



22 English Inflection and Derivation

JAMES P. BLEVINS

1 Introduction

Modern English approaches the ideal of an isolating language. Open-class items have comparatively few forms, so that many inflectional categories either remain unmarked, or are expressed periphrastically. The inflectional system is particularly simple, even by the standards of a West Germanic language. Regular paradigms contain at most four forms, and the inflectional exponents that distinguish these forms do not show much variation, apart from some phonologically conditioned allomorphy. English retains a number of 'strong' noun and verb forms, along with a few other irregular formations. These residual patterns do occasionally recruit a historically weak item, as in the case of *dove* or *snuck*, which, for many North American speakers, may replace the weak preterites *dived* and *sneaked* (Taylor 1994). However, the creation of new strong forms is so rare and sporadic that one cannot regard the strong patterns as productive inflection classes in any useful sense.

The derivational system is considerably richer and more varied. In addition to compounding processes and 'minor' word formation processes, which are covered in greater length in chapter 21 of this volume, English has various prefixal and suffixal strategies for forming new lexemes. As with inflectional patterns, it is important to distinguish productive from non-productive patterns, in order to avoid overstating the complexity of the derivational system. Mixing synchronic and historical patterns leads to the idea that English contains separate Latinate and Germanic sublexicons, and that a given derivational exponent may occur either with Latinate or Germanic bases. Chomsky and Halle (1968) distinguish between 'primary' and 'secondary' affixes, whereas Aronoff (1976) introduces a feature [\pm Latinate], which allows affixes to 'select'



bases from a particular sublexicon. However, the productivity of Latinate formations is open to question, given that Latinate bases comprise an essentially closed class and Latinate exponents induce idiosyncratic phonological changes. Hence it is highly plausible that the affixes that co-occur with these bases are likewise frozen, and, hence, that no productive derivational exponent in English selects a particular sublexicon.

The limited exponent inventory of English determines a correspondingly simple word structure. The few clearly inflectional exponents in English are suffixal, and at most one inflectional suffix may occur in any word. Derivational exponents are more numerous and may cooccur within a stem. Derivational prefixes tend to be category-preserving markers of morphosemantic lexeme-formation processes, and are commonly analyzed as attaching before derivational suffixes, which characteristically mark category-changing processes. Given that the historical ablauting process that gave rise to strong noun and verb forms is no longer active, as noted above, the productive morphological processes in English are predominantly affixal, and, indeed, concatenative.

From a typological perspective, the limited form variation within the English morphological system is of somewhat less interest than the way that functions are distributed over available forms. Noun paradigms have two forms: a stem form, which realizes the singular, and a plural form, usually marked by *-s* (/z/). Possession may be marked by the 'phrasal affix' *-s* (Anderson 1992), but the morphological categories of Case and Gender are not distinctive for common nouns. A number of forms that once expressed case contrasts survive in pronominal paradigms, but with subtly different functions. The former nominatives occur as simple subjects of finite verbs, whereas historically accusative or dative forms function as independent or 'default' forms (Hockett 1947).

The paradigms of regular verbs contain just four distinct forms: a stem form, an '*s*-form,' an '*ing*-form,' and an '*ed*-form.' The stem form expresses a range of functions, including imperative mood and 'non-3sg' present. Present participles and gerunds are realized by the *-ing* form, while regular preterites, and perfect and passive participles are all realized by the *-ed* form. Strong verbs tend to retain a contrast between preterites and perfect/passive participles, yielding five forms.

Although forms in *-s* are often classified as '3sg present' forms, both the tense and agreement properties of these forms are anomalous. Forms in *-s* are arguably better described as 'impersonal' (in one of the many senses of this term, cf. Blevins 2003a), i.e., as marking 'anti-agreement.' Like '3sg' forms in other languages, forms in *-s* occur with expletives, with sentential and prepositional subjects, and, in fact, with any subject that does not bear a 'marked' person or number feature. The 'present' interpretation of forms in *-s* is also anomalous. Forms in *-s* or, like 'non-3sg' stem forms, cannot be used for punctual events (where the progressive is required instead), but can be freely used





to express a future meaning, or even to give immediacy to the narration of past events.

Periphrastic strategies largely compensate for the shortage of synthetic verb forms. It is sometimes said that English has no future tense, though what is usually meant is just that the language lacks a synthetic future verb form. The future is hardly unusual in this regard, as English also lacks synthetic passive, perfect and progressive forms. Instead, future tense, passive voice, and perfect and progressive aspect are all expressed by periphrastic constructions consisting of a modal or auxiliary and a participle or infinitive. These 'compound tenses' present a longstanding descriptive challenge, as they appear to straddle the boundary between syntax and morphology. The fact that periphrastic constructions express a single morphosyntactic property leads one tradition to treat them as analytic forms of a single lexeme (Curme 1935; Ackerman and Stump 2004; Lieb 2003). Yet within the post-Bloomfieldian tradition, the syntactic independence exhibited by auxiliaries and 'main' verbs has been regarded as evidence that periphrastic constructions are syntactic combinations.

To provide a more detailed description of the English morphological system, it is useful to follow the traditional practice of separating 'lexeme-preserving' or 'paradigmatic' processes, which define new forms of a lexeme, from the 'word-formation' processes that create new lexemes. In what follows, the first type of processes are designated as 'inflectional' and the second type as 'derivational.' There are, of course, other ways in which the terms 'inflection' and 'derivation' can be understood and applied to morphological patterns in English. In some cases, these differences determine slightly different analyses, such as the treatment of a class-changing exponent such as *-ly* as 'inflectional' (Haspelmath 1996). In other cases, the differences lead to more radical variation, such as the treatment of plural as a derivational category (Beard 1995). Depending on how precisely inflection and derivation are demarcated, there may also be phenomena that resist a clear classification. For the most part, these differences reflect a lack of consensus about the meaning of the terms 'inflection' and 'derivation,' rather than substantive disagreements about the analysis of individual constructions. Although any of the established interpretations of 'inflection' and 'derivation' would be suitable for the purposes of the present chapter, a traditional view is adopted for the sake of familiarity.

2 Inflection

The inflectional system of English comprises a large regular subsystem and a few highly circumscribed irregular patterns. The regular system contains a small number of general formations, which incorporate an even smaller number of exponents. This system is summarized in its entirety in (1).





(1)

Word Class	Form	Exponent	Examples
Noun	plural	-s (/z/)	mugs, spas, books, buses
Verb	'3sg present'		sells, walks, sees, pushes
	preterite	-ed (/d/)	quelled, talked, skied, swatted
	'past' participle		
	'present' participle	-ing (/ɪŋ/)	eating, being, squealing, walking
	gerund		
Adjective	comparative	-er (/əɪ/)	faster, older, milder, yellower
	superlative	-est (/əst/)	fastest, oldest, mildest, yellowest

As the chart in (1) indicates, there are at most five productive inflectional exponents in English. The morph that marks noun plurals, which is represented orthographically by *-s* and phonemically as /z/, is the same **form** as the morph that marks 3sg verbs. Preterites and past participles are likewise marked by the morph *-ed* (/d/), while present participles and gerunds are marked by the morph *-ing* (/ɪŋ/). The small exponent inventory of English leads to various cases of inflectional syncretism. Descriptions of English must confront the problem of determining which cases of identity in form reflect the neutralization of contrastive morphosyntactic properties and which cases are merely due to the fact that English lacks the morphotactic resources to 'spell out' certain contrastive properties. Only nouns and verbs retain a significant number of irregular formations, as the irregularity in the adjectival system is restricted to the suppletion in *good-better-best* and *bad-worse-worst*. Forms in *-ing* are completely regular, as are non-auxiliary verb forms in *-s*. The irregularity in the noun and verb systems is thus largely confined to noun plurals and verbal preterites and past participles. Irregular noun and verb forms can be assigned to 'classes,' such as those in (3) and (9), which exhibit the residue of once-productive patterns. However, these classes typically have few members in modern English – well below the threshold required to recruit new members on more than a sporadic basis – and thus exert a very limited influence on the inflection of new nouns or verbs.



Sections 2.1 and 2.2 summarize the inflectional patterns within the nominal and verbal systems, and highlight some features of particular interest within each system. Section 2.3 turns to adjectives and then to gerundive and participial forms, which appear to straddle word classes in English.

2.1 Nouns

As noted in the introduction, English nouns inflect for number, but not case or gender. The misalignment of prosodic and grammatical structure in English sometimes leads descriptions to treat the possessive marker *-s* in *Eloise's book* as a genitive inflection. Zwicky (1987) and Stump (2001) develop a variant of this analysis in which the marker *-s* is treated as an 'edge inflection,' and Carstairs-McCarthy (2005) provides a critical assessment of this analysis. Yet most accounts follow Hockett (1947: 142) and Wells (1947: 193) in treating *-s* as an element that attaches to the right edge of a noun **phrase**. On this analysis, possessive phrases have the left-branching structure in (2).

- (2) a. [_{NP} Eloise]'s book
b. [_{NP} [_{NP} Eloise]'s sister]'s book
c. [_{NP} the director of personnel]'s office

The element *-s* may attach to *Eloise* in (2a) and (2b) because proper names have the distribution of noun phrases. In (2b), *-s* also attaches to the noun phrase *Eloise's sister*, not to the common noun *sister*. Hence the sequence *sister's* may be a prosodic unit, though it is not a grammatical unit. The phrasal character of *-s* is confirmed by patterns like (2c), in which *-s* clearly attaches to the noun phrase *director of personnel* and not to *personnel*, which just occurs at the right edge of the phrase.

2.1.1 Number

Noun plurals in English can be assigned to the three broad categories in (3). Regular plurals are marked by the exponent *-s* (/z/), which has the phonologically-conditioned variants [z], [s] and [əz]. In addition, English contains a number of irregular formations. Some of these plurals have no exponent, others retain ablaut patterns, and a couple of nouns preserve the historically weak ending *-en*. The third class contains nouns whose plural forms have been borrowed with their singulars.



(3)

Type	Exponent	Examples
Regular	-s	mugs ([z]), spas ([z]), books ([s]), buses ([əz])
Irregular	Ø	sheep, fish, deer, etc.
	ablaut	man – men, foot – feet, goose – geese, mouse – mice
	-en	child – children, ox – oxen
Foreign	-on → -a	criterion – criteria, phenomenon – phenomena
	-is → -es	analysis – analyses, crisis – crises, thesis – theses
	-ix → -ices	matrix – matrices, index – indices, appendix – appendices

The vast majority of English nouns follow the regular pattern, as do virtually all new nouns. Apart from the odd whimsical extension of irregular formations, such as the use of *vaxen* as the plural of the computer system *vax*, irregular patterns are not extended to new nouns. The surviving strong plural forms are relatively stable, but there is some speaker variation regarding nouns such as *roof*, whose plurals may either conform to the irregular voicing pattern, and end in [vz], or follow the regular pattern, and end in [fs]. Speakers are, naturally, aware of the remaining strong patterns, and these patterns sometimes inhibit the formation of regular plurals like *mongooses*, even though speakers show an even more general reluctance to extend the irregular ablaut pattern to these cases.

Some frequently occurring foreign formations have been nativized in Modern English, while others remain confined to particular registers. Whereas *crises* is securely established as the plural of *crisis*, forms such as *phenomena* are often used in the singular, even by some educated speakers. The use of *data* as the plural of *datum* is largely restricted to academic contexts; elsewhere *data* is more commonly encountered as a mass noun. Singulars in *-ix* often have alternative regular plurals in [əz]. Pairs of alternative plural forms may acquire different meanings, as in the case of *appendices*, which refers to material at the end of a printed work, and *appendixes*, which refers to body parts.

A number of forms, such as *children* or *agendas*, are occasionally described as 'double plurals.' These examples represent cases in which a historically plural form has been reanalyzed as a singular, and thus provided a base for the addition of 'another' plural marker. In the case of *children*, the *-r* reflects the strong Germanic plural (retained in the German cognate *Kinder*), while the





final *-en* reflects the weak plural marker, added when *-r* was no longer a transparent plural marker. In Latin, the form *agenda* is likewise the plural of *agendum*. Although some speakers are aware of this paradigmatic relationship, *agenda* is most frequently used as a singular, whose plural is formed with the regular exponent *-s*. In short, English ‘double plurals’ do not involve what Matthews (1991) terms ‘extended exponence,’ as the property ‘plural’ is not multiply marked at any synchronic stage.

The historically strong ablauted plurals and weak plurals in *-en* tend to occur more freely in compounds and derivational formations than do regular or foreign plurals. For example, many speakers perceive a contrast between *oxen cart* and **dogs cart*, between *lice-infested* and **fleas-infested*, and between *teeth cleaner* and **hands cleaner*. These contrasts are sometimes interpreted as evidence that irregular plural forms represent a type of ‘unproductive’ (Anderson 1992: 128) or ‘inherent’ (Booij 1996) inflection that may feed derivation, or, alternatively, as evidence that these form are number-neutral ‘second stems’ (cf. Aronoff 1994) that underlie plurals and compounds.

There is, however, a comparatively large number of counterexamples to the generalization that *s*-plurals do not occur in compounds. Interestingly, many of these cases involve collective plurals, like those in (4), which follow the pattern of *brother–brethren* rather than *brother–brothers*.

(4)

<i>Singular</i>	<i>Collective Plural</i>	<i>Compound</i>
saving	savings	savings bank
arm	arms	arms race
system	systems	systems analyst
custom	customs	customs union
admission	admissions	admissions office

There is a waning prescriptive pressure to pluralize the first element of Latinate compounds such as *attorney general*, *sergeant major* or *notary public*. This is, however, very much a learned pattern, and plurals like *attorneys general*, *sergeants major* or *notaries public* are almost never encountered in spontaneous speech. Some nominalized forms of phrasal verbs follow a similar pattern, exhibiting head inflection (Stump 1995). Thus the agentive nominal *passer-by*, derived from the phrasal verb *pass by*, has the plural *passers-by*, not **passer-bys*. However, the placement of the plural marker appears to be influenced by the nominal character of the marker *-er*. In cases where a peripheral nominalizing marker is available, the plural reverts to edge inflection. In the colloquial





language, a transitive phrasal verb such as *pick up* has the agentive nominal *picker uper*, where the first occurrence of *-er* attaches to the lexical verb *pick* and the second attaches to the phrasal verb *pick up*. The plural of this nominal is then *picker upers*, with a peripheral *-s*, not **pickers uper* (or **pickers upers*).

2.1.2 *The case of pronouns*

Descriptions of personal pronouns in English traditionally recognize at least a binary case contrast. Jespersen (1933: 132) states that ‘In some pronouns, but no other word-class, we find a distinction between the two “cases” **nominative** and **objective**,’ and suggests the analysis in (5).

(5)

Nominative	I	we	he	she	they	who
Objective	me	us	him	her	them	whom

Quirk et al. (1985: 346) similarly distinguish ‘subjective’ from ‘objective’ pronouns in (6).

(6)

		<i>Personal</i>		<i>Possessive</i>		
<i>Pers</i>	<i>Num</i>	<i>Subjective</i>	<i>Objective</i>	<i>Determinative</i>	<i>Independent</i>	<i>Reflexive</i>
1st	Sg	I	me	my	mine	myself
	Pl	we	us	our	ours	ourselves
2nd	Sg	you	you	your	yours	yourself
	Pl	you	you	your	yours	yourselves
3rd	Sg	he	him	his	his	himself
		she	her	her	hers	herself
	Pl	they	them	their	theirs	themselves

Yet, as the ‘scare quotes’ in the passage from Jespersen indicate, even traditional analysts harboured doubts about the status of case oppositions in Modern English. Post-Bloomfieldians expressed their reservations more forcefully, and clearly regarded traditional treatments as anachronistic. The objections that Hockett (1947: 241–2) raises remain equally relevant today.





At least in certain dialects, the morphs *I* and *me* (and similarly *we* and *us*, *he* and *him*, etc.) are in non-contrastive distribution; in some dialects, indeed, the complementation is probably complete. We may suspect that if it were not for the Latinizing school tradition, the complementation would be complete for most speakers: *I* initially, except in isolation, *me* directly after a verb or a preposition and in isolation. Actual exceptions to this are either on the Latin pattern (*It's I*, or *Who's there? – I*, instead of *Me*), or are overcorrections (*between you and I*) . . . There is no longer any justification for speaking of case in English; for the distinction between subjective and objective 'cases' (under whatever name) disappears as soon as *I* and *me*, etc., are shown to belong to the same morpheme.

For most if not all English speakers, expressions such as *It's I*, or *Who's there? – I*, are archaisms, perhaps learned at some point in school, but unusable outside the classroom. Similar remarks apply to comparative and coordinate environments. Educated speakers of standard English may come to accept – and, perhaps, even prefer – nominative objects of comparison in examples such as *He is faster than I*. However, less frequently drilled patterns, such as *They are faster than we*, remain anomalous for many speakers. The use of forms such as *I* and *we* in coordinate environments also bears the mark of the prescriptive school tradition. Pupils are often taught explicitly to use nominative pronouns in coordinate subjects, and even to place a 1sg pronoun last in a coordinate subject. Hence a coordinate subject such as *me or him*, which is common in children's speech and even in many colloquial registers, is deprecated in literary registers, where it is replaced by *he or I*.

It is instructive to contrast these expressions with their counterparts in modern German, which retains a more robust case system. In examples such as *Wer ist da? – Ich* 'Who is there – I,' or *Sie sind schneller als wir* 'They are faster than we,' the first person nominative pronouns *ich* and *wir* are required, and alternatives such as accusative *mich* and *uns* are unacceptable. In coordinate subjects such as *er oder ich* 'he or I,' the pronouns are likewise obligatorily nominative.

Moreover, even within literary registers of standard English, coordinated nominatives like *he or I* exhibit properties suggestive of an inculcated pattern. Speakers are especially prone to 'hypercorrect' in coordinate environments and use nominative pronouns as direct objects or as prepositional objects, as in Hockett's example *between you and I*. This type of error tends to be symptomatic of instructed patterns, where speakers are attempting to conform to a model of 'correct' usage. It is also noteworthy that English lacks any grammatical strategy for determining the agreement properties of coordinate pronouns. The agreement properties of coordinate subjects in languages such as German or Russian are often attributed to a process of 'principled resolution' which, for example, assigns 1st person priority over 2nd person, and assigns 2nd person priority over 3rd person (Corbett 1991). Discussions of coordinate structures, such as Sag et al. (1985) or Hudson (1995) provide no evidence of a comparable strategy in English. Instead, speakers confronted with the task of selecting a present tense verb in the frame '*He or I . . .*' may choose an invariant modal, adopt a salvage strategy of selecting a verb form that agrees with the nearest conjunct, or simply resort to circumlocution.



Taken together, these considerations indicate that case is no longer a distinctive category in modern English, even within the pronominal system. Hudson (1995) reaches much the same conclusion, on different grounds. As proposed by Jespersen (1933) and Quirk et al. (1985), the personal pronoun system in English is divided into one set of default or 'elsewhere' forms, and another set of 'special-purpose' forms with a more restricted distribution. However, this split does not pattern with the division between nominative and 'objective' cases in Old English or modern German, but rather with the contrast between preverbal subject clitics and independent pronouns in a language like French. Former nominative pronouns such as *I* and *he* correspond to the French preverbal subject clitics *je* and *il*, which occur solely as simple subjects, and cannot occur in isolation or in coordinate or comparative environments. Forms such as *me* and *us* likewise correspond to the 'emphatic' forms *moi* or *lui*, which occupy all other syntactic positions. The reclassification of English personal pronouns in terms of 'subject' and 'general' forms is set out in (7).

(7)

	<i>1sg</i>	<i>1pl</i>	<i>2nd</i>	<i>3sg</i>			<i>3pl</i>
Subject	I	we	we	he	she	it	they
General	me	us	us	him	her	it	them

2.2 Verbs

Noun and verb paradigms in English both exhibit 'word-inflection' in the sense of Bloomfield (1933: 225). A noun stem may stand alone as a singular noun. A verb stem, which provides a base for the other forms in (8), may stand alone as an infinitive, imperative or general present form.

(8)

<i>Form</i>	<i>Regular</i>	<i>Strong</i>
Stem	walk	eat
Present Participle	walking	eating
Past Participle	walked	eaten
Preterite	walked	ate
3sg Present	walks	eats





Regular verb paradigms contain three forms based on the stem: a form in *-ing* that functions as a present participle and gerund, a form in *-ed* that functions as a preterite and past participle, and a '3sg' present form in *-s*. Irregular main verbs also have stem-based forms in *-ing* and *-s*, but exhibit distinctive patterns of preterite and participial suppletion. A partial list of patterns is given in (9). Quirk et al. (1985: 115ff) can be consulted for a more comprehensive list and detailed discussion.

(9)

<i>Pattern</i>	<i>Stem</i>	<i>Preterite</i>	<i>Past Participle</i>
Regular	walk	walked	walked
No Syncretism	sing	sang	sung
	eat	ate	eaten
No Variation	cut	cut	cut
	hit	hit	hit
Preterite = Past Participle	meet	met	met
	seek	sought	sought
Preterite = Stem	beat	beat	beaten
Stem = Past Participle	come	came	come

Due to their frequency, the irregular verbs are of importance to the learner of English, and are prominent in pedagogical descriptions. However, the classes exhibit essentially frozen patterns, and do not recruit formerly weak verbs, or apply to new verbs with any regularity. The psycholinguistic studies summarized in Clahsen (1999) indicate that native speakers of English memorize irregular conjugational forms, and do not 'derive' them synchronically from the stem form.

The conjugational system of English is very simple in certain respects. Regular paradigms contain four morphotactically simple forms, and irregular paradigms may add a fifth. Each form is either based on the stem and a regular suffix (*-ing*, *-ed* or *-s*), or follows one of a small number of suppletive patterns. Hence, the main descriptive challenge for a description of English arises in determining the number of **entries** that are realized by these forms, particularly by the 'past participle,' the '3sg present' and the 'present participle.' Some approaches to this challenge are outlined briefly below.





2.2.1 Compound tenses

The pre-Bloomfieldian English tradition tends to recognize a large number of ‘compound tenses,’ which are ‘formed by the use of a present or a past tense of an auxiliary in connection with a participle or an infinitive’ (Curme 1935: 319). The individual compound tenses are summarized in (10).

(10)

<i>Tense/Aspect/Voice</i>	<i>Auxiliary</i>	<i>Main Verb</i>
Progressive	be	Present Participle
Passive		Past Participle
Perfect	have	
Future	will	Stem

This type of analysis nicely captures the way that periphrastic formations express morphosyntactic properties through distinctive combinations of forms. For example, passive voice is not uniquely associated with the auxiliary *be*, which may also occur in the progressive, nor with the past participle, which may also occur in the perfect. Rather, passive voice is expressed by the distinctive **combination** of a general auxiliary *be* and a ‘past’ participle. Perfect aspect is similarly expressed by a past participle and form of *have*, as proposed in Ackerman and Webelhuth (1998) and Spencer (2001). The progressive is likewise expressed by *be* and a ‘present participle’ (Lee 2004).

The traditional conception of compound tenses is implicitly ‘construction-based’ in essentially the sense of Kay and Filmore (1999). Properties such as passive, perfect and progressive are not ‘assembled’ in a bottom-up fashion from the meanings assigned to individual auxiliaries and participles. Instead, a traditional account proceeds in a top-down fashion from a properties to the particular combinations of auxiliaries and participles that spell them out. The meanings of auxiliaries and participles are preserved in a compound tense, but the meaning of the compound tense is more than just the sum of the meanings of its parts. The interpretation of the present perfect provides a useful illustration. The English present perfect is grammatically a present construction, as Klein (1992) confirms. The use of this construction to refer to past events reflects the implication that an event that is completed in the present must have occurred in the past. In an example such as *has arrived*, the present auxiliary *has* contributes the present tense meaning, the participle *arrived* contributes the lexical meaning of *arrive*, and the combination of *has* and *arrived* express perfective aspect.



The fact that the auxiliaries in passive, perfect and progressive tenses may themselves have compound forms introduces a limited degree of 'recursion' within the system of complex tenses. An example such as (11a) illustrates the full expansion of this system. Working outward from the passive *be observed*, one can construct the progressive *be being observed*, the perfect *have been being observed*, and finally the future *will have been being observed*. Although none of these properties are obligatorily present, they are always realized in the fixed order in (11b) when they are expressed.

- (11) a. They surely will have been being observed.
b. Future < Perfect < Progressive < Passive

The 'expansions' of the auxiliary system thus involve a finite – indeed quite small – number of elements, with highly restricted combinations. There are plausible explanations for some restrictions, while others are less well understood. The innermost placement of the passive can be attributed to the claim that the passive is a derivational, stem-forming, process (Bresnan 1982; Blevins 2003a). Conversely, the outermost placement of the future *will* reflects the fact that *will* is a finite modal, and that verbs in English do not subcategorize for finite verb phrase complements. Yet the ordering of the perfect and progressive is not attributable to any general considerations of this nature.

Within the post-Bloomfieldian tradition that originates with Harris (1951) and Chomsky (1957, 1975), these patterns have usually been treated as syntactic. The main disagreement within this literature concerns whether auxiliaries should be regarded as verbs in their own right (Ross 1969), as 'specifiers' of main verbs (Chomsky 1970), or as a type of 'functional' category (Chomsky 1995). On the other hand, the morphosyntactic coherence of these expansions, and the limited combinations that they allow, have led a number of recent accounts (notably Börjars et al. (1997) and Ackerman and Stump (2004)) to rehabilitate a traditional perspective and treat them as morphological.

2.2.2 Agreement or anti-agreement?

Apart from the auxiliaries *be* and *have*, all verbs in English have a single preterite form, which does not vary according to form of its subject. The future auxiliary *will* is also invariant, though some speakers retain a contrast between first and second person *shall* and third person *will*. The opposition between stem forms and forms in *-s* thus represents the only regular agreement pattern within the conjugational system of English. Although there is no question about the number of forms in a regular present paradigm, there is again some dispute about the number of present entries.

One traditional answer is supplied by Curme (1935), who proposes the six entries in (12): a 3sg entry *walks* and five homophonous entries, one for each person-number combination realized by *walk*. Most contemporary descriptions regard this analysis as unsatisfactory, since there is no motivation within the verb system for recognizing five distinct stem entries.





(12)

<i>Person</i>	<i>Singular</i>	<i>Plural</i>
1st	walk	walk
2nd	walk	walk
3rd	walks	walk

Huddleston (1984) adopts the Bloomfieldian idea that the verb paradigm with the largest number of forms determines the number of cells for all paradigms. Since the present paradigm of *be* has three distinct forms: 1sg *am*, 3sg *is* and a general form *are*, Huddleston proposes that regular verbs also have the three entries in (13): a 3sg entry in *-s*, a 1sg stem entry, and a general stem entry.

(13)

<i>Form</i>	<i>Person</i>	<i>Number</i>
walks	3	sg
walk	1	sg
walk	–	–

By treating *am* as an isolated entry within the irregular paradigm of *be*, Quirk et al. (1985) reduce regular paradigms to the limit of two entries: a stem form and an *s*-form. Significantly, Huddleston (1984) and Quirk et al. (1985) agree in treating the stem form as a general present form, and the *s*-form as a dedicated 3sg form. The analyses in (14) illustrate the most straightforward interpretation of this proposal, on which forms like *walks* are assigned the features [3] and [sg], while general forms like *walk* are unspecified (or partly specified) for person and number.

(14)

<i>Form</i>	<i>Person</i>	<i>Number</i>
walks	3	sg
walk	–	–

An intuitively appealing feature of this proposal is that the stem form is clearly the **morphotactically** unmarked form in the present paradigm. Nevertheless,



it is much less clear is that this form is also **morphosyntactically** unmarked. As in many other languages, '3sg' forms in English occur in contexts where the syntactic subject is an inappropriate agreement 'controller.' Although syntactic subjects are generally obligatory in English, a variety of subject types – including expletives, clauses, infinitives and prepositional phrases – are not appropriate agreement controllers. For example, the sentences in (15) contain sentential and infinitival subjects, which lack person and number features and thus cannot enter into agreement relations with personal verb forms. In these environments, forms in -s are obligatory, and the ostensibly general stem forms are disallowed.

- (15) a. [_S That Max drives at night] alarms/*alarm his friends.
- b. [_{VP} To neglect to vote] is/*are highly irresponsible.
- c. [_S That Max drives at night] tends/*tend to alarm his friends.
- d. [_{VP} To neglect to vote] seems/*seem (to be) highly irresponsible.

The fact that forms in -s are required in contexts where there is no agreement controller suggests that the stem form is not, in fact, unmarked for agreement properties. This pattern also suggests that the exponent -s does not mark agreement with a 3sg subject, but rather signals **non-agreement** with a personal subject. The correct generalization for standard English appears to be that an s-form may **not** cooccur with any subject that bears the marked person features [1] or [2] or the marked number feature [pl]. Since 3sg NPs and non-NPs both lack marked features, the s-form occurs with these subjects, but not with any plural or 1st or 2nd person subject. The present stem form is then not a general form *tout court*, but a general personal form, which requires a personal subject.

A simple contrast between personal and non-personal entries will capture the binary structure of regular verb paradigms in English. This contrast cannot be expressed directly in terms of person or number features alone, since a personal entry may have a marked value for either feature. However, the contrast can be expressed in terms of a binary feature, such as 'Agr' in (16), given an appropriate correspondence between Agr and the Person and Number properties of nominal subjects.

(16)

Form	Agr
walks	-
walk	+

If the property '[Agr +]' is implied by any marked Person or Number feature (i.e., by 1st or 2nd person or by plural number), English personal pronouns





will have the Agr values in (17). Singular NPs will pattern with 3sg pronouns, and plural NPs with 3pl pronouns. Subject-verb agreement is then wholly determined by Agr properties: a subject and verb agree if they have compatible Agr features, and fail to agree otherwise. Since person and number properties are not distinctive for regular verbs, the verbal entries in (16) are not specified for these features. Person and number features do, of course, distinguish pronominal forms, and are specified in the entries in (17).

(17)

<i>Form</i>	<i>Person</i>	<i>Number</i>	<i>Agr</i>
we	1	pl	+
I	1		+
you	2		+
they		pl	+
he/she/it			-

It is the use of 'Agr' as a feature 'interface' between verb and noun entries that permits the simple verb paradigms in (16). Person and number properties remain relevant within the pronominal system, but do not enter into agreement relations, or influence the structure of regular verb paradigms, as they do in the traditional analysis in (12). Instead, the person and number features of nominals imply Agr features, which determine compatibility with regular verb forms. Nominals with a [1], [2] or [pl] feature will be positively specified for Agr and thus combine with the stem form of a regular verb. Conversely, nominals that lack marked features will combine with the *s*-form.

2.2.3 *Minor patterns and innovations*

The traditional division of verbs into 'main' and 'helping' classes is largely based on distributional criteria, as 'helping' verbs may undergo 'inversion,' cooccur with negative elements and occur in a variety of other environments that disallow main verbs. The subsequent division of helping verbs into modal and auxiliary subclasses is principally morphological. Whereas auxiliaries tend to have full inflectional paradigms, modal paradigms are defective, and usually consist of a single form.

Modal and auxiliary verbs exhibit a few distinctive morphological patterns, though none of these patterns can be described as productive, given that modals and auxiliaries form a small, closed class. Finite forms of the auxiliaries *be*, *have* and *do* have negative forms in *-n't*, as do many modals. These formations





are historically contractions with the negative adverb *not*, and the term 'negative contraction' is still applied to them. However, as Zwicky and Pullum (1983) show, forms in *-n't* are inflected forms in modern English, not reductions of syntactic constructions containing *not*. The negative forms of modals and auxiliaries are not always predictable from the affirmative form, as in the case of *will-won't*, *must* [mʌsnt]–*mustn't* [mʌsnt] or *do* [du]–*don't* [downt]. Once these irregular patterns have been listed, it is not clear how much work remains for a synchronic contraction rule.

The status of 'weak' auxiliaries is somewhat less settled. Some descriptions treat contractions such as *I'm*, *we'll* or *she's* as reductions of the corresponding strong forms *I am*, *we will* and *she has/is*, whereas others recognize parallel inventories of strong and weak auxiliaries. Whether or not one regards this entire class as incipient morphology, there are at least some instances that pattern with morphological formations. The reduction of auxiliary *have to* [əv] and thence to [ə] has produced a new class of contracted forms colloquially represented as *woulda*, *couldn'ta*, etc. The morphological character of this pattern is suggested by the fact that it extends [ə] to contexts that do not allow the unreduced auxiliary, at least in standard varieties of English. Forms such as *hadda* and *hadn'ta* are often acceptable to speakers who do not accept the ostensible sources **had have* and **hadn't have*.

2.3 Adjectives, participles, and gerunds

Adjectives do not inflect for agreement properties, and, apart from a few isolated examples like *lone-alone*, do not vary in form between attributive and predicative functions. Most monosyllabic adjectives and many disyllabic adjectives have synthetic comparatives in *-er*, and superlatives in *-est*, as illustrated by *old-older-oldest* and *yellow-yellower-yellowest*. The majority of adjectives with two syllables, and nearly all with three or more, form analytic comparatives with *more*, and superlatives with *most*, as in *foolish-more foolish-most foolish* or *precocious-more precocious-most precocious*. A number of disyllabic adjectives may follow either pattern; thus *narrow-narrow-narrowest*, alongside *narrow-more narrow-most narrow*. A few monosyllables lack synthetic forms, and follow the analytic pattern, as in *right-more right-most right* or *tan-more tan-most tan*.

Traditional descriptions tend to classify synthetic comparatives and superlatives as inflectional, on the grounds that they pattern more like forms of an adjective than as independent adjectives in their own right. Although positive, comparative and superlative forms can be consolidated into a single adjectival paradigm, these forms may participate in processes that are traditionally classified as derivational. In particular, comparative and superlative forms may occur in some of the same types of compounds as the corresponding positive forms. Thus *older-seeming* patterns with *old-seeming* and *faster-growing* with *fast-growing*. Some accounts interpret the fact that comparatives and superlatives may 'feed' compounding as evidence that these forms are cases of



'inherent' inflection (Booij 1996), much like the strong noun plurals discussed in section 2.1.1. However, the distribution of comparative and superlative forms can also be taken as evidence that the distinction between lexeme-preserving paradigmatic processes and lexeme-creating processes is orthogonal to the contrast between 'word-forming' inflection and 'stem-forming' derivation (Blevins 2001).

2.3.1 Verbal participles

Present and past participles are usually included in the inflectional paradigm of English verbs, in large part because of the role that they play in the formation of periphrastic verbal constructions. The adjectives that correspond to these participles are, on the other hand, often regarded as falling outside the verbal paradigm. Adjectives may sometimes correspond to a perfect participle (or to the perfect 'use' of a past participle), as in the case of *a matriculated student*, the counterpart of *the student has matriculated*. However, adjectives corresponding to present and passive participles (or to passive 'uses' of the past participle) represent a much more common pattern. Nearly any intransitive present participle may function as an attributive modifier, as in *a sleeping child*, *the charging boar*, etc. Passive participles of transitive verbs may likewise serve an attributive function, as in *a lost handbag*, *the neglected evidence*, etc. Whereas traditional accounts characteristically refer to adjectival or attributive 'uses' of verbal participles, contemporary approaches tend to regard participial adjectives as separate elements, derived by a process of 'transposition' (Haspelmath 1996; Spencer 1999) or 'zero conversion' (Bresnan 1982, 2001). Yet a peculiar aspect of many conversion-based approaches is that the participial 'input' to a conversion rule is already implicitly adjectival, in that the term 'participle' is merely a designation for a verbal form with adjectival properties.

The traditional view that participles are latently adjectival can be recast formally by treating adjectives as neutral for whatever features are taken to distinguish verbs from adjectives. In the X-bar model of Chomsky (1970), the feature is $[\pm N]$, so that participles will be lexically unspecified for $[N]$, as van Riemsdijk (1983) proposes. Underspecification can then be resolved within a disambiguating syntactic or morphological context, along the lines originally suggested in Chomsky (1970). An underspecified participle will be resolved to an adjective when it combines with an adjectival exponent, or when it occurs with a predicate that selects an adjectival complement, or when it is introduced in an attributive context that requires an adjective. A participle will be resolved to a verb when it occurs with a verbal exponent, or is introduced in a periphrastic construction or in any other environment that selects a verb. The implementation of this analysis is fairly straightforward, and is set out in more detail in Blevins (2005). However, the main virtue of this type of analysis is the way that it reconciles the traditional view that a participle is a single item with multiple 'uses' with the fact that a participle function unambiguously as a verb or adjective in any particular use.



2.3.2 Gerunds

The use of categorial neutrality to express the traditional notion of ‘an X used as Y’ suggests a similar solution to the problem posed by ‘gerunds’ in English. In addition to functioning as present participles and attributive adjectives, forms in *-ing* also head ‘gerundive nominal’ and regular ‘derived nominals’ (Chomsky 1970). Examples of each type of gerundive construction are given in (18).

- (18) a. [_{NP} their [_V [_V renewing] the lease]]
b. [_{NP} the [_N [_N renewing] of the lease]]
c. [_{NP} the [_N [_N renewal] of the lease]]

The gerundive nominal in (18a) exhibits the structure proposed in Pullum (1991), in which the form in *-ing* heads a verbal phrase within a larger noun phrase. In the regular derived nominal in (18b), the form in *-ing* functions as a noun within a fully nominal construction. The irregular derived nominal in (18c) has the same structure as (18b), but is headed by the deverbal noun *renewal*. Contemporary analyses of forms in *-ing* tend to divide up these forms in one of two ways. One approach groups gerundive nominals with derived nominals as instances of a general ‘nominalization’ process that excludes present participles (Jackendoff 1977). Another group gerundive nominals with present participles, as verbal constructions that are categorially distinct from derived nominals (Huddleston 1984; Pullum 1991). However, there is really no need to split up the class of forms in *-ing* in either way. As with participles, one may assume, adapting the proposal of Chomsky (1970: 22), that these items ‘appear in the lexicon with fixed selectional and strict subcategorization features, but with a choice as to the features associated with the lexical categories noun, verb, adjective.’ The neutrality of an underspecified entry for *renewing* can again be resolved in a disambiguating syntagmatic context. The entry for *renewing* is resolved to a noun when it is combined with a category-specific exponent, such as plural *-s*, or when it is introduced into the nominal context in (18b). Yet when introduced into the verbal context in (18a), *renewing* is resolved to a verb. This context-dependence again captures the traditional treatment of *-ing* forms as single items with multiple ‘uses.’ In contrast, the entry for a deverbal noun such as *renewal* in (18b) has a fully determinate category ([+N, -V] in X-bar terms), and is only compatible with a nominal context.

3 Derivation

The strategies for creating new lexemes in English are more numerous and considerably more varied than those available for inflecting existing lexemes. Moreover, whereas inflectional processes are generally regarded as productive (and sometimes even defined in terms of productivity, as in Haspelmath 1996), the processes that create new lexemes differ greatly in generality and regularity.



The class of morphotactic processes such as ‘clipping,’ acronym formation or ‘blending,’ can be dealt with briefly here, as they are discussed at greater length elsewhere in the volume. Each of these processes define new forms, either with no change, or no predictable change in meaning or grammatical properties. The output of clipping may correspond to an initial element of a longer word, as in *prep* for *preparatory*, a final element, as in *phone* for *telephone*, or even a medial sequence, as in *flu* for *influenza*. Although recent clippings may be marked by an apostrophe, as in *'flu*, and initially perceived as colloquial, over time they come to establish an identity separate from their historical base. The same independence is characteristic of acronyms. Thus the acronym *OPEC* functions as a proper name, without a preceding article, whereas *Organization of Petroleum Exporting Countries* shows the distribution of a common noun phrase. Blending is a similarly sporadic process, which combines parts of existing words to form new words, such as *smog* from *smoke* and *fog*, or *eurocrat*, from *European* and *bureaucrat*. Cases of ‘word manufacture’ are often assigned to classes according to the relation between ‘source’ items and manufactured ‘outputs’; e.g., whether an output corresponds to an initial, final or medial part of an original item. Yet this classification is essentially taxonomic, and does not interact significantly with other grammatical processes.

English also contains a variety of processes that induce a change in grammatical and/or semantic properties, which may – though need not – be accompanied by a change in form. These processes are sometimes taken to define a ‘derivational paradigm,’ which contains the members of different word or valence classes that can be derived from a given lexeme. The following outline of the English derivational subsystem begins by distinguishing the processes that alter valence or meaning in section 3.1 from those that change word class in section 3.2. Sections 3.3 and 3.4 then consider the role of analogical processes and interactions between derivational and inflectional processes.

3.1 Category-preserving processes

Although English verbs exhibit valence alternations, valence classes are not marked morphologically. As discussed in section 2.2.1, the contrast between active and passive voice is not marked on participles in English, reflecting the general pattern in West Germanic (Blevins 2003b). Alternations between what are sometimes termed ‘causative’ and ‘inchoative’ entries are similarly unmarked in English, so that forms such as *break*, *open* or *sink* may function either as transitive or as (unaccusative) intransitive verbs. As in many languages, transitive verbs may be used intransitively, and intransitives may occur with a ‘cognate object,’ but neither usage involves a change in verb form.

English contains a number of suffixal exponents that change the meaning or subclass of a noun. Productive examples include *-dom*, *-ship*, and *-monger* in (19), as well as the more recent *-gate*. Some of these formations show an affinity with compounds, and Marchand (1966: 290) classifies *-monger*, in particular, among the ‘semi-suffixes’ that ‘stand midway between suffixes and full words.’



(19)

<i>Suffix</i>	<i>Meaning</i>	<i>Examples</i>
-dom	'territory, domain'	kingdom, martyrdom, fandom, hackerdom
-ship	'state or condition'	courtship, editorship, friendship, marksmanship
-monger	'promoting' (disparaging)	scandalmonger, scaremonger, warmonger

However, category-preserving processes are predominantly prefixal in English. These processes may express logical notions such as negation or *Aktionsart* meanings such as repetition, as well as a variety of other lexical semantic notions. Some examples of prefixal patterns are given in (20).

(20)

<i>Prefix</i>	<i>Category</i>	<i>Meaning</i>	<i>Status</i>	<i>Examples</i>
anti-	N	'against'	productive	anti-slavery, anti-vivisection, anti-war
ante-	N	'preceding'	lexicalized	antecedent, antechamber, antedate
un-	V	'reversal'	productive	unpack, unravel, unwind, unzip
un-	A	'not'	productive	uncertain, un-English, unkind, unwise
in-	A	'not'	lexicalized	ineligible, immaterial, irrelevant
dis-	A	'not'	lexicalized	dishonest, disloyal, dispassionate
re-	V	'again'	productive	reread, retell, reheat, re-cover
re-	V	'back'	lexicalized	recline, recuperate, recover, return



Some prefixal elements within borrowings have never been established as separate morphs in English. This is clearly the case for *re-* in *recline* in (20), or *pre-* in *prescribe*, which contrast with *re-* in *reread* and *pre-* in *pre-heat*. The relation between adjectival *un-* and *in-* parallels the relation between suffix pairs such as *-ness* and *-ity*, which are discussed in section 3.2 below. Whereas *un-* applies to an open class of adjectives, including participial adjectives, *in-* occurs in Latinate formations, where it is sometimes described as ‘assimilating in place to a following consonant.’ Given the restricted distribution of *in-*, the ‘assimilation’ illustrated by *immaterial* and *irrelevant* in (20) is best regarded as a historical process. The negative prefix *dis-* shows a similarly restricted distribution, and, as Marchand (1966: 112) notes, ‘does not in general combine with non-Romance elements.’

3.2 Category-changing processes

A notable property of Modern English is the lack of any consistent marking of word class or subclass. The basic stems of nouns, verbs and adjectives do not exhibit any characteristic pattern, so that the ‘conversion’ or ‘coercion’ of an item from one class to another is indicated by its cooccurrence with inflectional or derivational exponents, or by its use in a particular syntagmatic context. Just about any noun can be ‘verbed,’ so to speak; that is, used as a verb that denotes an activity conventionally related to the noun meaning. A similar process may apply to adjectives as well, yielding a characteristically causative interpretation. However, as illustrated by ‘verbed,’ the conversion to a verb is not marked by a change in the form of the item, but is instead signaled by the verbal inflection *-ed*.

Adjectives may also assume a nominal function with no change in form, though this usage is somewhat less common than in other Germanic languages. Frequently occurring examples, such as *the rich* or *the innocent*, often have a conventionalized character. This strategy can be extended to new adjectives, such as *the stubborn* or *the naturalized*, which are clearly perceived as neologisms.

A number of noun-verb pairs are distinguished by stress patterns. These pairs are often listed in pedagogical descriptions, and there is no evidence that the alternation reflects a synchronically active process in English. The nouns *áddress*, *cónvict*, *súbject* and *tórment* normally have initial stress, while the corresponding verbs: *addréss*, *convíct*, *subjéct* and *tormént* are usually produced with final stress. A few verb-noun pairs exhibit vowel and voicing differences, as in the case of the noun *bath* ([baθ]) and the verb *bathe* ([beið]), but this pattern is again not productive. Back formation may yield verbs that differ from the substantives on which they are based. Thus the final vowel [ai] in *televize* and *opine* contrasts with the penultimate [i] in *television* and *opinion*.

As noted in connection with the derived nominal constructions in section 2.3.2, English retains a class of irregular deverbal nouns, sometimes termed



'action nominalizations.' Unlike productive forms in *-ing*, the form of these deverbal action nominals is not in general predictable from the form of the corresponding verb. Moreover, none of these irregular patterns are extended to new verbs, and most occur only with existing Latinate stems. The examples in (21) all retain the meaning 'act of *Ving*,' but many have also acquired stative or lexicalized abstract noun meanings.

(21)

<i>Effect</i>	<i>Suffix</i>	<i>Examples</i>
V → N	-age	breakage, coverage, shrinkage, spoilage
	-al	arrival, approval, refusal, survival, withdrawal
	-ance/-ence	acceptance, attendance, emergence, resistance
	-ion	destruction, instruction, production, reduction
	-ment	appeasement, confinement, improvement

English also contains a number of highly productive category-changing processes, including the strategies for forming deverbal adjectives and deadjectival verbs in (22).

(22)

<i>Effect</i>	<i>Suffix</i>	<i>Stems</i>	<i>Examples</i>
V → A	-able	any	approachable, believable, breakable, livable, readable
A → V	-ize	any	civilize, legalize, tenderize, westernize, winterize

Various other derivational processes come in productive and non-productive pairs. For example, English contains the two strategies for forming agentive nominals illustrated in (23). Nominals in *-er* can be formed from nearly any verb in English, including the phrasal verbs *pass by* and *pick up* mentioned in section 2.1.1, which have the nominals *passer-by* and *picker-upper*. A few agentive nominals have no corresponding verbs, as in the case of *butcher*. The suffix *-ant* also marks agentive nominals, though, like the suffixes in (21), *-ant* occurs only with a closed class of Latinate stems.



(23)

<i>Effect</i>	<i>Suffix</i>	<i>Stems</i>	<i>Examples</i>
V → N	-er	any	baker, complainer, manager, receiver
	-ant/-ent	Latinate	attendant, contestant, dependent, inhabitant
A → N	-ness	any	fairness, redness, tenderness, strangeness
	-ity	Latinate	agility, gravity, insanity, reality, curiosity

The strategies for forming abstract deadjectival nouns in (23) exhibit a parallel contrast. Nouns in *-ity* are confined to Latinate formations, as Aronoff (1976) notes, and exhibit what is sometimes termed ‘trisyllabic shortening’ (Chomsky and Halle 1968). This is illustrated by the pair *agile–agility*, as the long final vowel [ai] in *agile* corresponds to the short penultimate vowel [ɪ] in *agility*. In contrast, nouns in *-ness* are formed from an open class of stems and do not induce a change in their base. To distinguish *-ity* from *-ness*, Chomsky and Halle (1968) assign *-ity* to a class of ‘primary’ affixes that combine with their base before ‘secondary’ affixes such as *-ness*. Aronoff (1976) likewise introduces the lexical features [\pm Latinate] to allow *-ity* to ‘select’ bases from a Latinate sublexicon. Models that incorporate a notion of ‘level ordering’ (Kiparsky 1982) impose a parallel classification by treating *-ity* as ‘level 1’ suffix that attaches before the ‘level 11’ prefix *un-*.

3.3 Productivity and analogy

These contrasts between exponents, levels, and ‘sublexicons’ serve essentially to reinstate a distinction between productive and nonproductive exponents, which is thoroughly obscured in Chomsky and Halle (1968). A ‘secondary’ exponent such as *-ness* marks a productive nominalization process, which may apply to new adjectives. A ‘primary’ affix, such as *-ity* or *-ant*, on the other hand, is largely encapsulated in existing forms. The sole productive use of *-ity* is in combination with *-able*, where it is encapsulated in a complex exponent *-ability*. Existing forms in *-ity* or *-ant* may provide a basis for analogical extensions, though analogized forms need not be morphologically transparent. A traditional four-part proportional analogy (Hock 1991: 172) provides a means of generalizing forms in *-ity*, *-ant*, *-ion*, etc. The basic schema in (24a) takes a morphological relationship between a pair of forms *a* and *b* as the basis for deducing a form *X* from an established form *c*. For example, the relationship between the adjective *grammatical* and the noun *grammaticality* can serve as the basis for deducing a nominal counterpart of *ungrammatical*. This deduction is set out in (24b), which asserts that *grammatical* is to *grammaticality* as *ungrammatical* is to *ungrammaticality*.



- (24) Analogical extensions
- a. $a : b = c : X$
 - b. $grammatical : grammaticality = ungrammatical : X$
 - c. $X = ungrammaticality$

Similar deductions can account for the generalization of other nonproductive exponents. The correspondence between *complete* and *completion* and the existence of the form *incomplete* permit the extension of *-ion* in the form *incompletion*, understood in the sense of an 'incomplete forward pass' in American football. In this way, the traditional process of analogical deduction extends the use of exponents that do not freely combine with new bases. However, the resulting forms often resist the sort of 'compositional' analyses that can usually be assigned to productive formations. On first exposure, analogized formations may even have something of a neologistic character, though the intended interpretation is usually salient, and comes to be associated with the new term.

The contrast between *ungrammaticality* and *ungrammaticalness* highlights a key difference between analogized back-formations and productive formations (irrespective of whether productive forms are attributed to 'word-building' rules or to productive analogical principles of the sort proposed in Paul 1968 [1880]). The analysis of *ungrammaticalness* is given in (25). The adjective *grammatical* provides a base for the derived adjective *ungrammatical*, which underlies the nominalization *ungrammaticalness*. The structure in (25) also corresponds transparently to the interpretation of *ungrammaticalness*, which is normally understood as 'the state or property of being ungrammatical,' rather than as the negation of 'the state or property of being grammatical.'

- (25) $[_N [_A un [_A grammatical]] ness]$

The analysis of *ungrammaticality* is much less straightforward, as any structure that combines *-ity* and *un-* with the base *grammatical* will tend to violate the distributional restrictions on one of these exponents. The analyses in (26) exhibit the two possible orders for combining *-ity* and *un-*.

- (26) Derivational bracketing 'paradoxes'
- a. $[_N un [_N [_A grammatical] ity]]$
 - b. $[_N [_A un [_A grammatical]] ity]$

Models that treat Latinate exponents as productive usually classify *-ity* as a primary or 'level 1' suffix and *un-* as a secondary or 'level 11' prefix. This dictates the structure in (26a), in which *-ity* combines with *grammatical*, yielding the nominal *grammaticality*, to which *un-* then attaches. This structure is motivated by the assumption that level affixes may induce stress shift, from *grammátical* to *grammaticálicity* in this case. Yet this structure clearly violates the distributional constraints on *un-*, which otherwise attaches to adjectives, not nouns. The alternative in (26b) observes the constraints on *un-*, by combining *un-* first with the adjective *grammatical*, and then attaching *-ity*. This analysis





also corresponds more transparently to the semantic analysis. But (26b) violates the generalization that level affixes attach before level affixes. The fact that the distributional requirements of *-ity* and *un-* are not mutually satisfiable leads to an impasse – or a ‘paradox’ – if one assumes that both exponents combine with *grammatical* to form *ungrammaticality*. It does not really matter whether one thinks of the analyses in (26) as representing a part-whole structure, as in Lieber (1992), or whether one regards the analyses as representing the order in which word formation rules are applied to *grammatical*, as in Anderson (1992) or Stump (2001). The introduction of *-ity* in these analyses is problematic, whether the exponent is assigned to an entry or associated with a rule. An analogical analysis avoids this problem, by treating *ungrammaticality* as a type of back formation in which *-ity* is not an immediate exponent. This analysis represents a trivial extension of the general account of bracketing paradoxes in Spencer (1988). The traditional schema in (24a) is a more general form of the ‘proportional analogy’ that Spencer (1988: 675) proposes as ‘a general principle of English word formation operating over entries in the permanent lexicon.’ As Spencer (1988) shows, this principle sanctions a wide range of cases, from truncations, such as *psycholinguist*, derived from the pair *linguistics–linguist* and the established form *psycholinguistics*, to compounds, such as *baroque flautist*, from the pair *flute–flautist* and the established form *baroque flute*. Hence, extensions of nonproductive exponents and the existence of various classes of bracketing paradoxes in English can both be understood ‘if we don’t treat [them] as the result of morphological derivation, but rather as a kind of back-formation licensed by existing lexical entries’ (Spencer 1988: 675).

Bracketing paradoxes have attracted considerable attention in the morphological literature (see, e.g., Williams 1981; Stump 1991; Sproat 1992), and various strategies have been proposed for segregating demands that appear not to be satisfiable in a single structure. Yet if established lexical forms play the role that Spencer (1988) proposes, it may be that many apparent ‘paradoxes’ are just a symptom of misapplying a productive analysis on analogized patterns. This suggests in turn that much of the complexity attributed to the English derivational system – from levels and sublexicons through mechanisms for resolving bracketing paradoxes – compensates for the reluctance to distinguish productive from nonproductive processes in Chomsky and Halle (1968). Productivity has since become more of an active research topic, and the large and growing literature concerned with the productivity of derivational formations includes Baayen (1992), Plag (1999), and Bauer (2001).

3.4 Organization of derivational and inflectional processes

Overall, the morphological system of English exhibits a simple organization, which is mirrored to some degree by the simple morphotactic structure of non-compound words. English retains a stock of native Germanic stems, along with a sizeable collection of borrowings, many of Latinate origin. In some





cases, sub-units within these items have become established as independent stems or derivational exponents. However, the morphotactic patterns exhibited by many Latinate formations, although transparent in varying degrees to the speaker or analyst, are not extended beyond an original stock of forms. Descriptive strategies designed to restrict particular exponents to a Latinate 'sublexicon' implicitly concede the point that these elements do not have the status of independent units in English. Similar remarks apply to any elements restricted to a Germanic 'sublexicon.'

Word forms are often assigned a relatively uniform structure in English. Lexical roots are usually assumed to be modified by the category-preserving processes in section 3.1, which are chiefly prefixal, and by category-changing processes in section 3.2, which are exclusively suffixal. The output of these derivational processes provides a base for the few remaining inflectional suffixes of English. As noted in section 2, neither verbs nor adjectives retain personal agreement markers. The one regular verbal agreement exponent, *-s*, is more accurately described as marking non-agreement. The plural marker *-s* is the sole productive noun inflection, as case is no longer distinctive even for pronouns.

FURTHER READING

Detailed descriptions of the English morphological system can be found in the two comprehensive grammars of modern English, Quirk et al. (1985) and Huddleston and Pullum (2002). Aspects of the English system are also covered in many general introductions to morphological theory, including Bauer

(1988), Spencer (1991) and Haspelmath (2002). Other general works, including Matthews (1991), Carstairs-McCarthy (1992), and Spencer and Zwicky (1998), provide further discussion of some of the theoretical and methodological issues that arise in descriptions of the English system.

REFERENCES

- Ackerman, F. and Stump, G. (2004) Paradigms and periphrastic expression: a study in realization-based lexicalism. In A. Spencer and L. Sadler (eds.), *Projecting morphology*. Stanford: CSLI Publications, 111–58.
- Ackerman, F. and Webelhuth, G. (1998) *A theory of predicates*. Stanford: CSLI Publications.
- Anderson, S. R. (1992) *A-morphous morphology*. Cambridge: Cambridge University Press.
- Aronoff, M. (1976) *Word formation in generative grammar*. Cambridge, MA: MIT Press.
- Aronoff, M. (1994) *Morphology by itself: stems and inflectional classes*. Cambridge, MA: MIT Press.



- Baayen, R. H. (1992) Quantitative aspects of morphological productivity. In G. Booij and J. van Marle (eds.), *Yearbook of morphology 1991*. Dordrecht: Kluwer, 109–50.
- Bauer, L. (1988) *Introducing linguistic morphology*. Edinburgh: Edinburgh University Press.
- Bauer, L. (2001) *Morphological productivity*. Cambridge: Cambridge University Press.
- Beard, R. (1995) *Lexeme-morpheme base morphology: a general theory of inflection and word formation*. Albany, NY: SUNY Press.
- Blevins, J. P. (2001) Paradigmatic derivation. *Transactions of the Philological Society* 99, 211–22.
- Blevins, J. P. (2003a) Passives and impersonals. *Journal of Linguistics* 39, 473–520.
- Blevins, J. P. (2003b) Stems and paradigms. *Language* 79, 737–67.
- Blevins, J. P. (2005) Remarks on gerunds. In C. O. Orgun and P. Sells (eds.), *Morphology and the web of grammar: essays in memory of Steven G. Lapointe*. Stanford: CSLI Publications, 25–47.
- Bloomfield, L. (1933) *Language*. Chicago: University of Chicago Press.
- Booij, G. (1996) Inherent verses contextual inflection and the split morphology hypothesis. G. Booij and J. van Marle (eds.), *Yearbook of morphology 1995*. Dordrecht: Kluwer, 1–16.
- Börjars, K., Vincent, N., and Chapman, C. (1997) Paradigms, pronominal inflection and periphrasis. In G. Booij and J. van Marle (eds.), *Yearbook of morphology 1996*. Dordrecht: Kluwer, 155–80.
- Bresnan, J. (1982) The passive in lexical theory. In J. Bresnan (ed.), *The mental representation of grammatical relations*. Cambridge, MA: MIT Press, 3–86.
- Bresnan, J. (2001) *Lexical-functional syntax*. Oxford: Blackwell.
- Carstairs-McCarthy, A. (1992) *Current morphology*. London: Routledge.
- Carstairs-McCarthy, A. (2005) Affixes, stems and allomorphic conditioning in paradigm function morphology. In G. Booij and J. van Marle (eds.), *Yearbook of morphology 2004*, 253–81.
- Chomsky, N. (1957) *Syntactic structures*. The Hague: Mouton.
- Chomsky, N. (1970) Remarks on nominalization. In R. A. Jacobs and P. S. Rosenbaum (eds.), *Readings in English transformational grammar*. Waltham: Ginn and Company, 232–86. Reprinted in *Studies on Semantics in Generative Grammar*. The Hague: Mouton, 1–61.
- Chomsky, N. (1975) *The logical structure of linguistic theory*. Chicago: University of Chicago Press.
- Chomsky, N. (1995) *The minimalist program*. Cambridge, MA: MIT Press.
- Chomsky, N. and Halle, M. (1968) *The sound pattern of English*. New York: Harper & Row.
- Clahsen, H. (1999) Lexical entries and rules of language: a multidisciplinary study of German inflection. *Behavioral and Brain Sciences* 22, 991–1013.
- Corbett, G. (1991) *Gender*. Cambridge: Cambridge University Press.
- Curme, G. O. (1935) *A grammar of the English language*, vol. 1: *Parts of speech and accidence*. Boston: Heath.
- Harris, Z. S. (1951) *Methods in structural linguistics*. Chicago: University of Chicago Press.
- Haspelmath, M. (1996) Word-class-changing inflection and morphological theory. In Booij, G. and van Marle, J. (eds.), *Yearbook of morphology 1995*. Dordrecht: Kluwer, 43–66.
- Haspelmath, M. (2002) *Understanding morphology*. London: Arnold.
- Hock, H. H. (1991) *Principles of historical linguistics*, 2nd edn. Berlin: Mouton de Gruyter.
- Hockett, C. F. (1947) Problems of morphemic analysis. *Language* 23,



- 321–43. Reprinted in Joos (1957), 229–42.
- Huddleston, R. D. (1984) *Introduction to the grammar of English*. Cambridge: Cambridge University Press.
- Huddleston, R. D., Pullum, G. K., et al. (2002) *The Cambridge grammar of the English language*. Cambridge: Cambridge University Press.
- Hudson, R. (1995) Does English really have case? *Journal of Linguistics* 375–92.
- Jackendoff, R. (1977) *X-syntax*. Cambridge, MA: MIT Press.
- Jespersen, O. (1933) *Essentials of English grammar*. London: Allen and Unwin.
- Joos, M. (ed.) (1957) *Readings in linguistics*, vol. I. Chicago: University of Chicago Press.
- Kay, P. and Filmore, C. J. (1999) Grammatical constructions and linguistic generalizations: The *what's X doing Y?* construction. *Language* 75, 1–33.
- Kiparsky, P. (1982) Lexical phonology and morphology. In *Linguistics in the morning calm*. Seoul: Hanshin, 3–91.
- Klein, W. (1992) The present perfect puzzle. *Language* 68, 535–52.
- Lee, S.-A. (2004) Progressive and aspectual verb constructions in English. Ph.D. thesis, University of Cambridge.
- Lieb, H.-H. (2003) Notions of paradigm in grammar. In D. A. Cruse (ed.), *Lexikologie/Lexicology*. (Handbücher zur Sprach- und Kommunikationswissenschaft) Berlin: Mouton de Gruyter.
- Lieber, R. (1992) *Deconstructing morphology*. Chicago: University of Chicago Press.
- Marchand, H. (1966) *The categories and types of present-day English word-formation: a synchronic-diachronic approach*. University of Alabama Press.
- Matthews, P. H. (1991) *Morphology*. Cambridge: Cambridge University Press.
- Paul, H. (1968) *Prinzipien der Sprachgeschichte*. Tübingen: Max Niemayer Verlag.
- Plag, I. (1999) *Morphological productivity: structural constraints in English derivation*. Berlin: Mouton de Gruyter.
- Pullum, G. K. (1991) English nominal gerund phrases as noun phrases with verb-phrase heads. *Linguistics* 763–99.
- Quirk, R., Greenbaum, S., Leech, G., and Svartvik, J. (1985) *A comprehensive grammar of the English language*. London: Longman.
- van Riemsdijk, H. (1983) The case of German adjectives. In F. Heny and B. Richards (eds.), *Linguistic categories: auxiliaries and related puzzles*. Dordrecht: Reidel, 223–52.
- Ross, J. R. (1969) Auxiliaries as main verbs. *Journal of Philosophical Linguistics* 1, 77–102.
- Sag, I. A., Gazdar, G., Wasow, T., and Weisler, S. (1985) Coordination and how to distinguish categories. *Natural Language and Linguistic Theory* 117–71.
- Spencer, A. (1988) Bracketing paradoxes and the English lexicon. *Language* 64, 663–82.
- Spencer, A. (1991) *Morphological theory*. Oxford: Blackwell.
- Spencer, A. (1999) Transpositions and argument structure. In G. Booij and J. van Marle (eds.), *Yearbook of morphology 1998*. Dordrecht: Foris, 79–102.
- Spencer, A. (2001) The paradigm-based model of morphosyntax. *Transactions of the Philological Society* 99, 279–313.
- Spencer, A. and Zwicky, A. M. (eds.) (1998) *Handbook of morphology*. Oxford: Blackwell.
- Sproat, R. (1992) *Unhappier* is not a bracketing paradox. *Linguistic Inquiry* 23, 347–52.
- Stump, G. T. (1995) The uniformity of head marking in morphological theory. In G. Booij and J. van Marle (eds.), *Yearbook of morphology 1994*. Dordrecht: Kluwer, 245–96.



- Stump, G. T. (1991) A paradigm-based theory of morphological mismatches. *Language* 67, 675–725.
- Stump, G. T. (2001) *Inflectional morphology: a theory of paradigm structure*. Cambridge: Cambridge University Press.
- Taylor, A. (1994) Variation in past tense formation in the history of English. In *University of Pennsylvania Working Papers in Linguistics* 1. Philadelphia, 143–59.
- Wells, R. (1947) Immediate constituents. *Language* 23, 81–117. Reprinted in Joos (1957), 186–207.
- Williams, E. (1981) On the notions “lexically related” and “head of a word.” *Linguistic Inquiry* 12, 245–74.
- Zwicky, A. M. (1987) Suppressing the Zs. *Journal of Linguistics* 23, 133–48.
- Zwicky, A. M. and Pullum, G. K. (1983) Cliticization vs. inflection: English *n't*. *Language* 59, 502–13.

