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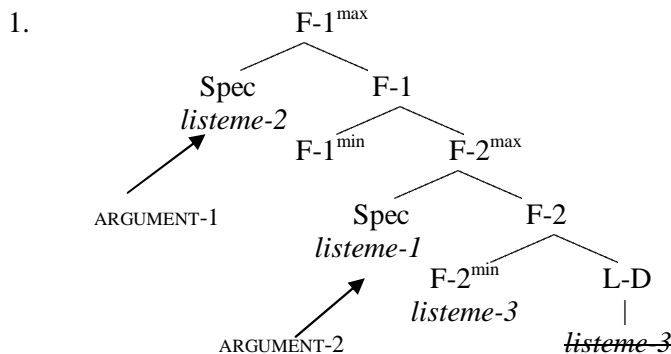
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**Chapter 2
Nuts and Bolts**

1. The Architecture of the Grammar

1.1. Licensing Functional Structure: Abstract Head Features and F-Morphs

Suppose we consider in greater detail the diagram in (18) of Chapter 1, repeated here as (1) and the architecture of the model which it gives rise to:



I assumed that the conceptual array consists of listemes. The general reservoir of such listemes constitutes the *encyclopedia*, a list of all arbitrary pairings of sound and meaning, where by sound we mean a phonological index, and by meaning we refer to the appropriate package of conceptual properties associated with such an index. Pending certain refinements developed in Book II (and see especially Chapter 10, section 4 as well as the concluding comments in Chapter 20), we will assume that no grammatical information is otherwise associated with the relevant encyclopedic listemes, and specifically, that they are not marked for syntactic category, that they do not specify syntactic or morphological insertion environment, and that they are devoid of any morphological marking of any sort, be it derivational or inflectional.¹

¹ Within Distributed Morphology, the term *root* has been employed in reference to encyclopedic entries which are likewise devoid of grammatical specification. However, DM roots, crucially, are not associated

Alongside the encyclopedia and distinct from it, the grammar has a functional lexicon, including, in essence, grammatical formatives. These, I will assume, come primarily in two varieties: independent grammatical functional formatives (henceforth *f-morphs*), e.g., *the*, *will*, and (phonologically abstract) head features, e.g., $\langle pst \rangle$, for past tense. As a first approximation, then, we may assume that some grammatical formative α merges with the L-Domain (L-D), in turn categorizing it (unless itself category neutral in the sense already discussed in section 2 of Chapter 1). Subsequent functional mergers are of course possible as well. Consider, as an illustration, α to be the equivalent of some value for Tense, e.g. $\langle pst \rangle$, in a language in which verbs are inflected for tense. The merger of $\langle pst \rangle$ and L-D would give rise to the structure in (2):

2. [$\langle pst \rangle$ [_{L-D} *listeme-1 listeme-2*]]

Assuming free copy and merger (and abstracting away from the possibly covert nature of verb movement in English), in principle any of the listemes in the conceptual array may merge within the L-D, and any listeme in the L-D may merge a copy in T, but under standard assumptions, only one may do so. That element will thus become the head of L-D. In turn, L-D will become a VP in the context [$\langle pst \rangle$ [_{L-D}]], effectively making its head in T, as well as the copy of that head in L-D a V. It only remains to be hoped that some post-derivational phonological storage area will be capable of dispensing, for the resulting V. $\langle pst \rangle$ structure, a well-formed phonological representation. If it does not, the derivation would not converge and ungrammaticality would result.

As it turns out, in English, for a conceptual array consisting of *sink*, *boat*, *dog*, there will be a phonologically felicitous representation for all the combinations of [$\langle pst \rangle$ [_{L-D} *listeme*]] should they merge in L-D and raise to T. Thus all the representations in (3) are not only syntactically licit; they also converge phonologically:

3. a. [[_V*sink*]. $\langle pst \rangle$ [_{VP} [_V~~*sink*~~]]] (*sank*)
 b. [[_V*dog*]. $\langle pst \rangle$ [_{VP} [_V~~*dog*~~]]] (*dogged*)
 c. [[_V*boat*]. $\langle pst \rangle$ [_{VP} [_V~~*boat*~~]]] (*boated*)

Consider now the derivation of future tense in English (and abstracting away from the role of English future markers as modals). A derivation in which an array item merges a copy in T would not converge. This might be either because there is no abstract head feature $\langle fut \rangle$ in English, or more plausibly, because the combination V. $\langle fut \rangle$ fails to give rise to an appropriate phonological representation.² On the other hand a well-formed derivation with a future interpretation could still result just in case the *f-morph will* merges with L-D. Here as well, L-D will become a VP and some listeme within it will become the relevant head. We note that as, in principle, there could be

with phonological information. The term *listeme* is adopted here to highlight the fact that the entries in question do have an arbitrary facet, specifically their phonological index. For a more detailed review of the consequences of this difference see Borer, (to appear-a, forthcoming).

² These two options differ conceptually, in that one postulates essentially a functional lexicon, for every language, which includes all possible abstract head features, but disallows the phonological representation of some, while the other allows languages to differ on their inventory of abstract head features. In the former, but not in the latter, variation, inter-linguistic and intra-linguistic, is placed in the phonological component, a prima facie desirable result. Empirically, however, the issue is virtually impossible to determine, and so we will leave it open here.

more than one listeme in L-D, there is an issue here concerning the choice of head. If no relevant categorizing morphology distinguishes the items in L-D (e.g., no item is of the form *verbalize* or alternatively, *transformation*, which would force the former to be V and the latter to be non-V), any of the items in L-D could, in principle, be the head. The structure will not, however, remain hopelessly ambiguous, quite simply because the non-head constituents will be themselves embedded under functional structure, categorizing them, specifically, as PPs, a matter to which I return shortly. Should that not turn out to be the case, the L-D could not be internally ordered and the derivation would crash.

The two modes of projecting functional structure, the one associated with the English past tense and the other with the English future, are, I believe, the two major strategies universally available in conjunction with the licensing of functional structure. One involves the projection of an abstract head feature, which requires movement of a head to be instantiated. The output of this head movement gives rise to an [L.<*feature*>] complex, the input to the phonology, which will (or will not) dispense a phonological representation of it. The other strategy involves the licensing of functional structure through an independent f-morph. In this latter case, head movement is not needed, and, at least in the case of English *will*, is in fact blocked. As is obvious, these two strategies do not characterize an inter-grammatical situation, but rather, an intra-grammatical one, putting forth a view of language variation which is firmly associated with the morpho-phonological properties of grammatical formatives, rather than with syntactic structures or the semantics of grammatical formatives, as such.³

³ Two important issues are set aside here for future research. First, we distinguish between abstract head features which require a head in order to be instantiated, and which are, I will suggest, non-morphemic, (or a-morphous in the sense of Anderson, 1992. See section 2 for additional discussion) and f-morphs which are morphemic and which block head movement. However, clearly such a picture leaves out cases in which head-movement is necessary to support obviously morphemic, but bound f-morphs. While I will argue that e.g., past tense in English is a-morphous, pronominal clitics, to the extent that they license functional structure, clearly are often morphemic. Further, if the criteria distinguishing abstract head features from f-morphs to be put forth in section 2 have any validity, there is a good possibility that, e.g., the English progressive marker, *-ing* is an f-morph and not an abstract head feature, although it does require support by a stem. It is thus extremely plausible that f-morphs come in two varieties – morphologically bound and morphologically free, following traditional morphological terminology, and that the absence of movement is the property of the latter. The former, but not the latter, are typically associated with morphological hierarchical structures, including the categorizing kind (e.g., English suffixes such as *-ation*, *-al* etc.) and the non-categorizing kind (e.g., most English prefixes, such as *re-*, *un-*, *mis-* etc.). I return to this matter briefly in Book II, Chapter 20, section 2.2, and see Borer (forthcoming) for extensive discussion.

A second matter concerns the possibility that a head feature, in the sense defined in the text, may be instantiated on an f-morph, instead of an L-head. Quite possibly, such a derivation is required in some cases. Thus if auxiliaries are part of the functional lexicon, as appears plausible, we note that in English they support the head feature <*pst*>. The question of what type of head in a given system may support a particular head feature, and specifically, whether it is an L-head or an f-morph, and in the case of the latter, which f-morph, clearly is the source of much additional potential inter-language as well as intra-language variation. Except where otherwise noted, however, the case studies in this work all involve instances in which head features must be instantiated on an L-head, and may not be supported by an *f-morph*. The full articulation of

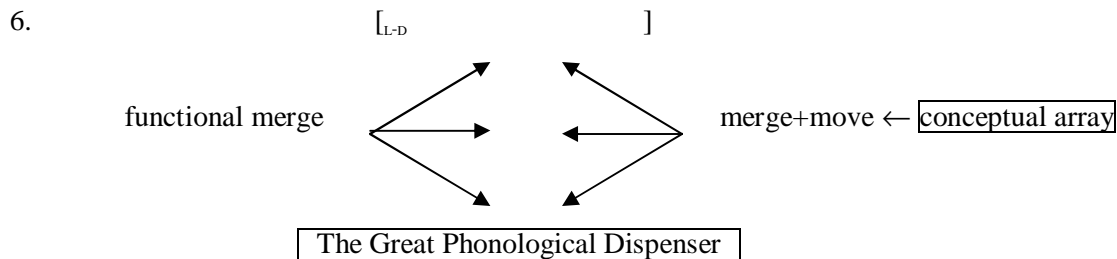
This having been said, it is nonetheless striking that while many languages exhibit both strategies side by side, the use of the (independent) f-morph strategy is particularly common in Creole languages. Thus consider the following examples from Kraho, an Amazonian-Indian Creole spoken in Brazil (see Souza 1990):

4. a. *me kahay*
 PL woman
 'women'
 b. *me par*
 PL foot
 'feet' (Kraho)

While in English plurality is a head feature which is realized on an L-head (in turn nominalizing it), having, plausibly, the representation in (5a), this is not the case in Kraho, where plurality is an f-morph, *me*, and where there is no N movement to support it. The resulting representation is essentially as in (5b) (see Chapter 4 for an extensive reanalysis of the role and function of plural marking):

5. a. [<pl> [NP woman]] → /women/
 b. [*me* [NP kahay]]

Viewing matters in general terms, the emerging picture could be schematized by the diagram in (6):



We turn now to a more detailed investigation of functional structures and the manner in which they interact with both head features and f-morphs.

1.2. Functional Heads as Open Values: Adverbs of Quantification

Typically, it is assumed that all tenses, however represented, project a uniform functional structure, call it TP. Considerations of generality also favor a system in which it is T that verbalizes an L-D, rather than some instantiation of T, such as a head feature (e.g., <pst>) or an f-morph. We note that within a Bare Phrase Structural system, and assuming any structure to involve the iterative projection of the terminal heading it, this means that at the very least, past tense would have to be marked as <pst>_T and future would have to be marked as <will>_T. Any structure which

a system with *f-morph* support, if indeed attested, must await future research. See Chapter 7, fn. 12 for some additional comments on this point.

The issue here is separate from that which applies to portmanteau grammatical formatives (e.g., case marked determiners or agreeing determiners), which I assume to be a single grammatical formative with a double value, which moves from one functional head to the next. For discussion of portmanteau morphs, see Chapter 4, section 3.

projects from such grammatical formatives is thus already a conglomerate of features, including not only the specific semantic value of the grammatical formative itself, but also a statement concerning a category label.

Consider, from this perspective, the following paradigms:

7. a. During the summer, water in the pond mostly evaporates
b. Hummingbirds always die young
8. a. Water in the pond is mostly lost through evaporation
b. Hummingbirds always drink from our birdfeeder.

As is well known (see Milsark, 1974, Lewis, 1975, Heim, 1982, Doetjes, 1997 for some relevant discussion), the adverbs of quantification in (7)-(8) may range either over the interpretation of the event (a reading most salient in (8)) or over the interpretation of the subject (a reading most salient in (7)). Thus in (7a), most water evaporates, but it is not the case that most (relevant) events during the summer are those of water evaporation. Likewise, for (7b) to be true, all hummingbirds have to be mortal, but it is not necessary for some hummingbird dying event to be constantly going on. This is not the case for the most salient reading of (8a-b), however. Here, most water-losing events must be through evaporation, but it is not necessary that most water is lost. Likewise, the most salient reading for (8b) is that there is always an event of a hummingbird drinking from our feeder, but it need not be the case that all hummingbirds drink from our feeder.

Crucially, the readings are mutually exclusive. Setting aside the specific reasons for the preferred readings in (7)-(8), we note that even if it were plausible that all hummingbirds in the world drink from our birdfeeder, under that reading, it wouldn't necessarily imply that they are constantly doing so. Likewise, (8a) cannot mean that most water is mostly lost. Finally, we note that under the nominal reading, the DP under consideration can include no other quantifier. (9a-b), under the relevant reading, are ungrammatical (i.e., the adverb of quantification can only range over the event):

9. a. most/all hummingbirds always die
b. most/all water in the pond mostly evaporates

It thus emerges that adverbs of quantification, when associated with a nominal expression, are in complementary distribution with DP-internal quantifiers. If we adhere to the age old practice of assuming that complementary distribution is an indicator of structural competition, it follows that a DP-internal quantifier and an adverb of quantification are, at least in some sense, competing for the same structural slot. But what is that structural slot? Standard constituency tests would place DP-internal quantifiers in a position which is distinct from that of adverbs of quantification. To complicate matters, if we assume, as put forth in Chapter 1 section 2.1., that no semantic manipulation of syntactic output is possible, we cannot assume a single syntactic representation for adverbs of quantification which is in turn semantically manipulated to give rise to two distinct readings.

A solution is available if we assume that in the nominal readings the adverb of quantification binds, in some syntactically well-defined sense, some functional structure within the DP, while in the event readings the adverb of quantification binds, in some equally well-defined syntactic sense, some functional structure which is related to the event. Focusing on the nominal cases, it is precisely because the adverb binds some otherwise unspecified value within the nominal, that a

DP-internal quantifier may not do so. A DP-internal quantifier and an adverb of quantification are thus in structural competition not because of their specific projection site, but because both function as operators, binding the same variable. But if this is the case then functional heads are best viewed as operator-variable pairs, rather than as singleton terminals.

A concrete formulation of this proposal would be to view functional heads as *open values* which are in turn assigned *range* by a variety of means. The open value under consideration here for (7)-(8) is not completely free, of course. Quantificational expressions compete here with other quantificational expressions, and not with, e.g., plurality or tense. Suppose, then, that the open value under consideration is associated with a categorial label, and the categorial label under consideration determines the semantic class of the elements that may assign range to it. For the nominals under consideration, let us call this categorial label Quantity Phrase, a nominalizer (henceforth #P), and let us assume that #P is headed by an open value, marked categorically as #, which may be assigned range by a class of appropriate range assigners. The emerging representation, and abstracting away from the DP projection, is as in (10):

10. [_{#P} <e># [_{NP}]]

In (10) <e> is an open value and the subscript # marks its categorial membership. <e># may be assigned range, in English, either by an f-morph (*most, all, three* etc.) that merges with it or by an adverb of quantification. I will be arguing explicitly that plurality, as such, is not a species of quantity, and that it does not assign range to <e># (cf. Chapter 4). However, I will also suggest that dual marking, e.g., in Hebrew, does assign range to <e># (cf. Chapter 7). As dual marking in Hebrew is a head feature, by the criteria developed here, it means that in principle, and subject to phonological instantiations in particular languages, all the range assignment possibilities in (11) may be attested. Superscripting notates range assignment relations:

- | | | | |
|--|--|----------------------------------|---|
| 11. a. | [_{#P} <q ³ >.<e ³ >#.<N | [_{NP} N]] | head feature, L-head movement obligatory. |
| b. | [_{#P} <i>f-morph</i> ³ _Q .<e ³ ># | [_{NP} N]] | (free) <i>f-morph</i> ; L-head movement blocked. |
| c. <i>adverb</i> ³ _Q | [_{#P} <e ³ ># | [_{NP} N]] | adverb of quantification; L-head movement not forced. |

Within the verbal system, the same situation can be illustrated. Consider the following example from Hebrew:

12. a. *Rani* *ʔabad* *mi-ševa ʔad ʔeser*.
 Rani work.3SG.M.PST from-7 until 10
 ‘Rani worked from seven to ten’
- b. *bi-tqumat ha.limudim, Rani haya ʔobed kol boker mi-ševa ʔad ʔeser*.
 during school Rani be.3SG.M.PST work.SG.M every morning from-7 to 10
 ‘During school, Rani was working every morning from seven to ten.’
- c. *Rani ʔobed bagina*.
 Rani work.SG.M in-the-garden
 ‘Rani is working in the garden.’

While in (12a) the main verb is fully inflected for tense and agreement, in (12b), the main verb occurs in a participial form which only displays gender and number agreement but not person agreement or tense, and the copular verb *haya* ‘be’ is inflected for the full agreement paradigm, including person, and for past tense. Independent evidence in Modern Hebrew suggests that while the main verb in (12a) moves to I (or T), this is not the case in (12b). In turn, Dechaine (1993) and

Shlonsky (1997) argue convincingly that even when the participle is not accompanied by an overt copula, as in the present tense sentence in (12c), T remains null and is interpreted as present tense, and the V-head does not undergo movement to T. Suppose now that TP is a projection of the open value $\langle e \rangle_T$ (a verbalizer), which must be assigned range, and that past tense in Hebrew is associated with a head feature $\langle pst \rangle$. In the cases of (12a-b), that head feature is supported by the V-head and the auxiliary *haya*, respectively. The emerging structures for (12a-b) respectively are

thus as in (13a-b) (relevant listeme marked as its tri-consonantal root, *ḡ.b.d*; irrelevant details of the derivation, including number-gender-person agreement, the status of the copula, and the derivation of the participle, set aside):⁴

13. a. $[_{TP} \langle pst \rangle^3 . \langle e \rangle^3_T \quad [_{VP} \text{ḡ.b.d}]] \rightarrow [_{TP} \text{ḡ.b.d} . \langle pst \rangle^3 . \langle e \rangle^3_T \quad [_{VP} \text{ḡ.b.d}]]$
 b. $[_{TP} \langle pst \rangle^3 . \langle e \rangle^3_T \quad [_{aux} \text{h.y.y} \quad [_{VP} \text{ḡ.b.d}]]] \rightarrow [_{TP} \text{h.y.y} . \langle pst \rangle^3 . \langle e \rangle^3_T \quad [_{aux} \text{h.y.y} \quad [_{VP} \text{ḡ.b.d}]]]$

Consider now (12c). We could assume of course, that T dominates an obligatorily null copula which supports an abstract head feature, $\langle pres \rangle$, and that the output is phonologically empty. One drawback to such an account is the fact that it is hard to see why the verb cannot move to support such a head feature, as it does in the case of past tense. A clear alternative, especially in view of the present tense interpretation of such utterances. would be to assume that the open value of $\langle e \rangle_T$ here is not assigned range by a head feature altogether, and as a result, movement of the L-head is not attested. Rather, $\langle e \rangle_T$ is assigned range by some form of D-linking, as has been independently suggested by Dechaine (1993) and by Hyams (1996). Following the spirit of the execution in Dechaine (1993), we will assume that T is 'null' in a very specific sense – it includes the open value $\langle e \rangle_T$, but the functional lexicon of Hebrew does not include any head feature or an f-morph which can assign range to it (alternatively, has no phonologically licit form associated with such items). Dechaine explicitly argues that “the temporal reference of a bare sentence [i.e. a clause with a projected null tense] is mediated by discourse principles” (p. 437). While a full review of the conditions on tense D-linking proposed in Dechaine is outside the scope of this work, it is clear that such a system is essential in order to account for the typically unambiguous temporal interpretation of Dechaine's \emptyset -tense, $\langle e \rangle_T$ here, which is attested in languages such as Haitian, Chinese, and numerous others (see Dechaine 1993 for a detailed argumentation for the presence of a null T node in all those cases). If on the right track, it suggests that (12c) has the structure in (14), in which range is assigned by an (abstract) discourse operator, linked to the speech time, constituting a case of range assignment from without the functional projection line, on a par with that attested with the adverbs of quantification in (11c):

14. *D-operator*³ $[_{TP} \langle e \rangle^3_T \quad [_{VP} \text{ḡ.b.d}]]$

⁴ We note that structures such as those in (13a-b) provide an immediate explanation for the absence of double marking in natural language. Specifically, the view of a functional head as dominating an open value in need of range assignment, and the view of grammatical formatives as operators which must assign range to an open value rules out all cases of double markings since they involve vacuous quantification, thereby ensuring that past tense could be associated with exactly one element, be it the L-head which supports an abstract head feature, or a dedicated *f-morph* (and note, as an aside, that the absence of such a double marking remains mysterious within Minimalist checking systems, such as Chomsky, 1993, 1995a. See Borer and Rohrbacher, to appear, for some detailed discussion of this point).

Suppose we refer to range assignment by an f-morph or a head feature as *direct range assignment*, and to range assignment by an adverb of quantification, or D-operator, as *indirect range assignment*, with the intuition here being that range assignment by a member of the functional lexicon of the given language, dedicated to the assignment of range to a specific open value, and projecting as a head (in a sense to be elaborated on shortly), is more 'direct'. As it turns out, indirect range assignment is instantiated in one more important domain – that of specifier – head agreement, a matter to which we turn now.

1.3. Range Assignment through Specifier – Head Agreement and Definiteness Marking

The marking of definiteness in English is, at first sight, a simple matter. We may assume that D is headed by an open value, call it $\langle e \rangle_d$, where the assignment of range to $\langle e \rangle_d$ translates to the assignment of a referential index to objects. Specifically, we may assume that the English definite article and assorted demonstratives inherit their index from some discourse antecedent (and see Chapter 6, section 1 for additional discussion). We may now assume that they are f-morphs which assign range to $\langle e \rangle_d$, where range assignment in this case consists of transmitting a referential index and making $\langle e \rangle_d$, in essence, a logical variable (and see Chapter 3 for some detailed discussion).⁵ For the simple definite description in (15a), the emerging structure is as in (15b). As *the* is a (free) f-morph, N-movement to D is neither expected nor attested (intermediate functional structure in (15b) is ignored, but see Chapter 6, section 1 for an argument that definite articles may assign range to both $\langle e \rangle_{\#}$ and $\langle e \rangle_d$):

15. a. the cat
 b. [_{DP} *the*. $\langle e \rangle_d$ [(AP)[_{NP} *cat*]]]

Consider, however, Hebrew, for which it has been argued extensively that definiteness is a feature on the head (see Borer, 1989, 1999a; Siloni, 1997). Siloni (1997) further argues, within a checking model, that an N marked as +def (and base-generated as such) moves to D to check its +def feature. In turn, the overt movement of N to D in (definite) expressions in Hebrew in particular and in Semitic languages in general has been extensively argued for, beginning with Ritter (1988) and much subsequent work (including, but not limited to, Ritter, 1991, 1995; Fassi Fehri, 1989; Mohammad, 1988; Hazout, 1991, 1995; Ouhalla, 1991a; Siloni, 1996, 1997; Shlonsky, 1997). Evidence for N to D movement is available from the post-nominal ordering of adjectives, from the NSO word order in derived nominals, and from definiteness agreement between adjectives and heads, among others (the reader is referred to the references cited for detailed argumentation, and to Borer 1999a for a detailed review). Converting that assumption to

⁵ In turn, some further refinement is needed to mediate the assignment of referential index to $\langle e \rangle_d$ when the determiner in question is a strong quantifier, such as *each* or *every*. Such a refinement may require either the assumption that *each* and *every* assign a set of possible indices to $\langle e \rangle_d$, or alternatively, that a QR operation leaves in place an index-bearing variable, which is in turn bound by *each* or *every*, and that it is the relevant variable which assigns a referential index to $\langle e \rangle_d$. As the resolution of this matter is largely orthogonal to the emerging syntactic structure, it is set aside in the rest of this work. For a detailed discussion of the relevant syntactic configurations, see Chapters 3 and 6.

the proposed execution, suppose we assume that definiteness, in Hebrew, is a head feature assigning range to $\langle e \rangle_d$. As such, it requires the movement of the N-head to be realized:⁶

16. a. *ha.xatul*
 the.cat
 b. $[_{DP} \langle e \rangle_d (AP) [_{NP} xatul \quad]] \rightarrow [_{DP} xatul. \langle def \rangle. \langle e \rangle_d (AP) [_{NP} \cancel{xatul} \quad]]$

The difference between English and Hebrew, then, boils down to the fact that in English, $\langle e \rangle_d$ is assigned range (typically) by an f-morph, but in Hebrew it is assigned range by a head feature, necessitating head movement. The distinct structures are the result of these distinct modes of range assignment.

As it turns out, however, (15b) is not the only way of assigning range to $\langle e \rangle_d$ in English. In Chapter 3 I discuss in detail the structure of proper names where, I will argue, movement of N to D (albeit covert) is required in English as well. This suggests that at least in these cases, value is assigned to $\langle e \rangle_d$ by a head feature and not by an f-morph, thereby showing that the assignment of range to $\langle e \rangle_d$ by an f-morph is not a property of the *grammar* of English, as such, but rather, a phonological property of the specific range assigners *the, that* etc. Consider, however, the contrast in (17):

17. a. The dog's ear
 b. A dog's ear

As is well known, (17a) is a definite description, but (17b) is not. Furthermore, as is equally well known, a definite article (or for that matter, an indefinite article) is barred in (18a-d):

⁶ The Hebrew transcription used in this work represents a compromise between the pronunciation of Modern Hebrew and an attempt to render the examples, at least up to a point, morpho-phonologically transparent. Specifically, in MH pronunciation, spirantized *k* is pronounced as /x/, otherwise occurring in the language, spirantized *b* is pronounced as /v/ otherwise occurring in the language, and the pronunciation /k/ is associated with two distinct segments, one which spirantizes, and one which does not. Further, although contemporary phonological processes still distinguish between the historical glottal stop (ʔ) and the historical pharyngeal stop (ɣ), both are pronounced as glottal stops in MH. Wishing to help the reader to discern relatedness between morpho-phonologically related forms, the following transcription conventions are adopted:

| | |
|---|----------|
| Historical glottal stop (ʔ) | ʔ |
| Historical pharyngeal stop (ɣ) | ɣ |
| Spirantized <i>b</i> (ב) | <u>b</u> |
| <i>v</i> (consonantal (ו)) | v |
| <i>x</i> (ח) | x |
| Spirantizable <i>k</i> (when unspirantized - כ) | k |
| Spirantized <i>k</i> (כ) | <u>k</u> |
| non-spirantizable <i>k</i> (ק) | q |
| Spirantized <i>p</i> (פ) | <u>p</u> |

18. a. *the dog's the ear
 b. *a dog's two ears/the ear
 c. *the dog's an ear
 d. *a dog's an ear

One might propose that the ungrammaticality of (18) is due to the presence of the genitive marker in D, blocking the insertion of an article. This explanation, however, is quite unsatisfactory. Case assignment and inflection are not typically in complementary distribution in the grammar. Nominative case, to wit, is not in conflict with tense marking or with agreement marking, although it is rather commonly assumed that either T or AgrS are implicated in the assignment of nominative case. Furthermore, such an account would fail to explain the emergence of a definite interpretation for (17a) and an indefinite interpretation for (17b). A further complication emerges when the ungrammaticality of (18b) is contrasted with the grammaticality of (19), which suggests that a simple statement of the complementary distribution between the genitive marker and determiners is not sufficient:

19. a. The dog's two ears
 b. A dog's two ears

There is nothing logically necessary about the picture in (17a-b), note. Indefinite possessors for definite nominals are possible, as are definite possessors for indefinite nominals. They are barred, specifically, in the structure in (17a-b), but not in other structures:

20. a. an ear of the dog
 b. the ear of a dog

Intuitively, it is clear that definiteness for the nominal in (17a) is mediated through the definiteness of the possessor DP, presumably in [Spec,DP], and that likewise, the indefiniteness of the nominal in (17b) is brought about through the indefiniteness of the possessor. How can this intuition be captured formally? We note that the situation is reminiscent of that already discussed for adverbs of quantification. Although the possessor does not seem to be in the 'right' position to realize D, not only does it assign interpretation to it, it also prevents any other grammatical formative from doing so.

Suppose, then, that just like in the case of adverbs of quantification, specifier – head relations can give rise to indirect range assignment. Because the possessor is in [Spec,DP], and because it is itself marked as definite through its own DP-functional structure, it will assign range to $\langle e \rangle_d$, providing it is in specifier – head agreement with it. The resulting configuration, for definites, is as in (21):

21. $[_{DP}[_{DP} \textit{the dog's}]^3 \langle e^3 \rangle_d \dots [_{NP} \textit{ear}]]$

In turn, the grammaticality of (19a) emerges as a direct result of the fact that *two* and *the* may co-occur, as in (22):

22. the two ears (of the dog)

I return to a detailed discussion of the structure in (22) in Chapter 6, section 2. Simplifying somewhat, we note that *two* is not a range assigner to $\langle e \rangle_d$, but rather, to $\langle e \rangle_\#$. The emerging structure is thus as in (23), where *two* and *the dog* are not competing for range assignment to $\langle e \rangle_d$:

23. $[_{DP} [\textit{the dog's}]^3 \langle e^3 \rangle_d [_{\#P} \textit{two}^2 \langle e^2 \rangle_\# [\textit{ears}]]]$

And what of indefinites? I will argue in great detail in Chapter 5 that indefiniteness is not determined at the D level, but rather at the # level. It is thus plausible to assume that the specifier in (18b) not only assigns range to $\langle e \rangle_{\#}$, but is also in conflict with all other assigners of range to $\langle e \rangle_{\#}$, such as cardinals or the indefinite article *a*. The emerging structure is thus as in (24), and is ruled out by double marking (i.e., by vacuous quantification):⁷

24. *_{[DP <e>_d [_{#P} [*a dog's*] two² <e²>_# [*ears*]]]}

1.3.1. A Brief Summary

Before I turn to some additional formal considerations, a brief summary of the points made so far is in order:

- A. Functional structures are headed by categorically labeled open values which must be assigned range by the appropriate operator
- B. The functional lexicon of each language makes available an array of range assigners for specified open values. Such range assigners come primarily in two varieties; f-morphs, independent morphemes, which are linked with a phonological index, and abstract head features. The latter require the support of some head (L, possibly F), a fact that typically translates to the obligatory nature of head movement in such contexts (and see fn. 3 for some relevant comments).
- C. The derivation converges just in case the phonology dispenses a representation for the combination of head+*head feature*.
- D. Two modes of indirect range assignment are possible (i.e., range by elements which are not specified, in the functional lexicon, as range assigners for a particular open value). One involves range assignment by an adverb of quantification or a Discourse operator. The second involves specifier – head agreement.⁸

⁷ Some important issues are glossed over here in anticipation of a future discussion. The structures in (23)-(24) are somewhat simplified. Furthermore, I am setting aside the question of whether or not range is assigned to $\langle e \rangle_d$, in indefinites, only to return to it in great detail in Chapter 5. For (17b), such assignment would be accomplished, presumably, through the raising of [*a dog's*] from [Spec,#P] to [Spec,DP]. The reader is referred to Chapter 6 for the detailed discussion of definite articles, indefinite articles and cardinals, and specifically to the discussion of the complementary distribution between *the* and *a* (but not, note, *one* or any other cardinal).

The text discussion presupposes that genitive assignment is available in [Spec,#P]. We assume this without any further discussion here, as genitive constructions, on the whole, are not analyzed any further in this work. For a specific proposal involving the assignment of genitive in [Spec,#P] (or its structural equivalent, thereof) in Hebrew, see Ritter (1991), and Siloni, (1996, 1997).

⁸ A note of clarification is in order here. Note that in principle, in the presence of indirect range assignment, head movement is not blocked, provided that it is not associated with the instantiation of some head feature. In (i), range is assigned to $\langle e \rangle$ through specifier – head agreement, and head movement (e.g.,

For the sake of being concrete, I will assume that the functional lexicon of any given language is organized so as to open a file, containing range assigners, upon the merger of the relevant functional label with its open value. To illustrate with respect to the specific grammatical formatives discussed thus far, a partial list is as in (25):

| 25. | $\langle e \rangle_T$ | $\langle e \rangle_d$ | $\langle e \rangle_{\#}$ | 'plural' |
|---------|---|--|---|----------------------|
| English | Past: $\langle pst \rangle$ Future: <i>will</i> Present: $\langle pres \rangle$ | <i>the</i> <i>this</i> <i>that</i> etc. | <i>three</i> <i>a</i> <i>most</i> etc. | $\langle pl \rangle$ |
| Hebrew | Past: $\langle pst \rangle$ Future: $\langle fut \rangle$ Present: <u>empty</u> (alternatively, $\langle pres \rangle$ without a phonological realization for V. $\langle pres \rangle$) | $\langle def \rangle$ | | $\langle pl \rangle$ |
| Kraho | | | | <i>me</i> |

While range assignment to $\langle e \rangle_T$ will not be discussed any further in this work, range assignment to both $\langle e \rangle_d$ and $\langle e \rangle_{\#}$, as well as to the value $\langle e \rangle_{div}$ which, I will suggest, is assigned by plural marking, is the subject matter of extensive discussions in Book I of this work. Book II takes on, primarily, the task of elaborating on the functional structure associated with events, introducing the open values $[_{ASPQ} \langle e \rangle_{\#}]$ (quantity aspect) within the verbal domain, as well as the open value $\langle e \rangle_E$, devoted to events.

Before I turn to some formal ramifications, one important note is in order. I have ruled out the double marking of any open functional value by more than one range assigner as a case of vacuous quantification, thereby making a strong prediction concerning the absence of double marking in natural language. Some ramifications of this prediction are discussed in detail in Chapter 15 of Book II. The system does not, however, predict a one-to-one correspondence between a functional range assigner and an open value, just as operators, in general, are not assumed to bind only a single variable. It is perfectly possible for a specific grammatical formative, be it a head feature or an f-morph, to bind more than one open value, should the range of its semantic properties allow it. The assumption that such a configuration is licit in the grammar, and is mediated through head movement, will be extensively used. To illustrate, I will assume that strong quantifiers may assign range to both $\langle e \rangle_{\#}$ and $\langle e \rangle_d$, and that such double range assignment is accomplished through the movement of the relevant quantifier from its initial merger site (e.g., in #) and the merger of a copy in D. For e.g., *every*, the relevant emerging structure would be as in (26):

to support a higher head feature) is possible. But head movement is blocked if a free f-morph assigns range to $\langle e \rangle$, as in (ii):

- i. $[_{F-1} L\text{-head} \langle feature \rangle \langle e \rangle_{F-1} [_{F-2} DP^2 \text{ } \cancel{L\text{-head}} \langle e^2 \rangle_{F-2} [_{L-D} \text{ } \cancel{L\text{-head}} \text{ }]]]$
- ii. $*[_{F-1} L\text{-head} \langle feature \rangle \langle e \rangle_{F-1} [_{F-2} DP \text{ } \cancel{L\text{-head}} f\text{-morph}^4 \langle e^4 \rangle_{F-2} [_{L-D} \text{ } \cancel{L\text{-head}} \text{ }]]]$

If on the right track, this predicts that an abstract head feature may not assign range to an open value which is higher than an open value assigned range by an f-morph. We turn to the detailed investigation of this prediction in Chapter 7, section 2.

26. [_{DP} every.<e>_d [_{#P} every.<e>_# [dog]]]

I will assume that a quantifier such as *every*, by definition a range assigner to both <e>_d and <e>_#, is a semantic portmanteau of sort (see Gil, 1995). Although listed both under <e>_d and <e>_#, it must be inserted at the lowest possible point, or the logical properties associated with its <e>_# range assignment properties will not be satisfied. I return to discussion of the relevant properties of such morphemes in Chapters 4-6.⁹

1.4. What's in a Head?

The notion of 'head', as it emerges from the previous discussion, deviates architecturally from what is typically assumed by canonical phrase structural accounts. Canonical phrase structural accounts, with their fundamentally bottom-up approach to categorial properties, do not distinguish between the lowest phrasal label and the terminal it dominates. In X¹-theory (and its predecessors), entries, lexical or functional, are typically inserted under X⁰, as in (27a). In Bare Phrase Structural accounts, the identity between the lowest label instantiation and the terminal is even more strongly stated, in that it is the terminal itself which projects, iteratively, up the tree, as in (27b):

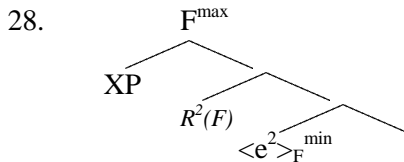


In (27a-b), the question of how the appropriate value is associated with the relevant syntactic projection (i.e., how range is assigned) does not arise. In (27a), it is typically assumed that some percolation mechanism is responsible for the association of the properties of the maximal projection with those of the terminal. In (27b), the maximal projection is but an expansion of the terminal, and the statement of the relationship is even more direct. In turn, neither system allows, in a natural fashion, for the statement of the relations which we called *indirect range assignment*, in which the relevant properties of the maximal projection – and its head – do not emerge from within the projection itself and are not mediated by the categorial and semantic properties of the terminal, but rather, they emerge from the availability of an outside operator, associated with a presumably null head. Within Bare Phrase Structure, we note, the problem is particularly acute, since if phrases project from terminals, in the absence of an (overt) terminal, we would have to assume the existence of an abstract, phonologically null entry with some well defined properties, which agrees, by some mechanism to be specified, with some material which is outside the main projection line, indeed, outside the maximal projection altogether, as in the case of adverbs of quantification. Note further that the direct projection of lexical terminals as in (27b) does not in actuality circumvent the need to specify a syntactic category for *the*, or the fact that, e.g., both *the* and *that* have a determiner distribution (i.e. are D, project above NP, need case, etc.) cannot be stated. Rather, we

⁹ The text statements notwithstanding, note that adverbs of quantification may not assign range simultaneously to <e>_# and to whatever event structure they may otherwise bind, thereby suggesting that the assignment of range to more than one open value is subject to constraints, plausibly permitted within one extended projection, but not across it.

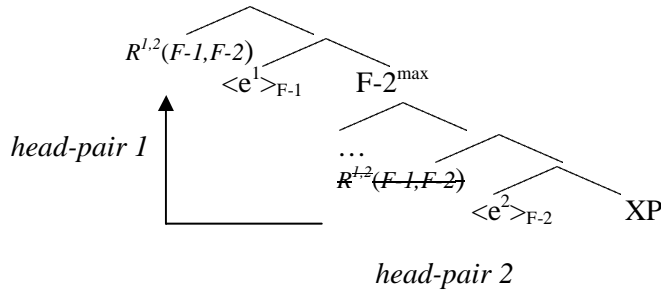
must assume that *the* or *that* are specified as having a specific categorial value D , and that it is their sharing of it that accounts for their similar distribution.

Suppose, however, that we structurally separate the category label from the terminal, or in terms of the system proposed here, separate the open value from the range assignment. Specifically, let us assume that (functional) category labels are but labeled open values, and that the functional terminals associated with them are best viewed as operators which assign range to them. On that view, what *the* and *that* have in common is that both can assign range to the same open value, that associated with the category label D , and projecting as $\langle e \rangle_d$. In and of themselves, however, they are **not** D . Indeed, they have no syntactic category. Of course, $\langle e \rangle_d$ can project without a projection-internal range assigner, in which case range could still be assigned, indirectly, by an adverb of quantification or a discourse operator. In such a case there won't be a terminal associated with the head, but DP would still have a head – $\langle e \rangle_d$, which is interpreted through indirect range assignment. Supposing this to be on the right track, an (overt) categorial head emerges as a pair, in which one member provides the category label and the open value, while the other, optional one, provides the range assigned to that value. We can thus assume the structure in (28), where $\langle e \rangle_F$ is some functional open value of the type F , where $R(F)$ is a range assigner to $\langle e \rangle_F$, and where co-superscripting notates range assignment:



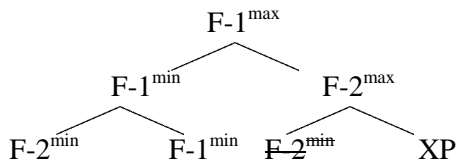
A detailed formal justification for the structure in (28) is not undertaken here, as phrasal architecture is by and large orthogonal to the main focus of the study to be undertaken here (but see Borer, forthcoming, for much additional discussion). Some aspects of the structure in (28) nevertheless need to be pointed out. First, it does not involve (a base-generated) adjunction of $R^2(F)$ to $\langle e^2 \rangle_F^{\min}$, and as such, it does not entail a violation of the Extension Condition of Chomsky (1995a and subsequent work). Second, it allows for a natural statement of head movement, without a resulting violation of the Extension Condition, and also in conformity with the Uniformity Condition of Chomsky (1995b). Specifically, note that we may assume the existence of movement which affects solely $R(F)$ (but not $\langle e \rangle_F$). $R(F)$ may in turn merge with some higher open value, assigning range to it, without resulting in the inheritance of categorial properties, as $R(F)$, in and of itself, does not have a category. Further, as $R(F)$ is, by definition, part of a head pair, it is not maximal in either one of its instantiations, and the Uniformity Condition is adhered to. The emerging structure would be as in (29), and would involve grammatical formatives which can assign range to more than one open value, e.g. *every*, as in (26), without assuming adjunction:

29.



To the extent that a range assigner can thus move and merge a copy with a higher categorial open value, and to the extent that we are correct in assuming that such grammatical formatives are range assigners and not, in and of themselves, associated with a category label, the typical complications associated with head movement, in which a subordinate labeled X^{\min} adjoins to a higher labeled Y^{\min} , do not emerge. In turn, should it turn out that the movement of labeled open values is independently necessary, and if head adjunction is to be ruled out by the Uniformity Condition, we predict the movement of labeled open values to be possible only if it involves the re-projection of the moved head as a second instantiation of a maximal projection of the same type (see especially, Holmberg, 1991, 2000 and Fanslow, to appear, for some relevant discussion). Either way, configurations of the type in (30) are no longer clearly necessary within the domain of functional projections, although the appearance of canonical head movement may still be attested, through the movement of unlabeled range assigners in conformity with the Extension Condition and the Uniformity Condition:¹⁰

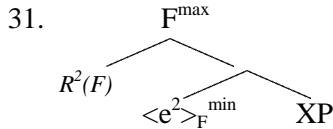
30.



¹⁰ I leave open, in the remainder of this work, the question of whether head adjunction is ever a grammatical option. We note that if head movement of the type discussed here does not give rise to adjunctions, and if inflection, as we shall argue, is largely non morphemic, there is little reason to assume head adjunction within the phrasal domain, thereby side-stepping at least some of the problems with head movement discussed by Holmberg (1991), (2000), Chomsky (1995a), Koopman and Szabolcsi (2000), and Fanslow (to appear), among others.

These matters notwithstanding, it might still be the case that within the domain of morphological word formation, adjunction structures are attested, including cases of bound f-morphs which are themselves range assigners. This matter is by and large orthogonal to the issues under consideration in this book, which involve, almost exclusively, relations between functional open values and grammatical formatives which assign range to them. Head adjunction is used once in this work, in the structure assumed for Hebrew Construct State nominals, and specifically, in reference to the word-formation operation which constructs X-N sequences in Construct nominals (cf. Chapter 7, section 2). Head adjunction may also be necessary for some cliticization operations discussed in Book II, Chapter 18. Executions which side step head adjunction in both cases might be possible, but are not attempted there. The matter is revisited at some length in Borer (forthcoming).

Note now that a configuration such as that in (31) is fundamentally ambiguous, in that $R^2(F)$ may be either a specifier or a member of a head-pair:



The reader may now recall that it was specifically denied that there is an inherent semantics, within the functional domain, for specifiers, making the structural ambiguity of (31) immaterial, especially as we just concluded that open values may be assigned range, indirectly, through specifier – head agreement. As $R^2(F)$ is by definition both minimal and maximal, if it is a specifier, no particular problem emerges. On the other hand, should an additional element merge with [$\langle e^2 \rangle_{F, R^2(F)}$] which is itself non-minimal, $R^2(F)$ would have to project as part of the head pair.

In turn, if $R^2(F)$ moves and merges with a higher open value, and if Uniformity is to be obeyed, it must preserve its minimal/maximal status, to wit, if it is maximal in (31), and hence a specifier, it must merge as such with the higher open value. If, however, it is minimal but not maximal, i.e. a member of the head pair, it will merge as non-maximal with the higher open value.¹¹

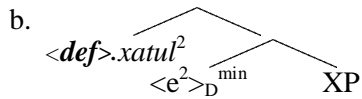
Finally, consider the structure which emerges when a head feature, by definition abstract, is supported by a moved head, as illustrated by e.g. (16b), repeated here as (32a). I will suggest in section 2 that head features are not morphemic. Assuming that morphemes do project, this means that head features, as such, are not nodes in the structures. Rather, I will assume, a head feature is a semantic specification that is instantiated in the context of an appropriate lexical head. Thus in (32a), $\langle def \rangle$ is instantiated on *xatul* 'cat', in a position which enables it to assign range to $\langle e \rangle_d$. The emerging structure thus does not branch, and the head pair consists of $\langle def \rangle.xatul$ and $\langle e \rangle_d$, as in the structure in (32b). Specifically, the relevant feature $\langle def \rangle$ does not exist in the structure prior to the merger of *xatul*, 'cat', and it is the merger of *xatul* that allows $\langle def \rangle$ to be instantiated on it, with the range assignment to range to $\langle e \rangle_d$ resulting.¹²

¹¹ It is precisely at this point that a system with a head pair is not reducible to a system with multiple specifiers. If $R^2(F)$ must always be a specifier, its ordering with respect to a non-minimal additional specifier must be otherwise stipulated. If, however, it is both minimal and maximal, in the presence of a non-minimal phrase, it may not project as a specifier (assuming one specifier at most per each maximal projection).

An interesting formal issue might emerge, nevertheless, concerning the ordering of two f-morphs with respect to each other. We note, however, that the projection of two f-morphs, in most cases, would result in double marking, and hence vacuous quantification, thereby narrowing down considerably the number of cases under consideration. For discussion of some residual cases, see Chapter 6, section 2.

¹² We note that if it is assumed that inflection is base-generated on a stem, as in Chomsky (1991, 1995a, and subsequent work), the non-branching nature of $\langle def \rangle.xatul$ in the structure in (32) follows directly. The execution proposed in the text is thus formally equivalent to checking with base-generated inflection, from this perspective. It is not identical to a checking system insofar as the representation *xatul*. $\langle def \rangle$ is not part of the lexical entry of *xatul*.

32. a. $[_{DP} \langle e \rangle_d (AP) [_{NP} xatul \]] \rightarrow [_{DP} xatul.\langle def \rangle.\langle e \rangle_d (AP) [_{NP} \cancel{xatul} \]]$



1.5. Ordering within the L-D

Clearly, not all lexicalized material is licensed through the type of functional structure discussed thus far. Thus at least a few comments are in order concerning the licensing of PP and clausal complements, as well as the licensing of modifying adverbs and adjectives, especially if it is assumed that modifiers do not project as specifiers of dedicated functional projections.¹³

Starting with the latter issue, we note that it presents a minor problem. A system in which VP and AP modifiers spell out as adverbs while NP modifiers spell out as adjectives is relatively easy to design, and the structural conditions on the realization of a particular modifier as an adjective or an adverb are likewise relatively simple (e.g., a modifier which is a sister of V/A or some extended projection of V/A, vs. a modifier which is a sister of N or some extended projection of N). Such a system need not appeal to an inherent N,V,A marking, but rather, can employ derived lexical labels, themselves created by some functional structures.¹⁴

A separate question concerns the functional structure which dominates modifiers. Thus if adjectives are dominated by a DegP of some sort, as is often assumed (cf. Corver, 1997; Kennedy, 1999 among others), we must assume that N modification is only possible in the context of a DegP, and that in turn, it is DegP which adjectivizes the listeme heading its functional projection. Likewise, if adverbs are dominated by some functional structure (DegP as well, presumably, but with distinct categorial, and possibly semantic, properties), it is this functional structure that will adverbialize the listeme heading it. All these issues are relatively easy to resolve, and a more detailed execution will not be attempted here.

Consider now PPs, both as complements and as adjuncts. Prepositions, members of the functional lexicon, categorize their complements as either nominal or prepositional. I will assume that in the majority of cases, the semantics of prepositions, once properly characterized, will account for the assignment of interpretation as well as inherent case to complements, where necessary (see van Riemsdijk, 1995, 2000. For some discussion of non-semantic prepositions see section 4 of Chapter 10, in Book II). A nominal complement of P can be N or D, and possibly # as well, as illustrated by (33). The projection of a PP complement requires, in turn, the insertion of an

¹³ Contra Cinque (1997) and much subsequent work. The results presented in this work are by and large theoretically neutral on this issue. Although adjunction is typically assumed for modification structures, nothing theoretically crucial rests on that assumption.

¹⁴ There is no necessary commitment here, we note, to the semantic identity of the relations which hold between an adjective modifier and an N (or some extended projection of it), and the relations which hold between an adverb modifier and a V or A (or some extended projection of it), given that it is not assumed here that N and V/A are identical, or that the functional structure which verbalizes, nominalizes, and possibly adjectivizes is semantically identical.

additional preposition, which will likewise categorize its complement in the relevant sense, as illustrated by (34):¹⁵

33. a. They came in pairs (NP)
 b. She fell to pieces (NP)
 c. I broke the glasses to three pieces (possibly #P)
 d. I broke the glasses to three beautiful pieces (DP)
34. a. She emerged from under the house
 b. She threw him out of the room

Considering now PPs within the complement domain, suppose we assume that all items in the conceptual array (within a particular phase) which are not otherwise licensed merge with an appropriate preposition which categorizes them, and assigns interpretation and inherent case to them where necessary. In turn, such a PP either merges directly with the L-head (or its copy) within the L-Domain, or alternatively, it merges with an additional preposition. Illustrative derivations are in (35a-c) (f-morphs underlined):

35. a. *house* →
 <from_P *house*> →
 [_P from [_{DP} *the* ... [_N *house*]]] →
 <*emerge* [_P from [_{DP} the ... [_N *house*]]]> →
 [_V *emerge* [_P from [_{DP} the ... [_N *house*]]]]
- b. *hell* →
 <from_P *hell*> →
 [_P from [_N *hell*]] →
 <*came* [_P from [_N *hell*]]> →
 [_V *came* [_P from [_N *hell*]]]
- c. *house* →
 <under_P *house*> →
 [_P under [_{DP} the ... [_N *house*]]] →
 [_P from [_P under [_{DP} the ... [_N *house*]]]] →
 <*emerge* [_P from [_P under [_{DP} the ... [_N *house*]]]]> →
 [_V *emerge* [_P from [_P under [_{DP} the ... [_N *house*]]]]]

If we assume that the Linearization Correspondence Axiom of Kayne (1994), or some modification of it, is applicable to the structures in (35), the ordering of the verb preceding the PP follows.¹⁶

¹⁵ For a detailed argumentation, albeit within a different set of assumptions from those made here, that prepositions are functional, see Baker (2001). It may turn out that prepositions are at least at times quasi-functional (see fn. 4 of Chapter 1). See Li (1998) for the projection and the availability of a bare #P and its interpretation. See Chapter 3 for a discussion of the relations between DP and reference, and the non-referentiality of bare NPs.

¹⁶ An interesting issue concerns the order and the structure of cases in which more than one PP complement merges within the L-Domain. I return to a detailed discussion of the emerging structure and the emerging derivation in Book II, Chapter 12, section 3.

A similar set of considerations will guide the ordering of clausal complements, be they sentential, as in (36a-c), or so-called small clauses, as in (36d-e):

36. a. It is likely that Kim will arrive late
- b. I think that Kim will arrive late
- c. The fact that Kim will arrive late
- d. They want the prisoners alive
- e. I consider Pat a good chair

Concretely, I will assume that clauses, small and otherwise, constitute a separate phase. Following the construction of embedded clauses, they will merge with the L-head of the (superordinate) L-Domain, with LCA determining the linear order in the usual fashion. We note that consistency at this point requires the assumption that small clauses, nominal as well as adjectival, must represent a functional structure, which has the ability to categorize the relevant listeme (*alive* in (36d), *chair* in (36e)) and assign interpretation, in some dedicated specifier position, to *prisoners* and *Pat* respectively. The specific nature of that structure is not pursued any further.¹⁷

This, however, cannot be the entire picture, or any PP complement could occur in the context of any lexical head, and all verbs could take a clausal complement. Some measure of traditional lexical selection must be integrated into the system in some fashion, to capture the fact that heads do appear to select particular prepositions and that clausal complementation is not free. It is precisely within this domain that the limits of the system to be presented here are reached, necessitating some statements concerning the properties of particular listemes. Some aspects of the treatment of such cases are negotiated in Book II (and see in particular section 4 of Chapter 10, Chapter 19, and the concluding remarks in Chapter 20). For some general discussion of the limitations of the XS model in particular, and constructionist approaches in general, see Book II, Chapters 17 and 20.

2. A Note on Inflection

The model presented thus far puts forth a particular view of the relationship between, e.g., a verb and past tense inflection in English. We proposed that such a relation consists of the instantiation, on a V-head, of an abstract head feature, which is itself neither morphemic nor is it associated with a general phonological representation. As such, the proposal put forth here is incompatible with much current research which postulates an isomorphism between inflection and syntactic structure, assuming, specifically, that inflected words are built, morpho-phonologically, through the movement of heads and their attachment to inflectional morphemes heading functional structure.

¹⁷ In Book II, Chapter 17, section 1.2 I will argue against a small clause analysis for resultative expressions such as the underlined portions of (i):

- i. I hammered the metal flat
 I sang the baby asleep

The objections raised there, however, are specific to the resultative construction, and are neutral with respect to the possible existence of small clauses of the type in (36d-e).

The approach is also incompatible with many morphological, non-syntactic analyses of inflection as morphemic and compositional, and as such, constituting a unified module with derivational morphology (cf. Williams, 1981, Lieber, 1980 and much subsequent work). In contrast, it is fully compatible with the view of inflection within the family of approaches called *Word and Paradigm* (see, especially, Matthew, 1972, Anderson, 1982, 1992, Beard, 1981, 1995). In what follows I will briefly review some reasons to reject a hierarchical representation for (at least some of) inflection. When put together with a hierarchical view of (at least some of) derivational morphology, as proposed in Borer (to appear-a, forthcoming), a picture emerges in which, rather contrary to tradition, (much of) inflectional marking is non-syntactic and non-hierarchical, while (much of) derivation is hierarchical, and at least at times, syntactic (the reader is referred to Stump 1998 for an excellent review of the relevant considerations with respect to inflection).

As the multiplicity of reservations in the above paragraph indicates, the division that will emerge here correlates only partially with the classical division between inflection and derivation. And indeed, I believe the distinction to be largely useless, morphologically. While there is a notion of inflection which is syntactically coherent, and is based on syntactic function, that notion does not translate usefully to any morpho-phonological generalizations. At the bottom of the confusion, I believe, is the conflation of syntactic function with morpho-phonological form. When viewed functionally, inflection is perfectly coherent. Morpho-phonologically, however, it turns out to consist of two distinct operations. One is morphologically compositional and hierarchical (English *V+ing*, for progressive, being an illustration), the other is neither morphological nor hierarchical (English *V.<pst>* being an illustration, with *<pst>* as a non-morphemic head feature and the combination as a non-branching syntactic node). In what follows, some of these claims are made more specific. Derivation, however, plays a very minor role in the following chapters, and is by and large set aside.

Perusing the literature on inflection, one often finds the claim that in some sense, inflection is 'regular', while derivation is irregular. In fact, such an assumption underlies much of the domain separation between inflection and derivation commonly assumed, whereby inflection is syntactic, in some sense to be specified, while derivation is lexical. If the lexicon is perceived, following essentially Chomsky (1970), as the repository of all information on word formation which is not otherwise predictable from structure, such a division of labor would, indeed, capture the 'regularity' of inflection vs. the irregularity of derivation.

There is a very clear sense in which inflected forms *are* regular, as well as syntactic. The appropriateness of marking a particular noun as, e.g., accusative is determined by a particular syntactic context, and has, presumably, syntactic ramifications of a well-defined sort. Further, with the exception of whatever interpretation is imposed on an accusative noun by virtue of being in some particular syntactic position (i.e., that position which is responsible for the appropriateness of accusative case), no other meaning is typically added to the noun. The interpretation of inflected forms is thus compositional, in the same sense that the interpretation of syntactic structures is compositional.

Consider now derivation, as illustrated, e.g., by English N-N compounding. As the compounding rule does not change the category of the output, the syntactic environment is not affected, and cannot be implicated in checking the appropriateness of compounding. *Man*,

presumably, is syntactically well-formed in all environments in which *fireman* is appropriate. Furthermore, the meaning of *fireman* is not compositionally determined by the meaning of its parts. To see that this is so, compare *fireman* with *firefly*. While for the latter, the meaning seems to be something like 'fly which emits fire', it is to be hoped that *fireman* does not mean 'man who emits fire'. It therefore follows that in some sense at least, *fireman* and *firefly* must be listed together with their interpretation, but not so for an accusatively marked noun, which is perfectly compositional, and whose distribution is entirely predictable from its syntactic environment.

As it turns out, the compositional meaning of inflected forms as well as their syntactic conditioning has been often translated into a rather different claim, according to which inflectional *morphology* is syntactic and regular, and as such, constitutes a word formation module which is distinct from derivational *morphology*, which is lexical and irregular. According to this logic, the best way to capture the compositional meaning of inflected forms is to assume that *inflected morpho-phonological units*, as such, are put together by the syntax. It is precisely here that serious problems emerge, due to the conflation of function and form. While the *function* of inflection is clearly regular and syntactic, no such claim can be made about its *form*. In fact, inflectional form is notoriously idiosyncratic, a fact that has been often recorded, and which has been highlighted in this specific theoretical context by Halle (1973), Anderson (1982, 1992), Beard (1981, 1995) and many others. Morpho-phonologically speaking, inflection is every bit as erratic as derivation, involving listed relations between stems and marking, accidental gaps, and stem changes which do not yield easily to a characterization in terms of compositional morphology. To illustrate, past tense marking in English includes at least all the instantiations in (37a), where the specific choice for a marker is dependent on the stem, thereby mimicking quite closely, it would appear, the situation for the choice of nominalizer, as in (37b):¹⁸

37. a. walk → walked
run → ran
think → thought
drive → drove
cut → cut
read → read (/red/)
go → went
- b. construct → construction
destroy → destruction
transform → transformation
arrive → arrival
require → requirement
transcend → transcendence
know → knowledge

¹⁸ For nominalizers here, the list abstracts away from *-ing* nominals which are possible for virtually all eventive verbs in English (see Book II Chapter 17, section 2.4 for some discussion), as well as from \emptyset -nominalizers, argued in Borer (to appear-a, forthcoming) to reflect the existence of category-neutral stems categorized by syntactic contexts, and are hence not affixes.

Further, inflection often does have a 'derivational' function, giving rise to meaning change. Thus consider the following, from Hebrew, where a plural marker gives rise to a form with distinct interpretation from that associated with its singular stem (albeit, a *pluralia tantum* form which requires plural agreement. See Chapter 4 section 2 for some additional comments, as well as a more extensive discussion in Chapter 10 of Book II):

| 38. stem | plural.f | stem | plural.m |
|---------------|----------------|---------------|-----------------|
| <i>xol</i> | <i>xolot</i> | <i>laban</i> | <i>lebanim</i> |
| sand | dunes.pl.f | white.Adj | linen |
| <i>mitzva</i> | <i>mitzvot</i> | <i>taxton</i> | <i>taxtonim</i> |
| commandment | age 13 | lower.Adj | underwear |
| <i>gbura</i> | <i>gburot</i> | <i>šepək</i> | <i>špakim</i> |
| heroism | age 80 | river-delta | sewer |
| | | <i>pan</i> | <i>panim</i> |
| | | facet | face |

In fact, when viewed exclusively from a morpho-phonological perspective, much of inflection is considerably more idiosyncratic than so-called derivational marking. If regularity, within the morphological domain, is measured against the predictability of form from function and function from form, we note that neither derivation nor inflection exhibit a predictability of form from function. If, e.g., PAST, or PLURAL are functions, in the relevant sense, and if NOM is a function, in that same sense, their form is not predictable from their function. However, within the derivational domain, function is pretty much predictable from form. Thus a verb, when combined with *-(a)tion*, is a noun, a complex form ending in *-ize* a verb, etc. Not so within the domain of (much of) inflection, where the function is not predictable from the form, either. As an illustration, consider the following participial forms in English:

39. a. drive → drove → driven; eat → ate → eaten;
 b. break → broke → broken; get → got → gotten; speak → spoke → spoken

Morpho-phonologically, it appears rather obvious that for *drive* and *eat*, the participial form is derived from the form which otherwise correlates with the present. For *break*, *get*, and *speak*, on the other hand, it appears equally obvious that the participial form is derived from the form which otherwise correlates with the past. From the perspective of any attempt to characterize coherently the function of the participle, it is clear that it should be uniformly derived from the same source, be it present, past, or a neutral stem, no matter the details of its derivational history. Any attempt to correlate that function with a straightforward morpho-phonological form, thereby maintaining some measure of isomorphism between morphological properties and syntactico-semantic properties, however, would run into obvious complications. Specifically, one would have to assume the following (cf. e.g., Halle and Marantz, 1993):

40. a. There is a \emptyset past tense morpheme in English, which is lexically specified to occur in the context of specific verb stems (certainly *put* and *cut*, but also *drive*, *run*, *speak*, *eat* and all other strong forms).
- b. The \emptyset past tense morpheme (but not any overt past tense morpheme) triggers, at times, the selection of a stem allomorph. Specifically, and as specified lexically for specific verb stems, when the past tense morpheme \emptyset attaches to e.g. *eat*, it selects the stem allomorph *ate*. When it attaches to *drive*, it selects the stem allomorph *drove*, etc.
- c. The participial is derived from the stem. When derived with *-en* (but never with *-ed*) it too may trigger the selection of a stem allomorph, again as specified in the lexical entry of specific verbs. Hence *-en* when attached to *drive* selects the allomorph *drive*, but when attaching to *break* selects the stem allomorph *broke*.

Thus, for instance, for a stem such as *drive*, the relevant entry would specify all the information in (41a). For *break*, the information would be as in (41b):

- | | |
|-----------------------------|-----------------------------|
| 41. a. <i>drive</i> : | b. <i>break</i> |
| Past: with \emptyset | Past: with \emptyset |
| allomorph: <i>drove</i> | allomorph: <i>broke</i> |
| Participle: with <i>-en</i> | Participle: with <i>-en</i> |
| allomorph: <i>drive</i> | allomorph: <i>broke</i> |

The drawbacks of the solution here, seeking, as it does, to retain some measure of form to function predictability, are evident. First, it requires the assumption that, e.g., *run*, *drove*, *spoke* etc. are bi-morphemic when they occur in past tense contexts, but mono-morphemic when embedded within a participle, a claim which is otherwise hard to substantiate from a pure morpho-phonological perspective. Second, as the system requires massive listing of correlations between function and specific form in the entries of every verb, one wonders what, if anything, is accomplished by the past tense \emptyset morpheme, and by the assumption that compositional morphology is involved, rather than simply the listing of actually attested forms. In other words, if the phonological entries for *drive* and *break* respectively were as in (42), the grammar would, in actuality, be simplified:

- | | |
|---------------------------|---------------------------|
| 42. a. <i>drive</i> : | b. <i>break</i> |
| Past: <i>drove</i> | Past: <i>broke</i> |
| Participle: <i>driven</i> | Participle: <i>broken</i> |

If the representations in (42) are on the right track, they already suggest that the best way to view at least some of inflection is not as morphemic in nature, but rather as *amorphous*, in the sense of Anderson (1992). Within such a view, phonological representations are paradigmatic, and inflection is a process of mapping from a set of non-morphemic representations, such as *V. <pst>* to a complex phonological entry, which contains a full list of potentially unpredictable forms. Within such a view, we note, regular forms, e.g., *walk* \rightarrow *walked_{past}* and *walk* \rightarrow *walked_{participle}* need not be listed. Rather, a phonological realization convention would spell out *walk. <pst>* as *walked* and *walk.participle* as *walked* as well. The application of such a phonological realization convention would be triggered when a specific phonological index comes without a paradigm (and see Beard, 1995; Anderson, 1982, 1992 for more specific executions and some relevant theoretical considerations, as well as Stump, 1998 for a review.).

Inflectional systems which are thus organized, usually referred to as *Word and Paradigm* systems, have been carefully articulated (see references cited). In addition to providing a more

parsimonious solution for the problem of form failing to predict function within the inflectional domain, they can also handle quite easily situations in which the order of inflectional marking differs from one instantiation to another. As an illustration, consider the verbal paradigm in Hebrew:

| 43. Imperfective/future | | Perfective/past | |
|-------------------------|--------------|-----------------|--------------|
| <i>'ektob</i> | write.1.sg | <i>katabti</i> | write.1.sg |
| <i>tiktob</i> | write.2.sg.m | <i>katabta</i> | write.2.sg.m |
| <i>tiktebi</i> | write.2.sg.f | <i>kabat</i> | write.2.sg.f |
| <i>yiktob</i> | write.3.sg.m | <i>katab</i> | write.3.sg.m |
| <i>tiktob</i> | write.3.sg.f | <i>kaba</i> | write.3.sg.f |
| <i>niktob</i> | write.1.pl | <i>kabnu</i> | write.1.pl |
| <i>tiktebu</i> | write.2.pl | <i>kabtem</i> | write.2.pl.m |
| | | <i>kabten</i> | write.2.pl.f |
| <i>yikto<u>bu</u></i> | write.3.pl | <i>kabu</i> | write.3.pl |

The problem here, as noted and discussed extensively by Noyer (1997) and by Ritter (1997), among others, is to correlate inflectional form with function. First, clearly number, gender and person markers must constitute distinct paradigms in the imperfective and the perfective, already making a clear morphemic representation of the forms in (43), syntactic or otherwise, problematic. What, to illustrate, is the 1.sg. morpheme in Hebrew, given that in the perfective/past it is realized following the stem, as *-ti*, while in the imperfective/future it is realized preceding the stem, as *'e-*?¹⁹ An even graver problem, for morphemic accounts, is presented by the pattern of agreement within the imperfective. While plausibly person/gender marking always occurs preceding the stem, plural marking is realized following the stem for 2nd and 3rd person, but preceding the stem for 1st person forms. At the very best, a morphemic account for such a paradigm would require distinct phonological realization for identical functions (e.g., 1st sg. in the perfective and the imperfective), as well as the separation into distinct morphemes of person and number, with 1st person plural counting as a person, rather than a number. We note, in the context of the latter assumption, that if the *u* is postulated to be a plural marker, as would seem plausible on the basis of the imperfective plural 2nd and 3rd forms, and the past 3rd plural form, then we would have to assume that 1st plural is marked independently for both person and number in the perfective (*kab-n-u*), but not in the imperfective.

It is the belief of this author that pending significant additional insight into the nature of inflection, the course of action is to radically separate form and function within the domain of inflection. The reader may recall that I suggested that abstract head features must be realized on stems (L-heads, but possibly at times f-morphs as well). Seeking to integrate that particular view with a view of non-morphemic inflection, I will assume that while more than one head feature can

¹⁹ Shlonsky (1997) as well as Benmamoun (1998) argue that the imperfective form does not move as high as the perfective form, thereby accounting, within a syntax-morphology isomorphic system, for at least the post-stem placement of agreement for perfective derivations. We note, however, that as agreement within the imperfective paradigm at times precedes the stem and at times follows it, this solution, at best, accounts only partially for the observed facts. It further remains entirely silent on the issue of what specifically is the 1st person morpheme in Hebrew, such that it is phonologically realized in different ways in the perfective and the imperfective.

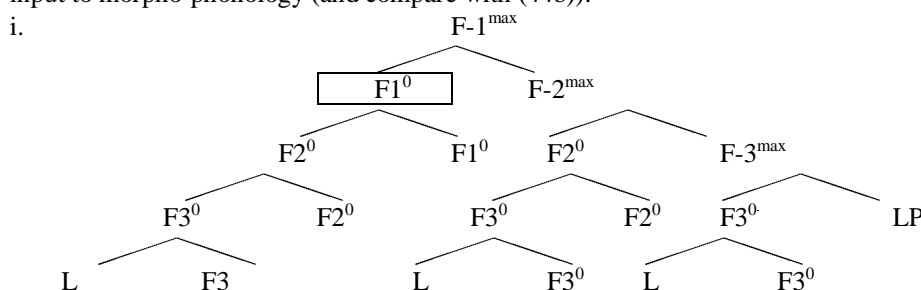
be realized on a single L-head, those features are neither ordered, nor hierarchically organized. Specifically, for a representation such as (44a), the input to the phonological component is as in (44b):

44. a. [_{F-1} L-head.<f3>.<f2>.<f1> <e_{F1}> [_{F-2} L-head.<f3>.<f2> <e_{F2}> [_{F-3} L-head.<f3> <e_{F3}> [_{L-D} L-head]]]
 b. L-head.<f3>.<f2>.<f1> (with {<f3>.<f2>.<f1>} as an unordered set)

(44b), in turn, serves as the basis for the choice between members of the paradigm given by the relevant phonological entry. While some phonological regularities associated with the realization of some feature combinations are of course expected and attested, the forms remain, crucially, morphological simpletons, and there is no expectation for either linear or hierarchical correlations between the syntactic structure and the placement of inflectional marking.²⁰

This said, it is clear that some markings which is functionally inflectional is extremely regular. Thus, for instance, *-ing* in its function as the progressive, or the present participle, attaches to virtually all English verbs, and never triggers any stem allomorphy or meaning change. It thus stands to reason that *-ing*, unlike, e.g., past tense in English, is not an abstract head feature, but rather a bound f-morph, differing from an f-morph such as *the* in forcing the movement of some L-head to support it. As such, I believe, *-ing* patterns with (much of) derivational morphology, where affixes do give rise to a hierarchical combination with their host stem, and where, at least at times,

²⁰ It is precisely here that our assumptions on the nature of inflection differ from those made within Distributed Morphology (cf. Halle and Marantz, 1993; Noyer, 1997, Harley and Noyer, 1999.) Within DM, morphology is in actuality two separate components, one which correlates roughly to morpho-syntax, the other which correlates roughly to morpho-phonology. As in the present work, it is assumed within DM that phonological words are not built by the syntax, and that the syntax-morphology isomorphic approach must be rejected. Nevertheless, within DM, there does exist an isomorphism between syntax and some abstract notion of morpheme structure, such that e.g., PAST is a morpheme, projected under T, and combined with the verb through verb movement. Successive movement of the head, e.g., from Asp to T to Agr gives rise to a hierarchical structure, roughly as in (i), with the boxed F1⁰ node the domain which serves as the relevant input to morpho-phonology (and compare with (44b)):



Once in the morpho-phonological domain, F1⁰ is assigned M-structure, in essence a structure which reflects its actual morpho-phonology, with the syntactic hierarchical input structure operated on by a variety of language particular (indeed, stem particular) structure-changing rules, including Merger, Local Prosodic Inversion, Impoverishment, Fission, and the insertion of non-syntactically represented morphemes, to give rise, eventually, to a form which bears few if any hierarchical correlations with the structure of F1⁰ and which is largely non-hierarchical in nature. Within the system proposed here, since no hierarchical structure is built for the relevant inflected forms, no structure-changing operations are required.

movement of an L-stem is required. This issue is however set aside for the remainder of this book. The reader is referred to Borer (forthcoming) for a detailed discussion.

3. An Overview

This study is devoted primarily to an attempt to shift the burden of projecting structure and assigning interpretation away from lexically listed properties and from type shifting, and onto structures which largely determine not only the interpretation of phrases and propositions, but also the fine grained meaning of specific L-heads embedded within them. In the next 9 chapters, I embark upon detailed case studies of the claims made so boldly in the introductory chapters. The work here is divided into two books, with a third book still in the pipelines. Book I, *Determining Structures* is an investigation of the functional structure of DPs, and the way in which it contributes to the emergence of specific interpretations associated with (non-predicate) nominals.

Chapter 3, which serves also as a general introduction to the mode of argumentation employed in the rest of this work, includes a review of some arguments for the existence of a syntactic D projection, as well as a discussion of some of the properties of that D projection when it is headed by a null element, i.e., when there is no overt range assigner for the open value heading D, $\langle e \rangle_d$. I then turn to the investigation of one specific mode of assigning range to $\langle e \rangle_d$: that of proper names. I suggest that the proper name/common name distinction does not involve lexical listing, nor is an operation of type shifting required to handle it. Rather, proper names and common names interpretations emerge from two distinct syntactic structures, in which range is assigned differently to $\langle e \rangle_d$.

In Chapter 4 I turn to the motivation of one more functional open value within the nominal domain: Classifier Phrase (CL^{max}), headed by the open value $\langle e \rangle_{div}$ (div. for 'division'). CL^{max} , I will argue, is responsible for the generation of mass vs. count structures and is assigned range, in English, both by plural inflection and by the indefinite article *a*. #P, on the other hand, is the merger location of all other determiners, including strong determiners, weak determiners, cardinals, and, as I shall argue in Chapter 6, the definite article as well. Empirically, Chapter 4 focuses on the mass-count distinction as well as on the singular-plural distinction in a number of languages, but in particular English and Chinese. The chapter further contains an extensive discussion of the affinity between bare mass nouns and bare plurals, when contrasted with singulars, and provides for a typology of determiners across languages. As in the case of proper vs. common names, I will argue that no lexical listing is required to distinguish mass nouns from count nouns, and that, as in the case of proper/common names, the distinction is fundamentally structural, rather than lexico-semantic.

Chapters 5 and 6 are dedicated to the investigation of properties of determiners. The main thesis here is that the syntactic placement of determiners, and specifically the open values which they assign range to, are responsible for the emergence of definiteness and indefiniteness, as well as strong and weak nominal readings. Specifically, in Chapter 5, I suggest that the properties of the Quantity Phrase (#P) in conjunction with the properties of DP are responsible for derivation of strong vs. weak readings for quantifiers, cardinals, and indefinites. In lieu of an operation of type shifting, the key element in deriving distinct types involves the assignment of range by the same determiner to $\langle e \rangle_{\#}$, the value heading #P, and to $\langle e \rangle_d$, the value heading DP. Chapter 6 includes

an analysis of the definite article in English, analyzing it as a range assigner not only to $\langle e \rangle_d$, the node that heads DP, but also to $\langle e \rangle_#$, the node that heads #P (aka Number Phrase). It further includes a detailed discussion of range assignment by heads vs. range assignment by specifiers, together with the different structural predictions made by such assignment.

Part III (Chapters 7 and 8) is an in depth application of the system developed in Chapters 3-6 to the nominal system in Hebrew, with a special focus on the properties of the definite article (Chapter 7), the structure of singulars (Chapter 7), the distribution of cardinals (Chapter 7), and the structure of so-called measure and container expressions (Chapter 8). That investigation results in a further elucidation of the interaction between modes of range assignment and the emerging syntactic and semantic properties.

Chapter 9 concludes Book I with a few summarizing comments on language variation and the role of the morpho-phonological system in determining it.

Book II, *The Normal Course of Events*, takes on the task of elaborating on event structure and the way in which it is syntactically determined. Book III, *Parallel Morphology* (Borer, forthcoming, working title) addresses in greater detail the nature of word formation within an XS system, with a special view towards derived nominals.