Introduction

While current generative theory acknowledges the importance of argument structure and productive morphological processes, it nevertheless continues to be essentially syntactocentric and has therefore failed to produce a fully integrated, balanced theory of the relation between argument structure, the productive affix-driven operations that alter it, and the syntactic structures it projects. In *The Syntax of Argument Structure* I propose an explicit, unified theory of the mapping between a verb's argument structure representation and the core syntactic structure of the sentence it heads.[1] This theory's primary hypothesis is that *a sentence's core syntactic representation is the direct projection of the main verb's final argument-structure representation*, which entails that there is an isomorphic mapping relation between the positions in argument-structure representation and the corresponding positions in its syntactic projection, and that *the former determine the latter*. In slightly different terms, the premise on which this theory is based is that a sentence's core *grammatical (syntactic) relations are the direct projection of the internal relations of the main verb's final (derived) argument structure*. It follows that determining and substantiating the internal architecture of argument-structure representation, to which chapter 1 is devoted, is an indispensable precondition for the theory of the relation between argument structure and morphosyntactic structure presented in *The Syntax of Argument Structure*.

Extensive empirical evidence will be presented demonstrating that argument-structure based morphosyntactic theory is better able than the more familiar syntax-based theories to explain the universal relations between argument structure, the operations (canonically affix-driven) that alter the verb's *initial* (basic) argument structure, and syntactic structure. It will be demonstrated that many of the syntactic structures whose derivations have been assumed in the generative literature to be primarily syntactic are in fact the syntactic projection of affix-driven operations on the main verb's argument structure. In other words, the main computational action often occurs in argument structure

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rather than in syntactic structure. The crucial assumption here is that *function words and productive affixes have their own argument structures*, which interact with the lexical verb's argument structure, producing a single derived composite argument structure. For example, the active ~ passive alternation results from different affix-driven argument-structure level operations on the same verb stem's initial argument structure; active sentences are thus not transformed into passive ones by syntactic operations. More specifically, the verb stem's initial (underived 'active') argument structure is made passive by an affix-driven argument-structure level rule and the passivized verb's *final* derived *passive argument structure* projects to syntax as a passive sentence (see Jaeggli 1986, Roberts 1987; see below for details).[2] In more general terms, argument-structure level rules or operations canonically involve the *composition* or, more accurately, the *amalgamation* of a lexical verb stem's argument structure with a productive affix's argument structure; the projection-to-syntax of the resulting composite argument structure is perceived as having systematic *syntactic effects*, many of which have been misinterpreted as primary syntactic rules or operations.[3]

It will be argued that the internal organization of a verb stem's argument structure (**V**'s diathesis) and the type of operations that alter it are linguistic universals. Many of the systematic language-specific differences we observe among the world's languages are encoded in the diatheses of the overt and null affixes (**-af**) that drive argument-structure level derivations. This is why the theory presented in *The Syntax of Argument Structure* is characterized as *morphosyntactic* (rather than *syntactic* with a subsidiary morphological component): the *final* argument-structure representation (diathesis), which projects as the sentence's core syntactic structure, is canonically derived by the affixation of one or more of a relatively small set of productive, argument-structure-bearing, language-specific affixes.[4]

In order to help readers to better orient themselves, I present the following outline of the theory's terminology, notation, and criterial properties, all of which will be discussed in greater detail in the chapters to follow.

- All verbs are represented in the mental lexicon as *stems*, which have an *initial* argument structure.[5]
- The lexicon of each language has a distinct set of productive *paradigmatic affixes*, which have their own argument structures; they include what are traditionally classified as both *inflectional* and *productive derivational* affixes.
- Argument-structure level operations involve the *composition* of a verb stem (**V**) and its argument structure (diathesis) with one or

more paradigmatic affixes and their diatheses. Each paradigmatic affix composes with an initial stem **V** or a derived stem **[V…af-]**, inducing a specific change in the argument structure of the initial or derived stem it composes with.

- It is essential to bear in mind in what follows that all diatheses have the same internal skeletal structure (i.e., the same number (x) of positions or places, some or all of which may be unfilled) and that when two diatheses, each with x places, *compose*, they *amalgamate*, the result being a *derived diathesis* with precisely x places (not 2 x places). A corollary of this conception of diathesis composition is that no matter how many lexical and affixal diatheses compose in a given derivation, the result is a final diathesis with x places – it is the 'contents' of these positions that change; we see below that in natural language x = 4. Given that a **V**'s diathesis may have unfilled positions, another corollary of diathesis theory is that, whereas the number of positions in a **V**'s diathesis is immutable (x = 4), its *valence* (the number of *arguments* it selects to fill these positions) can range between zero and three; the fourth position is occupied by **V** itself (see (1); the reason for this will be explained in chapter 1).

- The argument structures of stems and paradigmatic affixes have the same universal hierarchical internal organization, which, I argue, is responsible for the universal aspects of syntactic structure.

- **V**'s *initial* diathesis is altered in highly restricted ways by the diathesis of the first paradigmatic affix it composes with; **[V-af-]**'s derived diathesis is further altered by the diathesis of the next paradigmatic affix, and so on. The derived argument structure of **[[[V-af] -af] … -af$_n$]** is the derivation's *final diathesis* (argument structure representation), which projects to syntax. **[[[V-af] -af] … -af$_n$]** is a well-formed *word*, whose internal structure cannot be accessed by the syntactic rules that operate on its syntactic projection (see Di Sciullo and Williams 1987).[6]

- The theory proposed in *The Syntax of Argument Structure* is a successive, 'in-line' morphosyntactic derivational theory: first, **V**'s initial diathesis composes with the diatheses of a subset of the language's paradigmatic affixes, producing **[[V-af]…-af$_n$]** (a *word*, which is a barrier to subsequent diathetic operations) and **V**'s *final* diathesis, which projects to syntax as the initial syntactic structure from which the sentence's final syntactic structure is derived by successive *syntax-level operations* (e.g. the merging of the higher functional projections,

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> *wh*-movement, topicalization, raising to A'-positions, expletive merger, etc.).[7]

- Our most important assumption, which is implicit in other theories (see below), is that **V** cannot have more than three syntactic arguments; what appear to be 'fourth arguments' turn out to be *adjuncts*.[8]

- Much of *The Syntax of Argument Structure* is devoted to presenting empirical evidence that argument structure has the 2×4 bipartite organization represented by the *diathesis* in (1), according to which **V**'s argument structure consists of two related *tiers*, a *theta-role-selection tier* (theta-selection, s-selection, theta-grid) and a corresponding *linked categorial tier* (subcategorization frame, c-selection). Since each argument's categorial head is *linked* to a corresponding theta role *in argument structure*, an argument is bipartite.[9] Since the maximal number of arguments **V** can have is three, argument structure has the four positions represented in (1): **i, j**, and **k** are theta roles, **N** is a categorial noun head, and **V** is a lexical verb-stem head.[10] A theta role may be linked to **V** in *derived* diatheses only (e.g., see the *by*-phrase in passive derivations and the causative derivation of Turkish *ditransitive* (three-argument) verbs in §1.9).

(1)   The diathesis of a ditransitive verb:

i	j	k	-
N	N	N	V
1	2	3	4

The following is an alternative, linear representation of the two-tiered box structure in (1) (read " ^ " as "is linked to"; the curly brackets represent the bipartite arguments; the outer curly brackets demarcate **V**'s diathesis):

(2) $\{\{i\char`\^N\}_1 \{j\char`\^N\}_2 \{k\char`\^N\}_3 \{- \char`\^V\}_4\}$

- The argument structure representation in (1)/(2) is universal: *all* predicators and productive affixes have this skeletal 2×4, eight-slotted structure, regardless of their initial *valence* (which ranges from zero to three).[11] The reason for this is that initially unfilled slots like the theta-slot in $\{- \char`\^V\}_4$ in (1)/(2) will be shown to play an active role in many argument-structure level operations. Unfilled argument positions (e.g., $\{-\char`\^-\}_3$ in the diathesis of monotransitive verbs) that are not affected by diathetic operations do not project to syntax.

- Given the bipartite structure of arguments, argument-structure rules, unlike syntactic rules, can operate on a theta role without affecting the **N** it is linked to (e.g., $\{i\char94 N\}_1 > \{\char94 N\}_1$ *dethematization* in passive derivations) or can delete N without affecting **i** (e.g., $\{i\char94 N\}_1 > \{i\char94\text{-}\}_1$ in the derivation of *s(mall)-predicates* (see below). Syntactic rules as presently conceived cannot delete an NP (DP) but not its theta role, or delete a theta role, stranding its NP.

- The two-tiered, four-positioned diathesis in (1)/(2) does not involve *redundancy* (see Lasnik and Uriagereka 2005: 3–7): (i) Since the unfilled positions in impersonal (zero valence), unergative, unaccusative, mono-transitive, and ditransitive diatheses play a crucial role in constraining diathesis-level operations involving the *rightward displacement* of initial arguments, they must be explicitly represented in each verb's diathesis (see §1.9). (ii) Conclusive evidence will be presented that the two tiers in diathesis representation are *autonomous*, i.e., **V**'s c-selection (subcategorization tier) *cannot* be predicted from its theta-selection tier, as has been claimed (see Pesetsky 1982, Bošković 1997, and others).[12] (iii) Empirical evidence will also be presented for the existence of *external subcategorization* in Russian and other languages, which entails that Chomsky's Extended Projection Principle is not an absolute universal: not all *verbs* have external arguments and, accordingly, not all *sentences* have subjects (e.g., the external argument of an impersonal verb is $\{\text{-}\char94\text{-}\}_1$, which does not project to syntax).[13] It appears that subject-optionality is a special case of a more general parameterizable universal, which I tentatively call the Spec-Parameter: the fact that the spec-position in Russian noun phrases and the subject position in Russian clauses (spec-vP) may be unfilled is an instantiation of the same parameter setting.

- The representation of argument structure by the diathesis in (1) is *hierarchical* in the sense that $[\text{V-af}_n]$ in the final diathesis *merges* with $[\text{V-af}]$'s arguments *one at a time*, *from right-to-left*, projecting the sentence's core syntactic structure, which is the input (initial syntactic structure) to the syntactic phase of a sentence's derivation. Note that the bottom-to-top direction of syntactic projection and the binary branching of syntactic representation assumed in *The Syntax of Argument Structure* and in other theories are a consequence of the right-to-left merger of **V** and its arguments, which is determined by the diathesis's internal organization in (1)/(2).

- (1)/(2) projects the sentence's core syntactic structure (Extended Lexical Projection) in (3); 'small v' is the *finite affixal head* of vP:

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(3) $\{\{i\hat{}N\}_1 \{j\hat{}N\}_2 \{k\hat{}N\}_3 \{- \hat{}V-\}_4\}$ => $[_{vP}$ NP$_i$ $[_{v'}$ [V-v] $[_{VP}$ NP$_j$ $[_{V'}$ t$_V$ NP$_k$]]]]

Since $\{i\hat{}N\}_1$ is the left-most argument in **V**'s diathesis, it is the last to merge syntactically and, given that VP has only two argument positions (spec-VP and sister-to-V), $\{i\hat{}N\}_1$'s syntactic projection is *VP-external*: it projects to spec-vP as the sentence's subject.[14] The vP s (mall)-clause in (3) canonically *merges* with higher functional heads and the subject NP$_i$ canonically moves to the spec-position of a higher functional phrase (not shown in (3)). Once vP is projected to syntax from **V'**s final diathesis, all subsequent operations are syntactic.

- The theory outlined above has the following corollaries: (i) *The 2×4 hierarchical structure of the final diathesis exhaustively determines the projected sentence's core grammatical (syntactic) relations*. (ii) Syntactic rules do not change a sentence's basic grammatical relations or the cases that express them, i.e., there are no syntactic movement rules that induce abstract or morphological case-change. All operations that alter **V**'s initial diathesis and, therefore, its projected syntactic relations, are diathesis-based and are canonically the result of the composition of **V**'s 2×4 initial diathesis with the 2×4 diatheses of its affixes or functional verbs (e.g., auxiliary verbs). Thus *alternations*, including voice alternations, are alternative realizations of a given **V**'s initial diathesis; the complete set of a given **V**'s alternations is its *morphosyntactic paradigm*. For example, the movement of direct object to subject position (with accompanying change of accusative to nominative case) in middle, passive, and unaccusative derivations does not by hypothesis involve syntactic movement. (iii) There are no rules of any kind at any level that change the value of a theta role. For example, when a Turkish unergative **V**'s initial external agent theta role is right-displaced by the causative suffix's diathesis and realized as $[\textbf{V-af}_{\text{CAUS}}]$'s direct object, it is an agentive accusative direct object: the agent role is not nor can it be converted to patient role (see §1.9).

- The initial and final diatheses of verbs and paradigmatic affixes always have 2×4 structure, which entails the following universal: there are no operations of any kind at any level that can alter the basic 2×4, eight-slotted *skeletal structure* of the diathesis; all argument-structure level operations begin and end with the diathesis's eight slots intact; rules may of course act upon the contents of the slots, adding, displacing, deleting, and delinking arguments. This is the foundation of the theory proposed in *The Syntax of Argument Structure*. We shall see

below that diathesis-level operations may: (i) delink a theta role and its categorial head (e.g., *dethematization* and right-displacement of external **i** in passive derivations, which may be schematically represented as: $\{\{i\char94 N\}_1\ldots\{\text{-}\char94 V\}_4\} > \{\{\text{-}\char94 N\}_1\ldots\{i\char94[\text{V-af}_{\text{pass}}]\}_4\}$); (ii) create *s-predicates* by deleting **V**'s external **N**, i.e.: $\{\{i\char94 N\}_1\ldots\{\text{-}\char94 V\}_4\} > \{\{i\char94\text{-}\}_1\ldots\{\text{-}\char94\ [\text{V-af}]\}_4\}$;[15] (iii) add new arguments to **V**'s initial diathesis in productive applicative and causative derivations *provided that appropriate positions are available*.[16] Given that a sentence's core syntax is determined by **V**'s final diathesis, the immutability of the diathesis's 2×4 structure predicts that the core syntax of clauses should be cross-linguistically *uniform* (allowing for variation due to the parameterization of universal principles like the headedness parameter); it also predicts the absence of *construction-specific grammatical relations* (see below).

- *s-predicates*, which are derived diatheses with unlinked external theta roles, i.e., $\{i\char94\text{-}\}_1$, will be shown to play a central role in the building of morphosyntactic structures. For example, the following are s-predicates: attributive (but not predicate) forms of the adjective (chapter 2), hybrid verbal adjuncts (chapter 3), and subject-controlled infinitive complements (chapter 4). Now, if there are productive operations in natural language that dissociate (delink) theta roles and their categorial heads (e.g., $\{i\char94 N\}_1 > \{i\char94\text{-}\}_1$ [s-predicate] or $\{i\char94 N\}_1 > \{\text{-}\char94 N\}_1$ [dethematized verb]), there must be a computational level of representation at which such operations are possible. Whereas syntactic rules are not able to dissociate an NP and its theta role (e.g., delete or move an NP, stranding its theta role), the 2×4 structure of the diathesis, in which *arguments are bipartite* (i.e., their theta roles and categorial heads are distributed over two autonomous tiers), predicts the existence of precisely this kind of delinking operation in argument-structure level derivations.

The theory outlined above is characterized as an integrated *morphosyntactic* theory because diathesis-level operations, which are canonically *affix-driven*, derive final diatheses, which *project core morphosyntactic structure*. In other words, if verbs are represented in the lexicon as stems, their derivations necessarily involve the composition of the stem's diathesis with the diathesis of at least one affix to create a *word*, which is the 'atom' of the syntactic phase of the derivation (see Di Sciullo and Williams 1987). If this theory is correct, a sentence's universal Extended Lexical Projection is a morphosyntactic structure (see vP in (3), where the head v is the finite verbal affix).

Explicit theories have a way of taking on a life of their own, making falsifiable predictions and suggesting solutions to problems that were not initially envisaged. This phenomenon is responsible for my decision to expand my original circumscribed goal of exploring the mapping between argument structure and syntax into a comprehensive theory of morphosyntax in which argument structure is promoted from its accessory status in Government and Binding theory and the Minimalist Program to a far more central role. For example, since, as we shall see below, s-predicates turn out to play a fundamental role in syntactic structure building and, since the unbound projection of $\{i^-\}_1$ is syntactically ill-formed, diathesis-based theory requires an explicit theory of *control*, which will be demonstrated to derive entirely from Binding theory and which is far broader than infinitive control (see chapters 2–5). Furthermore, theta binding chains (TBC), in which s-predicates are *vertically bound* (Williams 1994), turn out to also account for case, number, and gender *agreement*: the vertically bound tail of a TBC agrees with the TBC's head. Thus an explicit theory applied systematically to the full range of data both provides new solutions to old problems (e.g. the use of noun phrases as both arguments and predicates) and, equally important, identifies new problems based on old data that were erroneously thought to be well understood (e.g., see the similarities and differences between copula and auxiliary verbs in chapters 2, 3, and 4).

While data in *The Syntax of Argument Structure* comes from English, Turkish, Icelandic, French, and other languages, the star of the show is Russian.[17] The reason for this is the same as the reason I have been working on Russian morphosyntax since 1965: Russian, with its rich inflectional system and concomitant free word order, is essentially the typological polar opposite of English and perforce plays an important role in getting beyond English-specific phenomena in our search for morphosyntactic universals. For example, Russian's elaborate system of impersonal sentences provides robust empirical evidence against the English-biased claim that all sentences in all languages have a null or overt subject (see the Extended Projection Principle) and against Burzio's Generalization (see §1.8). Russian's rich case and agreement morphology provides precisely the kinds of data and problems that a coherent morphosyntactic theory must be able to account for (see Franks 1995, Lavine 2000). Note too that, as we shall see in chapter 1, it is overt case morphology in tandem with argument structure that licenses 'scrambling' (see Bailyn 1995a, 1995b, 2006, Junghanns and Zubatow 1997, Slioussar 2005). Russian's systematic gender, number, and case agreement serves a critical diagnostic function, enabling us to pinpoint the presence and absence of null categories; e.g., see chapter 4 where the case agreement of the adjunct s-predicate pronominal

adjectives *sam* '(by) himself', *odin* 'alone', and *ves'* 'all' provides incontrovertible empirical evidence that infinitive complements come in three sizes: *infinitive s(mall) clauses*, which have *null* dative subjects when controlled: [$_{\text{infP}}$ PRO$_{\text{i.DAT}}$ inf'$_{<i>}$]; *infinitive s(econdary) predicates*, which, like all anaphors, must be bound: [$_{\text{infP}<i>}$ inf'$_{<i>}$]; and *bare infinitive phrases*: [$_{\text{infP}}$ inf'], which obligatorily cooccur with auxiliary verbs (see §4.12). I assume that many of the categories, distinctions, relations, operations, and constructions analyzed in the following chapters, which are overtly realized in Russian, are morphosyntactic universals which happen not to have formal realizations in English and many other languages.

The theoretical scaffolding of *The Syntax of Argument Structure* is Government and Binding theory and the Minimalist Program enriched by the insights of Williams' *Thematic Structure in Syntax* (1994). Williams' influence has been profound (e.g., the crucial notions of *vertical binding* and *external argument* are his). The influence of what I will call the Russian School has also been substantial: I first encountered the two-tiered diathesis and its use as the basis for a typology of alternations in Mel'čuk and Xolodovič 1970 and Xolodovič 1974.[18] Relational Grammar has also exerted an influence, but more as a theory of argument structure than syntax (see Channon 1979, Perlmutter 1983, Perlmutter and Rosen 1984, Blake 1990, Farrell 2005: ch. 6). The following publications influenced my conception of argument structure in this book's early stages: Fillmore 1968 (see Cook 1989), all references to Bowers, Marantz 1984, Pinker 1984: ch. 8, Zubizarreta 1987, Baker 1988b, Grimshaw 1990, Speas 1990, Wechsler 1995, Alsina 1996, Epstein *et al*. 1998, and all the references to Levin and Rappaport Hovav.

Since *The Syntax of Argument Structure*, which presents what I take to be a new theory of the mapping between argument structure and morphosyntactic structure, has unfamiliar terminology and notation, and is based primarily on Russian, which I do not assume my readers know, the book's readability has been a constant concern. To this end I have in most cases avoided protracted polemical discussions, preferring instead to devote the limited space at my disposal to working out the details implicit in diathesis theory.[19] My assumption is that the best way to introduce a new theory is to demonstrate its explanatory power on the basis of a broad range of data rather than dwell on the perceived weaknesses of its competitors. My argumentation is accordingly data based (empirical) rather than theory internal.

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