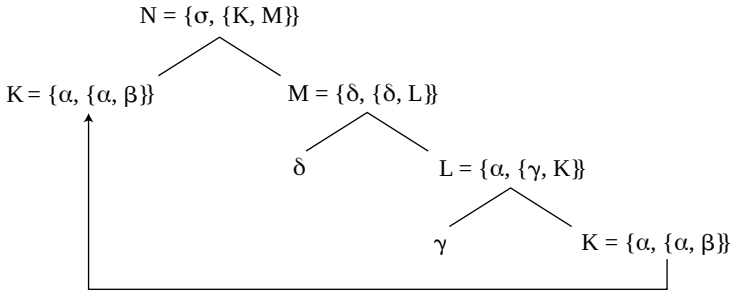
to enter into c-command relations, (7) would also require that *buy* and *it* precede *the* and *man,* since T′ asymmetrically c-commands *the* and *man* and dominates *buy* and *it.* This undesirable state of affairs can be prevented if it is assumed that intermediate projections do not enter into c-command relations (see Chomsky 1995:336). If so, *he* and *man* precede *but* and *it,* as expected.

Keeping this in mind, let us reconsider the structure (4). In (4) X becomes an intermediate projection after projecting and, as such, it cannot enter into c-command relations. Under the assumption that chain links must be in a c-command relation, the chain $CH = (X_i, t_i)$ is not legitimate because X does not c-command its trace, presumably leading the derivation to crash or be canceled. Thus, the c-command condition on chain links prevents maximal projections from projecting after moving (see (2c)). Given that this is the only instance where the UC is independently required, it can now be dispensed with entirely.

There are several reasons to pursue an account of (2c) based on c-command rather than on the UC. The first one is methodological. C-command is a notion that appears to be the basis of almost every relation that takes place in the mapping from the initial array to LF (see Epstein 1995 and Frank and Vijayashankar 1995 for recent discussion). In the case at hand, the c-command condition on chain links is independently required to prevent unwanted instances of ''sideward movement'' from a given syntactic object K to a syntactic object L, disconnected from K (see Chomsky 1995:253 and Nunes 1995:chap. IV). On the other hand, the UC is required only to ensure (2c), if the considerations in section 2 are correct. All things being equal, methodological considerations thus lead us to make use of a more pervasive condition that is independently required, instead of postulating a new condition that is not independently motivated.

The second reason for an account in terms of c-command instead of the UC is that the former allows us to derive the impossibility of movement of intermediate projections, whereas the latter does not. Consider the abstract structure in (9), for instance, where the intermediate projection K moves and merges with M.

(9)



If the moved K in (9) projects so that $N = \{\alpha, \{K, M\}\}$, the moved K is still an intermediate projection and M becomes the specifier of α; on the other hand, if M projects so that $N = \{\delta, \{K, M\}\}$, M

becomes an intermediate projection and the moved K becomes the specifier of δ. Given that in either case a specifier-head configuration obtains, a checking relation can be licensed and LR can be satisfied. However, both cases are excluded regardless of which element projects, if we assume that chain links must be in a c-command relation; the chain CH = (K, K) is not licit because the trace of K is an intermediate projection and intermediate projections do not enter into c-command relations, as independently motivated by the discussion of the linearization of (8). Thus, the c-command condition on chain links assumed here derives the impossibility of movement of intermediate projections straightforwardly (see Kayne 1994:17).[5]

By contrast, the UC is not so successful. In the situation where the upper copy of K in (9) projects, the chain CH = (K, K) satisfies the UC, because both instances of K are intermediate projections. In order to prevent such a case, an analysis based on the UC requires the additional assumption that intermediate projections are also exceptional in not being able to undergo movement.

4 Conclusion

Exploring a rationale for the departure from optimality in the configurations of checking, I have proposed that optimality considerations preclude movement of heads or FFs to specifiers (see (2a–b)). In turn, the standard c-command condition on chain links excludes derivations where a nonminimal maximal projection projects after moving (see (2c)). Hence, there is no need to postulate the Uniformity Condition and make the dubious assumption in (6) to ensure that (2a–c) hold. By holding to strictly minimalist considerations, we are thus led to a much simpler and conceptually natural system as far as movement operations are concerned.

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[5] Notice that in order for chains of the type CH = (FF_i, t_i) formed by covert movement to be licit objects, FF should be able to enter into c-command relations. That this is correct is argued by Chomsky (1995:274), on the basis of the interaction between agreement and the licensing of control structures.

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A Slovak Argument for the Onset-Rhyme Distinction

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The goal of this squib is to examine how Slovak glides can contribute to a better understanding of syllable constituency. I focus on *ji* and *ij* syllables, which, I argue, must be analyzed as onset – nucleus and nucleus – coda, respectively. I investigate a few options for representing these structures, and I conclude that the rhyme is necessary in syllable constituency.

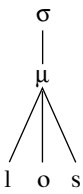
The structure of the argument is as follows. First, I claim that [ji] and [ij] do not constitute complex nuclei. Rather, [j] serves as either an onset (in [ji] cases) or a coda (in [ij] cases). Second, I show that [i] and [j] have identical feature specifications. Consequently, [i] and [j] must be distinguished structurally in terms of their position in the syllable. Third, I argue that the relevant structural distinction cannot be made in the current moraic theory, because this theory cannot adequately represent coda segments. Fourth, I demonstrate that a change in the moraic theory to represent codas (suggested by Prince and Smolensky (1993)) loses sight of generalizations that refer to nuclei and codas. Consequently, the rhyme is needed. This constituent is readily available in the X-slot model of the syllable but not in the current moraic model. Therefore, two options are available: either to accept the X-slot model or to modify the moraic model.

I would like to thank Jill Beckman and Cathie Ringen for their help and discussion. I am also grateful to the two anonymous *LI* reviewers, whose comments have contributed to improving this squib. Last but not least, my gratitude goes to Martin Votruba for his invaluable consultation and advice regarding the data. Needless to say, responsibility for the content of the squib is solely mine.

In section 1 I present essential background facts. I also establish that consonants are nonmoraic in Slovak—a crucial fact because it means that coda segments are not moraically distinct from onset segments and a nuclear [i] does not contrast with a coda [j] since both are under the same mora. In section 2 I examine the treatment of glides.

1 Background

In the moraic framework,[1] the two types of syllable constituency in (1) have most often been used. They are exemplified here with the Polish word *los* 'fate'.

(1) a. 

b. 

The constituency in (1a) is assumed by Zec (1988). It is closely related to the original concept of Hyman's (1985) foundational work in moraic theory. The constituency in (1b) derives from the work of McCarthy and Prince (1986) and Hayes (1989) and is the most widely accepted model of moraic syllable structure.

The representations in (1) are correct for languages that are not subject to Weight-by-Position (Hayes 1989). In these languages consonants do not contribute to weight and are thus nonmoraic. Polish is an obvious example here because it is entirely weight insensitive: it has no long vowels, no diphthongs, no weight-sensitive rules of any type. In contrast, Slovak is weight sensitive; but interestingly, it has no moraic consonants. This fact is best documented by the Rhythmic Law, a generalization stating that a heavy syllable shortens after a heavy syllable (e.g., Peciar 1946, Dvonč 1955, Kenstowicz 1972, Kenstowicz and Rubach 1987). Schematically:

(2) *Rhythmic Law*
V: → V / V: ____

The Rhythmic Law is triggered by syllables with complex nuclei regardless of whether the nucleus has a long vowel (3a), a diphthong (3b), or a long syllabic consonant (3c). However, there is no shortening after VC syllables (3d). The underlying representation of the dative plural suffix has a long vowel. It can be seen on the surface when the stem is short, as in *žen + ám* [žena:m] 'woman' (dat.pl.). (Note: an acute accent over the vowel marks length in the Slovak orthography: [ie], [uo], and [ia] are diphthongs.)

[1] The X-skeletal nucleus-rhyme syllable is discussed later.

(3)		nom.sg.		dat.pl.
a.	Rhythmic Law:	minút + a [minu:ta] ‘minute’	–	minút + am [minu:tam]
		mín + a [mi:na] ‘mine’	–	mín + am [mi:nam]
b.	Rhythmic Law:	riek + a [rieka] ‘river’	–	riek + am [riekam]
		kôr + a [kuora] ‘surface’	–	kôr + am [kuoram]
		čiar + a [čiara] ‘line’	–	čiar + am [čiaram]
c.	Rhythmic Law:	vŕb + a [ʊr:ba][2] ‘willow’	–	vŕb + am [ʊr:bam]
d.	No Rhythmic Law:	sekunda [se.kun.da] ‘second’	–	sekund + ám [se.kun.da:m]
		slamk + a [slam.ka] ‘straw’	–	slamk + ám [slam.ka:m]
		farb + a [far.ba] ‘color’	–	farb + ám [far.ba:m]

I conclude that consonants are nonmoraic in Slovak and consequently that the representations in (1) for Polish are also true for Slovak.[3] With this background information in mind, let us look at the behavior of glides.

2 Glides

In section 2.1 I consider onsets and conclude that the syllable constituency in (1a) is inappropriate for Slovak. In section 2.2 I examine codas and conclude that the representation in (1b) is also inadequate. What is needed is a model of syllable constituency that permits identification of codas.

2.1 Onsets

Standard descriptive sources (e.g., Dvonč et al. 1966, Isačenko 1968, Král’ 1988) report the occurrence of *ji* syllables, with *j* being in the onset and *i* in the nucleus. These syllables occur both morpheme-internally and at morpheme boundaries: *Ukrajin* + *a* ‘Ukraine’, *kraj* + *in* + *a* ‘countryside’. I will argue that the *j* is in the onset and that the two other options—first, that the *j* is in the coda, and second, that the *j* is in the nucleus—are not available.

The coda option cannot be correct since, on the one hand, native speakers report the syllabification *kra.ji.na* ‘countryside’ (Martin Vo-

[2] [ʊ] is a labiodental approximant; see Rubach 1993.

[3] Technically, syllabic liquids are moraic and long syllabic liquids are linked to two moras, but these moras are not an effect of Weight-by-Position. It is the absence of Weight-by-Position that is the essence of the conclusion here, since then a segment is not assumed to have a mora by virtue of the fact that it is in the coda.

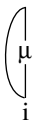
truba, personal communication) and, on the other hand, *ji* may occur word-initially, as in *jiríčk + a* 'linnet'. The option that *j* is part of the nucleus is also untenable. First, nuclear *j* and *i* would constitute a heavy syllable. In that case *jiríčk + a* [jiri:čka] would have two heavy syllables (the *í* is long), violating the Rhythmic Law. The explanation that the Rhythmic Law is cyclic and cannot apply morpheme-internally (Kenstowicz and Rubach 1987) would not be particularly convincing since there are no cases on record of Rhythmic Law violations morpheme-internally. The only such case would be *ji,* if *j* were to be part of the nucleus. Second, Slovak has a lengthening rule that applies in some grammatical contexts, for example, in the genitive plural: *slin + a* (nom.sg.) 'saliva' – *slín* [sli:n] (gen.pl.).[4] Lengthening does not affect complex nuclei, because nuclei may be maximally bimoraic: *riek + a* [rieka] 'river' – *riek* [riek] (gen.pl.), *lúk + a* [lu:ka] 'meadow' – *lúk* [lu:k] (gen.pl.). However, *ji* does undergo Lengthening: *krajin + a* [krajina] 'countryside' – *krajín* [kraji:n] (gen.pl.). This means that *ji* is not a complex nucleus.

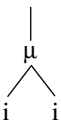
The behavior of *j* in *ji* is in keeping with the behavior of prevocalic *j* in general: *jV* neither triggers the Rhythmic Law nor inhibits Lengthening.

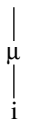
(4) jam + a [jama] 'pit' – jam + ám [jama:m] (dat.pl.) – jám [ja:m] (gen.pl.)

Finally, if *j* is in the onset, as I claim, then it should be able to combine with long vowels. This is indeed the case: *júl* [ju:l] 'July', *jímat'* [ji:mat'] 'undertake'.

I conclude that *j* in *jV* syllables, including *ji,* is in the onset. This fact can be represented if the syllable constituency is as in (1b) but not if it is as in (1a). The former predicts the structure (5a) for *ji,* which is adequate. The latter predicts (5b), or rather (5c), which are incorrect.

(5) a. 

b. 

c. 

The problem with (5b) is that it is unable to distinguish *ji* from *ij* (and the latter is attested, as I explain below). In addition, (5b) violates the Obligatory Contour Principle (OCP; also see below). The representation in (5c) adheres to the OCP but is untenable for another reason. It cannot distinguish *ji* from *i,* and both *ji* and *i* occur: *jiríčk + a* 'linnet', *Iran* 'Iran'. I conclude that the syllable constituency in (1a) is inadequate.

[4] This rule is well documented in the literature; see Dvonč et al. 1966, Isačenko 1966, Kenstowicz and Rubach 1987, Rubach 1993, and others.

2.2 Codas

The syllable constituency in (1b), a widely accepted structure, becomes difficult to maintain when we consider *ij* syllables. These occur morpheme-internally, both at the end and in the middle of words.

(6) kyj [kij][5] 'stick', patricij 'member of a noble family', Kolumbij + č + an 'Colombian' (N)

The fact that [ij] can appear word-finally makes it clear that *j* could not be in the onset. We are left with two options: either the *j* is in the coda or it is in the nucleus. I will argue that the former is correct and the latter incorrect.

If *j* were in the nucleus, then it would constitute a heavy syllable when combined with *i*. We would expect that *ij* should trigger the Rhythmic Law, but it does not. The words in (7a) behave like those in (7b), in which the nucleus is short, and not like those in (7c), in which the nucleus is complex. The testing example is the suffix *ý*, which is long in the underlying representation and remains long phonetically even when it follows an *ij* syllable.

(7) a. režij + n + ý [režijni:] 'stage production' (Adj.), štipendij + n + ý [štipendijni:] 'fellowship' (Adj.), olympij + sk + ý [olimpijski:] 'Olympic', kolumbij + sk + ý[6] [kolumbijski:] 'Colombian'
b. star + ý [stari:] 'old', sol' + n + ý 'salt' [sol'ni:] (Adj.), sloven + sk + ý [slovenski:] 'Slovak'
c. rieč + n + y [riečni] 'river' (Adj.), klíč + n + y [kli:čni] 'embryo' (Adj.), kĺb + n + y [kl:bni] 'joint' (Adj.), občian + sk + y [opčianski] 'citizen' (Adj.), pán + sk + y [pa:nski] 'sir' (Adj.)

Evidently, *ij* does not trigger the Rhythmic Law. Furthermore, it does not undergo it either. Thus, the shortening of the diphthong in (8a) contrasts with *ij* in (8b).

(8) a. nes + iem [ɲesiem] 'I carry' *versus* môž + em [muožem]
b. Ázij + č + an [a:zijčan] 'Asian' (N), melódij + k + a[7] [melo:dijka] 'melody' (dim.)

The tests applied in (7) and (8) are combined in (9), which shows that *ij* can neither trigger nor undergo the shortening.

[5] The vowel [i] is represented in the Slovak orthography by two letters; *i* to indicate that the preceding consonant is palatalized, and *y* to show that the preceding consonant is not palatalized (native vocabulary).

[6] Notice that appealing to Strict Cyclicity would not help because *ij* and the long vowel are in a derived environment.

[7] The argument is the same as in the case of *jiríčk + a*. The Rhythmic Law could be blocked by Strict Cyclicity, but this explanation carries little weight since *ij* syllables would be the only recorded case of a Rhythmic Law violation morpheme-internally.

(9) ázij + sk + ý [a:zijski:] 'Asian', líbij + sk + ý [li:bijski:] 'Libyan', melódij + k + ám [melo:dijka:m] 'melody' (dim. dat.pl.)

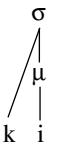
A different type of test, syllabification, corroborates the conclusion that *j* is not in the nucleus. The observation is that the *j* of *kyj* 'stick' resyllabifies into the onset when a vowel is added: *kyj* + *a* [ki.ja] 'stick' (gen.sg.). This runs counter to the generalization that constituents of syllable nuclei are resistant to resyllabification.

Finally, if *ij* were to constitute a nucleus, then it would have to be admitted that Slovak has both rising diphthongs (exemplified in (3b), (7c), and (8a)) and falling diphthongs (the latter limited to *ij*). This is odd typologically since languages have one or the other type of diphthong, but not both at the same time. I conclude that *j* in *ij* is in the coda rather than in the nucleus. This conclusion is confirmed by the facts that coda *j* can be combined with all vowels and that such combinations neither trigger the Rhythmic Law (10a) nor inhibit Lengthening (10b).

(10) a. taj + ný [tajni:] 'secret', čuj + n + ý [čujni:] 'sensitive', stroj + ník [strojɲi:k] 'mechanic'
b. tajg + a [tajga] 'taiga' – tájg [ta:jk] (gen.pl.), chajda [xajda] 'shack' – chájd [xa:jt] (gen.pl.), ujm + a [ujma] 'injury' – újm [u:jm] (gen.pl.)

Now, given the syllable constituency in (1b), the question is how [ij], in *kyj* 'stick', can be represented. Two options are reviewed in (11).

(11) a. 

b. 

The structure in (11a) faces two objections. First, it becomes impossible to determine which of the two *i*'s stands for [i] and which stands for [j]. Introducing a principle that it is the *i* on the left that is the ''head'' of *ii* is not only ad hoc but also rather infelicitous in the case of Slovak. Such a principle would be at odds with the fact that Slovak has rising diphthongs. (The ''head,'' if it were to be introduced at all, should be on the right.) Second, (11a) violates the OCP. The solution here would be to regard *j* as [+cons], as suggested by Hyman (1985) and Hayes (1989).[8] Although this may work for some languages, it is particularly badly suited to Slovak.

Isačenko (1968) notes that [j] is related to [i] in terms of its

[8] Characterizing *j* as a consonant goes back to Whitney (1865), who used the term ''vowel'' in the sense of today's ''syllable nucleus'' and ''consonant'' in the sense of today's ''syllable margin.'' But Whitney did not have an autosegmental theory at his disposal.

phonetics and its distribution. Phonetically, the *j*'s in *jojkat*' 'lament' are sonorants. Isačenko's assertion is supported by the phonological behavior of *j*. First, in *fjord* 'fjord', a recent borrowing, [f] and [j] disagree in [voice]. Had [j] been an obstruent, this disagreement would not have been possible because Voice Assimilation is entirely exceptionless in Slovak.[9] Second, the occurrence of the labiodental approximant [ʋ] is restricted to the position before sonorants,[10] but it freely appears before [j], as in *v* + *jazd* [ʋjast] 'entrance'. This shows that [j] must be a sonorant.

Distributionally, *j* and *i* are complementary, with *j* occurring before and after a vowel and *i* in other positions.[11] There are a few exceptions, but paradoxically, they strengthen rather than weaken Isačenko's generalization that [j] is derived from /i/. Thus, [i] is found next to a vowel in *koktail* 'cocktail', *email* 'enamel', *druid* 'Druid', *ionizovat'* 'ionize', and a few other words. (All these words are recent borrowings.) However, the occurrence of [i] is unstable and limited to a high-style pronunciation. In ordinary speech [i] is replaced by [j], exactly as expected (Král' 1988, Martin Votruba, personal communication). The free variation between [i] and [j] testifies to the relatedness of these two segments.

A different type of argument for [− cons] *j* derives from palatalization. For example, a rule known as First Velar Palatalization operates before front vowels and *j* but not before palatalized consonants. The environment is thus [− cons, − back] and the rule treats *j* as [− cons].[12]

To summarize, there is much evidence in favor of deriving [j] from /i/: articulatory facts, complementary distribution, nativization of borrowings, and the operation of phonological rules. I conclude that *j* is not [+ cons] in Slovak and that consequently *ij* violates the OCP in (11a). However, this objection has recently lost much of its force since, given Optimality Theory (Prince and Smolensky 1993), constraints are violable.

Although regarding the OCP as violable may be a solution in the case of some other languages, it is inappropriate for Slovak. First, all

[9] The exceptionless nature of Voice Assimilation is documented by foreign accents: adult speakers of Slovak learning other languages cannot pronounce a cluster consisting of a voiceless consonant and a voiced consonant.

[10] In the remaining contexts, //ʋ// surfaces as a labiodental obstruent, as in *vdova* [vdoʋa]; see Rubach 1993.

[11] As I point out in Rubach 1993, *i* → *j* Gliding is blocked in the *CiV* environment. The rationale here is the avoidance of complex onsets at the expense of creating onsetless syllables: *dialekt* 'dialect' is syllabified [di.a.lekt] rather than [dja.lekt]. In the former syllabification, *a* is an onsetless syllable. Words such as *v* + *jazd* 'entrance' are not exceptions here. The *v* //ʋ// is a prefix, and, like all prefixes in Slavic languages, it is adjoined to the phonological word node. That is, *v* + *j* do not constitute an onset; see Rubach 1993.

[12] For reasons of space I do not go into the details of palatalization here; but see Rubach 1993:chap. 4.

vowels except *i* and *u* (but see *iu* below) have corresponding diphthongs: *e – ie, o – uo, a – ia.*[13] Second, Contraction, a process that collapses *i* and a vowel into a single nucleus (Browne 1971, Kenstowicz and Rubach 1987, Rubach 1993), derives diphthongs in all cases except those in which the vowel happens to be *i.*

(12) /če.sa.ni.e/ → [če.sa.nie][14] 'combing' (nom.sg.)
/če.sa.ni.a/ → [če.sa.nia] (gen.sg.)
versus /če.sa.ni.i/ → [če.sa.ni:] (loc.sg.)

The exceptional behavior of *i.i*—the fact that they do not form a diphthong—cannot be accounted for by restricting diphthong formation to nonhigh vowels. The reason is that *i.u* do form a diphthong: /če.sa.ni.u/ → [če.sa.niu] 'combing' (dat.sg.). All these mysterious facts follow from the OCP and do not require any stipulations: *i* forms diphthongs with all vowels except *i*, because /i.i/ is collapsed into long [i:] by the OCP, as in the loc.sg. /če.sa.ni.i/ → [če.sa.ni:].[15]

In sum, the representation in (11a) is undesirable, because, on the one hand, it violates the OCP (an active constraint in Slovak) and, on the other hand, it makes it impossible to determine which of the two *i*'s should be understood as [i] and which as [j]. This objection should not be treated lightly, since Slovak exhibits the three-way contrast illustrated in (13).

(13) long [i:] sladký 'sweet' *versus* [ij] kyj 'stick' *versus* short [i] boky 'sides'

The final syllables are perceived as distinct by native speakers (Král' 1988, Martin Votruba, personal communication). This fact shows that (11b) is not an adequate representation for [ij] either because the contrast between [ij] and [i] is neutralized, which is incorrect. But then [ij] cannot be represented within the constituency model shown in (1b). Another solution is needed.

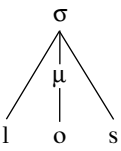
Prince and Smolensky (1993) mention in passing the possibility that not only the ''onset'' segments but also the ''coda'' segments may be linked directly to the syllable node.[16] This is a modified version of (1b), and it suits the facts of Slovak well. In the ordinary case, such as that of *los* 'fate' in (1), the representation is as in (14a). If this is correct, then [kij] is not a problem because it can be represented as in (14b).

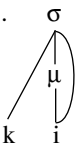
[13] The [ia] comes from the diphthongization of the long *ä* /æ:/, with a subsequent change of /æ/ to [a]; see Kenstowicz and Rubach 1987, Rubach 1993. The other source of [ia] is Contraction, as shown in (12).

[14] The /i/ is a gerund morpheme and the /e/ is an inflectional ending; see Rubach 1993:191 for an analysis.

[15] For another argument for the OCP, *j*-Shortening (not presented here because of its length and complexity), see Rubach 1993:258ff.

[16] Prince and Smolensky (1993) do not argue for this method of representing syllables because it is not essential to the points they make.

(14) a. 

b. 

Although (14b) solves the Slovak problem (no OCP violations; [ij] is reflected in syllable structure), it raises questions of a different nature. First, extrapolating onsets and codas in (14a–b) is awkward. It is no longer possible to define onset segments as those directly linked to the syllable node, as was the case in (1b), since both ''onsets'' and ''codas'' are linked directly to σ. One must resort to writing the mora into the structural description of generalizations referring to onsets and codas. In the former case, the ''onset'' segment is one that has a mora to its right and is linked to σ. In the latter case, we have a mirror image: the ''coda'' segment is one that has a mora to its left and is linked to σ. This procedure is awkward in the sense that it is reminiscent of the *SPE* practice of translating onsets and codas into CV and VC strings, respectively. More importantly, the model in (14) is unable to capture generalizations that refer to the property ''onset as such'' and that do not distinguish between the positions ''immediately before a moraic segment'' and ''farther away from the moraic segment.'' One example is the clear – dark *l* distribution in British English (Received Pronunciation).

As is well known (see, e.g., Jones 1972 and Gimson 1970), the occurrence of clear and dark *l* is complementary. The former is found in onsets and the latter in rhymes (Mohanan 1985, Halle and Mohanan 1985).

(15) a. clear *l*: Billy, lip, balloon, billion [bɪljən]
b. dark *l*: Bill, belt, battle, always

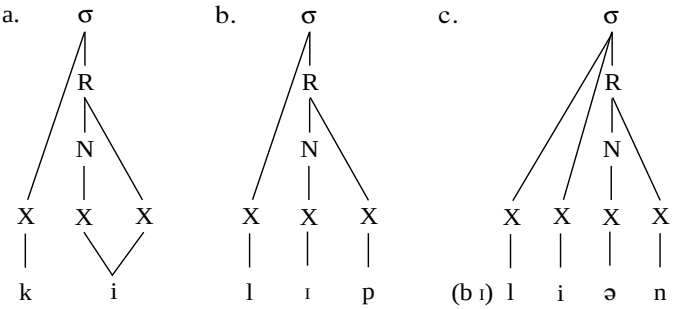
Instructive here is the distribution of [l] and [ɬ] before glides: *billion* versus *always.* It follows naturally from syllable structure since [lj-] is a permissible onset in Received Pronunciation whereas *[lw-] is not.[17] Consequently, we find clear *l* in *billion* and dark *l* in *always.* Crucially, however, the [l] can be either before the moraic segment, as in *lip* and *balloon,* or not, as in [bɪ.ljən]. Thus, the generalization truly refers to the position in an onset and not to the prevocalic position.[18] But this fact cannot be expressed in terms of (14). I conclude that the syllable constituency model in (14) is not adequate.

[17] [lj-] is also found in words such as *allure* and *allude* (both cited in Jones and Gimson 1977), but there it is in free variation with [l]. This is a reflection of the well-known rule that deletes *j* after coronals in stressed syllables. In East Coast American English, this rule has taken its heaviest toll: [j] does not appear in *new, tune, due, allure,* and so on. In Received Pronunciation, *j*-Deletion has begun with *r* ([rju:d] *rude* is unattested) and is now being extended to *l.*

[18] The opposite generalization, *l* → *ɬ* in ''codas,'' is not available in terms of (14) because the contexts in which [ɬ] appears cannot be defined: the [ɬ] is

All the difficulties accumulated in this section disappear if we adopt a syllable constituency model that permits reference to the rhyme and thus defines onsets and codas, albeit indirectly. One such model is the standard X-skeletal representation (e.g., Steriade 1982, Levin 1985), whose roots can be found in Pike and Pike 1947 and Kuryłowicz 1947.[19] The representations of the Slovak [kij] and the Received Pronunciation [lɪp] and [bɪ.ljən] are shown in (17).

(17) a. b. c.



The onset is defined as linking to the syllable node and the coda as linking to the rhyme. Now the distribution of clear versus dark *l* in Received Pronunciation is straightforward and there are no OCP violations in Slovak. The contrasts in the final syllables of *boky* [i] 'sides', *sladký* [i:] 'sweet', and *kyj* [kij] are not a problem either: single-slot nucleus *versus* complex nucleus *versus* single-slot nucleus – rhyme.

To conclude, a review of various current models of moraic syllable constituency has shown that these models are not adequate as they stand. We need more structure than has so far been afforded. Specifically, we must be able to define codas. This is not a problem if we recognize the rhyme as a constituent, as exemplified in (17).[20] In sum, there are two options: either to accept the standard X-skeletal theory[21] or to modify the moraic theory in a way that permits more constituent structure than is recognized in the current theory.

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moraic in *battle* and *belt* but nonmoraic in *avail.* An analysis that posits *l* → *ɬ* cannot avoid reference to the rhyme as a constituent because [ɬ] occurs in two positions: in the coda *(belt, avail)* and in the nucleus *(battle).*

[19] The difference is that these authors used onsets and codas as real constituents and not as positions that permit onsets and codas to be ''read off'' from the constituent structure.

[20] Humbert (1997) points out that Nasal Assimilation occurs in codas (regressive assimilation) and in nuclei (progressive assimilation), as in English *bank* [bæŋk] and *bacon* [beikŋ]. (In rapid speech the syllabic nasal is pronounced as an angma.) This shows that the domain of Nasal Assimilation is the rhyme. See also footnote 18.

[21] For an analysis of the Rhythmic Law in terms of this theory, see Kenstowicz and Rubach 1987 and Rubach 1993.

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