

[REVIEW]

Contiguity Theory

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1. Introduction

Richards proposes Contiguity Theory, which is an attempt to offer an answer to the question of why languages differ in the type of overt movement that they display, which has not been given any principled answer in the Minimalist Program. He argues that “apparent syntactic differences between languages are always the consequences of more fundamental phonological and morphological parameters together with a crosslinguistically invariant syntactic system” (p. 2). Under Contiguity Theory, the building of certain aspects of prosodic structure begins in narrow syntax. This allows syntax to make reference to phonology, which is contrary to a strict segregation of syntax from phonology, the commonly held view in the Minimalist Program that “phonological information is absent from the representations manipulated by the syntactic derivation” (p. 7). Contiguity Theory can account for variations with overt movement including A-movement to the Spec of TP, *wh*-movement and head movement.

The organization of this review is as follows. Section 2 presents an overview of the book under review. Sections 3 and 4 explicate crosslinguistic variations with overt A-movement to the Spec of TP (the EPP effects) and *wh*-movement. Section 5 discusses head movement. Section 6 points out remaining issues to be investigated. Section 7 presents concluding remarks.

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2. Overview

Chapter 1: Introduction of the book under review presents background assumptions about syntax and phonology. The syntactic assumptions are based on the Minimalist Program developed in Chomsky (1995, 2000) and much other work. Richards then introduces two major phonological assumptions adopted in this book, i.e. an approach to the mapping of syntactic trees onto prosodic structures known as Match Theory (see, among others, Selkirk (2009, 2011) and Elfner (2012)) and an approach to word-level stress developed by Idsardi (1992). Chapter 2: Affix Support and the EPP offers an analysis of the distribution of overt A-movement to the Spec of TP (the EPP effects), arguing that whether a given language exhibits the EPP effects or not follows from rules for morphology and stress assignment for its verbs. Chapter 3: Match Theory and Contiguity presents an account of the distribution of overt *wh*-movement, arguing that the grammar is required to create prosodic domains connecting *wh*-phrases with complementizers where they take scope under Match Theory. Chapter 4: Probe-Goal Contiguity and Chapter 5: Selectional Contiguity show that the prosodic condition on *wh*-phrases and complementizers proposed in Chapter 3 also holds of probes and goals and selectional relations between heads. Chapter 6: Head Movement deals with head movement in declarative tensed clauses. Chapter 7: Further Topics in Head Movement discusses infinitival clauses, questions, and verb-second phenomena. In the following three sections, I will investigate how Richards' theory accounts for crosslinguistic variations with overt A-movement to the Spec of TP (the EPP effects) and *wh*-movement and how head movement can be accommodated under the same principles that govern the movement of phrases.

3. A-Movement

Richards investigates overt A-movement to the Spec of TP in numerous languages, arguing that variations in the EPP effects can be captured by the requirement of Affix Support (1) coupled with phonological and morphological parameters (2a–c):

(1) Affix Support

If a head is an affix, there must be a metrical boundary in the direction in which it attaches. (Richards (2016: 27))

- (2) a. Tense may be head-initial or head-final.
 b. Tense may be an affix or not; if it is an affix, it may be a prefix or a suffix.
 c. Tense may be reliably separated from the verb by a metrical boundary or not. (Richards (2016: 17))

Richards makes the following two phonological assumptions. One is Match Theory (see, among others, Selkirk (2009, 2011) and Elfner (2012)), which is a set of mapping principles between syntactic and prosodic (metrical) structures: (i) Every syntactic head corresponds to a prosodic word ω , (ii) Every XP corresponds to a phonological phrase ϕ , and (iii) Every clause corresponds to an intonational phrase ι (p. 72). The other is an approach to word-level stress proposed by Idsardi (1992). In this approach, potentially stress-bearing units like syllables are grouped into metrical feet, and one member of each foot is distinguished as the head, which receives more stress than the other members. Hence, a metrical boundary in (1) is assumed to be a boundary between metrical feet, prosodic words, phonological phrases, and intonational phrases.

Let us first look at his analysis of languages with head-initial T. In languages like Greek, Irish, and Tagalog, head-initial T is a prefix. Affix Support requires the prefix T to precede something containing a metrical boundary, which is always satisfied by its complement νP as shown in (3); these languages lack the EPP effects:

- (3) $[_{\text{TP}} \text{T- } \nu\text{P}]$

In languages like Catalan, Italian, and Spanish, where head-initial T is a suffix, a metrical foot boundary is inserted to its left as soon as T is merged. Suffixal T is preceded by a metrical foot boundary represented as $_{\text{FOOT}}$ in (4), which captures the fact that stress appears on the vowel that precedes the tense suffix. This metrical foot boundary satisfies T's need for Affix Support; there are no EPP effects:

- (4) $[_{\text{TP}} \text{ }_{\text{FOOT}}\text{-T } \nu\text{P}]$

In languages like English and French, on the other hand, suffixal initial-T is not preceded by a metrical boundary. Affix Support for T is satisfied by placing a phrase in the Spec of TP as shown in (5); the EPP effects appear:

- (5) $[_{\text{TP}} [\text{XP}] [_{\text{Tr}} \text{-T } \nu\text{P}]]$

Let us next look at Richards' analysis of languages with head-final T. In languages like Japanese, head-final T is a suffix. Although Richards assumes Kayne's (1994) Linear Correspondence Axiom (LCA), where heads are universally generated preceding their complements, he departs from Kayne in claiming that the complement-head order is derived not by move-

ment but by untethering (de-linearization) (6):

(6) Untethering

Given two sisters, X and Y, delete all ordering statements that refer to either X or Y. (Richards (2016: 23))

According to the untethering approach, once T is merged with its complement, untethering removes the ordering statements that order T with respect to its complement as shown in (7). The double-headed arrow between T and ν P represents the fact that these two sisters are untethered and hence unordered with respect to each other, though Richards assumes that Retethering, the operation that reestablishes an order between sisters, will make T head-final later in the derivation:

(7) $[_{TP} -T \Leftrightarrow \nu P]$

In order to satisfy Affix Support for T, DP undergoes movement to the Spec of TP, which creates a new ordering statement $\langle DP, T \rangle$. Since DP contains metrical structure, this new ordering statement satisfies Affix Support for T; the EPP effects appear in Japanese (see, among others, Miyagawa (1989, 2001) and Kishimoto (2001)).

Let us turn to languages where head-final T is a prefix. Affix Support for T can be satisfied by elements internal to ν P before untethering applies:

(8) $[_{TP} T- \nu P] - \text{Untethering} \rightarrow [_{TP} T- \Leftrightarrow \nu P]$

Affix Support for T can only be satisfied if T is followed by a metrical boundary and thus a verb stem constitutes its own stress domain. Witsuwit'en, an Athabaskan language with a T-final prefix, is such a language, where stress is put on the verb stem.

4. *Wh*-Movement

Richards argues that Generalized Contiguity (9) accounts for whether a given language moves its *wh*-phrases or leaves them in situ (Richards (2016: 146)):

(9) Generalized Contiguity

If α either Agrees with or selects β , α and β must be dominated by a single prosodic node, within which β is Contiguity-prominent.

In (9), β is Contiguity-prominent within ϕ if β is adjacent to a prosodically active edge of ϕ . There are two operations for satisfying Generalized Contiguity:

(10) Grouping

Take a pair of prosodic nodes α , β , and create a ϕ that dominates them both. (Richards (2016: 118))

(11) Contiguity-adjunction

Take a pair of adjacent prosodic nodes and make one of them a daughter of the other. (Richards (2016: 108))

The language variation concerning *wh*-movement has to do with which edge of ϕ is prosodically active. The grammar then uses whichever strategy, Grouping (10) or Contiguity-adjunction (11), is appropriate to create Contiguity.

If prosodically active edges of ϕ lie on the opposite side of the *wh*-phrase from C, then the *wh*-phrase remains in situ, becoming Contiguous with C via Grouping. This is the case in C-final languages like Japanese and in C-initial languages like Chicheŵa. Let us consider Japanese, taking (12) as an example:

- (12) Naoya-ga nani-o nomiya-de non-da no?
 Naoya-Nom what-Acc bar-at drink-Past Q
 ‘What did Naoya drink at the bar?’ (Richards (2016: 81))

- (13) [_{CP} [_{TP} [_{KP} [_{NP} Naoya] ga] [_{T'} [_{VP} [_{KP} [_{NP} nani] o] [_{VP} [_{PP} [_{NP} nomiya] de] nonda] v] T]] C]

The sentence (12) is assigned syntactic structure (13). In (13), the Japanese nominal is represented as KP, with K headed by the case morpheme and DP being left out. It should be noted that the Q particle *no* is not included in (13), because Richards assumes that whether C is overt or null, being idiosyncratic, is not represented in the narrow syntax. According to Match Theory and Japanese prosody advocated by, among others, Selkirk and Tateishi (1988) (cited on p. 71), every XP corresponds to a phonological phrase ϕ . Then, prior to Merge of C, the TP of (13) is mapped onto prosodic structure (14). It is crucial in Richards’ analysis that prosodic structures “are generated by the narrow syntax, as the derivation proceeds” (p. 81):

- (14) [_(ϕ_1) [_(ϕ_2) Naoya-ga ‘Naoya-Nom’] [_(ϕ_3) [_(ϕ_4) nani-o ‘what-Acc’] [_(ϕ_5) [_(ϕ_6) nomiya-de ‘at the bar’] non-da ‘drink-Past’]]] (Richards (2016: 82))

In Japanese, the left edges of maximal projections, which are signaled by prosodic effects like initial low boundary tones and reset of downstep, are prosodically active. Under his notation, only prosodically activated edges are represented in structures. In (14), prosodically activated left edges are annotated as parentheses. Once C is merged and Agrees with the *wh*-

phrase, Grouping (10) applies to (14), yielding (15):

- (15) $[(\phi_b [(\phi_2 \text{ Naoya-ga}] [(\phi_a [(\phi_3 [(\phi_4 \text{ nani-o}] [(\phi_5 [(\phi_6 \text{ nomiya-de}] \text{ non-da}]]] C]$ (Richards (2016: 83))

Grouping changes (14) in a way that maximally preserves the existing structure by taking the largest ϕ that begins with the *wh*-phrase *nani* ‘what,’ which is ϕ_3 , and then creating a new ϕ , ϕ_a , which dominates both C and ϕ_3 . Since the *wh*-phrase is adjacent to the ϕ_a ’s prosodically active edge, i.e. its left edge, Generalized Contiguity between C and the *wh*-phrase is satisfied. Finally, a new ϕ , ϕ_b , which dominates both ϕ_2 and ϕ_a , is created. C-initial languages like Chicheŵa, where the right edge of ϕ is prosodically active, can be dealt with in the same way.

If prosodically active edges of ϕ lie on the same side of the *wh*-phrase as C, the *wh*-phrase must be made adjacent to C, since we cannot satisfy Generalized Contiguity requirement between C and the *wh*-phrase by manipulating prosody. Let us first look at C-initial languages like English and Tagalog. In C-initial languages like English and Tagalog with prosodically active left edges of ϕ , *wh*-phrases must undergo overt *wh*-movement to the left periphery of a clause as in (16). It should be noted here that Richards advocates a novel view that English has prosodic activity at left edges:

- (16) $[(\phi_1 \text{ wh-phrase C}] [(\phi_2 \dots$

In (16), the *wh*-phrase and C are both dominated by ϕ_1 . The *wh*-phrase is Contiguity-prominent within ϕ_1 , since the *wh*-phrase is adjacent to the left edge of ϕ_1 ; Generalized Contiguity between C and the *wh*-phrase is satisfied. In C-final languages like Georgian and Basque with prosodically active right edges of ϕ , *wh*-phrases must be placed as far right in a clause as possible to satisfy Generalized Contiguity.

Although Richards’ analysis neatly accommodates the variation in the placement of *wh*-phrases across the languages examined, it is not entirely clear how his analysis deals with languages that allow both questions with in-situ *wh*-phrases and those with fronted *wh*-phrases like French and Spanish. Let us consider French as an example:

- (17) a. Jean a acheté quoi?
 Jean has bought what
 b. Quel livre Jean a-t-il acheté?
 which book Jean has-he bought
 ‘Which book did Jean buy?’ (Cheng and Rooryk (2000: 4))

Richards claims that French is one of the languages with initial complementizers and prosodically active right edges of ϕ . Generalized Contiguity between C and a *wh*-phrase can be satisfied in two ways, i.e., “the *wh*-

phrase can be left in situ and connected to C via ... Grouping, or it can be moved to become adjacent to C, making Contiguity-adjunction possible" (p. 112). Hence, French allows both questions with in-situ *wh*-phrases and those with fronted *wh*-phrases. A question still remains, however, why languages like Japanese, where prosodically active edges of ϕ lie on the opposite side of the *wh*-phrase from C, cannot employ Contiguity-adjunction to derive *wh*-questions with fronted *wh*-phrases. Richards suggests that the difference between French-type languages and Japanese-type languages resides in applicability of Grouping. In Japanese-type languages, Grouping is freely applicable, thereby making Contiguity-adjunction unavailable. In French-type languages, on the other hand, Grouping is limited in the sense that those languages "impose limits on what kinds of prosodic structures can undergo Grouping" (p. 113), thereby making Contiguity-adjunction available in some cases. As Richards himself admits, however, further research is needed to give a principled explanation of the difference between Japanese-type languages and French-type languages. Furthermore, it is not the case that a *wh*-question in French can be uttered freely with a *wh*-in-situ or with a fronted *wh*-phrase. Cheng and Rooryk (2000) argue that in-situ *wh*-questions in French like (17a) obligatorily involve sentence-final rising intonation whereas *wh*-questions involving movement like (17b) involve non-rising intonation. This indicates that sentence-final rising intonation plays a role in licensing in-situ *wh*-questions in French. Richards' analysis cannot capture this prosodic licensing of in-situ *wh*-questions in French.

5. Head Movement

Richards argues that head movement can be accommodated under the same principles that govern the movement of phrases, i.e. Affix Support and Generalized Contiguity. Let us consider (18) as an example. Its derivation proceeds as in (19):

(18) John eats Chocolate.

- (19) a. [_{VP} [_{DP} John] [_{v'} [_{V+v} eat- ϕ] [_{VP} [_v-eat] [_{DP} chocolate]]]]]
 b. [_{ASpP} [_{DP} John] [[_{ASp} - ϕ] [_{VP} [_{DP}-John] [_{v'} [_{V+v} eat- ϕ] [_{VP} [_v-eat] [_{DP} chocolate]]]]]]]
 c. [_{TP} [_{DP} John] [_{T'} [_{ASp+T} ϕ -s] [_{ASpP} [_{DP}-John] [[_{ASp} - ϕ] [_{VP} [_{DP} John] [_{v'} [_{V+v} eat- ϕ] [_{VP} [_v-eat] [_{DP} chocolate]]]]]]]]]

In (19a), the head *v*, a null affix, satisfies Affix Support with the DP *John*. V undergoes head movement to *v*; the object becomes Contiguous with *v* through Contiguity-adjunction of the prosodic word containing V and *v* to

the object. The object DP is Contiguous-prominent within ϕ_{DP} , thereby satisfying Generalized Contiguity for Agree between ν and the object DP. In (19b), the Asp head is merged with νP . The Asp head $-\phi$ requires Affix Support, which is satisfied by movement of the subject DP *John*. Movement of *John* also satisfies Generalized Contiguity for selection between Asp and ν . In (19c), T is merged with AspP. Since T is both a probe and an affix, it follows Generalized Contiguity for Agree and Affix Support as well as Generalized Contiguity for selection between T and Asp. Assuming that the grammar prefers to create the Contiguity relation with the closer element first, Asp must move to T first, establishing Generalized Contiguity for selection between T and Asp. Since this head movement does not satisfy Affix Support, *John* moves to the Spec of TP. This movement also satisfies Generalized Contiguity for Agree between T and the subject.

6. Remaining Issues

6.1. Untethering and the EPP Effects in Japanese

In his discussion of A-movement to the Spec of TP, Richards assumes that Japanese has the EPP effects based on Miyagawa's (2001) scope facts in (20):

- (20) a. Zen'in-ga sono tesuto-o uke-nakat-ta. (All>Not, *Not>All)
 all-Nom that test-Acc take-Neg-Past
 'All didn't take that test.'
- b. Sono tesuto-o zen'in-ga *t* uke-nakat-ta. (All>Not, Not>All)
 that test-Acc all-Nom take-Neg-Past
 'That test, all didn't take.' (Miyagawa (2001: 299))

While the subject *zen'in* 'all' takes scope over negation in (20a), *zen'in* 'all' may take narrow scope with respect to the negation in (20b), where the object is scrambled over the subject. Miyagawa claims that the subject *zen'in* 'all' in (20a) is in the Spec of TP, satisfying the EPP requirement of T, and hence asymmetrically c-commands the negation; *zen'in* 'all' takes scope over the negation. (20b) can be derived by A'-scrambling of the object, which involves adjunction to TP as represented in (21):

- (21) [_{TP} Sono tesuto-o [_{TP} zen'in-ga [_{NegP} [_{VP} *t* uke] nakat] ta]]
 that test-Acc all-Nom take Neg Past

In this case, the subject, which is in the Spec of TP, takes scope over the negation. He argues that (20b) can also be derived by A-scrambling of the object, which he claims involves movement to the Spec of TP as represented in (22):

- (22) [_{TP} Sono tesuto-o [_{NegP} [_{vP} zen'in-ga *t* uke] nakat] ta]
 that test-Acc all-Nom take Neg Past

The scrambled object satisfies the EPP requirement of T, which allows the subject *zen'in* 'all' to stay in the Spec of vP; the Not>All reading is allowed.

As pointed out by Saito (2009), however, examples like (23) cast doubt on Miyagawa's analysis (Saito (2009: 48–49)):

- (23) a. Zen'in-ga zibun-zisin-ni toohyoosi-nakat-ta (to omo-u)
 all-Nom self-self-Dat vote-Neg-Past that think-Pres
 'Everyone did not vote for herself/himself.'
 (All>Not, *Not>All)
- b. Zibun-zisin-ni_i zen'in-ga *t_i* toohyoosi-nakat-ta (to omo-u)
 self-self-Dat all-Nom vote-Neg-Past that think-Pres
 'For herself/himself, everyone did not vote.'
 (All>Not, Not>All)

As correctly predicted by Miyagawa's analysis, while the subject *zen'in* takes wide scope over the negation in (23a), a scope ambiguity emerges in (23b). Under Miyagawa's analysis, (23b) has two different derivations depending on whether the object undergoes A- or A'-scrambling. When the object undergoes A-scrambling, it moves to the Spec of TP and the subject remains in the Spec of vP as shown in (24):

- (24) [_{TP} Zibun-zisin-ni_i [_{NegP} [_{vP} zen'in-ga *t_i* toohyoosi] nakat] ta]
 self-self-Dat all-Nom vote Neg Past

The subject takes narrow scope with respect to the negation. This derivation, however, is in violation of Condition C of the binding theory as the scrambled object reflexive A-binds the subject. It follows that the object can only undergo A'-scrambling. This incorrectly predicts that the subject *zen'in* 'all' must take scope over the negation.

It would then be fair to say that further research is needed to decide whether Japanese has the EPP effects with T. Suppose that contrary to what Richards claims, Japanese does not have the EPP effects with T and subjects in Japanese stay in the Spec of vP, as advocated by, among others, Fukui (1986) and Kuroda (1988). If we do not adopt Kayne's LCA approach or the universal base hypothesis, then Japanese is a head-final language, where a head-final suffix T satisfies the requirement of Affix Support for T through merging with its complement vP in [_{TP} vP -T]. This could make the operation untethering, which motivates the EPP effects in Japanese, dispensable in the analysis of the crosslinguistic variation with the EPP effects, though the verbal stress facts in Witsuwit'en need another

explanation. This view is theoretically desirable in that it makes discussions of this book more consistent. This is because although Richards argues that untethering must be motivated by Contiguity to account for the Final-over-Final Constraint (Biberauer, Holmberg, and Roberts (2014)), untethering between T and ν P in Japanese is not motivated by Contiguity.

6.2. Contiguity Theory and the Notion of Externalization Parameter

This subsection investigate whether Contiguity Theory is consistent with Berwick and Chomsky's (2011, 2016) notion of the externalization parameter, since both of them claim that aspects of syntactic variation should be derived from phonological and morphological properties.

Chomsky (2000) characterizes the Strong Minimalist Thesis (SMT), a defining tenet of the Minimalist Program, as follows (Chomsky (2000: 97)):

(25) Language is an optimal solution to legibility conditions.

What the SMT claims is that the principles of language are determined by efficient computation and language keeps to the simplest recursive operation Merge designed to satisfy interface conditions. It is then hard to see how parameters would fit in the Minimalist Program, since crosslinguistic variation is not a priori expected in an optimal natural object like language. This has led Berwick and Chomsky (2011, 2016) to claim that parameterization is restricted to externalization. Externalization is an ancillary phonological and morphological process, i.e. outside of the narrow syntax, that converts syntactic objects to entities accessible to the sensory-motor system. Berwick and Chomsky claim that since the problem of externalization can be solved in many different ways, externalization is subject to crosslinguistic variation.

Under Richards' analysis, although syntactic differences among languages are the consequences of phonological and morphological parameters, it is crucial that prosodic structures "are generated by the narrow syntax, as the derivation proceeds" (p. 81). In other words, the phonological and morphological process, which is the locus of parametric variations, is part of the narrow syntax. Recall his analysis of Japanese *wh*-question (12) explicated in section 4. It is crucial in his analysis that prior to Merge of C, TP is mapped onto prosodic structure (14). After C is merged, Grouping applies to prosodic structure (14), yielding prosodic structure (15), where Generalized Contiguity is satisfied. If the construction of prosodic structures started after the narrow syntax, however, the prosodic structure of (12) would be (26):

- (26) [_{φ_a} [_{φ₁} [_{φ₂} Naoya-ga ‘Naoya-Nom’] [_{φ₃} [_{φ₄} nani-o ‘what-Acc’]
[_{φ₅} [_{φ₆} nomiya-de ‘at the bar’] non-da ‘drink-Past’]]] C]

In (26), although ϕ_a contains both C and the *wh*-phrase, the *wh*-phrase is not adjacent to the ϕ_a 's prosodically active edge, i.e. its left edge; Generalized Contiguity is not satisfied. Under Richards' theory, the distribution of *wh*-phrases in situ in Japanese only follows from the view that prosodic structures are generated by the narrow syntax during a derivation. Hence, Contiguity Theory is not consistent with Berwick and Chomsky's (2011, 2016) notion of externalization parameter as it stands.

7. Conclusion

Richards (2016) seriously investigates the interaction of phonology and syntax, a topic which has long been regarded as important but has not been too actively investigated compared with the amount of syntactic literature. This book counts as an important contribution to the syntax-phonology interface research, some recent representatives of which include Selkirk (2009, 2011) and Elfner (2012). This book is also valuable because the phonology-syntax interaction is pursued in a typological framework. This is a highly recommended book for anyone interested in the phonology-syntax interaction and parametric variations among languages.

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