

Adjectives and the organization of lexical inventories*

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A definition lexical classes is proposed based on the mapping between the prototypical semantic and the unmarked syntactic properties of nouns and verbs which at once captures cross-linguistic generalizations made by previous authors and at the same time explains the typological variation shown in parts of speech systems. Adjectives are the most marked class and that most susceptible to neutralization across languages, which vary with respect to whether or not a class of adjectives is present and, if not, which of the two remaining classes serve the adjectival function of unmarked modifier. Choices as to which of the criterial features of the adjectival class are active in a given language are crucial to determining the underlying shape of the lexical inventory, which in turn has important consequences for the grammar of a language, as shown by an examination of Salish, a verb-adjective conflating family of languages.

Paradoxically, the notion of lexical class or “part of speech” forms an integral part of most — if not all — syntactic theories, yet precise and rigorous definitions of these classes have never been successfully formulated. More often than not, lexical classes are treated as primitives, either in terms of input to rules, determinants of underlying phrase structure, or as sources of valency and subcategorization frames; thus, class-designations such as “verb”, “adjective”, and “noun” are the linchpins of semantic, syntactic, and morphological structure, but the terms themselves are rarely defined, and their properties, both formal and functional, are often taken for granted. While it is certainly possible to carry out successful linguistic analysis without a clear definition of the basic units involved (as long as the identity of these units can be agreed upon), any theory which proceeds without a full understanding of its own primitives rests on uncertain foundations and is often ill-equipped to deal with novel or exotic data. One common source of such data is linguistic typology. Most current linguistic theories — whose main proponents are speakers of and researchers in European languages — are built on the model of what Sapir referred to as the “Standard Average European” (SAE) language type with its familiar three-way division of the lexicon into open classes of verb, noun, and adjective. Cross-linguistic investigation has shown, however, that not all languages fit this pattern and at one time or another claims have been made that certain languages lack

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distinctions between adjectives and verbs, adjectives and nouns, or even between nouns and verbs (*e.g.* Kinkade 1983; Schachter 1985; Bhat 1994; Broschart 1997). When confronted with the neutralization of parts-of-speech contrasts, any theory which relies on the three open classes as primitives — or which, at least, has no clear idea of their origin — will have little success in dealing with the cross-linguistic variation in lexical class systems, or of providing adequate explanation of the origins of this variation.

It is my goal in this paper to outline a theory of lexical classes which both provides for and properly constrains the variation in class membership of wordforms expressing certain types of meanings. In Section 1.0, I will discuss some of the previous attempts to define the three major parts of speech (nouns, verbs, and adjectives), and in Section 2.0 I will show how aspects of some of these analyses can be combined to avoid the pitfalls of taking a too narrowly syntactic or a too narrowly semantic point of view. Following this, in Section 3.0, I propose a set of four formal principles or definitions which, when combined with some uncontroversial ideas about syntactic structure, can be used to derive working definitions of the three major lexical classes and their principal syntactic roles or functions. Section 4.0 examines variation found cross-linguistically in parts of speech systems and sets out both to model the attested types of lexical inventory and to account for the constraints that hold on their shape. Section 5.0 examines a specific language family, Salish, with a reduced or “underspecified” inventory in which verbs and adjectives form a single lexical class of words representing semantic predications. In Section 6.0, I will examine some of the larger implications of my approach for theories of language as a whole and suggest some promising avenues for future typological investigation.

1. Theories of lexical classes

Traditionally, definitions of open lexical classes can be divided into three types — semantic, morphological, and syntactic. The most familiar and intuitively appealing of the three is the semantic definition which groups words into the three open classes based on their denotational or “contentive” meaning. Generally, in such approaches nouns are said to be those lexical items denoting “people, places, and things”, verbs are those which denote “actions and states”, and adjectives are lexical items which denote “properties and qualities”. Such definitions run into problems on two fronts. First, intra-linguistically, many words of one lexical class express meanings which fit the definition of another — for instance in Hausa, *tauri* ‘hard’ is a noun, yet it clearly denotes a property, whereas in Bemba the words *ashipa* ‘strong’, *akosa* ‘brave’, and *aceenjela* ‘wise’ are verbs, in spite of the fact that they denote qualities and, hence, by a naïve semantic definition, should be adjectives (Schachter 1985). Cross-linguistically, semantic definitions of this type run into even greater problems in that meanings whose lexical expression falls into one class in one language belong to a different class in another. Thus, the quality ‘hard’

surfaces as a noun, *tauri*, in Hausa, as an adjective, *duro*, in Spanish, and as a verb, *ƙtadis*, in Lushootseed (see also, among others, Hale & Platero 1985). This problem is particularly marked in languages that have a reduced, closed class of adjective and divide the remaining “adjectival” meanings — that is, meanings denoting properties, states, and qualities — between nouns and verbs. Dixon (1982) observes that, in this type of language, the meanings of the reduced class of adjectives seem to cluster consistently around notions relating to dimension, age, value, and colour (DAVC), whereas meanings he terms “physical properties” (e.g. ‘heavy’, ‘soft’, ‘sweet’) tend to be expressed by verbs and “human propensities” (‘greedy’, ‘kind’, ‘clever’) tend to be expressed by nouns.

Nevertheless, in languages with a closed class of adjective, the number of meanings whose expressions are adjectives can range from dozens down to a mere handful. For example, the Bantu language Venda chooses — out the potentially much larger set of DAVC meanings — some twenty meanings to be expressed as adjectives, given in Table 1:

Table 1.

<i>Adjectives in Venda (Southern Bantu)</i>			
<i>hulu</i> ‘big’	<i>tluku</i> ‘small’	<i>lapfu</i> ‘long’	<i>pfufhi</i> ‘short’
<i>denya</i> ‘thick’	<i>sekene</i> ‘thin’	<i>nlu</i> ‘wet’	<i>tete</i> ‘soft’
<i>rema</i> ‘black’	<i>tshena</i> ‘white’	<i>tswu</i> ‘black’	<i>tswuku</i> ‘red’
<i>vhisi</i> ‘raw, green’	<i>swa</i> ‘young, new’	<i>lala</i> ‘old’	<i>hulwane</i> ‘important’
<i>vhuya</i> ‘good-natured’	<i>vhi</i> ‘bad’	<i>setlha</i> ‘yellow’	<i>khwivhilu</i> ‘red’

(Dixon 1982:4 – 5)

Igbo, on the other hand, realizes only a subset of seven of these meanings (plus ‘good’, which is not an adjective in Venda) as adjectives:

Table 2.

<i>Adjectives in Igbo (Kwa)</i>			
<i>úkwú</i> ‘large’	<i>óhú’ rú</i> ‘new’	<i>ójí’ í</i> ‘black’	<i>óma</i> ‘good’
<i>ntà</i> ‘small’	<i>ócyè</i> ‘old’	<i>ó’cá</i> ‘white’	<i>ój’ó’ ó</i> ‘bad’

(Dixon 1982:4; Schachter 1985:15)

The remainder of the set of DAVC meanings in Table 1 that are not expressed as adjectives in Table 2 are thus presumably divided up in the Igbo lexicon between the lexical classes of verb and noun. It is difficult to see how a sliding scale of “adjectival” meanings such as that proposed by Dixon can be handled by the more traditional semantic definition of adjective, although work such as Dixon’s and that of Givón (1979) have led to a number of interesting proposals for defining lexical classes in terms of semantic prototypes, an issue we will return to below.

The second type of definition that has enjoyed wide currency is an essentially morphological one that seeks to define parts of speech in terms of their inflectional

classes. The simplest approach along these lines posits certain basic inflectional categories which are purported to be diagnostic of particular parts of speech, both within and across languages. Thus, nouns are defined as those lexical items that are inflected for number (Eng. *dog* : *dogs*), gender (Sp. *doctor* ‘doctor_{MASC}’ : *doctora* ‘doctor_{FEM}’, and case (Rus. *mašina* ‘car_{NOM}’ : *mašiny* ‘car_{ACC}’); verbs are inflected for tense (Eng. *he runs* ; *he ran*), aspect (Rus. *kričat’* ‘shout_{IMP}’ : *kriknut’* ‘shout_{PERF}’), voice (Bella Coola *tixis* ‘he cut it’ : *txim* ‘it was cut_{PASS}’ : *txa* ‘he cut_{AP}’), and mood (Sp. *dices* ‘you speak’ : *diga* ‘speak!’); and adjectives are inflected for comparison (Eng. *big* : *bigger* : *biggest*). Cross-linguistically, however, there is considerable variation with respect to the inflectional categories marked on lexical items belonging to all three classes. For instance, nouns in most Salish languages are not obligatorily marked for number, and recent research has suggested that, cross-linguistically, plurality is an inflectional category potentially applicable to both nouns and verbs (Dolinina & Beck 1997). Interior Salish languages, like Chinese, lack inflectional marking of nouns for gender, while the Coastal Salish languages have gender, but generally lack inflectional case, as do Chinese and (outside the pronominal paradigms) English and Spanish. Verbs in Salish, Chinese, and many Bantu languages do not mark tense, and verbs in Hebrew in all tenses are marked for gender, as they are in the Russian past tense. In Lushootseed, meanings corresponding to Indo-European tenses and moods can be applied to nouns, as in:¹

1. a. tu-*q̣iyaλəd* ti tu-*sčistx^w-s*
 PST-slug D PST-husband-3PO
 ‘Slug had been her former (*i.e.* deceased) husband.’
 (Hess 1993:84)
- b. *x^{wi}?* *k^{wi}* *g^{wə}-pišpiš*
 NEG D SUBJ-cat
 ‘There are no cats.’
 (Hess 1993:123)

In (1a) the meaning ‘past’ — a tense in SAE and similar languages — is applied to two different nouns, the predicate nominal *q̣iyaλəd* ‘slug’ and the syntactic subject *sčistx^w* ‘husband’, whereas in (1b) the subjunctive, generally classified as a mood, is applied to *pišpiš* ‘cat’ to indicate its non-existence (*cf.* the use of the subjunctive in negated subordinate clauses in Spanish: *no conozco a nadie que sepa usarla* ‘I don’t know anyone who **knows**_{SUBJ} how to use it’).

A more promising approach along the same lines is to define a set of inflectional characteristics that are cross-linguistically typical of one or the other parts of speech and then to decide, on a language by language basis, which of these

¹The abbreviations used in the interlinear glosses are as follows: 1, 2, 3 = first, second, third person; ACC = accusative; AP = antipassive; D = deictic; DAT = dative; ECS = event-external causative; *f* = feminine; GEN = genitive; HAB = habitual; ICS = event-internal causative; IMP = imperfective; INTR = intransitive; MID = middle; NEG = negative; NEU = neuter; NOM = nominative; NP = nominalizing prefix; P = preposition; PASS = passive; PERF = perfective; PNT = punctual; PST = past; POSS = possessive; PREP = prepositional; PST = past; RDP = reduplication; SG = singular; STAT = stative; SUBJ = subjunctive.

is diagnostic of lexical classes in a given grammatical system. Although there is some difficulty with languages having little or no inflection, definitions such as these often give results which are highly consistent with semantic and syntactic definitions of lexical classes, which is in itself an indication of the fundamental shortcoming of purely morphological definitions of parts of speech. Such definitions offer no account of their own success — a success that can, in fact be attributed to their tacit reliance on semantic and syntactic assumptions about the meanings and distributions of parts of speech. Tense in Salish, for instance, might be dismissed as a diagnostic for verbhood given its appearance on the nouns *q̄iyaλəd* ‘slug’ and *s̄c̄istx^w* ‘husband’ in (1a), but this presupposes that they are, in fact, nouns.² Even in less problematic cases — say, gender in Russian — where it is possible to devise more rigorous morphological criteria (there is a set of words which always bear gender and which are further quantifiable and are marked for case (nouns), while there is another set which bears marking for tense and aspect (verbs) but can only be marked for gender in the past tense), such definitions do nothing on the cross-linguistic front to explain why it is that the bulk of those words singled out as nouns in Russian morphology express the same meanings and have the same syntactic distribution as those words singled out by the language-specific tests for nouns in Hebrew, English, Lushootseed, and Chinese.

Even more telling against a purely morphological definition of lexical classes is the fact that intralinguistically lexical-class boundaries drawn on purely inflectional bases often give problematic results. Most languages, for instance, have lexical items considered to be a member of a given class which do not have all of the inflections that might be considered criterial for membership in that class. Thus, the English word *significance* can be neither a plural (**significances*) nor a possessor (**significance’s*), whereas plurality and possessive inflections are commonly cited as morphological indicators of nounhood in English (Lyons 1977:426). In Russian, the word *pirožnoe* ‘pastry’ is declined as if it were an adjective showing concord with a neuter noun and thus patterns morphologically with more run of the mill adjectives such as *bol’šoj* ‘big’ and *xorošij* ‘good’, as shown in Table 3:

²Alternatively, it could be argued that *tu-* is not a past tense marker because it appears both on verbs and nouns—but again, this presupposes that words like *q̄iyaλəd* ‘slug’ and *s̄c̄istx^w* ‘husband’ are nouns and therefore preclude the application of a true tense.

Table 3.

Declension of pirožnoe ‘pastry’, bol’šoj ‘big’ and xorošij ‘good’

	<i>pirožnoe</i> ‘pastry _{NEU} ’	<i>bol’šoe</i> ‘big _{NEU} ’	<i>xorošee</i>
‘good _{NEU} ’			
NOM	<i>pirožnoe</i>	<i>bol’šoe</i>	<i>xorošee</i>
ACC	<i>pirožnoe</i>	<i>bol’šoe</i>	<i>xorošee</i>
GEN	<i>pirožnovo</i>	<i>bol’šovo</i>	<i>xoroševo</i>
DAT	<i>pirožnomu</i>	<i>bol’šomu</i>	<i>xorošemu</i>
INST	<i>pirožnym</i>	<i>bol’šim</i>	<i>xorošim</i>
PREP	<i>pirožnom</i>	<i>bol’šom</i>	<i>xorošem</i>

Semantically, however, *pirožnoe* is more closely related to morphological nouns such as *pirog* ‘pie’ and *tort* ‘cake’; syntactically, *pirožnoe* patterns as a noun as well, undergoing quantification (*pjat’ pirožnix* ‘five pastries’), serving as subject or object (*Oni s’eli pirožnye* ‘they ate the pastries’), the complement of a preposition (*Ja ne mogu žit’ bez pirožnyx* ‘I can’t live without pastries’), or the head of a relative construction (*pirožnoe, kotoroe ja kupil* ‘the pastry that I bought’). What’s more, unlike true adjectives but like nouns, *pirožnoe* can not serve as a modifier (**pirožnoe testo* ‘pastry dough’), nor does it have comparative (**pirožnee*) or superlative (**samoe pirožnoe*) forms. Given that, first and foremost, lexical classes serve as input to syntactic rules — that is, they characterize lexical items for the purpose of the rules used in the organization of syntactic structures — the classification of *pirožnoe* as an adjective is at best inconvenient, given that it is recognized by the syntax as a noun, as reflected in both its functions and its distribution.

This last type of problem, that syntactic distribution is often more closely related to lexical class membership than to inflectional patterns, has led to a number of attempts at defining parts of speech (often called “syntactic categories” in such definitions) in purely distributional terms. The most elementary of these approaches defines each part of speech strictly in terms of the syntactic roles in which it is permitted to appear: nouns are defined as lexical items that can be the subjects of a sentence, verbs can be syntactic predicates, and adjectives are attributive modifiers (cf. Chomsky 1965). Such definitions falter, however, when confronted with lexical items appearing in their non-prototypical or extended uses. English nouns, for instance, can comfortably serve as modifiers of other nouns, as in *jazz musician* or *gas stove*, while certain adjectives can act as syntactic subjects (e.g. *Red is my favorite colour*). By the same token, syntactic roles singled out as definitive of lexical classes can be filled by complex, multi-word expressions such as non-finite VPs and subordinate clauses. Thus, in *the cat yowling in the backyard* the element which fits the definition of adjective given above, “attributive modifier”, is not a lexical adjective but a participial phrase, *yowling in the backyard*, and in the sentence *That she found him so quickly was a great surprise*, the syntactic subject is a finite clause, *that she found him so quickly*, rather than a noun. Even in simpler

sentences like *The red squirrel sits in the park*, as Lyons (1977:429) observes, “it is not nouns, but nominals, that function as subjects ...” and, by extension, it is not necessarily adjectives, but members of the “expression class” adjectival, which act as modifiers. On a micro-level this problem could be overcome by simply adding the *proviso* “lexical item” to the syntactic definitions of parts of speech given above (*i.e.* “an X is a **lexical item** whose syntactic distribution is Y”), but solutions of this type gloss over the larger question of the relation between lexical classes and the corresponding expression class — namely, what is it about nouns and nominals that accounts for their parallel distribution, and how best to capture the semantic relationship between simplex (lexical) and complex elements that fill the same syntactic role?

From a cross-linguistic perspective, these questions seem even more pressing when it becomes evident that the distributional parallels between simplex and complex elements found in languages like English (*i.e.* nouns have similar distributional patterns to finite complement clauses, adjectives pattern with participles and relative clauses, etc.) are found in a wide range of the world’s languages. An additional cross-linguistic difficulty with distributional definitions of parts of speech comes from languages with reduced lexical inventories — that is, languages which appear, on a distributional basis, to lack one or more lexical class distinctions. Consider, for instance, the examples in (2) from the Salishan language Lushootseed, which show the distributional overlap between verbs and nouns (2a and b), and between verbs and adjectives ((2c) and (d)):

2. a. ?u-?əʔəd ti?iʔ piʂpiʂ ?ə ti?ə? s?uladx^w
 PNT-eat D cat P D salmon
 ‘That cat ate a salmon.’
- b. piʂpiʂ ti?iʔ ?u-?əʔəd ?ə ti?ə? s?uladx^w
 cat D PNT-eat P D salmon
 ‘That one eating the salmon is a cat.’
- (based on Hess 1993:133)
- c. $\text{ʔ-u-lək}^w\text{-əd}$ ti?ə? ha?ʔ s?əʔəd
 HAB-PNT-eat-ICS D good food
 ‘He/she would eat the good food.’
- d. ha?ʔ ti?ə? s?əʔəd $\text{ʔ-u-lək}^w\text{-əd}$
 good D food HAB-PNT-eat-ICS
 ‘The food he/she would eat was good.’
- (based on Bates *et al.* 1994:105)

The sentence in (2a) illustrates a sentence whose predicate is the verb ?əʔəd ‘to eat_{INTR}’ and whose syntactic subject is ti?iʔ piʂpiʂ ‘that cat’; in (2b), piʂpiʂ serves as the syntactic predicate, while in (2d) the syntactic predicate is the word ha?ʔ ‘good’, which is shown acting as a preposed modifier in (2c). Any distributional metric defining verb as “a lexical item that can act as a syntactic predicate” would not only pick out the syntactic predicates of (2a) — ?əʔəd ‘to eat_{INTR}’ — and (2c) — $\text{lək}^w\text{əd}$ ‘to eat_{TRANS}’ — as verbs, but would point to the predicates of (2b) —

pišpiš ‘cat’ — and (2d) — *haʔʔ* ‘good’ — as well. Such arguments can and have been used as evidence that Lushootseed, and Salish in general, lacks an underlying lexical distinction between verbs, nouns, and adjectives (*e.g.* Kuipers 1968; Kinkade 1983), although — as discussed in detail in Section 4 — there is in fact some evidence for at least one of these distinctions, that between verb and noun (see also, van Eijk & Hess 1986; Matthewson & Demirdache 1995). If this is indeed the case, and Salish does differentiate between nouns and verbs, then clearly something other than straightforward distribution has to be used to define the relevant categories.

More recent syntactic approaches have dealt with such problems in terms of syntactic **markedness** — that is, they have sought to define parts of speech in terms of their unmarked or typical syntactic distribution. For SAE languages, such definitions claim that the typical syntactic role of nouns is as a syntactic actant (subject or object) of a verb,³ that verbs are typically predicates, and that adjectives are typically modifiers of nouns; all of these lexical classes, however, have additional — marked or “extended” (Dik 1978) — uses which overlap with the typical or unmarked distribution of the other classes. The task of the linguist then becomes sorting out — in an unambiguous, non-tautological manner — which of the uses of a given lexical item constitute extended uses and which are unmarked, and hence, indicative of that item’s lexical class membership. How this is done varies from author to author. Hengeveld (1992a, 1992b) makes reference to the “additional” grammatical machinery required to allow a lexical item to appear in an extended semantic role. Hengeveld refers to such mechanisms as “further measures” and uses this notion to arrive at definitions of the major lexical classes such as the following:⁴

3. **verb**: a lexical item which, without further measures being taken (WFM), has predicative use **only**
- noun**: a lexical item which WFM can be used as the argument of a syntactic predicate
- adjective**: a lexical item which WFM can be used as the modifier of a noun

For Hengeveld, “further measures” are defined as those morphosyntactic means which “derive” Functional Grammar predicates from constituents that are not already predicates (1992a:58). In more conventional terms, “further measures” can be regarded as the morphological, syntactic, or semantic features taken on by an element in a non-prototypical syntactic role. Thus, using Hengeveld’s examples, we have the following set of English attributive constructions:

³In Meaning-Text Theory (Zholkovskij & Mel’čuk 1967; Mel’čuk 1988) and various other dependency-based grammars, an actant is the equivalent of a syntactic argument in generative phrase-structure grammars; a more precise definition will be worked out Section 2 below. I will continue to use this term throughout in order to avoid confusion with the term “argument” which I will restrict to the semantic sphere.

⁴Note that I have re-formulated Hengeveld’s definitions—which in the original are couched in the terms of Functional Grammar (Dik 1978)—to make them more accessible to those unfamiliar with the framework. Hengeveld’s own formulations can be found in Hengeveld (1992a:58).

4. a. the *intelligent* detective
 b. the *singing* detective
 c. the detective *who is singing*

(Hengeveld 1992a:58)

All of the italicized elements in (4) are, in syntactic terms, modifiers of the noun *detective* — however, only the first one, *intelligent*, is used “without further measures being taken” and so fits into the category of adjective. The modifier in (b) is a verb, *sing*, suffixed with the participial/gerundive suffix *-ing* (an inflectional measure), whereas in (c) the modifier is the same verb contained within a relative clause (a syntactic measure); these examples show that verbs in English can be modifiers, but not without further measures being taken. Also included under the rubric of further measures would be derivation — *the cowardly detective* — and the use of syntactic elements such as complementizers, particles, and copulas.

For Bhat (1994), the distinction between unmarked and extended uses of lexical items is signaled not only by extraordinary morphosyntactic measures, but also by the processes of “decategorization” and “recategorization” — that is, by the extent to which a lexical item in an extended use can be shown to have lost the grammatical properties typical of its class, or the degree to which it has adopted the grammatical properties of the lexical class for which its current use is unmarked. The Russian adjective *xolodnij*, for instance, becomes decategorized and loses its ability to take case-endings when used as a(n individual-level) predicate in a sentence like *Mne xolodno* ‘I am cold’ (lit. ‘to-me [it is] cold’), whereas the English noun *horn* becomes partially recategorized as a modifier and takes on a participle-like inflection (typical of verbs when used as modifiers) in expressions like *horned toad* or *three-horned chameleon*. Even in cases where there is no overt morphosyntactic indication of de- or re-categorization, Bhat points out that there are often semantic indications that one of the two processes has taken place. When English nouns are used as modifiers, for instance, they show signs of decategorization in that they lose the referential properties they have in their other, more typical uses as actants or syntactic arguments. Returning to Hengeveld’s detective in (4), the noun *London*, seems to be an eligible modifier WFM in a phrase like *the London detective*. Note, however, that whereas in its other uses (e.g. *The detective from London*), *London* serves a referential function identifying a specific location, as a modifier the interpretation of *London* is much more highly context-dependent. It does not refer the listener’s attention so much to a specific geographic location as it does to some pragmatically plausible relationship between the nominal head and that location — thus, in *London detective*, *London* could serve to identify the detective’s home or point of origin (‘detective from London’), his current location (‘one of a set of South African detectives dispatched to London (the others having gone to Paris and Rome)’), or (a bit fancifully) his current assignment (‘the detective assigned the task of finding London’). By the same token, *London* takes on completely different readings when associated with other types of noun: *London double-decker* ‘a two-level bus of the style used in London (but not necessarily from or located there)’, *London Bridge* ‘a particular bridge, one of many in London’, *the London train* ‘a

train whose destination is London’, and so on. Approaches like Hengeveld’s and Bhat’s, then, have the dual advantage of defining the typical syntactic distribution of a given lexical class, while at the same time allowing for extended uses of lexical items which in themselves can be the source of diagnostic patterns.

On the down side, the grouping of lexical items singled out by definitions like those in (3) are potentially arbitrary and their membership is unconstrained — that is, there is no obvious reason why it is that ‘dog’ is a noun in language after language rather than a verb, or why it is that meanings like ‘red’ show cross-linguistically variable class membership while meanings like ‘kiss’ do not. And this brings us back to the issue of the semantics of lexical classes. For, while it is true that purely semantic definitions have met with relatively little success, it is nonetheless a fact that there is across languages a highly consistent common core or “focal class” (Lyons 1977, 440) of meanings associated with each of the major lexical classes, and that these semantic “prototypes” correlate in predictable ways with the lexical classes singled out by definitions in terms of syntactic markedness. This type of correlation is made explicit in the work of Croft (1991), who demonstrates that, cross-linguistically, words which are unmarked in one of three principle syntactic roles (in his terms, “pragmatic functions”) belong prototypically to a particular semantic class of meanings, as illustrated in Table 4:

Table 4.

<i>Prototypical semantic classes of parts of speech</i>			
	noun	adjective	verb
semantic class	object	property	action
pragmatic function	reference	modification	predication

(Croft 1991:55)

To account for typological variation in semantic class membership, Croft goes on to identify four semantic properties — three contentive and one formal — which typify each class and which can be used as criteria for class membership:

5. VALENCY: “inherent relationality” or the requirement by the lexeme of the existence of another entity or argument;
- STATIVITY: the presence or absence of change over time in the state of affairs described by the lexeme;
- PERSISTENCE: how long a process, state, or entity is likely to last over time (non transitoriness);
- GRADABILITY: whether the entity denoted by the lexeme can be manifested in degrees.

(Croft 1991:62 – 65)

Each of these semantic classes has prototypical values for these features as outlined in Table 5:

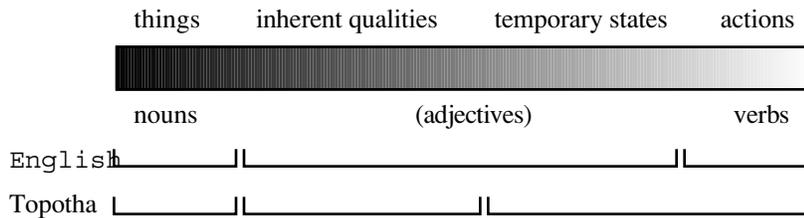
Table 5.

<i>Semantic features of parts of speech</i>			
	objects	properties	actions
valency	0	1	≥ 1
stativity	state	state	process
persistence	persistent	persistent	transitory
gradability	non-gradable	gradable	non-gradable

(Croft 1991:65)

Individual languages may depart from these prototypes in that they can differ with respect to which value of a given feature is assigned to a particular meaning and, hence, to which semantic class that meaning is felt to belong. This type of variation is seen in expressions of temporary states in English, where they are adjectives, contrasted with their expressions in the African languages Krio or Topotha, where they are verbs (Givón 1979). The crucial difference, according to Givón, is that, for English, temporary states lie far enough towards the permanent end of the “continuum of time-stability” to be classified as adjectives, whereas Krio and Topotha draw the line between verbs and adjectives at a different point, closer to the transitory end of the continuum, thereby classifying temporary states as verbs, as shown in Figure 1.

Figure 1.



The continuum of time-stability

In Croft’s system, English speakers would consider temporary states temporally stable enough to have the feature PERSISTENT, qualifying them as properties and, hence, as adjectives, whereas Krio speakers would mark them as TRANSITORY, making temporary states more like prototypical actions and therefore classifying them as verbs.

A second — and, from our point of view, more important — potential for variation inherent in Croft’s system is in the mappings between specific semantic classes and “pragmatic functions”, which in Table 4 represent only the prototypical or unmarked mappings found in tripartite, SAE-type lexical class systems. There are, however, languages which seem to neutralize certain lexical class distinctions and thus allow for alternate mappings. For instance, in Hausa (Chadic), most

English adjectives correspond to nouns, meaning that both properties and objects must be mapped simultaneously onto the pragmatic functions of reference and modification. As a result, modification is realized by a possessive construction:

6. a. mutum mai alheri/arziki/hankali
 person POSS kindness/prosperity/intelligence
 ‘a kind/prosperous/intelligent person’
 b. itace mai tauri/laushi/nauyi
 wood POSS hardness/softness/heaviness
 ‘hard/heavy/soft wood’
 c. mutum mai doki
 person POSS horse
 ‘a person who has a horse’

(Schachter 1985:15 – 16)

On the other hand, in the Bantu language Bemba, both properties and actions can be used as either predicates or modifiers, as in (7):

7. a. umuuntu ù-ashipa/akosa/aceenjela
 person RELATIVE.SUBJECT.CONCORD-brave/strong/wise
 ‘a brave/strong/wise person’
 b. umuuntu ù-alemba
 person RELATIVE.SUBJECT.CONCORD-write
 ‘a person who is writing’
 c. umuuntu á-ashipa/akosa/aceenjela
 person SUBJECT.CONCORD-brave/strong/wise
 ‘The person is brave/strong/wise.’
 d. umuuntu á-alemba
 person SUBJECT.CONCORD-write
 ‘The person is writing.’

(Schachter 1985:16)

Thus, Bemba seems to map both the semantic classes of property and actions onto two the separate pragmatic functions of predication and modification — in effect, neutralizing the distinction between the lexical classes of verb and adjective, just as Hausa seems to neutralize the distinction between adjectives and nouns.⁵

Although Croft (1991) expresses some skepticism about the existence of languages which completely neutralize the prototypical semantics–pragmatics correspondences, he does allow for the possibility that such languages exist, provided that they do not show a “negative markedness pattern ... so that, say, lexical roots denoting objects take a non-zero function-indicating morpheme in referring expressions but not in modification” (p. 94). In other words, Croft argues

⁵It should be noted, however, that Bemba and Hausa, like many languages, have a reduced, closed class of adjectives which, in the case of Bemba, refer to dimension and one or two physical properties (Dixon 1982). The issue of closed classes in such languages will be discussed in more detail below.

that languages where nouns are marked as referential items but are unmarked modifiers, or where verbs are marked as predicates but are unmarked subjects, should be non-existent. And so they are. What is a problem for Croft is not so much the existence of languages that his model excludes, as much as the non-existence of languages that his model allows. For, while the existence of languages of the Hausa-type (neutralization of the object–property distinction) and of the Bemba-type (neutralization of the action–property distinction) are widely known and well documented, there do not appear to be any languages that show the third possible type of neutralization, that between objects and actions. That is, there are no languages that we know of that neutralize the distinction between nouns and verbs, while maintaining the distinction between these two and adjectives.⁶ Thus, while there are languages that lack adjectives but have verbs and nouns, there are no languages that have adjectives and lack verbs and/or nouns. It is this fact which led Hengeveld (1992b, 68) to propose the “parts-of-speech hierarchy” in (8):

8. Parts of Speech Hierarchy
Verb > Noun > Adjective > Adverb

(8) is an expression of the implicational relations that hold for the existence of various lexical classes and states that the existence of a lexical class on the right of the hierarchy in a given language implies the existence of all of those classes to its left. Any language which has a class of adverbs, then, must have all three of the classes of verb, noun, and adjective, and — more to the point — any language that has adjectives must also have verbs and nouns.

In general, implicational hierarchies such as that in (8) are dealt with in terms of markedness — in other words, elements on the right end of the scale are considered to be more marked than elements to their left (Greenberg 1963), and distinctions that hold between elements at the right end of the scale, being more marked, are expected to be more readily neutralized than distinctions that hold between elements at the left end of the scale (Trubetskoj 1969). Thus, the typological distribution pattern of adjectives seems consistent with the fact that, as a lexical class, adjectives are more marked than verbs. In a certain sense Croft (1991:130ff) acknowledges this and offers some ancillary explanation for the fact that adjectives are in many ways an “intermediate” category between verbs and nouns, although there is nothing inherent in his approach to account for the markedness of the adjectival class or the typological asymmetries in neutralization patterns in and of themselves. Similarly, Hengeveld (1992a, 1992b), who puts forward the hierarchy in (8), offers little in the way of motivation for it. What is

⁶There have been, of course, claims made in the literature for languages that neutralize all three distinctions—that is, for languages that have no lexical classes. Some of the more recently cited examples are Tongan (*e.g.* Broschart 1997), Mundari (Bhat 1994), and Cayuga (Hengeveld 1992a). It has also been claimed that Salish, Wakashan, and Chimakuan also lack a noun verb distinction (*e.g.* Kinkade 1983); however, I will argue below that Salish at least shows a distinction between nouns and verbs, grouping adjectives with verbs in the Bemba pattern (see also, van Eijk & Hess 1986; Matthewson & Demirdache 1995; Davis & Matthewson 1995; and, for Wakashan and Chimakuan, Jacobsen 1979).

needed, then, is an account of lexical classes which accounts for both their typical semantic and syntactic properties and which provides a natural explanation of their relative markedness. A natural starting place for such an explanation seems to be a re-examination of the least marked classes, those of noun and verb, to see if we can define them in terms of the unmarked mapping between their semantics and their syntax. This will be undertaken in the section that follows.

2. Nouns, verbs, predicates, and things

While nailing down exact definitions of noun and verb is, as we have seen, a tricky and often treacherous undertaking, there is in fact a widespread consensus among authors as to some of the properties, both semantic and syntactic, that are — leaving aside issues of criteriality — typical of each of the lexical classes. Indeed, looking at a range of definitions of parts of speech, it is relatively easy to discern certain semantic and syntactic characteristics that serve to define the typical instances of these classes or the class “prototypes”, particularly those of verbs and nouns. On the semantic front, prototypical nouns are uniformly held to be semantic “things” (Langacker 1987), or referential items (Croft 1991; Bhat 1994) referring to semantic classes or KINDS (Wierzbicka 1988) of discrete entities in the real world; in this sense, nouns are said by Lyons to be “first-order entities” of which it is characteristic that

under normal circumstances, they are relatively constant as to their perceptual properties; that they are located, at any point in time, in what is, psychologically at least, a three-dimensional space; and that they are publicly observable. First-order entities are such that they may be referred to, and properties may be ascribed to them, within the framework of what logicians refer to as first-order languages (*e.g.* the lower predicate calculus). (Lyons 1977:443)

Lyons’ definition captures not only the traditional notions of “person, place, or thing”, but seems eminently compatible with the broad range of subtleties attributed to the semantic nominal prototype by all of the authors named above. Indeed, setting the issue of contentive semantics completely aside, all of the proposals mentioned here share, either explicitly or implicitly, the second part of Lyons’ definition, namely that nouns or “first-order entities” are those referential expressions (or terms) of which properties (or participation in events) may be predicated — in short, that they are semantic “terms” or **names** which serve as arguments of semantic predicates.

Defining nouns in this way also points us to a semantic characterization of verbs: if nouns correspond to semantic names that serve as the arguments of semantic predicates, then verbs ought to correspond to the semantic predicates that take those names as arguments. At first glance this might seem a bit facile, particularly given the myriad semantic definitions of verb found in the literature —

although, in all fairness, much of the diversity seems best ascribed to the vagueness of the terms employed by the various authors than to actual differences of opinion. In fact, the distance separating notions such as “action” (Croft 1991), “functional predicate” (Bhat 1994), “processual relation” (Langacker 1987) (not to mention the more widespread terms such as “event” or “state of affairs”) dwindles quite rapidly when we consider these under the more general rubric of what Lyons (1977) terms “second-order entities” — that is, “events, processes, states-of-affairs, etc., which are located in time and which, in English, are to said occur or take place, rather than to exist” (p. 443). And these second-order entities are — again, in formal, rather than contentive terms — semantic predicates.⁷

Giving a concise and uncontroversial syntactic characterization of nouns and verbs is an even more straightforward task. It is taken as a given by virtually all of the syntactic or distributional attempts to define these classes that nouns are syntactically unmarked in the role of syntactic actants, while verbs are unmarked in the role of predicate. While it is true that both of these parts of speech show a good deal of typological variation with respect to the other syntactic roles they can occupy, these other roles of nouns and verbs are extended uses. For instance, many languages allow nouns to function as both actants and modifiers (*e.g.* Eng. *the pencil holder*), but, noted earlier, nouns appearing in such atypical syntactic roles show signs of re- and de-categorization (in this case, loss of referential meaning). What is more important is that in all languages that we know to have nouns and verbs, nouns serve as unmarked syntactic actants and verbs serve as unmarked syntactic predicates; thus, these two syntactic roles represent the minimal functional core or most basic use of each of the two lexical classes and so constitute their most fundamental syntactic characterization.

The widespread agreement that these two semantic and syntactic properties are attributable to (if not criterial for) verbs and nouns also gives us some insight into the typical correspondences between these two sets of characteristics for each of the two lexical classes — that is, it gives us the unmarked mapping between prototypical semantic classes and their syntactic distribution. These are given in Table 6:

Table 6.

<i>Unmarked mapping between semantic class and syntactic role</i>		
	noun	verb
semantic class	name	semantic predicate
syntactic role	actant	syntactic predicate

As we shall see below, these correspondences not only allow us to formalize our definitions of these two lexical classes in a useful manner, but they allow us to formulate a definition of the third major class, adjectives, in a way which shows it

⁷ See also Chafe (1970: 96), who proposes similar semantic characterizations of noun and verb, although he rejects the terms “predicate” and “argument” as being redundant in the particular system that he advocates.

to correspond to a more marked mapping between semantics and syntactic structure. Adjectives are thus, as the marked category, correctly predicted to be more susceptible cross-linguistically to neutralization with one or the other of the unmarked categories of noun or verb. In this way, our definitions allow us to account for the range of attested typological variation in lexical class systems, as well as to explore some of the consequences that this variation in the organization of the lexicon might have for the grammar of a language.

3. Semantics, syntax, and the lexicon

Now that we have outlined in rather broad strokes the most likely form for a definition of verbs and nouns, we can develop more concrete formulations of these definitions. As shown in the discussion above, nouns and verbs can be properly characterized in terms of a prototypical correspondence between a semantic class and an unmarked syntactic role. On the semantic side of things, we saw that verbs are the expression of semantic **predicates** and nouns are the expression of semantic **names**. Both of these are terms borrowed from formal logic, defined as in (9):

9. **predicate** — “a term ... used in combination with a name in order to give some information about the individual that the name refers to” (Lyons 1977:148)
name — a term referring to an individual or discrete entity (Lyons 1977:149)

As noted above, in terms of contentive meaning, predicates are prototypically second-order entities and names are prototypically first-order entities.

On the syntactic side, deciding on a set of terms to use in our characterizations of lexical classes is a much more difficult task, particularly given the wide variety of competing syntactic frameworks currently in use. Given that our goal here is elucidation of the empirical data, irrespective of the theory-internal concerns of any particular linguistic school, what are needed are terms that are both straightforward enough to be useful in a wide variety of contexts (and in dealing with a wide variety of languages, many of whose syntactic structures have not been fully explored) and which are proper to, or can be translated into, the widest possible range of syntactic theories. To this end, I propose the terms **head** and **dependent**, which can be defined as in (10) (based on Trask 1991:77 and Mel’čuk 1988—see also Nichols 1986):

10. **head** — any wordform X whose presence, absence, or linear precedence in a given construction determines the presence, absence, or linear precedence of another element Y
dependent — any wordform Y whose presence, absence, or linear precedence in a given construction is determined by the presence, absence, or linear precedence of some other element X

Of these two, “head” is the least controversial, being — in most cases explicitly — a feature of virtually every theory of syntax. “Dependent”, on the other hand, seems a little less transparent, although it is in fact the logic consequence of the concept of head: given that head is an expression of a hierarchical relation between two wordforms, the existence of a head (a syntactic governor) entails the existence of a dependent (a syntactically governed element). One of the reasons for the disuse of the term “dependent” in the literature is surely the currency of a large number of phrase structure grammars (*e.g.* Chomsky 1965, 1995; Pollard & Sag 1994) in which dependency relations — which are relations between two heads, or between a head and a terminal node in a tree — are partially obscured by intermediate levels of syntactic structure. In the more familiar terms of Chomskian generative grammar, a dependency can be thought as C-command relations between phrasal heads — in other words, Y is a dependent of X iff X C-commands the maximal projection containing Y. Distinctions between kinds of dependent — *e.g.*, between complements and specifiers — are handled in most dependency theories in terms of typed dependency relations (*cf.* Mel’čuk 1988; for another approach, see Hudson 1990); this is somewhat orthogonal to the present discussion, however — for our purposes it is enough to have established that dependency is a concept natural to any hierarchically-structured model of language and, with a little tinkering, can be translated directly into the terms of any theoretical framework.

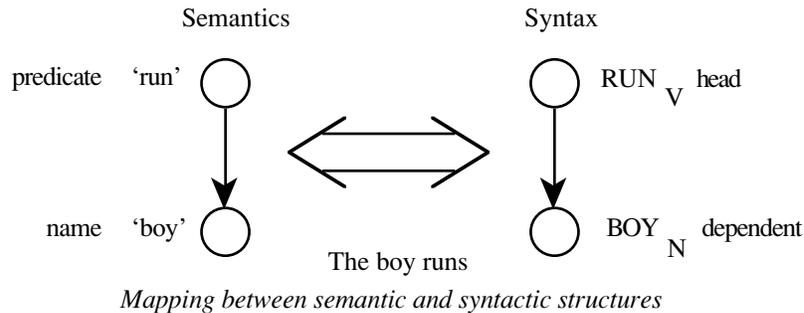
Armed with these four terms, then, it is now possible to give working definitions for each of the two unmarked (or less marked) lexical classes as in (11):

11. **verb** — a lexical item representing a semantic predicate which can be an unmarked syntactic head of the lexical item representing its semantic argument

noun — a lexical item representing a semantic name which can be an unmarked syntactic dependent of the lexical item representing its semantic predicate

These definitions can be represented graphically borrowing some formalisms from Meaning-Text Theory (Zholkovskij & Mel’čuk 1967; Mel’čuk 1988) to show the typical mapping between a semantic and a syntactic structure, in this case the (simplified) representations of the sentence *The boy runs*:

Figure 2.



The tree in the left half of Figure 2 represents the semantic relation holding between the simple one-place predicate ‘run’ and its single referential argument, the semantic name ‘boy’ (the tree being the graphic equivalent of the more familiar but less transparent expression $\text{run}(\text{boy})$). The right half of Figure 2 gives a syntactic dependency tree showing the hierarchical relations between the lexeme RUN_V and its single actant BOY_N . In both trees, the direction of the single-headed arrow indicates the direction of the dependency, running from the head and pointing towards the dependent. The broad, double-headed arrow in the diagram represents the correspondence or mapping between the two levels of representation. This correspondence is made by rules for translating between semantic structure and (deep) syntactic structure via the selection and combination of items from the lexicon. In the syntactic structure shown in Figure 2, RUN is a **syntactic predicate**, which we can define as

12. **syntactic predicate** — the expression of a semantic predicate which is the syntactic head of the expression(s) of its semantic argument(s)

In the same tree, as a syntactic dependent of RUN , BOY is an **actant**, which in turn can be defined as

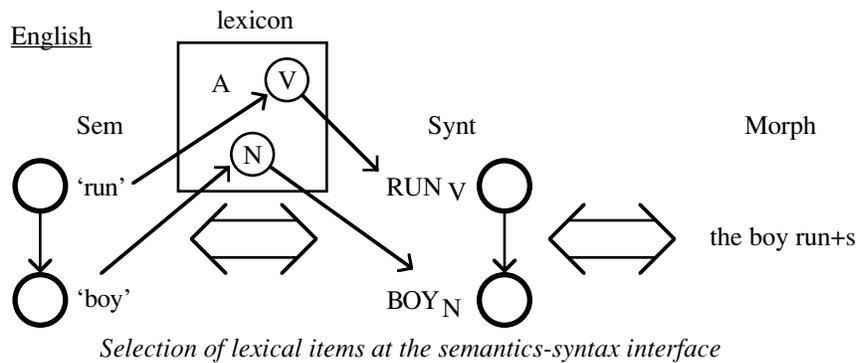
13. **actant** — the expression of a semantic name which is the syntactic dependent of the expression of its semantic predicate

As in most frameworks, lexical items in the syntactic tree bear specification for membership in a particular lexical class, in this case “N” (noun) for the name/dependent BOY and “V” (verb) for the predicate/head RUN . This, of course, leaves us with the question of where the classes “N” and “V” come from and how the speaker knows which class a given lexeme belongs to.

A commonly-held answer to these questions is that such classes originate in the lexicon (*i.e.* they are lexical classes). While the specific nature of the lexicon has been a fascinating and frequently contentious issue for both formal and cognitive-functional approaches to linguistics, the detailed structure of lexical knowledge and

the nature of lexical entries need not concern us here — once again, the goal is to cast our net as widely as possible and extract enough of the features common to multifarious approaches so as to get the job done without being bound to any one theoretical framework. Thus, for our purposes it is enough to conceive of the lexicon as a set of vocabulary items or a **lexical inventory** which combines information about the phonological shape of words with their meanings and, most importantly, with information about their semantic structure and their syntactic uses (*cf.* Saussure 1916; Mel'čuk 1995). Sentence-building (and interpretation) can then be thought of as consisting in part of a matching of elements of semantic structure with appropriate entries in the lexicon, as shown in Figure 3:

Figure 3.



In the first set of correspondences (semantics \Leftrightarrow syntax) shown in Figure 3, the semantic predicate 'run' and its argument, the name 'boy', are matched to the entries for the lexemes RUN and BOY, respectively, these lexemes being specified as "verb" or "noun" according to their classification in the lexicon. The next set of correspondences in Figure 3, those between syntactic and morphological structure, show how lexical-class information is used in conjunction with syntactic configuration to determine the correct morphological strings. In this particular case, the rules that establish the correspondences between syntax and morphology in English require that a verb governing a single syntactic actant (its syntactic subject) agree with that actant in person and number — hence, the affixation of the third-person singular present *-s* to "run" in the morphological representation.⁸

This same set of morphological rules that accounts for the ordinary inflection of words in their unmarked syntactic roles can be pressed into service to explain the morphological features of their extended uses as well. Consider, for instance, the diagram in Figure 4, representing the English expression *running boy*:

⁸Note that, once again, the structures here have been somewhat simplified and the semantic and syntactic representations of the "the" in the morphological representation in (18) have been omitted as they raise a number of issues particular to English determiners which are not relevant to the present discussion; similarly, the specification of the present tense, which has its origin in the semantic representation, has not been included in this and subsequent diagrams.

Figure 4.

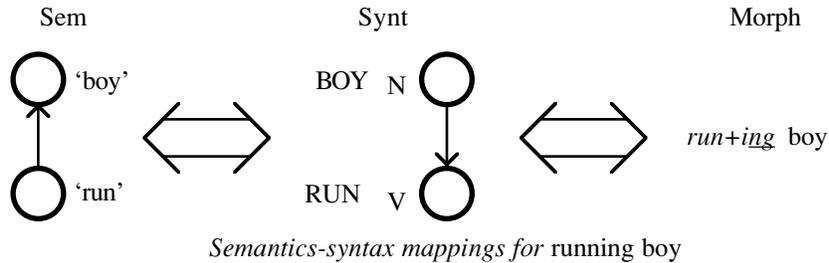


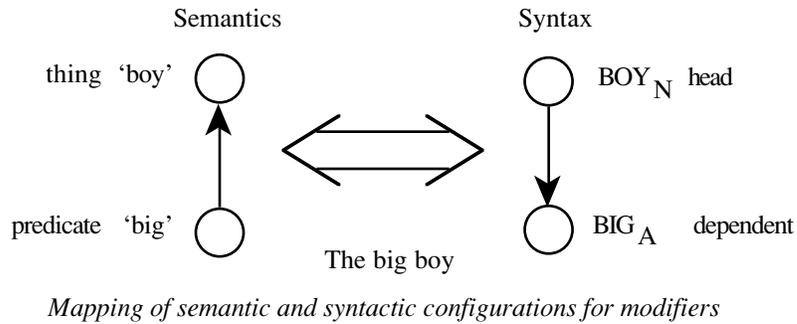
Figure 4, like Figure 2, illustrates the semantic relation between the one-place predicate ‘run’ and its argument ‘boy’ on the right side of the diagram; unlike the expression illustrated in Figure 2, however, in the expression *running boy*, the syntactic head is not the expression of the semantic predicate, but rather the expression of the semantic argument; in the semantic representation, ‘boy’ is considered to be communicatively dominant (that is, the expression refers to a type of boy rather than an instance of running — see Iordanskaja & Polguère 1988), and so in Figure 4 the semantic dependency tree is presented in inverted form with the semantic argument on top. Thus, RUN is realized as an attributive expression in the syntactic role of modifier, which can be defined as in (14):

- 14. **modifier**: a wordform representing a semantic predicate which is a syntactic dependent of a wordform representing (one of) its semantic argument(s)

Given that RUN is specified in the lexicon as a verb and that verbs in English are not unmarked syntactic modifiers, the rules for making morphological strings in English require that verbs appearing in modifier position be inflected, in this case with the suffix *-ing* as shown on the left of Figure 4.

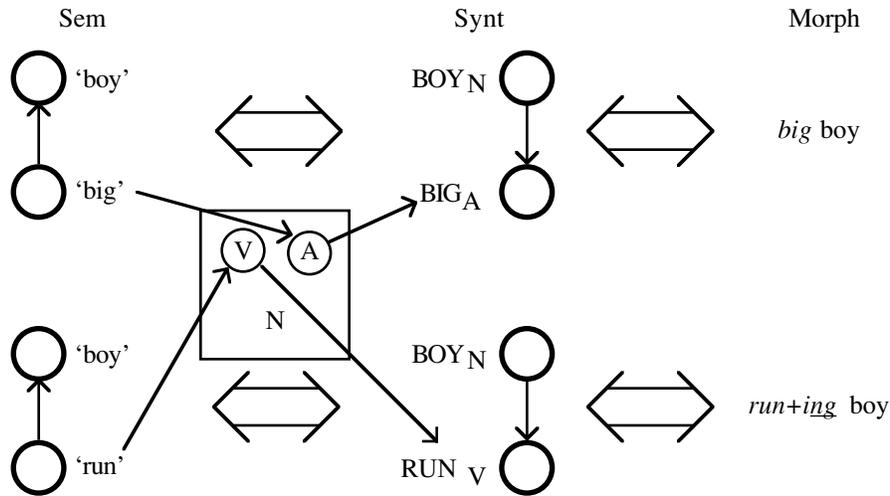
This treatment of the verb RUN in its marked role as a syntactic modifier also suggests a definition of the class “adjective”. Consider Figure 5, showing the English attributive construction *big boy* :

Figure 5.



Here, as in Figure 4, the direction of the semantic dependency between a predicate ('big') and its argument ('boy') is reversed in the syntax, where the noun BOY is the syntactic head of its dependent modifier BIG. The difference between Figure 4 and Figure 5 lies in the fact that the expression of the predicate 'big' is, in English, lexically an adjective, whereas the expression of 'run' is lexically a verb. Since the syntactic role of modifier is a marked one for verbs in English, the appearance of the verb RUN in that role results in the implementation of "further measures" (in this case, inflectional marking), whereas the appearance of BIG, an adjective, does not. This is illustrated in Figure 6.

Figure 6.



Comparative mappings for adjectives and participles

As with verbs and nouns, the definition of an unmarked syntactic role for adjectives is the first step in the formulation of a useful definition. The second is the definition of prototypical semantic properties. In the spirit of (11), adjectives can be characterized semantically as instances of Lyon's (1977) second-order entities — that is, they are prototypically semantic predicates. This is a characterization (once again, not necessarily criterial) which is shared by, among others, Croft (1991) — who argues that adjectives have a valency of > 0 — and Langacker (1987), who defines adjectives as "atemporal relations".⁹ Indeed, according to Bhat (1994, 245), the position among logicians that adjectives are predicates can be traced back to Plato and Aristotle. The fact that adjectives are unmarked syntactic modifiers on the one hand and that they are semantic predicates on the other allows us a definition of the lexical class of adjective in the following terms:

⁹See also Lakoff (1965) who offers a number of arguments for the treatment of adjectives as a subclass of verbs on the basis of their predicative properties.

15. **adjective**: a lexical item representing a semantic predicate which can be an unmarked syntactic dependent of a lexical item representing its semantic argument

An important feature of the definition is that it offers a straightforward explanation of the relative markedness of the adjectival class: unlike reference and predication, modification as a syntactic role represents a reversal of the direction of dependency that obligatorily holds between semantic predicate and semantic argument. Thus, the relationship between the semantic and syntactic representations in Figure 4 and Figure 5 can be said to be marked with respect to the relation between the representations shown in Figure 2. In the unmarked situation in Figure 2, in which a semantic predicate ‘run’ is realized as a syntactic predicate RUN, syntactic structure is a mirror of the semantic structure. This type of correlation seems clearly to be a case of structural isomorphism or **iconicity** and allows us to characterize markedness in the semantics \Leftrightarrow syntax correspondence in terms of the “Weak Iconicity Principle”:

16. **The Weak Iconicity Principle**

In the unmarked case, syntactic structure will be isomorphic with or a direct reflection of its underlying semantic structure

Thus, by Weak Iconicity, the unmarked syntactic role for the expression of a semantic predicate is that of syntactic predicate or head of the expression of its argument. Semantic predicates whose expressions appear in the syntax as dependents of the expressions of their arguments, then, occupy a marked or non-isomorphic role in terms of the way semantic structure is mapped onto the syntax. Those languages like English that distinguish a lexical class of adjective, then, designate a specialized subset of semantic predicates for this marked role — that is, for the purposes of modification. These words are considered, either on the basis of their contentive features or by dint of historical accident, to occur most naturally as syntactic modifiers and so are allowed by the rules of the grammar to take on this role. How this type of differentiation takes place is, of course, an open question and is likely a combination of cognitive considerations, the effects of grammaticalization processes, issues of language acquisition, and discourse factors; while a number of these topics will be touched on in the discussion that follows, the focus here will be not so much on the question of which meanings are specified as adjectives as on whether — and on what basis — any meanings are so designated at all.

4. Types of lexical inventory

As noted above, cross-linguistically not all languages make the same divisions in the lexicon as do languages like English that make the traditional tripartite noun-verb-adjective distinction. Languages with non-SAE lexical inventories are commonly said to be of two types — those with two open classes of nouns and

verbs and a smaller, closed class of adjective, and those in which the property meanings typical of adjectives in other languages are subsumed by some other open class of word (Dixon 1982). Our primary focus here will be the latter type. In terms of the number of open classes, there are four types of lexical inventory that have been proposed in the literature, although the last of these is controversial (Schachter 1985; Croft 1991; Bhat 1994):

17. **full inventory**: the lexicon distinguishes between three open classes of words — noun, verb, adjective (*e.g.* English, Russian)
VA inventory: the lexicon conflates adjectives and verbs, distinguishing only nouns and verbs (*e.g.* Bemba, Salish, Chinese)
NA inventory: the lexicon conflates nouns and adjectives, distinguishing only nouns and verbs (*e.g.* Hausa, Quechua)
NVA inventory: the lexicon conflates all lexical classes, making no distinctions at all (proposed: Tongan, Mundari)

As noted in the sections above, the asymmetry in these patterns — that is, the fact that when only one distinction is neutralized it is that between adjectives and some other part of speech — seems to argue for the markedness of the adjectival class relative to the class of nouns and verbs. This markedness can be accounted for by Weak Iconicity, which predicts that the unmarked syntactic role of the expression of a semantic predicate will be that of a syntactic predicate (head) rather than a modifier (dependent). A four-member system of the type shown in (17) can be easily derived using these two parameters, which can be reformulated in terms of whether the organization of a particular lexical inventory is driven by one or both of semantics or syntax:

18. — a language is said to be **predicate/name driven** if its lexicon distinguishes lexemes representing semantic predicates from those representing semantic names
 — a language is said to be **head/dependent driven** if its lexicon distinguishes lexemes that can be unmarked syntactic heads from those which can be unmarked syntactic dependents

Languages organize their lexicons around either or both of these factors. This can be expressed as a feature system which corresponds to the types of inventories listed in Table 7:

Table 7:

Types of lexical inventories

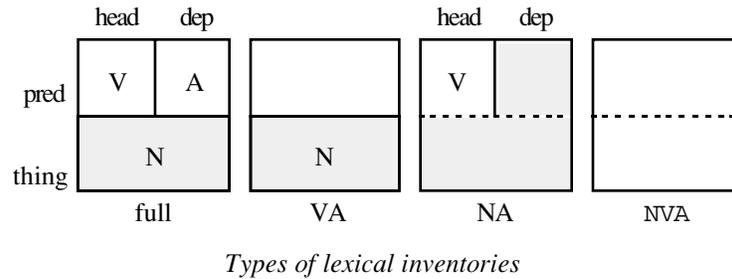
	predicate/name driven	
head/dependent driven	+	–
+	full inventory (English, Russian)	NA (Totonac)
–	VA (Salish)	NVA (Tongan, Mundari)

In the case of full inventory languages, then, the lexicon can be said to be organized on the basis of a combination of semantic and syntactic factors, whereas in the case of a VA inventory conflating verbs and adjectives, the lexicon is sensitive to purely semantic considerations. As a result, all predicates belong to the same lexical class and function as unmarked syntactic heads of their arguments, meeting the criterial definition of verbs.¹⁰

While VA languages can be said to be sensitive only to one of semantics or syntax in that they partition their lexical inventories between words representing semantic names and words representing semantic predicates, the same is not quite true of NA languages, which conflate nouns and adjectives. This type of lexical inventory organizes its lexicon around the syntactic distinction between unmarked head and unmarked dependent. Thus, a language like Hausa divides its lexicon primarily between those words which are unmarked syntactic predicates (heads) and those words which are unmarked syntactic dependents of other words in the syntax — *i.e.* actants and modifiers. However, given the fact that actants, as referential items, prototypically refer to people, animals, and discrete objects in the real world (Hopper & Thompson 1984) — that is, to what are prototypical semantic names — even in Hausa the lexical class of dependents must necessarily subsume the semantic class of names. This asymmetry is shown schematically in Figure 7, which represents the divisions of the lexical inventory or the “inventory shape” of each of the language types in Table 7.

¹⁰Of course, this also means that all expressions of predicates in VA languages meet the definitional criteria of adjectives (*i.e.* that they are lexical items expressing semantic predicates which can be WFM syntactic dependents of lexical items expressing their semantic arguments). This raises the rather trivial issue, familiar from phonology, of what, in the case of the neutralization of the distinction between two elements, to name the resulting conflated category. I have chosen here to make use of the name of the less marked of the two categories (*i.e.* verb) principally because the category containing meanings such as ‘hit’ or ‘devour’ which would otherwise be unattested as adjectives in any other language type.

Figure 7:



Thus, in a sense, the semantic distinction between predicate and name leaves an indelible mark on the lexicon. While it may not be an “active” distinction in the sense of motivating the lexical-class divisions made by a language, it nevertheless plays a role in the sense of constraining where the dividing lines are actually drawn, and what meanings may be included within certain bounds.

As we have begun to see already in some of the preceding examples, languages with different inventory shapes can be predicted to differ in certain respects in their grammatical typology and behaviour. Languages with a full range of syntactically differentiated functions — that is, full inventory languages which distinguish between all three of reference, predication, and modification — can be expected to have a broad range of derivational, inflectional, and syntactic means of allowing lexical items to appear in extended uses. Thus, NA languages like Hausa which have no distinction between nouns and adjectives but distinguish the syntactic role of modifier neutralize the distinction between genitive and attributive constructions, while VA languages like Bemba, in the absence of a class of unmarked modifiers, use relative constructions for attributive modification (Dixon 1982; Schachter 1985). By the same token, languages with similar inventory-types should form such things as complement clauses and complex modifiers in similar ways — for instance, languages which are predicate/name driven should employ strategies of nominalization or genitive-like constructions to form clausal complements, while languages of the NA type should be expected to have extensive strategies for forming participial and other types of deverbal modifiers from verbs and verb phrases. The first step in identifying and motivating the strategies and constructions typical of each of the four inventory shapes is thorough and accurate description of languages believed to have these inventories. In the next section, I present a case study of a VA language type, Salish, focusing on two of the most distantly-related members of this family, Bella Coola and Lushootseed.

5. An underspecified inventory: Salish

One of the most striking features of languages of the Salishan family is the tremendous flexibility that they show vis-à-vis the syntactic roles open to members of various lexical classes, something which has led a number of researchers (*e.g.* Kuipers 1968; Kinkade 1983; Jelinek and Demers 1994) to propose that these languages lack an underlying distinction between nouns and verbs. The central and most prevalent argument for this is an essentially distributional one, based on the ability of what correspond to English nouns and other non-verbal lexical classes to function as syntactic predicates:

19. Lushootseed

- a. stubš
man
'He is a man.'
- b. stubš čəx^w
man 2SG
'You are a man.'

(van Eijk & Hess 1986:324)

Bella Coola

- c. ?imlk-c
man-1SG
'I am a father.'

(Nater 1984:33)

These structures seem completely parallel in both their syntax and their morphology to sentences with predicates expressing more ordinary verbal meanings such as (20):

20. Lushootseed

- a. təlawil
run
'He runs.'
- b. təlawil čəx^w
run 2SG
'You run.'

(Hess 1993:24)

Bella Coola

- c. ʔikm-c
run-1SG
'I run.'

(Nater 1984:33)

In the sentences in (19), a word expressing a semantic name serves as the sentence predicate, which is taken as evidence that these nouns are in some sense "verbal". The drawbacks of this type of distributional argument have already been discussed in detail above, but data such as that in (19) do create the impression that words

expressing both semantic predicates and semantic names can serve unmarked as syntactic predicates, thereby meeting strictly syntactic definitional criteria. This impression is strengthened by examples like the form in (19c), where the Bella Coola predicate nominal bears subject agreement identical to that in (20c); however, morphological arguments for lexical class membership are even more tenuous, particularly when confronted with typological data. In the case of predicates expressing semantic names, these are also inflected for agreement with their subjects in many other languages, including those in (21):

21. Buriat (Mongolian)

- a. ferme daagša bi-b
 farm manager me-1SG
 'The farm-manager is me.'

(Bertagaev & Cudendambaev 1962:58)

Beja (Cushitic)

- b. ti-k^waa-t-oo-`k=t-u
 D-sister-FEM-GEN-2SG=she-3SG
 'She is your sister.'

(Hudson 1974:126)

Thus, while words expressing semantic names can be syntactically predicative in Salishan, they can be predicative in other languages as well, many of which (*e.g.* Buriat) have complex systems of verbal and nominal morphology which clearly distinguish the two classes of noun and verb (Skorik 1968) and identify their differing markedness patterns in various syntactic environments.

While it is true that morphological and purely syntactic arguments are not enough to establish the absence of a noun-verb distinction in themselves, the data in (19) and (20) do need to be evaluated in terms of the definitions offered in (11) above for nouns and verbs. In (20), the sentence predicates *təlawil* and *ʔikm* 'run' fit our definition of verbs in that they are words representing semantic predicates that are unmarked syntactic heads of the words expressing their semantic arguments. Not surprisingly, however, the data in (19) are a bit more problematic in that while *stubš* and *ʔimlk* 'man' are unmarked syntactic predicates, they do not represent semantic predicates, but semantic names. The question for us here is whether or not the name/predicate distinction plays an active role in the organization of the lexical inventory. If does not, and there is no difference in morphosyntactic behaviour between words expressing semantic names and words expressing semantic predicates in either the syntactic role of predicate or of referent, then the contention of Kuipers (1968), Kinkade (1983), and others is indeed correct, and Salish has an NVA inventory. Otherwise, we will have grounds for identifying one of the two syntactic roles as the unmarked role for a given semantic class of expression and, hence, we will have grounds for dividing the lexicon between the classes of noun and verb.

As we have already seen, words expressing semantic names seem to serve as unmarked syntactic predicates. The remaining possibility for differentiation between words expressing semantic names and words expressing semantic predicates is to

examine the behaviour of the latter in the syntactic function typical of the former, that of reference. At first sight, it appears that semantic predicates can, in fact, be realized unmarked in referential roles. Just as words we would call nouns in English have predicative use in Salish, words we would call verbs have non-predicative uses and often surface as actants:

22. Lushootseed

- a. *tiʔiʔ sqʷəbayʔ ti ʔučala-t-əb ʔə tiʔiʔ wiwʷsu*
 D dog D chase-ECS-MID P D children
 ‘The dog is the one chased by the children.’
 (Hess 1993:128)

- b. *tsiʔiʔ luʷ*
 D_{FEM} old
 ‘The old woman.’
 (Hess 1993:18)

Upper Chehalis

- c. *ʔit wáʔ-ʔaq-n tat ʔac-máʔkʷ-ʔ*
 D loosen-tie-3SG D STAT-wrap-INTR
 ‘He unwrapped the package.’
 (lit. ‘The wrapped one is what he unwrapped.’)
 (Kinkade 1983:35)

The examples in (22) illustrate a number of points. The first is that deixis is obligatory in Salish for every expression in the language filling a referential or “nominal” role in a sentence. Thus, in the Lushootseed example in (22a), both the complement of the preposition *ʔə* — *tiʔiʔ wiwʷsu* ‘the children’ — and the expression serving as the sentence subject — *ti ʔučalatəb ʔə tiʔiʔ wiwʷsu* ‘the one chased by the children’ — bear deixis. Note also that the syntactic predicate — *tiʔiʔ sqʷəbayʔ* ‘the dog’ — also bears deictic marking, although in predicate position this is not obligatory for expressions of semantic names; in the absence of deixis, the construction is taken as a statement of class membership of the syntactic subject (‘what the children chased [was] a dog’), whereas in the presence of a deictic marker the sentence becomes an equative construction (‘what the children chased [was] that dog’).¹¹

¹¹Note that the distribution of deixis is offered by Kinkade (1983) as an argument against the noun-verb distinction. The argument runs that any and all actants—be they semantic “verbs” or semantic “nouns”—are introduced by deictic elements, which Kinkade interprets as nominalizers or complementizers which allow words expressing semantic predicates (all Salishan words excluding particles, according to Kinkade) to behave as referential expressions. In our terms, then Kinkade would consider deixis a sign of the markedness of the syntactic role of referent for all words, both “verbs” and “nouns”. It should be pointed out, however, that markedness is a relative thing and a given role can only be said to be marked for one class of expression if there is another class for which it is less marked. Claiming otherwise is tantamount to claiming that the role of actant is marked for English nouns because these must be inflected for definiteness/demonstrativity or that verbs in Spanish are marked in the role of predicate because they bear affixes marking tense and agreement. Thus, deixis is a feature of the syntactic function of reference, rather than an indicator of the markedness of one (or all) of the lexical classes in that role.

The second point illustrated in (22) is that nominal roles can be filled both by simplex expressions of semantic predicates and by more complex expressions of semantic predications. Thus, in the Lushootseed form from (22b) we have a word representing a simple one-place predicate, ‘old’, as the head of a nominal expression — *tsiʔiʔ luλ* ‘the old woman’ — while in the Upper Chehalis example in (22c) the deictic *tat* ‘that’ is applied to an intransitive predicate to form a nominal expression acting as syntactic subject. In these expressions, the appearance of the deictics marks a shift in meaning away from the prototypical verbal expression of an event to that of an event-participant — in the case of (22c), *ʔacmáʔkʷʔ* ‘it is wrapped’ > *tat ʔacmáʔkʷʔ* ‘the wrapped one’. This shift is an indication that the use of such expressions as actants is an extended, non-prototypical use, and the appearance of deictics in these cases can thus be taken as evidence of partial recategorization — that is, as evidence that these expressions have taken on some properties of another lexical class, that of more ordinary referential expressions such as *tiʔiʔ wiwʔsu* ‘the children’ in (22a). What this means, in effect, is that the role of referent is a marked one for intransitive predicates such as *luλ* and *ʔacmáʔkʷʔ*, which are therefore not unmarked referential expressions. The same holds true for the more complex expressions in *ti ʔučalatəb ʔə tiʔiʔ wiwʔsu* ‘the one chased by the children’ (22a) and *ʔit wáʔʔaʔn* ‘the one [s/he] unwrapped’ from (22c). These phrases have as their basis an expression of an event — *ʔučalatəb ʔə tiʔiʔ wiwʔsu* ‘[s/he] was chased by the children’, *wáʔʔaʔn* ‘[s/he] unwrapped it’ — but undergo a semantic shift and become the expressions of one of the participants in that event (hence, the addition of “the one who” to their glosses). This gives us a means for differentiating between two classes in the lexicon: on the one hand there are those words that represent semantic names and are used as unmarked referential expressions syntactically dependent on the expressions of their semantic predicates (*i.e.* nouns); and on the other there are those words that represent semantic predicates and are unmarked syntactic heads of the words representing their semantic arguments but which are **not** used as unmarked referential expressions — in other words, verbs.

So far, we have established a distinction between those lexical items in Salish which represent semantic names and are unmarked actants (nouns) and those items which represent semantic predicates and are unmarked syntactic predicates, thus motivating a two-way division in the lexicon. In order to establish the shape of the inventory, however, we have to determine if there is also a class of words in the lexicon which function as, and only as, unmarked modifiers. Consider the data in (23):

23. Bella Coola

- | | | | |
|----|--------------------------|--------------|--------------------|
| a. | <i>kx-ic</i> | <i>ti-ya</i> | <i>ti-λmsta-tx</i> |
| | see-3SG.1SG | D-good | D-person-D |
| | ‘I see the good person.’ | | |

(Davis & Saunders 1978:40)

Lushootseed

- b. tiʔəʔ ʔəs-tiʔ^wil-abac stubš
 D STAT-sore:covered-body man
 ‘This man covered with sores.’

(Hess 1993:117)

In (23) we have examples of two words denoting properties (underlined), the first belonging to Dixon’s (1982) class of DAVC meanings (*i.e.* cross-linguistically typical meanings for adjectives), each acting as unmarked attributive modifiers.¹² These constructions parallel attributive constructions where the modifiers correspond to English verbs:

24. Bella Coola

- a. k̄x-ic ti-λ̄ap ti-λ̄msta-tx
 see-3SG.1SG D-go D-person-D
 ‘I see the going person.’

(Davis & Saunders 1978:40)

Lushootseed

- b. tiʔəʔ haʔł ʔu-k^wik^wəł q^wuʔ
 D good PNT-(RDP)trickle water
 ‘This nice, trickling water’

(Hess 1993:117)

Verbs in this position are not only unmarked morphologically, but they seem to retain all of their class properties, including the ability to be inflected for aspect (*cf.* the punctual marker ʔu- in (24b)) and to be marked for voice and transitivity distinctions, as in (25):

25. Lushootseed

- λ̄u-u-lək^w-əd tiʔəʔ λ̄u-ł̄čil-tu-b haʔł sʔəłəd
 HAB-PNT-eat-ICS D HAB-arrive-ECS-MID good food
 ‘She would eat the good food that was brought.’
 (lit. ‘She would eat the brought good food.’)

(Bates *et al.* 1994:105)

This example shows a verb, *ł̄čil* ‘arrive’, marked both for aspect (habitual) and for voice (passive, formed in Lushootseed by the combination of a transitivity suffix, in this case *-tu* ‘event-external causative’, and the middle-marker *-b* — Beck 1996). Verbs acting as modifiers also retain their ability to take actants, lending themselves to glosses as English relative clauses.

¹²The deixis appearing on the modifier *ya* ‘good’ in the Bella Coola example in (a) is the result of a rule of deictic-spreading. Deixis is marked by a proclitic–enclitic pair and in complex NPs the proclitic is iterated on every word in the phrase while the enclitic appears only phrase-finally (Davis & Saunders 1978).

Just as the lexical items we have identified as verbs can function as unmarked modifiers, so words expressing DAVC and other properties can serve as unmarked predicates, as shown in (26):

26. Lushootseed

- a. *hik^w* stubš
big man
'big man'
- b. *hik^w* tiʔił stubš
big D man
'The man is big.'
- c. ʔu-*hig^w*-il-əx^w tiʔił ʃəč-s
PNT-big-TRM-now D mind-3PO
'His courage grew.'
- (Hess 1976:191)
- d. haʔł tiʔił g^w-ad-s-əs-*hik^w*-tu-b ʔə ti ad-ʔiišəd
good D SUBJ-2POSS-NP-STAT-big-ECS-MID P D 2POSS-relative
'Your people would have great respect for you.'
(lit. 'Great would be the respect your people would have for you.')
- (Bates *et al.* 1994:109)

(26a) shows the word *hik^w* 'big' in an attributive role, modifying a noun, *stubš* 'man'; in (26b) the same word serves as the sentence predicate, as it does in (26c), where it also bears affixes marking aspect (ʔu- 'punctual' — *cf.* (24b)) and the transmutative *-il*.¹³ In (26d) *hik^w* appears as the root of a morphologically complex construction. Here, it is marked for passive voice (by *-tu-b*) and stative aspect (ʔəs-), then nominalized (*s-*) to form a participle and affixed with the second-person possessive (which represents the subject of the corresponding non-nominalized clause) and the subjunctive prefix (see Beck 1995b, to appear, for a detailed analysis of these structures). Note also the use of the DAVC word *haʔł* 'good' as the syntactic predicate in this example; this word appears in a modificative role in (25) above.

Thus, there appear to be no grounds for distinguishing a lexical class of adjective, at least from among the words expressing semantic predicates. All of these words can be used both as unmarked modifiers and as unmarked syntactic predicates.¹⁴ In Lushootseed and Bella Coola, however, nouns can also serve as modifiers of other nouns, as in (27):

¹³Mel'čuk (1994) defines the transmutative as "to begin to be [X]"; this is as opposed to the inchoative, which he defines as "to begin [X]". In this sense, a transmutative is a subtype of an inchoative: *fall asleep* is an inchoative of *sleep* [activity]; *warm up in the day* is *warming up* is a transmutative of *warm* [state].

¹⁴Davis *et al.* (1997) reach similar conclusions for the Interior Salish language *Státimcets*.

27. Bella Coola

- a. k̄x-ic ti-staltmx ti-?imlk-tx
 see-3SG.1SG D-chief D-man-D
 ‘I see the man who is chief.’

(Davis & Saunders 1978:41)

Lushootseed

- b. tiʔəʔ kiyuuq^ws stətudəq
 D seagull (RDP)slave
 ‘these seagull slaves’

(Hess 1993:117)

However, this use of nouns can be shown to be an extended one on both semantic and syntactic grounds. Semantically, nouns used as modifiers lose their referential meaning in the sense that they no longer refer to a specific thing or things, but instead they qualify another lexical item which does refer to some thing, helping to specify some of its qualities (*i.e.* *kiyuuq^ws stətudəq* ‘seagull slaves’ = ‘those slaves there who are seagulls’, not ‘slaves that are those seagulls there’), and as such they cannot take deixis (hence, **tiʔəʔ tiʔəʔ kiyuuq^ws stətudəq* and **tiʔəʔ kiyuuq^ws tiʔəʔ stətudəq*). In terms of syntax, nominal modifiers are marked in that they are required to precede their heads, whereas verbal modifiers may follow them (Davis & Saunders 1978).¹⁵

28. Bella Coola

- a. *k̄x-ic ti-?imlk ti-staltmx-tx
 see-3SG.1SG D-man D-chief-D
 *‘I see the man who is chief.’

(Davis & Saunders 1978:41)

- b. k̄x-ic ti-λmsta ti-ya-tx
 see-3SG.1SG D-person D-good-D
 ‘I see the good person.’

- c. k̄x-ic ti-λmsta ti-λap-tx
 see-3SG.1SG D-person D-go-D
 ‘I see the person who is going.’

(Davis & Saunders 1978:40)

Lushootseed

- d. *tiʔəʔ studəq kiyuuq^ws
 D slave seagull
 *‘these seagull slaves’
 ?‘these slave-seagulls’
- e. tiʔəʔ stubš ʔəs-ŋiq^wil-abac
 D man STAT-sore:covered-body

¹⁵Also, in Bella Coola, the deictic proclitic associated with the modifying noun must always agree with the clitics associated with its head—thus, **k̄xic tastaltmx tiʔimlktx* and **k̄xic tistaltmx cixnascx* (*cf.* *k̄xic cistaltmx cixnascx* ‘I see the woman who is chief’). This is undoubtedly also connected to the loss of semantic referentiality of nouns in modifier position, non-referential items not being amenable to deixis.

‘this man covered with sores’

(Hess 1993:118)

- f. tiʔəʔ q^wuʔ ʔu-k^wik^wəʔ
 D water PNT-(RDP)trickle
 ‘this trickling water’

(based on Hess 1993:117)

This is precisely what we would expect in a flexible VA language, where the lexicon is divided between semantic names and semantic predicates, and the latter class are allowed to function unmarked as both syntactic predicates and as modifiers.

6. Conclusion

In the preceding sections it has been my goal to make use of a few simple and uncontroversial principles to derive cross-linguistically valid definitions of the three major parts of speech — verb, noun, and adjective — that at once capture the thorough-going similarities in meaning and function shown by these classes in a wide variety of languages, and which at the same time correctly model and constrain their attested variation. Drawing on the large body of literature on parts of speech systems and lexical classes, I have taken a number of the basic insights found in these works and combined them in ways which avoid the major pitfalls of each approach on its own. Thus, drawing from semantically-oriented research, I have tried to show that the correct definitions of lexical classes must take into account characteristics of the meaning of lexical items, in particular the semantic nature of a given meaning as a predicate or a name. Conversely, from the syntactic literature, I have borrowed the notion of markedness of syntactic role or function for the various parts of speech. As noted by Croft (1991), the relationship between these two levels of representation — the semantic and the syntactic — shows strong correlation between semantic prototypicality and syntactic markedness. I have treated these correlations here as an expression of the principle of Weak Iconicity and have tried to show that not only do these correlations exist, but that they are in fact definitive of lexical classes and can be used to explain certain patterns of markedness and underspecification in the lexical inventory, particularly with respect to the class of adjective.

One of the keys to a successful definition here has been the postulation of lexical classes as originating in the lexicon as opposed to being categories particular to either the semantics or the syntax *per se*. By positing parts of speech systems as a part of the knowledge speakers have about the lexical inventory of their language, it becomes possible to delineate a constrained set of organizational criteria — some syntactic, others semantic — which speakers can use to divide and subdivide words into sets for the purposes of building syntactic structures. Languages can then differ with respect to the organizational criteria used to shape the lexicon and, hence, may differ (within limits) both with respect to the classes subsuming individual meanings and to the overall number of classes into which the lexical inventory is

divided. VA languages like Lushootseed make use of essentially semantic criteria to subdivide the lexicon, creating two lexical classes consisting of meanings which express semantic predicates (verbs) and semantic names (nouns). The prototypical members of each class are those meanings which surface in other languages as verbs and nouns. Thus, the class of semantic names includes words designating people, places, and things, while the class of semantic predicates includes meanings which designate actions, processual relations between things, and changes of state over time. In addition to such core meanings, however, the semantic class of predicates contains some less prototypical or peripheral (Rosch 1978) members which may be classified as (peripheral) members of the class of semantic names in other languages. In English, for instance, *hunger* is an expression of a semantic name designating a kind of sensation, feeling, or need and so surfaces as a noun, whereas in Lushootseed the corresponding meaning designates a state of being and is classified as a semantic predicate, surfacing as a verb, *tag^{wəx}* ‘to hunger, be hungry’. By attributing this difference to a difference between the English and the Lushootseed lexicon, it is possible to treat the underlying semantic representations of the two sentences *I am hungry* and *?əstag^{wəx} čəd* ‘I am hungry’ as the same in propositional terms and to attribute the differences to cross-linguistic variation in the organization of the lexicon — in other words, *tag^{wəx}* expresses a meaning which is categorized as a semantic predicate and is an unmarked syntactic predicate, whereas *hunger* is categorized by English speakers as a name and so is marked as a syntactic predicate (being preferentially replaced in this role by a derived adjectival predicate, *hungry*).

A related problem is that posed by languages with closed classes of adjectives which often display highly idiosyncratic, language-specific semantic characteristics. In such languages, the bulk of the lexical inventory is divided between words that are considered to express semantic predicates and those which are considered to express semantic names; within the class of predicates, however, a small group of lexical items are distinguished from verbs (unmarked syntactic predicates) in that they are considered to be unmarked attributive modifiers. Although, as shown by Dixon (1982), these do tend to cluster around the semantic prototype of dimension-value-age-colour (DAVC) meanings, closed classes must still be treated as an (idiosyncratic) artifact of the lexicon. In most of the languages in Dixon’s survey, any semantic parameter used to single out the members of the reduced adjectival class will inevitably single out meanings which are not part of that class as well. Further, as a non-productive class, new meanings are by definition excluded and so, presumably, new coinages that meet the semantic criteria for adjectives would fall outside of this class. Of course, this latter point is an assumption made by Dixon and others writing on the topic which has, to my knowledge, not been empirically tested. Psycholinguistic evidence for the “closedness” of the adjectival class in such languages would be extremely valuable and, if evidence to the contrary were produced (that is, if certain new coinages were felt by speakers to be sufficiently like the semantic adjectival prototype to be added to the reduced class), we would gain valuable insight into the processes used to organize the lexicon and the types of

semantic correlates that are used to set out a specialized set of semantic predicates to be unmarked in the role of attributive modification.

The treatment of lexical classes as the intersection of semantic and syntactic properties of items in the lexicon also goes a long way towards resolving a number of the problems created by morphological definitions of parts of speech discussed in Section 1.1 above. In the case of the Russian word *piroženoe* ‘pastry’, for example, the definitions in (9) would clearly single this lexeme out as a noun (an expression of a semantic name which is an unmarked syntactic actant). Information about its inflectional properties (that is, that it is inflected as an adjective showing concord with a neuter noun) would simply be a part of the speaker’s knowledge of that word and so, along with its characterization as a noun, would form a part of its entry in the lexicon. Cross-linguistic variation in the inflectional categories, too, becomes a part of the lexical knowledge of speakers, who learn which (if any) inflectional categories are marked on members of particular lexical classes: English speakers, for instance, learn that gender is a particular property of pronouns (a closed subclass of nouns), Spanish and Russian speakers learn that it is a property of all nouns (which triggers concord with attributive modifiers), and Hebrew speakers learn that gender is marked on both nouns and verbs. The fact that there is not as much or as frequent variation in the inflectional marking of parts of speech as is logically possible can be attributed to the semantic prototypes underlying the various lexical classes. Thus, nouns are more frequently inflected for number and (natural) gender than verbs because they prototypically represent objects and people which can be counted and fall into gender-based divisions; verbs prototypically designate processes which have a temporal dimension and so are more typically inflected for time-related categories such as tense and aspect than are temporally-stable nouns (prototypically semantic names); adjectives — that is, words singled out as specialized modifiers — are most typically properties and so are most amenable to comparison and gradation in that they tend to represent characteristics that can be attributed in differing degrees to semantic names.

This last issue, the semantic “content” of the adjectival class, is also one which requires a solution based on prototypicality. Unlike nouns and verbs, which are highly consistent in their meanings across languages (leaving aside those meanings which turn up as adjectives in tripartite systems), adjectives are less amenable to a consistent, cross-linguistic characterization: indeed, the one truly consistent feature that all adjectives seem to share is one they share with verbs — semantic predicativity. This fact falls out neatly from the approach developed here in that it can be seen as a product of the markedness of the adjectival class with respect to nouns and verbs. Whereas nouns and verbs take syntactic roles which mirror the semantic relations between their meanings, adjectives belong to a class of words which have been set apart in the lexicon to take on syntactic roles which reverse the underlying semantic configuration. That is, what the speaker knows about adjectives is that they are a specialized class of words whose meanings are predicative but which depend syntactically on (rather than govern) the expressions of their semantic arguments. What it is about adjectives semantically that sets them apart (in

languages that have them), however, is highly variable. In languages with open classes, adjectives seem roughly to express “properties” and “qualities”, while in languages with closed classes they tend to express DAVC meanings. Still, given the inherent variability in which DAVC meanings will be expressed as adjectives in closed-class languages, it seems unlikely that even this semantic core can be treated as criterial in and of itself. It seems more likely that words are classified as adjectives not based so much on their contentive semantics *per se* as on the degree to which they are felt by speakers (or a speech community) to properly be unmarked modifiers. This type of criteria will necessarily have a high degree of correlation with contentive semantics, but also leaves room for influence from diachronic, discourse, corpus-frequency, sociolinguistic, and other factors. Languages with open classes are most likely to have the highest degree of consistency with semantic criteria — hence, the useful folk-characterization of adjectives in SAE languages as “properties” — while languages with closed classes will have the lowest correlation and be the most idiosyncratic. These two cases, of course, represent logical extremes, and it is a promising feature of the type of approach being developed here that both can be easily accommodated within a single model.

A final advantage of the separation we are making between syntax, semantics, and the lexicon is that it allows us to consider the first two of these without specific reference to issues of lexical classification. This is especially useful when considering the problem of what Lyons (1977:424) terms “expression classes” — syntactically complex elements which occupy the syntactic roles typical of one or the other of the classes distinguished in the lexicon. As Lyons notes, definitions of parts of speech which seek to derive lexical class from syntactic distribution often overlook that fact that syntactic roles such as subject and modifier are often filled by expressions more complex than single words. Restricting the domain of parts of speech definitions to the lexicon eliminates this problem, and at the same time leaves the door open for definitions of broader categories such as “nominal” or “adjectival”. Work on nominalizations in Salish (Beck, to appear) suggests that complex expressions which share the distribution of nouns in these languages share many of their semantic properties as well, suggesting that the term “nominal”, like the term “noun”, may well designate a combination of semantic and syntactic features. Given that there appears to be a high degree of correlation cross-linguistically between the types of complex constructions that serve nominal roles (complementized clauses, participles, morphologically-nominalized clauses) and their semantic interpretations, it may well be that these, like ordinary lexical classes, work on the principle of Weak Iconicity. This seems like a promising approach to the typological study of the relationship between lexical class, semantic structure, and the syntactic processes of human language.

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