
Headless Constructions and Coercion by Construction

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1 Introduction

Among the many relations which play a role in syntactic and semantic generalizations one has carried a unique historic burden as the regulator of interaction between the two levels: that of head. While the canon of heads has been expanded to include an array of nonlexical categories, as in the functional projections of the minimalist program (see, e.g., Marantz 1995, Radford 1997), syntactic theorists have not traditionally questioned the centrality of heads to the syntax-semantics mapping: heads license complements, adjuncts and specifiers; they thereby determine the allowable expansions of the syntactic categories to which they belong. Licensing relationships are accordingly assumed to be sisterhood relationships. Under this assumption, there are no properties of the syntax-semantics interface which cannot be described by phrase-structure rules like those in (1):

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- (1) a. VP → V (NP) (PP)
 b. NP → (determiner) N

Phrase-structure rules are revealing because they distinguish the obligatory component of the phrase (its head) from its optional components, where ‘optionality’ is defined over lexical classes distinguished by the projection properties of their members, e.g., mass nouns, proper nouns and count nouns in (1b). The evidence shows, however, that the dependency relations which matter for syntax need not have anything in principle to do with phrase building. This evidence includes two general classes of exceptions. The first class consists of exceptions to locality. Zwicky (1995) describes a number of such cases under the rubric of NIECE LICENSING. Three illustrations of niece licensing are given in (2-4), respectively:

- (2) a. It was **too** heavy *to lift*.
 b. It was **so** hot that I almost fainted.
- (3) a. We’re **bored** *with* that story.
 b. We **hope** *for* a resolution.
- (4) a. Your suite **is** being *cleaned* right now.
 b. *White wine **is** being preferred right now.

In each of these examples, the licenser word is indicated in boldface while the licensed element is indicated in italics. In (2a-b), the degree words *too* and *so* each license a verb projection, whether infinitival or finite, which is not the sister of the intensifier but instead a daughter of that sister, an adjectival projection. In (3a-b), the lexical items *bored* and *hope*, respectively, license preposition phrases, each of which requires a specific prepositional head, *with* or *for*. This prepositional head is a ‘niece’ rather than sister of the word. The example in (4a) is slightly more complex. Here, the passive auxiliary *be* is sister to the Progressive auxiliary *be*, and has the appropriate gerundial form. The Progressive auxiliary requires a V’ sister whose head is a dynamic verb; this is shown by the ill formed (4b). However, in (4a) the lexical complement of the Progressive auxiliary, the accomplishment verb *clean*, is a niece rather than sister to the Progressive auxiliary. Both transformational and feature-passing solutions have been proposed for niece-licensing effects. For example, Hoeksema and Napoli (1993) model the noncontiguous licensing relationship in (2) by means of extraposition: the extraposed constituent is the clausal complement of the

degree word. This clausal constituent is claimed to originate as the right daughter of an intensifier phrase headed by the degree word. The feature-passing approach to niece licensing is widely attested in phrase-structure based grammars. One such example is found in the representation of nonlocal filler-gap dependencies in Head-Driven Phrase Structure Grammar (Pollard and Sag 1994): a 'gap' feature, whose value is the type of the left-isolated phrase, percolates up from that verb whose head licenses the left-isolated phrase. The result is a phrase whose specifier is the left-isolated constituent and whose head carries a gap feature corresponding to that constituent. Thus, the nonlocal relationship between a left-isolated phrase (e.g., a *wh*-word) and the predicator whose meaning that phrase completes is transformed, via feature passing, into a sisterhood relationship between that phrase and the clause or VP which follows it. The feature-passing mechanism also provides a plausible potential solution to the niece-licensing problem exemplified in (4): the feature [\pm dynamic] would be passed to the V' headed by the passive auxiliary *being*, enabling the progressive auxiliary *is* to look to its sister for the appropriate aspectual feature. As coherent as such a solution might be, it seems clear that it serves only to preserve a model of lexical licensing based on sisterhood relations. If there are exceptions to that model, locality itself becomes a defeasible assumption.

The second class of exceptions, which will be the focus of our attention here, comprises cases in which lexical items are combined with elements, whether via morphology or syntax, that they do not license semantically. This class is represented by the following examples, in which the projection properties of the boldfaced items are distorted in various ways. These distortions involve, respectively, nominal morphosyntax (5), verbal thematic structure (6), and those aspects of verbal morphosyntax which are determined by the aspectual class of the verbal projection, otherwise known as a tenseless proposition or SITUATION RADICAL (7):

(5) **Nominal Morphosyntax**

- a. Give me some pillow.
- b. They sampled some wines.
- c. She had a beer.

(6) **Semantic Frame**

- a. Down at the harbor there is teal-green clubhouse for socializing and parties. Beside it sparkles the community pool. (*Vanity Fair* 8/01).
- b. When a visitor passes through the village, young lamas stop picking up trash to mug for the camera. A gruff 'police monk' barks them back to work. (*Newsweek* 10/13/97)

(7) **Aspectual Morphosyntax**

- a. She liked him in a minute.
- b. I'm feeding him a line and he's believing every word.
- c. She washes the car.

In (5a), a word which denotes a bounded entity, *pillow*, is embedded in the morphosyntactic frame ordinarily projected by a mass noun, while in (5b-c) the inverse is the case. In (6a-b), two monovalent verbs, *sparkle* and *bark* are embedded, respectively, in a bivalent frame consisting of a location and a theme, and a trivalent frame, consisting of an agent, a theme and a goal. In (7a-b) stative situation radicals are combined with aspectual operators which logically require tenseless propositions denoting events. In (7a), the state radical *She like- him* combines with a frame adverbial (*in a minute*), which is logically compatible only with those predications which do not entail downward to subintervals, i.e., telic events (Herweg 1991). In (7b), the state radical *He believe- every word* combines with Progressive morphology. This combination is unpredicted by verbal aspect. Since the Progressive maps events to medial states, it appears to apply vacuously in this context (see Vlach 1981, Langacker 1987, Herweg 1991, De Swart 1998, this volume). In (7c), an event radical, *She wash- the car*, combines with Present inflection. While this combination is widely attested it too involves a distortion of verbal aspect: (7c) does not denote a unique event, as would its simple Past counterpart. As a momentaneous 'sampling' device, the Present cannot accommodate the positive temporal profile of an event. Instead, the

Present appears to index the class of stative situations, e.g., a state of the world in which car-washing takes place at regular intervals.

A model of the syntax-semantic interface based solely upon lexical-head licensing would, of course, fail to account for the fact that all of the examples in (5-7) have coherent, consistent interpretations. For example, the verb *bark* in (6b) is uniformly construed as denoting (metaphorical) caused motion, while the situation radical *I like- him* in (6a) receives an inchoative interpretation. Although these interpretive effects might be dismissed as the products of manner- or relevance-based implicatures, the relevant implications do not obviously qualify as generalized implicata: because they depend on the presence of specific lexical items, these implications, like conventional implicatures, can neither be detached nor suspended. The examples in (5-7) therefore suggest that there is not in fact a single source of sentence meaning: conceptual content comes not only from words but also from an inferential procedure which bridges semantic gaps in morphosyntax. I will refer to this procedure as IMPLICIT TYPE-SHIFTING, reserving the more widely used terms COERCION and COERCION EFFECT for the enriched interpretations which result from this procedure. As observed by De Swart (1998, this volume) coercion effects are produced by two distinct types of operators, TYPE-SHIFTING operators and TYPE-SENSITIVE operators. An example of the former is the plural suffix, while an example of the latter is the indefinite article.

Implicit type-shifting is syntactic in the sense that its occurrence is linked to specific morphosyntactic configurations. However, these configurations do not have a uniform formal characterization. The coercion trigger may be a syntactic head, as in the case of the Progressive, where the auxiliary head *be* selects for a participial complement of the appropriate aspectual class, and forces a dynamic reading in the 'mismatch' condition (7b). The coercion trigger may also be a specifier like *some* in (5b), which selects for a noun whose denotatum is a mass. Finally, the coercion trigger may be an open, or lexically empty, schema, as in (6), where the relevant scene-construal properties follow from the presence of a specific array of complements alongside the verb rather than being attributable to a given verb or argument type.

Coercion effects thus challenge models of composition based on licensing by syntactic heads, and appear instead to indicate a modular grammatical architecture, in which semantic composition may add meanings absent in the syntax in order to ensure that various functors, e.g., the indefinite article, receive suitable arguments. One such model, proposed independently by both Jackendoff (1990, 1997) and De Swart (1998), involves the interpolation of coercion operators in semantic structure. In the

case of (5c), for example, a specific coercion operator would be used to derive a count type from a mass type, making *beer* a suitable argument for the indefinite article. The interpolated-functor model successfully extricates two widely conflated head properties—that of being a syntactic head (determining the distribution of the phrasal projection), and that of being a semantic head—calling for an argument of a particular type (Zwicky 1985, Croft 1996). However, this model also has three significant failings.

- First, it requires a powerful indexing mechanism to constrain coercion operations. As Jackendoff (1997:50) observes, such operations might “insert arbitrary material into arbitrary arrangements”. De Swart (1998:361) seeks to avoid such overgeneration by assuming that a coercion operator is introduced only when there is a trigger for it. For example, a ‘unitizing’ coercion operator might be indexed to the class of linguistic expressions requiring count-noun sisters, e.g., the indefinite article. However, by enabling a given linguistically expressed operator to invoke a given coercion operator on an ‘as needed’ basis we do not thereby ensure that this operator will appear *only* where needed. For example, there is no obvious means by which to prevent the unitizing operator from intervening between the determiner *the* and a mass-noun sister (e.g., *beer*) in the expression *the beer*—an unwelcome result, because this expression need not denote either a portion or variety of beer. Coercion operations may be morphosyntactically invisible, but if their representations owe nothing to morphosyntax it is not obvious how such operations can be constrained.
- Second, it cannot account for cases of template-based coercion, as exemplified in (6). As noted above, the coercion effects in question cannot be traced to the presence of a specific functor, be it a verb or an argument. Instead, the modulation of meaning is the result of the verb’s conformity to a linking pattern whose valence set properly includes that projected by the verb. An additional example of this type involves the interpretation of adjectives in pre- and post-nominal position in Romance languages. When not subject to idiomatic readings, prenominal modifiers are restrictive; postnominal modifiers are necessarily nonrestrictive, requiring that the head noun denote a set which contains more than one member. In French, for example, prenominal placement of the adjective *vieux* (‘old’) in the NP *mon vieux papa* (‘my old dad’) yields the appropriate nonrestrictive reading, whereas postnominal placement

of the adjective yields an anomalous restrictive reading, in which my *old* father is being contrasted with my other fathers. As in the case of the argument-structure effects exemplified in (6), it is a syntactic pattern, rather than an operator, which is responsible for the semantic distortion in question.

- Third, the modular account provides no rationale for the existence of type-sensitive operators. What use does an interpretive module have for a set of identity functions? Since functions in construal-based semantic theories are intended to represent mappings across sets of types (e.g., types of entities or types of situations), type-sensitive operators, whose input and output types are identical, appear to serve no explanatory role. Why, for example, should a grammar have recourse to an operator whose sole purpose is to map the set of states onto the set of states

As an alternative to a modular account, I will propose an account of implicit type-shifting based upon the grammatical construction. This account is based on CONSTRUCTION GRAMMAR (Fillmore et al. to appear, Kay and Fillmore 1999, Zwicky 1994, Goldberg 1995, Michaelis 1994, Michaelis and Lambrecht 1996, Koenig 1999). In this model, the grammar is a network of symbolic rules of morphosyntactic combination. As in Bybee's (1995) conception of morphological storage and processing, rules traditionally conceived in processual terms are replaced with schemas which differ from one another with regard to the level of specificity (e.g., whether or not particular words or affixes are invoked) and productivity, as determined both by the restrictiveness of the schema and its type frequency (see Bybee 1995:432). In addition, constructions represent diverse formal objects. Grammatical constructions determine: constituent-structure relations, dependency relations, role-function linkages, linear orderings, and combinations thereof (Zwicky 1994). Grammatical constructions are combined with one another, and with lexical items, via superimposition, a mechanism whose technical implementation is UNIFICATION (Fillmore et al. forthcoming, Kay and Fillmore 1999). Grammatical constructions refer in the same way that words do: they denote types—among them classes of entities and events. Accordingly, coercion is not merely the resolution of semantic conflict, but is instead the resolution of conflict between constructional and lexical denotata.¹ This interaction is subject to a principle

¹ The idea that constructional requirements may override lexical requirements in the case of NPs like *a beer* is not part of the conception of Construction Grammar put forth in Kay and Fillmore 1999. In that version of the model, conflict of this type would represent a unification

which I will refer to below as the Override Principle. The construction-based model of coercion has the following explanatory features.

- First, it uses a single combinatory mechanism, the construction, to account for both coerced and syntactically transparent interpretations. Rather than representing a special form of composition, coercion effects are predictable by-products of construction-word combination: implicit type-shifting mediates conflicts between the meaning of a construction and the meaning of a superimposed lexical item. This means that the constraint which requires semantic concord between the syntactic sisters in the string *a bottle* also triggers the coerced interpretation found in *a beer*. Since this concord constraint is stated for a rule of morphosyntactic combination, the same construction underlies both strict and enriched composition.
- Second, it unifies endocentric (head-driven) coercion effects and exocentric (non-head-driven) coercion effects by treating them both as instances of syntactically based composition. Since combination in unification-based syntax has nothing *per se* to do with phrase building, licensing does not entail syntactic sisterhood. The combinatory mechanisms of Construction Grammar are schemas rather than sisterhood relations. For this reason, the Construction Grammar model not only captures licensing by predicators which are not heads (a virtue that it shares with modular theories) but also provides an equally straightforward model of functor-free coercion, as exemplified by (6).

failure, since the [bounded-] feature of the noun *beer* would conflict with the [bounded+] requirement that the Indefinite Determination construction imposes upon its nominal daughter. Therefore, the licensing of tokens like *a beer* requires the intercession of type-shifting constructions. A type-shifting construction has an external semantic value which is distinct from that of its sole daughter node. The Mass>>Count construction, for example, unifies with a mass noun like *beer*. Its external semantics is that of a count noun, which can thereby unify with Indefinite Determination. Type-shifting constructions are essentially lexical rules, and as such fail to capture an important generalization, since type-shifted nominals are freely generated but not indexed to the morphosyntactic contexts which trigger the relevant type shifts. Further, use of the 'box-within-a-box' constructions for type-shifting violates the spirit of a model which, in the interest of concreteness, eschews nonbranching domination in phrase structure. That is, in CG, no phrase consists simply of a noun. If a given lexical noun is of the appropriate semantic class, it will simply unify directly with any grammatical-function position in a construction. In accordance with Goldberg (1995), I therefore employ a version of the CG architecture which allows for unification with overrides, as per the Override Principle to be described in Section 2.

- Third, it predicts the existence of two sources of coercion effects: type-selecting constructions (e.g., Indefinite Determination) and type-shifting constructions (e.g., the Progressive). Type-sensitive constructions express concord relations while type-shifting constructions perform derivations. Both kinds of constructions denote types, whether entities or events, and invoke types. When the type provided is not the type invoked, implicit type-shifts may occur.

The remainder of this chapter will be structured as follows. In section 2, I will describe the construction-based model and its unification-based implementation, using nominal syntax to illustrate both transparent and enriched composition. In section 3, I will apply the model to argument structure, drawing upon the framework developed by Goldberg (1995). In section 4, I will analyze three distinct types of aspectual constructions: aspectual concord constructions (as illustrated by the Frame Adverbial construction), aspectual shift constructions (as illustrated by the Progressive), and tense constructions (as illustrated by the Present in English and French).

2 Coercion in Nominal Syntax

Unification of constructions can grossly be described in terms of a metaphor involving the superimposition of slides. A lexical entry can be superimposed upon a construction (or vice versa) as long as the semantic and syntactic specifications on each slide “show through”—that is, provided there is no conflict among the specifications on the slides in the stack. The specifications take the form of attribute-value matrices: a list of syntactic (*syn*) and semantic (*sem*) attributes (both relational and intrinsic) with exactly one value assigned to each (including the value [], or unspecified).² Among the values of the *sem* attribute are the attributes *index* and *frame*. The value of the *index* attribute is the referential index of the expression. The value of the *frame* attribute is the set of relations and participant roles which jointly define the type of the expression. The constructions themselves are represented as box diagrams. Each box corresponds to a node in a tree-structure representation, and contains an attribute-value matrix. In a branching construction, a lexical entry unifies with a single daughter box

² In a construct—a linguistic string licensed by a unified combination of constructions—any unspecified values (as for the maximality attribute of a mass noun) will be ‘filled in’, as Definite Determination imposes a [max-] value on its nominal daughter.

within the construction. The topmost attribute-value matrix of the construction represents the external syntax and semantics of the construction—that is, what instances of this construction ‘count as’. The traditional conception of a lexical head—as the determinant of the syntactic category and semantic type of its projection—plays a limited role in this model, as a default.

Unification is used to represent a semantic dependency between two or more types which figure in the statement of a construction. When there is a concord requirement within a branching construction, the two daughter boxes will contain identical atomic values for the relevant attributes. When a range of values is possible, a concord requirement will be indicated by a unification variable, a numbered pound sign # preceding the empty brackets, e.g., #1. For example, each of the two daughter constituents in the Determination construction (the article and the nominal head) carries the attribute-value pair *plural* #[] (Fillmore et al. to appear: ch. 2). This concord requirement rules out such tokens as **these person* and **this persons*. Functor-argument relations are represented by the *valence* attribute. The value of the valence attribute is the set of arguments which a lexical daughter (or its projection) requires, with intrinsic and relational information given for each member of the valence set. An argument of a functor (e.g., a verb) is represented as the daughter which unifies semantically with a member of the valence set of its sister, the functor. While some implementations of unification-based Construction Grammar, e.g., Kay and Fillmore 1999 (as described in fn. 1), equate any failure of unification with ill formedness, I assume a coercion mechanism whereby constructional requirements (e.g., semantic constraints upon the head daughter) ‘win out’ over lexical features when the lexical item and the construction upon which it is superimposed have different values for a given attribute. This accommodation mechanism is described in (8) as the Override Principle:

- (8) **The Override Principle.** If a lexical item is semantically incompatible with its syntactic context, the meaning of the lexical item conforms to the meaning of the structure in which it is embedded.

Under (8), coercion is a side effect of the ordinary semiotic function of grammatical markers rather than a special form of composition. In this respect, the construction-based model of coercion captures a generalization which models based on operator interpolation do not. Further, (8) targets a broader array of phenomena than do such models. Notice that the Override Principle refers to semantic incompatibility between a lexical item and its

syntactic context, rather than merely to the lack of conformity between a particular lexical item and a given grammatical formative, e.g., the indefinite article. In construction-based syntax, meaning-bearing grammatical units like the indefinite article and plural suffix are seen as the semantic heads of *partially lexically filled constructions*. This means that grammatical formatives are also grammatical constructions, and the Override Principle subsumes the classic cases of coercion. In addition, however, the Override Principle also explains the source of coercion effects which cannot plausibly be represented in terms of functor-argument relations. One such case, exemplified in (6), is that of argument-structure constructions. Another is that of constituent-building constructions. Two such constructions are the Verb Phrase construction and Subject-Predicate construction. These two constructions are exemplified in (9-10), respectively:

- (9) You have **apple** on your shirt.
 (10) **Apple** dries well.

In (9-10), the word *apple* denotes a mass type which it would not ordinarily denote. What is the source of that coerced interpretation? There is no determiner or modifier which calls for it. By the same token, neither the verbal sister of the nominal, *have*, in (9) nor the head of the VP *dries easily* in (10) could be said to coerce the mass interpretation: neither verb selects for a mass-type argument. Instead, implicit type-shifting occurs because a grammatical-function position is filled by a bare nominal. How does this work? The Verb Phrase Construction will be used to exemplify the procedure, the same observations will apply, *ceteris paribus*, to the Subject-Predicate construction.

The Verb Phrase construction captures the licensing relationship between a given verb and a nominal which expresses an internal argument of that verb (Fillmore et al. to appear: ch. 4). It licenses combinations containing a lexical head verb and one or more phrasal complements, whether these complements are arguments or adjuncts.³ The Verb Phrase construction captures the mechanism of lexical projection by providing that the valence set of the lexical verb is a subset (potentially a proper subset) of

³ The Verb Phrase label is taken literally: an intransitive verb like *disappear*, would, in the absence of adjuncts, simply unify directly with the Subject-Predicate construction, as in (a), rather than representing both a lexical verb and a verb phrase, as required by traditional X'-based models:

- (a) The problem disappeared.

the valence value of the Verb Phrase construction. The Verb Phrase construction requires that all sisters of the head verb represent *maximal* categories.⁴ Maximal nouns are those which refer, in the sense of introducing existentially quantified or anaphorically linked variables into semantic representation. Since maximality is a lexical feature, a noun will be marked for one of three maximality values in the lexicon, depending upon lexical class. If a lexical noun is to unify directly with the Verb Phrase construction, it must either bear the lexical feature [+maximal] (as does a pronoun) or have no value for the maximality feature. The only lexical nouns which are unmarked for maximality are those which denote mass types (Fillmore et al. to appear: ch. 2). As a result, a lexical noun can combine directly with the Verb Phrase construction only if it designates an unbounded (mass) type. Since the noun *apple* designates a bounded type, it must shift its designation in order to unify with the Verb Phrase construction, as in (9). Thus, the mass interpretation in (9) involves the resolution of conflict between the meaning of a word and the meaning of a syntactic pattern. This conflict is resolved in favor of the meaning of the construction, as per the Override Principle. It is the construction, rather than the semantic valence of a particular functor, which instructs the interpreter to construct a mass interpretation for the noun *apple* in (9).

Any model which extends to template-based or, equivalently, functor-free coercion will *a fortiori* provide a mechanism for representing those syntactic sisterhood relations which map isomorphically to functor-argument relations. Binary-branching constructions which feature such isomorphic structure provide particularly clear illustrations of both implicit and explicit type-shifting. We will now focus on two such examples drawn from nominal syntax: the Indefinite Determination construction and the Plural construction. In (11-12), we see two pairs of nominal constructs; each pair illustrates one of the two respective constructions. The (a) construct illustrates instantiation of constructional meaning while the (b) construct illustrates implicit type-shifting:

The maximality-based model in CG targets the same combinatory constraint that X-bar syntax captures by requiring that sisters to lexical heads be phrases. However, while the term maximality suggests a model based upon phrasehood, being maximal is not equivalent to being a phrase. The maximal word *water* in *She drank water* is not 'both' a noun and a noun phrase. The syntactic context plays no role in determining whether the nominal *water* is more appropriately categorized as a phrase or as a bare noun. It is always merely a noun, whether it receives the value [max+], via unification with the VP construction, or the value [max-], via unification with the Definite Determination construction. See Kay and Fillmore (1999:10) for discussion.

- (11) **Indefinite Determination**
 - a. She read **a book**. (lexical match)
 - b. Did you eat **a pudding**? (lexical mismatch)

- (12) **Plural**
 - a. She bought some **pencils**. (lexical match)
 - b. They serve delicious **soups**. (lexical mismatch)

The Indefinite Determination construction is shown in Figure 1. In this construction, the indefinite article *a* has a valence requirement calling for a noun with specific values for the attributes *boundedness*, *configuration* and *number*. These values are required to match those of the nominal sister. The nominal sister is the syntactic head, but its semantic type is restricted by its sister. The construct *a book* in (11a) transparently reflects the semantics of the construction: the input lexical item shares semantic feature values with the right daughter of the construction. By contrast, the construct *a pudding* in (11b) is an instance of implicit type-shifting: the noun *pudding* denotes a mass entity and therefore fails to unify with the construction’s right daughter, a ‘slot’ calling for a singular count nominal. In accordance with the Override Principle, the relevant feature values of the input noun will switch to those required by the construction. This means that mass nouns like *pudding* will receive the value [count+] in combination with the Indefinite Determination construction.

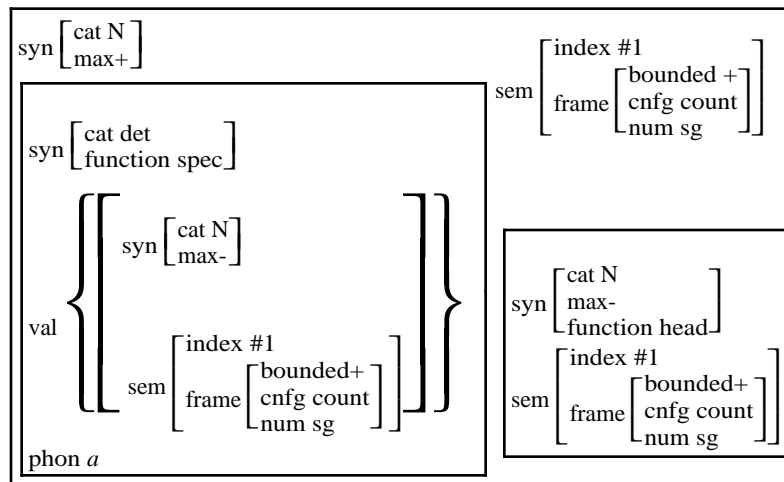


Figure 1. The Indefinite Determination construction

The Plural construction is shown in Figure 2. Like Indefinite Determination, the Plural construction is binary branching. And like the indefinite article, the plural suffix has a valence requirement which calls for a nominal sister having particular values for the attributes boundedness, configuration and number. The nominal sister shows these same values. However, there is no case in which the input lexical item and the construction itself will share all values for the relevant *sem* features. (By *relevant* here I mean the set of *sem* features which excludes the referential index.) The Plural construction SHIFTS the boundedness value of the input noun to [bounded-], producing forms like *soups* in (12b). Unlike the Indefinite Determination construction, the Plural construction performs two kinds of type shifts—one to which it is dedicated (an explicit type-shift) and one which is a side effect of its dedicated function (an implicit type-shift).⁵

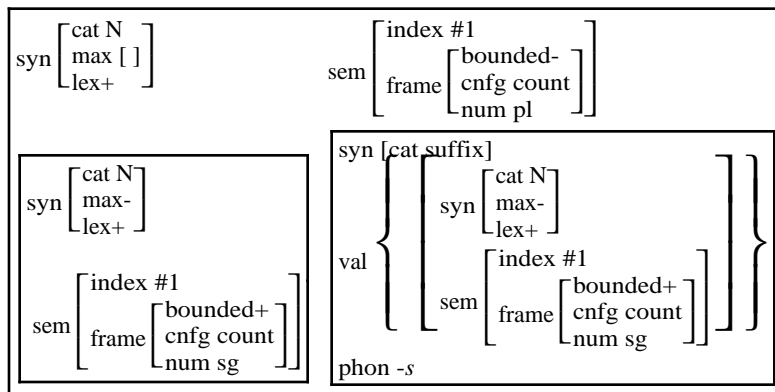


Figure 2. The Plural construction

⁵ Notice that by modeling inflectional morphology as syntactic combination, we potentially incur violations of the principle of lexical integrity, as discussed by Bresnan and Mchombo 1995. This principle states that elements of morphological structure are not subject to syntactic processes, e.g., recursion. Thus, the Plural suffix cannot be paired with a coordinate nominal head, although nothing in the representation in Figure 2 would seem to prevent this. While I leave open the question of how constructions like Plural might be brought into line with lexical integrity, I maintain that its both appropriate and parsimonious to represent inflectional morphology by means of constructions, since the combinatory constraints violated in words like *soups* are isomorphic to those violated in syntactic constructs like (11b).

As we have seen, two distinct types of type shifts are performed by nominal constructions. Definitions of the two types of shifts are given in (13-14):

- (13) **Explicit type-shifting.** A shift in the designation of a lexical item (or its projection) by a grammatical construction with which that lexical expression is conventionally combined.
- (14) **Implicit type-shifting.** A shift in the designation of a lexical item (or its projection) in order to reconcile semantic conflict between word and construction, as per (8).

How are these two functions allocated among constructions? Constructions which inherently perform type shifts differ from those which do not inherently do so. We capture this difference by drawing a distinction between *concord constructions* and *shift constructions*. These two classes are defined in (15-16):

- (15) **Concord construction.** A construction which denotes the same kind of entity or event as the lexical expression with which it is combined. In the case of branching constructions, the construction and its lexical daughter have the same values for the relevant semantic features. **Examples:** Indefinite Determination, *some*-determination.
- (16) **Shift construction.** A construction which denotes a different kind of entity or event from the lexical expression with which it is combined. In the case of branching constructions, the construction and its lexical daughter have different values for the relevant semantic features. **Examples:** Partitive, Plural.

While the Plural is a shift construction, it has something crucial in common with concord constructions like Indefinite Determination: it requires semantic agreement between its two daughters with regard to the boundedness, configuration, and number attributes. When the input noun does not match the semantic feature values requested by the Plural suffix, the result is coercion. As per the Override Principle, conflict is resolved in favor of grammatical meaning. Table 1 compares the two types of constructions:

Implicit type-shifting	Explicit type-shifting
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Concord	Yes (via (8))	No
Shift	Yes (via (8))	Yes

Table 1. Comparison of the two types of constructions

Table 1 shows that the two types overlap in function, since both types perform implicit type-shifting. Why should this overlap exist? In the case of functor-argument relations, whose constructional analog is syntactic sisterhood, the basis of this overlap is easy to see. Both concord and shift constructions have unification requirements involving semantic agreement between daughters. Since the Override Principle, as a constraint on conflict resolution, is potentially operative wherever sisters constrain one another semantically, the principle necessarily applies to shift constructions as well.

3 Argument-Structure Constructions

Another type of licensing relationship which is mediated by a construction within the Construction Grammar framework is the relationship between a verb and the thematic roles which that verb assigns. The relevant constructions are the argument-structure constructions, as described by Goldberg (1995) and discussed in section 1 above. These constructions are the source of mismatches between the event type denoted by the head verb and the event type denoted by the sentence. An example of such a mismatch is given in (17):

- (17) It worked, sir! We bored them right out of the game. (Marcie, *Peanuts* 10/97)

In (17), the verb *bore*, which is otherwise a bivalent verb licensing stimulus and experiencer roles, assigns an agent, a theme, and a goal. As a result, the sentence has a construal in which boring people is the means by which they are propelled in a particular direction. Under Goldberg's model, this meaning results from the combination of the verb *bore* with an argument-structure construction which denotes causation of a change of state. The valence set licensed by this construction properly includes the valence set licensed by the verb. The combination of verb and construction results in augmentation of the verbal valence. It also results in reconstrual of the verb's arguments according to the Semantic Coherence Principle: compatible thematic roles in the respective valence sets contributed by verb and construction are fused; the nonfused thematic roles are those contributed exclusively by the construction (Goldberg 1995: 50-51). Only once we

assume that linking patterns denote event types can we speak of such patterns as assigning thematic roles above and beyond those contributed by the verb.

While we have focused on mismatches like (17) in motivating Goldberg's theory, *instances* play a crucial role as well. Instances are clauses in which the projection properties of the verb and of the construction are identical. Example (18) illustrates the instance relation between verb and construction:

(18) She put them outside.

The argument structure projected by *put* is identical to that of the Caused-Motion construction. The fact that instances exist suggests that cases of verb-construction valency mismatch like (14) are appropriately treated as cases of coercion. This in turn suggests the appropriateness of an analogy between argument-structure constructions and functors like the indefinite article—an analogy which Goldberg exploits when she identifies constructions with closed-class expressions (pp. 39-43). The fact that argument-structure patterns create coerced interpretations is relevant for our purposes because it provides further evidence that the Override Principle is best stated in terms of word-construction interactions, rather than functor-argument relations alone. There is no functor that can plausibly be seen as the trigger of coercion in the case of (18). Instead, the modulation of meaning is the result of the verb's conformity to a linking pattern.

Formally, these linking patterns are verb-level constructions which are 'superimposed' upon the lexical entries of verbs. This unification has the effect of augmenting what Fillmore et al. (to appear) refer to as the *minimal valence* of the verb (the repertoire of semantic roles licensed by the verb). When a verb's lexical entry unifies with one or more linking constructions the result is a *fully specified* verbal valence, in which each semantic role of the verb is assigned a grammatical function. Crucially, as we have seen, the theta frame licensed by the construction may properly include that licensed by the verb. Figure 3 combines compatible proposals of Fillmore et al. (to appear: ch. 8) and Goldberg (1995: ch. 7):

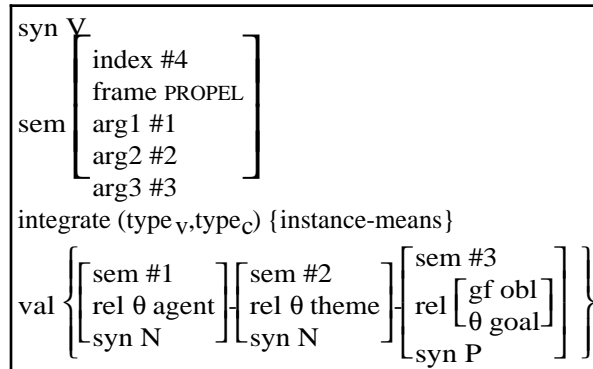


Figure 3. The Caused-Motion construction

As shown in Figure 3, the Caused-Motion construction specifies only one argument linking: the thematic role of *goal* is linked to an oblique grammatical function. The linking of the remaining arguments depends upon whether this construction unifies with the Passive construction or the Active construction. These two linking constructions are mutually incompatible. The Passive construction requires that the highest-ranking thematic role be linked to an oblique grammatical function. The Active construction requires that a nondistinguished argument (i.e., non highest-ranking argument) be linked to the Object grammatical function. In either case, the highest-ranking unlinked role will receive the Subject grammatical function, which must be assigned to one argument, as per the Subject Principle (Fillmore et al. to appear: ch. 8). What is relevant for our purposes here is the attribute *integrate*, whose value is the set of verb-construction integration relations licensed by the construction. As described by Goldberg (1995: ch. 7), the Caused-Motion construction permits both *instance* and *means* relations. The particular relation selected is determined by the verb itself. As mentioned, verbs which are instances of the construction's semantics, e.g., *put* in the case of the Caused-Motion construction, license a theta frame identical to that of the construction. Verbs which have a means relation to the construction license a valence set which is properly included by the construction's valence set. This is the case in (17). We view (17) as a case of coercion simply because the Caused-Motion construction, like Indefinite Determination, can and typically does merely exhibit semantic concord with the open-class element which combines with it. In (17), concord is 'forced', via the Override Principle, as is the count reading of the noun *pudding* in the nominal construct *a pudding*. Concord, or the achievement of concord, involves valence matching in the

case of argument structure. This means that we must recognize concord requirements as facts about grammatical patterns, not merely functors. However, while we will view coercion effects through the lens of the constructional framework, we must also keep in mind that many such effects can also be seen as involving the resolution of conflict between the requirements of a given functor and the particular argument with which that functor is paired.

Argument structure also demonstrates the constructional basis of explicit type-shifting. The *Way*-construction, described in detail by Levin and Rapoport (1988), Jackendoff (1990), Goldberg (1995) and Israel (1996), *inter alia*, provides an example of explicit type-shifting involving the augmentation of verbal valency. Examples of this construction are given in (19-20), with the coerced verbs shown in boldface:

- (19) She **talked** her way into the shareholders' meeting.
- (20) [A]nyone who has ever had the occasion to observe the average American family as they **snack** their way toward the departure gate[...] (Fran Lebowitz, *Vanity Fair* 10/97)

The meaning of the *Way*-construction, as described by the aforementioned authors, involves the motion of an agent creating a path by means of some activity or in a particular manner—in the case of (19-20), talking and snacking, respectively. The construction's head, an intransitive verb, denotes an activity which does not involve directed motion (e.g., neither talking nor snacking involve directed motion). The event denoted by the construction is an act of locomotion along a path. There is no verb which licenses a theta frame identical to that of the *Way*-construction. In fact, verbs which *do* denote directed motion inherently are not welcomed by the construction, as shown in (21-22):

- (21) ??He walked his way into the meeting.
- (21) ??She ran her way along the shore.

These facts suggest that the *Way*-construction is inherently a type-shifting device, since the event type denoted by the construction is always distinct from that denoted by the verb with which the construction combines. Figure 4 gives a representation of the *Way*-construction which reflects its role as a type-shifting device: the set of verb-construction integration relations does not include the instance relation:

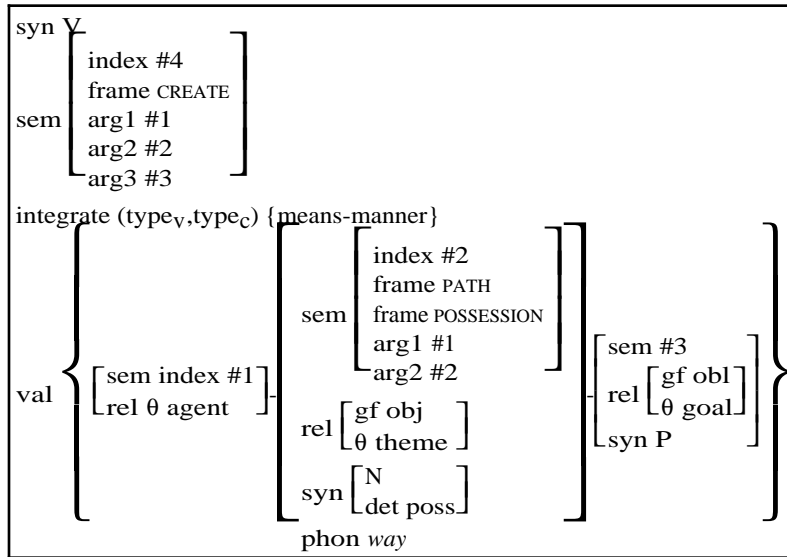


Figure 4. The *Way*-construction

We will see below that constructions which perform explicit type-shifting can perform this function in a quasi-iconic fashion. These constructions are generally phrasal: the phrase contains a head and a complement denoting distinct semantic types. The head determines the type denoted by the construction. The Progressive construction, as we will see, conforms to this description. However, our examination of the *Way*-construction has shown that explicit type-shifting via construction does not require the existence of a sisterhood relation. Explicit type-shifting entails only that the construction denotes a type distinct from that denoted by the lexical (open-class) expression with which the construction combines. As a shift construction, the *Way*-construction imposes aspectual constraints upon input verbs, and, as predicted by the Override Principle, it therefore also triggers coercion effects. Since the verb which combines with the construction is necessarily construed as an activity, verbs which do not otherwise have processual readings receive such readings in the context of the construction. Examples of implicit type-shifting involving the *Way*-construction are given in (23-24):

- (23) She blinked her way into the light.
 (24) He dove his way into the hearts of millions of viewers (??with a single dive).

While *blink* and *dive* have momentaneous (semelfactive or achievement) readings under ordinary circumstances, they are interpreted as iterated events in the context of the *Way*-construction: the subject-denotatum in (23) is necessarily construed as having blinked numerous times; the subject-denotatum in (24) is necessarily understood as having performed a series of dives. Such iterated events, or event chains, qualify as activities, as I will argue in section 4.1 below. Since the construction requires that the input verb denote the means or manner of directed motion, rather than directed motion itself, verbs which inherently denote directed motion are not welcomed (see (18-19)). However, as Goldberg observes (1995:205), verbs of directed motion are permitted in contexts in which “a basic-level motion verb is understood to imply motion despite difficulty”:

- (25) The novice skier walked her way down the ski slope.
 (=Goldberg’s (22a))

The explanation which I offer for the relative felicity of (25) is compatible with Goldberg’s, but requires a further assumption about the construal of *walk*: it does not denote a verb of directed motion. In essence, the *Way*-construction is here stripping the verb *walk* of its directed-motion component, so that the addition of the directed-motion component by the *construction* makes sense. We will see this same combination of semantic theft and reimbursement in the case of Progressive-form statives.

Argument-structure constructions do not merely augment verbal valence but may create it as well, and in this latter respect these constructions are important drivers of functional shift. For example, as Michaelis and Ruppenhofer (2001) observe, the German applicative (or *be*-prefix) construction combines not only with verbs also with nouns and adjectives, and in the latter case licenses constructs with no fused arguments. An attested example of valence creation involving the German construction is given in (26):

- (26) Es mag ja lustig sein, zwei hartgekochte Eier wie Clownsköpfe mit angekeimten Sojabohnen zu **behaaren** und sie auf Gurkenscheiben zu stellen, ihnen mit zwei Tomatenstreifen Münder zu verpassen und Auglein aus Sojasprossen einzudrücken

“OK, it might be funny to **hair** two hard-boiled eggs like clown’s heads with soy sprouts, to stand them up on cucumber slices, to give them tomato-strip mouths, and to impress soy shoots on them as little eyes.” (= (3) Michaelis and Ruppenhofer 2001)

In (26), a trivalent applicative predication, the base form is the noun *Haar* (‘hair’). This noun does not have argument structure, and it has no verbal counterpart outside of the applicative construction; there is no transfer verb **haaren* (‘hair’). The applicative predication in (26) denotes a transfer event of the type denoted by trivalent applicative verbs like *laden* (‘load’), and yet the transfer implication cannot be attributed to the semantics of the base form, which in this case is not even a verb, let alone a transfer verb. For Michaelis and Ruppenhofer, (26) is licensed by two unifying linking constructions: the Applicative construction and the Oblique Theme construction. Figure 5 shows a slightly modified version of the Applicative construction proposed by Michaelis and Ruppenhofer (2001):

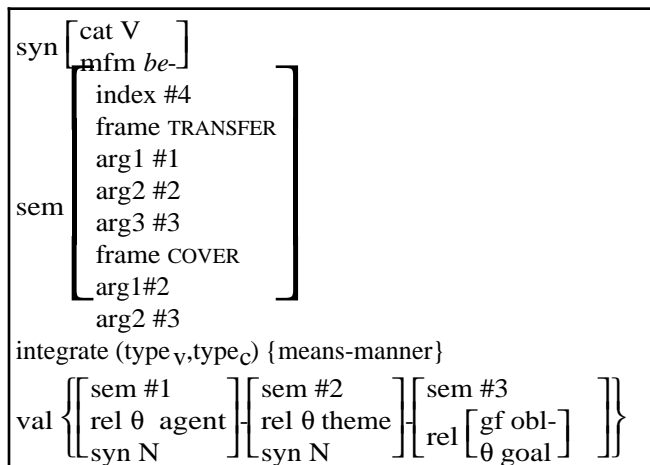


Figure 5. The Applicative construction

Like the Caused Motion construction, the Applicative construction, as depicted in Figure 5, is a concord construction which denotes an event of transfer. This construction does not license all Applicative predications in German, because many such predications are bivalent and do not partake of transfer semantics. An attested example of a bivalent Applicative predication is given in (27):

- (27) SELBSTKLIMMER = Kletterpflanzen, die mit speziellen Haftorganen Wände oder andere Flächen direkt **bewachsen** [...].

“Self-climbers = climbing plants that directly be-grow walls or other surfaces with the help of special adhesive/sticky extremities.” (= (6) Michaelis and Ruppenhofer 2001)

The bivalent Applicative construction is not of the appropriate aspectual type to be augmented up to a trivalent representation: bivalent Applicative predications do not necessarily denote states. For example, (27) is an accomplishment predication, and therefore cannot unify with the stative frame *cover* invoked by the trivalent Applicative construction in Figure 5. For this reason, Michaelis and Ruppenhofer regard the Applicative construction as having two instantiations, trivalent and bivalent. Because the former denotes a transfer event, it unifies with the Oblique Theme construction, represented in Figure 6. This construction allows for either oblique or null expression of the theme argument. The significance of this is that in cases of coercion like (26), where the form class of the noun is shifted in accordance with the Override Principle, the source noun is not analyzed as ‘denoting’ the theme. Such an analysis would make little sense: because the nominal *Haar* is a nonreferential expression in this context it cannot denote an argument. Instead, we assume that the evocation (by means of the verb) of the type denoted by the source nominal may in itself be sufficient to enable recovery of the type of the theme argument, making the theme argument potentially omissible. In (26), the type of the theme, soy sprouts, is not predictable from invocation of the type *Haar*, and the theme argument is accordingly expressed by means of a preposition phrase headed by *mit*, ‘with’.

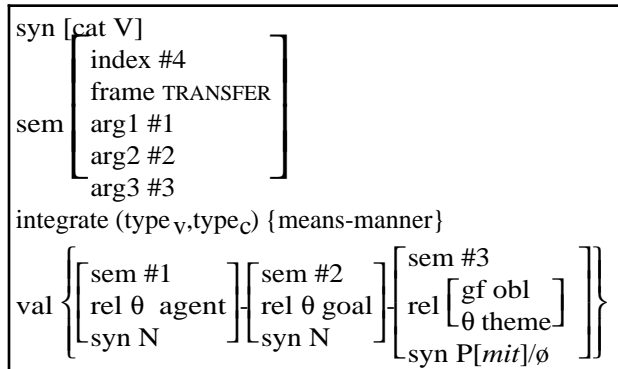


Figure 6. The Oblique Theme construction

It is worth noting that neither valence augmentation nor form-class shift have previously been described under the rubric of coercion effects, perhaps due to their being nonprototypical type shifts: the coercion effects triggered by argument-structure templates cannot be described by functional application, nor by its formal analog, binary branching syntax. However, as argued by Goldberg (1995), argument-structure constructions have meanings analogous to those of grammatical markers, and this would lead us to minimize the differences between functor-based and templatic coercion. In fact, as we have seen, argument-structure constructions behave in conflict conditions just as predicted by the Override Principle: only the input type (the lexical expression), and not the output type (the construction's denotatum), is altered in the resolution of a type mismatch.

4 Aspectual Constructions

4.1. Aspectual meaning

Theories of aspectual meaning appear to abound in large measure because there is no clear consensus concerning either what the semantically relevant categories are or what these categories are categories *of*. It would appear, however, that much of this confusion has arisen from the failure of theorists to distinguish between the CODING of aspectual categories, as by verbs, and the INVOCATION of aspectual categories, as by constructions. For example, the perfective and imperfective Past constructions of Romance are frequently referred to as exponents of 'grammatical aspect'. If these constructions were in fact exemplars of grammatical aspect, their very existence would

undermine a fundamental principle of aspectual theory—that aspect and tense make distinct contributions to clausal semantics—since each of the two relevant constructions entails a (past) tense relation. In fact, as De Swart (1998) has argued, such constructions are not aspect markers at all, but are instead aspectually sensitive TENSE operators. Once coding and invocation functions are distinguished, the rationale for a division between grammatical and lexical aspect (*Aktionsart*) becomes less apparent. According to this traditional division, verbs and verbal projections express ontological distinctions, e.g., the event-state distinction, while grammatical markers express viewpoint-based distinctions, e.g., the perfective-imperfective distinction. For example, Smith (1997:73) analyzes imperfective marking as the means by which a speaker “presents part of a situation, with no information about its endpoints”. This type of account is intuitive in that it is based upon a visual metaphor: the grammatical aspects are lenses of various powers through which speakers view the event schemas denoted by verbs. It is difficult, however, to extend this model to other conceptual domains. If we were to say, for example, that the speaker who pairs a mass noun with an indefinite article is ‘attending to the boundaries of the substance’, we would miss a generalization: this speaker is presenting a mass as an individuated entity by using the syntactic structure otherwise projected by count nouns. By the same token, the speaker who combines a state verb with the morphosyntax typically projected by an event verb is presenting that state as an instance of the event category.

If aspectual encoding is a form of categorization, it is reasonable to conclude that the ontological distinctions which figure in *Aktionsart*-based categorization underlie semantic representation at both the lexical and constructional levels. Constructions, as we have seen, both denote and evoke event types. The invoked event type may or may not be identical to the type denoted by the invoking construction. Invoked and denoted event types are identical in the case of concord constructions and distinct in the case of shift constructions. While only constructions evoke, both words and constructions denote. Therefore it stands to reason that aspectual meaning, whether expressed by a construction or a verb, should be represented in the same way.

If *Aktionsart* classification is to provide a unified aspectual semantics, then it must provide an inventory of types sufficient to describe all of the mappings involved in explicit and implicit aspectual type shifts. This system of representation must capture the fact that, for example, activities pattern with states for some grammatical purposes and with telic events for others. Thus, the inventory of *Aktionsart* types must be taxonomically organized. The primary ontological division in this taxonomy has an

epistemological basis: states are those situations whose existence can be verified on the basis of a momentaneous ‘sample’, while event verification requires tracking over time. Let us illustrate this criterion by application to the least prototypical class of events—activities. As described by Langacker (1987, 1991), activities are those situations which either involve repeated type-identical subevents (heterogeneous activities) or are conventionally construed as episodes (homogeneous activities). Verification of a heterogeneous activity, e.g., running, requires several frames. Since running consists of successive leaps involving alternating legs, witnessing a single leap is insufficient to verify an event of running. Verification of a homogeneous activity, e.g., holding a broom, standing in a corner or sleeping, requires access to points of inception and termination, as well as several contiguous frames between those endpoints. Sleeping is distinct both from being comatose and from nodding off for a second, and staying at one’s sister’s house is distinct both from popping in on one’s sister and living with her. While states like being tall endure in the same way that the events of sleeping and standing in a corner do, states do not take time: any subinterval of a state counts as an instance of that same state. The existence of a state can thus be confirmed on the basis of an atemporal sample. The same cannot be said of a *state phase*.⁶ Examples of state-phase predications are given in (28a-b):

- (28) a. She was sick for three days.
 b. She was short as a child

Once the duration of a state is fixed, as in (28a-b), it is ‘tracked’ in the same manner that an activity would be. Unlike activities, however, state phases do not entail energy input. For example, one can try to sleep or lie on the floor, but one cannot try to be sick for three days or to be short as a child. The epistemic criterion described here is highly compatible with the picture of the event-state distinction which emerges in the viewpoint-based models of grammatical aspect discussed above: perfective aspect involves ‘endpoint focus’ because the assertion that an event exists entails confirmation that

⁶ The category of state phase should not be confused with that of stage-level predications, as described by Partee (1991), *inter alia*. Stage-level predications denote temporary states like being on sale, on fire or angry. Stage-level predications, unlike state phases, have stative syntactic and interpretive behaviors, e.g., they are reportable by means of the simple Present in English (e.g., *Tomatoes are on sale*) and interpretable as including a past reference time, as in (a):

- (a) When I got to the supermarket, all the tomatoes were on sale.

this event has begun or ceased, or both. Under the assumption that grammatical aspect and Aktionsart have uniform semantic representations, we expect that categories at the two levels will have such isomorphic characterizations. Figure 7 gives a hierarchical representation of the Aktionsart classes:

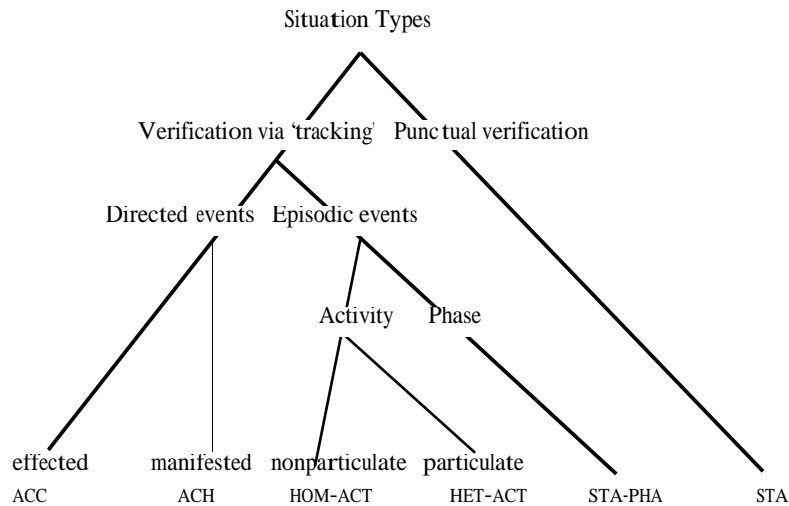


Figure 7. Hierarchical structure for the Aktionsart classes

In Figure 7, situations are divided into those which take place over time (events) and those which hold at a given point in time, (states). Within the class of events, a division is made between those events which culminate in a specific resultant state (directed events) and those which do not (episodic events). The class of directed events is divided into accomplishments (ACH), effected changes of state, which involve a preparatory process, and achievements (ACH). Achievements are state changes which come about rather than being brought about (Dowty 1986, Van Valin and LaPolla 1997). Within the class of episodic events, we distinguish between activities and phases. The label *activity* is used to refer to the class of actions which occur over a period of time but do not culminate (Binnick 1991:142-143). This category includes both internally homogeneous activities (HOM-ACT) and activities which comprise iterated subevents (HET-ACT). The category of phase includes nondynamic situations which nonetheless have duration. This category has a single member, that of state phases (STA-PHA). Because state phases begin and end within the reference interval, they can be assigned an

explicit duration, as in (28a). In contrast to states, state phases have perfective behavioral properties. For example, they can be enumerated, as shown in (29a), and they cannot be reported by means of the simple Present tense, as shown in (29b). Like states, however, state phases require no energy expenditure for their maintenance:

- (29) a. Anna was ill for two weeks twice
 b. *Anna is ill for two hours.

Situation types are both conceptual gestalts and topological structures. Aspectual topology underlies space-time analogies that are widely used in aspectual theory, in which states count as masses and events as individuals based on criteria like enumerability and internal composition (Mourelatos 1978). Gestalt-based situation-type categorizations describe the relationship of the situation type in question to a causative prototype (Smith 1997, Croft 1998). They are fundamental to aspectually based theories of argument linking. It therefore makes sense that both causal and temporal representations matter in aspectual type shifts. In the next three subsections, I will describe these two representational systems and two mapping operations, permutation and concatenation, which mediate between input and output representations.

4.1.1. Causal representation

Rappaport Hovav and Levin (1998), henceforth RHL, capture the distinction between aspectual and frame-specific features of verb meaning by proposing a set of fixed event-structure templates with which verbs can combine. Verbs ‘fill in’ information represented by constants; the type of the constant determines the information that the verb must provide. Table 2 presents an adaptation of RHL’s inventory of event-structure templates.

Aktionsart Class	Causal Representation
State	[x <STATE>] e.g., <i>seem</i>
State phase	[HOLD [x <STATE>]] e.g., <i>prefer white wine once</i>
Homogeneous activity	[x HOLD [x <STATE>]] e.g., <i>sleep</i>
Heterogeneous activity	[x REPEAT [x <EVENT>]] e.g., <i>skip</i>
Achievement	[BECOME [x <STATE>]] e.g., <i>sink</i>
Accomplishment	[[[x REPEAT [x <EVENT>]] CAUSE [BECOME [y <STATE>]]] e.g., <i>build</i>

Table 2. Causal representation (based on Rappaport Hovav and Levin 1998)

In these templates, operators (shown in small caps) represent subevent connectives in the Jackendoff-Dowty-Vendler tradition, while variables represent participant roles. Constants are represented by the capitalized material in angled brackets. I have augmented the RHL inventory of event templates in order to represent Aktionsart classes and event properties which, while having no direct relevance to verbal argument structure, figure prominently in aspectual type-shifts. The class of state phases has been added and the class of processes split into two classes: homogeneous and heterogeneous activities. The state-phase template, as shown, contains the operator HOLD. This operator combines with a stative situation type to yield a state which begins and ends within the reference interval. The homogeneous-activity template, as shown, also contains the operator HOLD. In this template, however, HOLD takes two arguments: a state radical and an effector. The effector argument is also an argument of the state radical; this notation reflects the fact that the subject-denotatum, although nonagentive, is responsible for the maintenance of the denoted state. The template for heterogeneous activities contains the operator REPEAT. This operator has the same valence and ‘control’ properties which HOLD has in the homogeneous-activity template. The use of the *repeat* operator captures the observation that heterogeneous activities, e.g., *skip*, consist of iterated type-identical events. Since a heterogeneous activity is itself an event, a heterogeneous activity may replace the event variable in the heterogeneous-activity template. The resulting event is an event chain, or, equivalently, a heterogeneous activity. As in RHL’s original model, the achievement template properly includes the state template, while the accomplishment

template contains the templates for activities, achievements and states, respectively.

4.1.2. Temporal representation

Temporal representations capture the patterns of stasis and change which characterize each situation type. They do not, for example, express causal links between contiguous situations or agentive implications attaching to certain participants. Table 3 gives temporal representations for the six Aktionsart classes discussed above:

Aktionsart Class	Temporal Representation
State	ϕ
State phase	$\tau \phi \tau$
Homogeneous activity	$\tau \phi \tau$
Heterogeneous activity	$\tau \phi [\tau \phi]^+ \tau$
Achievement	$\tau \phi$
Accomplishment	$\kappa \tau \phi$

Table 3. Temporal representation (based on Bickel 1997)

These representations utilize three situation-type components: *states* (ϕ), *transitions* (τ), and *event chains* (κ). States are internally homogeneous situations which include no transitions (i.e., temporal boundaries). For this reason, we say that states *include* the intervals at which they hold (Partee 1984, Herweg 1991). Transitions are state-change events, and as such are isomorphic to achievements. However, the category of transitions is not limited to those inchoative events which are lexicalized as achievement verbs, since it also includes the events of *inception* and *cessation*, which jointly define the endpoints of a situation. For example, the endpoints of sleeping, a homogeneous activity, are, respectively, the events of falling asleep and waking up. Unlike states, transitions cannot stand alone, nor can they be iterated without the mediation of a state. Accordingly, the representations $*[\tau]$ and $*[\tau \tau]$ are ill formed (Bickel 1997:126). By contrast, the representation $[\tau \phi \tau]$ is well formed; it corresponds to both a state

phase and a homogeneous activity (recall that agentive properties are invisible to temporal representation).

When the representation $[\tau \phi \tau]$ is iterated it corresponds to an event chain or heterogeneous activity (κ). The representation corresponding to heterogeneous activities contains the notation $[\tau \phi]^+$, denoting one or more instances of particular state change, e.g., that of crossing from one side of the room to another in an event of pacing. While both heterogeneous activities and homogeneous activities can be protracted indefinitely, the mechanisms are different in each case. In the former case, expansion entails iteration, while in the latter case expansion simply entails lack of change. Notice, however, that in neither case does expansion have any effect upon bounding: the initial and final transitions are present whatever intervenes between them. When a heterogeneous activity is embedded in an accomplishment representation, shown in Table 2 as $[\kappa \tau \phi]$, its offset transition is superimposed upon the initial transition of the embedded achievement, $[\tau \phi]$. This reflects the observation that, for example, in an event of walking home, the threshold-crossing transition is also the final step of the walk.

The constraint which rules out sequences of the form $*[\tau]$ and $*[\tau \tau]$ need not be stipulated, since one cannot logically conceive of an inchoative event which is unaccompanied by a resultant state. Notice, however, that in the temporal representations given in Table 2 resultant states are not consistently indicated. In particular, states which follow events of termination are missing from the representations. These states are not indicated because they can be ‘read in’ on the assumption that transitions are isomorphic to achievements. Notice, however, that *antecedent* states are equally crucial to the definition of transition, and our temporal representations lack these as well. Let us assume, therefore, that antecedent states and consequent states—as well as periods of stasis which lie BETWEEN chained events—can be subsumed under the rubric of RESTS. The term *rest* is meant to be construed as it is in rhythmic representation: a pause between ‘beats’, or transitions. While in the foregoing remarks I have distinguished intermediate states from antecedent and consequent states, this distinction is not particularly meaningful: because events are located with respect to one another on a time line, all events potentially qualify as chained events and all states can be construed as intermediate states. This point will become particularly relevant when we consider chained events which represent habitual and generic situations.

4.1.3. Aspectual mapping

Rather than being suppletive relations, aspectual mappings are based on shared structure. That is, all aspectual mappings are subject to a principle which I will refer to as Aktionsart Preservation. This principle is described in (30):

- (30) **Aktionsart Preservation.** In an aspectual mapping, whether implicit or explicit, input and output types must share some portion of their respective causal and/or temporal representations.

Aktionsart Preservation governs two kinds of operations upon Aktionsart structure: *permutation* and *concatenation*. Permutation operations add or select a single component of the input Aktionsart representation.⁷ The definition of component differs according to whether we are using causal or temporal representation. In causal representation, a component corresponds to an operator, e.g., *hold*, and the arguments it projects. In temporal representation, a component corresponds to a state, transition or event chain. As an example of addition, consider the transition from state to achievement. This type shift occurs implicitly when, for example, a frame adverbial is combined with a state radical, as in (7a), repeated here as (31):

- (31) She liked him in a minute.

This type shift involves the addition of the operator BECOME, or, equivalently, a transition, to the causal or temporal representation of the state.⁸ As an example of selection consider the explicit type shift performed by the copular resultative construction in English:

⁷ The augmentation operation is based upon RHL's rule of semantic derivation, called *template augmentation*. They describe this operation as follows: "Event structure templates may be freely augmented up to other possible templates in the basic inventory of event structure templates" (p. 111). The added structures are the subevents represented by operators, e.g., BECOME. Like the aspectual mappings proposed here, template augmentation involves the unification of Aktionsart representations. Through template augmentation, an event-structure template, e.g., the heterogeneous-activity template, projects that event-structure representation by which it is entailed—the accomplishment template. Template augmentation thereby drives verbal valence augmentation at the syntactic level. For example, the verb *sweep* has both a monovalent activity pattern (*She swept for hours*) and a trivalent accomplishment pattern, in which it denotes causation of motion (*She swept the dust off the steps*); the accomplishment template licenses both the direct object and locative oblique. RHL's account differs from the present one in its exclusive reliance on augmentation; for RHL, valence-affecting derivations do not include reduction or selection operations.

⁸ The mapping which shifts states to state phases, while unproblematic at the level of causal structure, presents a problem for temporal representation. At the level of causal structure this

- (32) a. The truck is loaded.
 b. The soup is cooled.

The resultant-state predications in (32a-b) denote states, or more specifically those states which are embedded in the Aktionsart representations of their participial complements. These states are, respectively, that of the truck being full and that of the soup being cool. The stative type shift performed by the resultative construction involves selection of the state component in the causal or temporal representation of the lexical verb. Since both the accomplishment verb *load* and the achievement verb *cool* entail a resultant state, the application of selection conforms to Aktionsart Preservation. Notice, however, that the type shift exemplified in (32a) is not incremental: states and accomplishments differ by more than a single component of Aktionsart representation, since the accomplishment entails two subevents (an activity and an achievement) which the state does not.

Occasionally, permutation operations appear to violate Aktionsart Preservation. These violations are in fact only apparent, since the relevant mappings are in fact mapping chains—ordered pairs of mappings, the first of which feeds the second. I will refer to these chained mappings as *indirect type shifts* since they involve the mediation of a third aspectual category. Indirect type shifts exist because semantic transitions, as equivalence relations, are transitive; that is, if A=B and B=C then it follows that A=C. Indirect type shifting will be invoked below in the analysis of the Progressive.

Like other mappings in the general class of repetition operations, concatenation applies to an event type (i.e., dynamic situation radicals), and outputs a series of events which are type identical both to one another and to the input event. In addition, like other iteration operations, concatenation is used to represent both implicit and explicit type shifting, e.g., coerced readings triggered by frequency adverbials, as in (33):

mapping involves the addition of the operator *hold*, a single component of causal representation. This mapping conforms to the constraint on minimal transitions. At the level of temporal representation, however, this mapping violates the constraint on minimal transitions, since it involves the addition of two components of temporal representation: the onset and offset transitions. Bickel (1997:124-126) solves this problem by assuming that the temporal representations of states include an onset transition. Under this assumption, the shift to an episodic reading involves only the addition of a single (terminal) transition. Since, however, this solution neutralizes the grammatically relevant distinction between state and achievement representations, I do not adopt it here.

- (33) She was depressed several times last year.

The difference between concatenation and its predecessor notions lies in the nature of the output type. While repetition operations are typically assumed to output state types, concatenation instead outputs an event chain, which, as discussed above, qualifies as a heterogeneous activity rather than a state. The identification of event chains with heterogeneous activities is an independently motivated one, since, as has been widely observed, telic verbs with multiplex complement denotata receive activity readings. Note, for example, the contrast between the sentence *She ate mushrooms*, which asserts an activity, and the sentence *She ate a mushroom*, which asserts an accomplishment. Further, as Smith observes (1997:51), the syntactic properties of habitual predications suggest that they are event predications: they can appear in imperatives, with agent-oriented adverbials like *deliberately*, and in pseudo-cleft constructions. The syntactic constructions in question do not in general appear capable of coercing perfective readings of stative predications: sentences like (34a-b) are awkward at best:

- (34) a. ??What she did was prefer white wine
 b. ??Prefer white wine!

Finally, by rejecting the assumption that repeated events are *ipso facto* stative, we resolve a longstanding paradox in the literature on generic aspect: situations which consist of multiple type-identical subevents, e.g., pacing, qualify as events rather than states; it is not obvious therefore why event radicals which otherwise qualify as unique events receive coerced repeated-event interpretations in morphosyntactic contexts which call for state radicals. Two such contexts are illustrated in (35):

- (35) a. She smokes.
 b. She smoked when I met her.

Habitual sentences appear to be recognized as such only on the basis of a mismatch between perfective verbal Aktionsart and the syntactic context in which that verb appears. For example, Bybee, Perkins and Pagliuca (1994), in attempting to motivate a grammatical category of present habitual sentences, observe that “the difference between habitual and present stative resides entirely in the lexical meaning of the predicate: the present habitual reading of dynamic predicates covers many different instances of the same situation, while the present stative covers one continuous situation” (p. 152). It therefore appears appropriate to conclude that habitual meaning is a

specific type of coercion effect, achieved by combining an event-chain radical with a state-sensitive construction. I therefore propose to treat habitual-event radicals and iterated-event radicals as indistinguishable at the level of Aktionsart structure: both qualify as heterogeneous activities. Accordingly, the concatenation operation takes us only part of the way toward a stative interpretation; it yields a heterogeneous activity. It is at this juncture that perfective and habitual meanings are compatible. The permutation operation of selection provides the ultimate bridge to stative meaning: since iterated events contain intermediate rests, and since such rests qualify as states, those type shifts which require stative input types (whether implicit or explicit) are free to select intermediate rests. In the next two sections, we will use the two Aktionsart-based operations of permutation and concatenation to analyze the type shifts performed by aspectual shift constructions and aspectual concord constructions.

4.2. Aspectual concord: The Frame Adverbial construction

The Frame Adverbial construction is represented in Figure 8. This construction is an adjunct-licensing construction as described by Kay and Fillmore (1999:11-12). Adjuncts and arguments are licensed in distinct ways in this model. While arguments are valence elements of the minimal lexical verb, adjuncts are contributed by particular constructions which unify with a lexical verb entry, augmenting the verbal valence. The result is a verb entry, rather than a branching structure. This flat representation appears justified in light of the fact that there is not strong evidence for the recursive branching V' structures that have traditionally been used in X-bar models to represent strings of adjuncts (see Napoli 1993: Chapter 4, Fillmore et al.: Chapter 1).⁹ In Figure 6, we see that the Frame Adverbial construction adds an

⁹ One traditionally cited argument for the existence of a recursive V' constituent is that without it there would be no way to capture the different-sized verbal constituents that the anaphor *do so* represents in the four continuations of (a) given in (b-e):

- (a) William played the trumpet softly with Steve in the attic on Thursday and
- (b) Pat did so angrily with Leslie in the basement on Tuesday.
- (c) Pat did so with Leslie in the basement on Tuesday.
- (d) Pat did so in the basement on Tuesday.
- (e) Pat did so on Tuesday.

In each of these sentences, the *do so* portion is something larger than a verb but smaller than a whole verb phrase. The problem with this line of argumentation is that the *do so* form must sometimes be construed as denoting a verbal constituent other than the one which it would be required to denote under the V' analysis. Notice, for example, sentence (f):

- (f) They cheated blatantly to win the door prize, but we did so in a subtle fashion.

adverbial expression to the valence set of the lexical verb. This valence set minimally contains one additional valence member, that element whose grammatical function is subject. The adverbial element (a preposition phrase headed by *in*) itself has a valence structure. The first member of the valence set is an event expression, whose semantic index is identical to that of the verb itself. The second valence member is an oblique expression denoting an interval. The semantic frame expressed by the adjunct is one in which event occurrences are counted. This construction is a concord construction. The construction denotes a telic event and the valence set of the adverbial element calls for an event of this same type. This construction is unlike Indefinite Determination, in that it is nonbranching: there are no boxes within it. Nonetheless, this construction projects a sisterhood relation and constrains this relation by means of an aspectual concord requirement, making it analogous to constructions like Indefinite Determination.

The adjunct which is added to the verbal valence is interpreted according to the logic of containment, as described in section 1. As discussed in that section, judgments of containment entail upward vis-à-vis intervals, and are therefore limited to those events which culminate within the relevant time frame. Therefore, frame adverbials select exclusively for those event radicals which denote or entail a change of state. As a result, examples like (36) represent contexts of coercion:

(36) My radio program ran in less than four minutes.

De Swart observes (1998:359) that examples like (36) allow both achievement and accomplishment readings. In (36), the frame adverbial *in less than four minutes* either denotes the running time of the program or the time during which the program began to air following some other event (say, a call to the radio station). These two readings involve distinct permutations of the input activity representation. Addition of an inchoative event to the causal structure of the input activity yields the accomplishment reading. The achievement reading, by contrast, results from selection: the event selected is the onset phase τ in the temporal representation of the input activity. The semantic representation of the construction is captured by the semantic frame labeled WITHIN. This frame has two arguments: a telic event and an interval. These arguments are coindexed with linguistic

In (f), *did so* is interpreted as standing for the predicate *cheated to win the door prize*. Under the recursive V' analysis, however, we would be forced to give *did so* in (f) the nonsensical interpretation 'cheated blatantly to win the door prize in a subtle fashion'.

expressions listed in the valence set of the preposition *in*. As a concord construction, the Frame Adverbial construction licenses instances, as in (37):

(37) She fixed the problem in a few minutes.

In (37), the verb matches the type called for by the valence of the frame adverbial: the class of telic (or, equivalently) directed events.¹⁰ Via the Override Principle, this construction also performs implicit type-shifting, as in (31): *She liked him in a minute*. In this example, a stative verb receives an inchoative construal: the event denoted is the onset of the liking state and therefore counts as an achievement. This construal involves the addition of the inchoative operator BECOME to the Aktionsart representation of the state; it reflects the reconciliation of a unification conflict between the verbal Aktionsart and the constructional semantics as per the Override Principle.

¹⁰ As observed by Dowty (1986:43-44) and Van Valin and LaPolla (1997), among others, aspectual types are expressed by predicate-argument combinations, rather than lexical verbs. However, I will assume, following Dowty, that the aspectual type of the verb is derivable from the type of its projection, whether this projection be a verb phrase or sentence. Because all information conveyed by attribute-value matrices is available at every node in a construct (a licensed combination of constructions), the semantic type information contributed by the verb's arguments is in the valence set of the verb. Therefore, the information necessary to perform aspectual categorization will always be available at the level of the verb. Information sharing obviates the need for us to propose that aspectually sensitive adjuncts are adjoined to sentences or VPs. This move would have no obvious rationale in the syntax and would serve solely to ensure that the adjunct has a sister to which the relevant aspectual features can accrue.

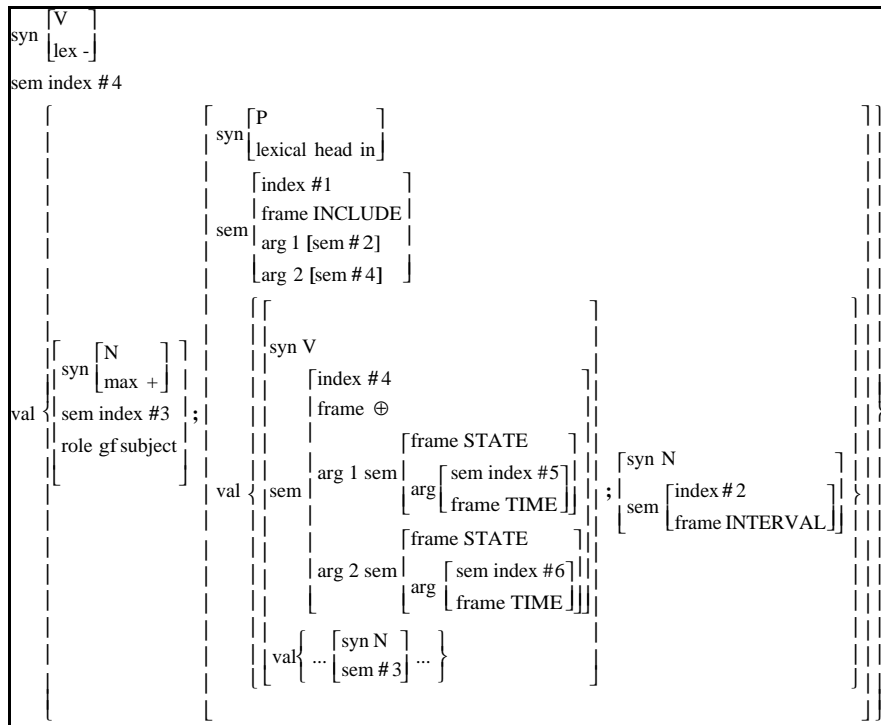


Figure 8. The Frame Adverbial construction (concord)

4.3. Aspectual Shift: The Progressive

The Progressive, like the Frame Adverbial construction, specifies a concord relationship via cross-indexation in paired valence sets. Unlike the Frame Adverbial construction, however, the Progressive construction also contains information about constituent structure: it has a binary-branching structure, in which an auxiliary head (*be*) is paired with a VP sister whose morphology is that of a gerund. The aspectual mapping performed by the

Progressive is directly reflected in its formal structure: the auxiliary head denotes a state and the participial complement denotes the situation radical from which that state is derived. However, a precise aspectual characterization of the type denoted by the complement has proven elusive. The Progressive appears to be less selective with regard to its input type than its type-shifting function would lead one to predict. I will argue that this apparent lack of selectivity in fact reflects restrictive input conditions coupled with broad coercive capacity.

The Progressive construction is shown in Figure 9. It is an instance of the *Coinstantiation* construction, as described by Kay and Fillmore (1999:22-23). The Coinstantiation construction captures both raising and control phenomena by requiring unification of the INTRINSIC (nonrelational) semantic values of an argument of the head verb and that valence member of the VP complement whose grammatical function is subject. In Figure 7, the unification formula captures the ‘raising’ property of the auxiliary head *be*. The Progressive as depicted in Figure 9 is a shift construction: its VP complement denotes an event of the *activity* Aktionsart type¹¹ and the construction denotes a state which holds during the interval for which the activity goes on (this period is represented as an argument of the activity frame, where it carries the referential index #5). The explicit type-shift performed by the Progressive involves the selection operation: the state which the Progressive denotes represents an intermediate rest in the temporal representation of the input activity.

¹¹ While the complement of the Progressive auxiliary *be* belongs to the syntactic category VP, its semantic type is that of event. Via the Coinstantiation construction, the subject requirement of the head verb of the VP complement is satisfied, i.e., ‘accounted for’, since it unifies with the NP which serves as subject of the finite auxiliary. Notice that we need not assume, as is traditional in the transformational tradition, that the complement of the auxiliary is ‘syntactically’ a sentence.

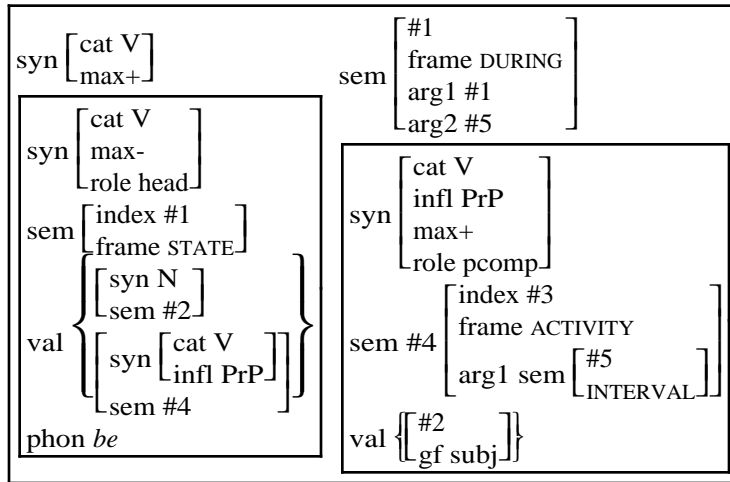


Figure 9. The Progressive construction (shift)

The Progressive construction can unify with any tense construction. A sentence which is licensed by the combination of the Progressive construction and a tense construction (e.g., the Past) has an interpretation which is identical to that of a simplex state predication of the same tense. Following Partee (1984), we will assume a state includes the reference time for which they are asserted. This inclusion relation captures the ability of a state to temporally overlap prior and subsequent events in a temporal discourse. Events, by contrast, are included within the reference times for which they are asserted, accounting for our intuition that events succeed one another in a temporal discourse.

The Progressive, as a stativizing device, triggers coercion when combined with a stative complement VP, as per the Override Principle (8). The concord feature which is relevant to the application of the Override Principle is the feature activity, which, as required, is invoked by both daughters in the construction. This feature expresses the semantic type of the VP complement and, via the unification index #4, the semantic value of the second valence member of the auxiliary head *be*. The activity feature ‘wins out’ over the stative feature of the input lexical item. By analyzing the VP complement of the Progressive construction as denoting an activity, we capture the intuition that Progressive-form state predications like (7b) *I’m living on Pearl Street*, as well as those in (38-40) below, express ‘temporary states’:

- (38) I'm liking your explanation.
- (39) He is remaining stable.
- (40) Right now she's believing there's going to be a reconciliation.

The 'temporary states' expressed by (7b) and (38-40) are not in fact states but homogeneous activities. To see this, recall the basis upon which we analyzed certain apparently stative verbs, e.g., *sleep*, *hold one's breath*, as denoting activities: such verbs exhibit perfective behaviors. For example, Present predications containing these verbs cannot be used to report upon events ongoing at speech time. This is shown by (41-44), where the # indicates infelicity on a reportive reading, rather than, e.g., a habitual one:

- (41) She's the one in the corner. #She wears a Fendi blazer.
- (42) Try to be quiet! #The baby sleeps!
- (43) #He holds his breath.
- (44) #Your socks lie on the floor.

Activities, like accomplishments, are enabled to continue by the energy input of an animate entity. The subject denotata of such predications are participants in a causal chain, whether they are agents, effectors or objects which an agent has oriented or configured in a specific way (e.g., socks which are in a bundle are *located* on the floor but not *lying* on the floor). The complement VPs in Progressive sentences like *We were living in Boulder* denote internally homogeneous activities analogous to those which require the Progressive form in (41-44).¹² The effector argument assigned by

¹² As we have seen, the activity class includes not only homogeneous activities of the sleep-type but also events of the run-type, consisting of iterated subevents. This division within the activity class leads us to predict that Progressive-form stative predications may have readings otherwise associated with heterogeneous activity sentences. It would appear at first glance that Progressive-form state sentences which express the accretion of a property have such readings:

- (a) I'm believing your story more and more.
- (b) I'm seeing the picture with increasing clarity.
- (c) I'm liking each song more than the last one.

The fact that the stative verbs in (a-c) are paired with comparative adverbials, e.g., *more and more*, suggests that they have heterogeneous-activity readings, since ordinarily only heterogeneous activities are compatible with such adverbials, as in (d):

- (d) She ran faster and faster.

Adverbials denoting 'accretion' of a gradient property are incompatible with telic predications, as shown by the ill formedness of (e):

- (e) *She broke the glass faster and faster.

the operator HOLD in the causal representation of the homogeneous-activity type represents the agentive properties which accrue to the subject denotata in (41-44). Crucially, a bounded state is not *ipso facto* a homogeneous activity; it is merely a state phase. By assuming that state phases and homogeneous activities are distinct situation types, we can explain why certain Progressive-form stative predications, exemplified in (45-47) are anomalous:

- (45) *His hair is being green this semester.
- (46) *The British Museum is containing the Elgin Marbles right now.
- (47) *She is having a cold today.

While all of the state radicals expressed by (45-47) can be described as temporary, no one of them is readily construed as a homogeneous activity. Such a construal would require that the subject denotata in these sentences be seen as effectors. If these sentences have interpretations at all, they require very unusual background assumptions, e.g., that the British Museum is preventing the Elgin Marbles from leaving. Therefore, it is reasonable to conclude that participial complements in Progressive constructs do not denote states, temporary or otherwise, whether or not their head verbs are stative. Progressive predications denote states, whatever the Aktionsart of

Such adverbials are also incompatible with state radicals, as shown by the ill formedness of (f):

- (f) *She is a French professor more and more.

However, the comparative adverbials in (a-c) need not be taken as symptomatic of a construal imposed by the Progressive construction. Instead, these adverbials can be viewed as themselves coercing activity readings. For example, a predication whose head is a state verb denotes a set of iterated episodes (i.e., an event chain) when combined with a comparative adverb:

- (g) She liked that song more each time she heard it.

It could be argued that (g) constitutes a state sentence rather than an activity sentence, since it could as easily be presented in the simple present tense, as in (h):

- (h) She likes that song more each time she hears it.

As I will argue below, however, the mere fact of co-occurrence with the Present tense is not evidence of stativity, since the Present tense can coerce stative readings of otherwise perfective predications. For this reason, I will reject Langacker's (1994) division between habitual sentences, as in (h), and repeated-event sentences, as in (g). Both (g) and (h) represent iterated-event sentences, i.e., activities. In the case of (h), however, the Present construction has imposed a state reading on what would otherwise be an activity radical.

the complement denotatum. Thus, an apparent paradox—a stativizing construction accepts stative input verbs—dissolves when we recognize that the input state—by the very fact of its combination with the Progressive construction—come to denote that type which warrants the use of the Progressive construction. The reconciliation procedure which yields the dynamic interpretations of Progressive-form state predications like those in (38-40) involves the addition operation: the operator HOLD and the effector argument it projects are added to the causal representation of the input state, yielding an activity representation. This type matches the type of the participial complement in the Progressive construction.

By treating the complement of the Progressive as denoting an activity rather than a telic event, we solve a problem of semantic representation which otherwise requires recourse to stipulation. It is generally assumed that the semantics of the Progressive is intensional (see, e.g., Dowty 1977): while the Progressive combines with both telic predicates and process predicates, in the former case the culmination of the event denoted by the predicate is only a potential. For example, a Progressive sentence containing a verb of creation, e.g., *She was knitting a vest*, entails nothing about the knitting event having reached its logical endpoint or about the existence of the vest. As De Swart describes this situation, “The Progressive picks out a stage of [a] process/event which, if it does not continue in the real world, has a reasonable chance of continuing in some other possible world” (1998:355). This view presents a paradox, since we cannot obviously provide a semantic representation for a stage of an event while preventing the variable which represents this event from being existentially bound. It is as though we had to represent the semantics of a Partitive NP, e.g., *an engine from an old Volvo*, while ensuring that the entity corresponding to the term *an old Volvo* is not part of the discourse model. This would make little sense; we cannot extract a portion from a type whose existence is not presupposed. A possible solution to this problem is to propose that the event exists in the discourse model but that it is “stripped” of its culmination point (De Swart 1998: 355). It is not clear what this proposal would gain us, since the very existence of a telic event entails its culmination. De Swart’s particular approach to the intensionality problem is to ensure through embedding that the event variable upon which the Progressive operates is not added to the discourse model (pp. 354-355). This solution does not seem to generalize, however, because event variables representing activities (e.g., *She was talking with her friends*) are clearly existentially bound. How will the rule which constructs a discourse representation from a Progressive sentence know the difference between an event which should ‘pop up’ to main box of the representation and that

which must not? The solution adopted here—to assume that the ‘input’ event type is inherently processual (i.e., an activity)—avoids such problems.

Under the present proposal, a Progressive sentence like *She is drawing a circle* denotes a state which is a subpart not of the accomplishment type *She- draw a circle* but of the activity type which is entailed by the semantic representation of the accomplishment type. Since this activity can be identified with the preparatory activity that circle-drawing entails, circle-drawing can be distinguished from square-drawing etc. within the narrow window afforded by a Progressive assertion (see Parsons 1990 and Mittwoch 1988 for compatible proposals). The only event variable which is added to the discourse model by a Progressive assertion is the activity denoted by the VP complement of the Progressive construction. Because of the subinterval property, any reasonably sized portion of this activity is sufficient to verify the occurrence of that event. The ontological nature of the situation type added to the model, and thus the nature of the commitment made by a speaker who employs a Progressive assertion, is expressed by the semantics of the Progressive construction: this construction denotes a state which holds during the time that a particular activity goes on. If I make an assertion that preparatory activity (e.g., circle drawing) was going on at some point, I say nothing about whether or not that preparatory activity led to its logical culmination (a completed circle).

But of course the representation of the Progressive construction given in Figure 9 predicts that we will induce a unification violation whenever we attempt to combine a telic verb or VP like *draw- a circle* with the construction, since the construction requires a complement denoting an activity. Only a complement with a processual denotatum like *play- cards* or *dance-*, unifies directly with the Progressive construction as given here. This poses a problem, since clearly telic VP complements ARE welcomed by the Progressive, as in, e.g., *They were baking a fruitcake*. The solution to this problem depends upon the Override Principle. I postulate that Progressive sentences containing telic VP complements are instances of coercion. In interpreting the sentence *They were baking a fruitcake*, the interpreter must derive an interpretation of the VP complement which is compatible with the activity feature that the construction imposes on its complement daughter. Since accomplishment predicates like *bake- a cake* entail processes, the compromise interpretation will be one in which the VP complement *baking a fruitcake* denotes the preparatory process which leads to the existence of a fruitcake. As we observed above, this preparatory process can be verified under the same circumstances that lead to verification of the state which the Progressive sentence denotes. The Aktionsart-based permutation involved

here, in which an accomplishment radical receives an activity construal, involves selection: an activity is selected from the causal representation of the input accomplishment radical. This type shift has a precedent in coercions triggered by the presence of durational adjuncts, e.g., *for ten minutes*. For example, the accomplishment predicate *walk home* receives an activity construal in (48):

- (48) She walked home for ten minutes and then decided to take the bus.

As in the case of the Progressive sentence *They were baking a fruitcake*, the activity denoted is entailed by the causal representation of the event radical.

What of the combination of the Progressive and an achievement radical, as in *She was winning the race*? This combination again yields a coerced processual interpretation of the VP complement. Our intuitions suggest that a Progressive-form achievement predication denotes a preparatory phase which is not entailed by the corresponding simple Past predication (*She won the race*). Dowty (1986) describes achievement verbs as “those kinesis predicates which are not only typically of shorter duration than accomplishments, [but also are not ordinarily understood] as entailing a sequence of subevents, given our usual everyday criteria for identifying the events named by the predicate” (p. 43). Our intuition that sentences like *She was winning the race* stretch out the temporal profile of an achievement to reveal its subevents makes sense only if we recognize such sentences as instances of coercion. Since the Progressive requires that its lexical complement denote an activity, the interpreter of a Progressive-form achievement predication is induced to ‘find’ an activity phase within an event which would otherwise represent a momentaneous transition. An achievement predication which entails the occurrence of a preparatory activity is for all intents and purposes an accomplishment; the sentences *She was winning the race* and *She was fixing the fence* are identical so far as the contribution of the Progressive is concerned. This equivalence is represented in our system by means of an indirect type shift: an activity predicate is added to the causal representation of the input achievement radical; this predicate then becomes available for selection, resulting in an activity representation.

The analysis of Progressive-form achievements offered here is a departure from standard accounts, since Progressive-form achievement predications are generally said to require iterated readings, as in *She was blinking* (Herweg 1991, Langacker 1991, Bickel 1997). However, such iterated readings are generally required only insofar as the noniterated reading

requires unusual background assumptions—for example that a single blink can be ‘tracked’ during the time that it occurs. Further, the interpretive potential represented by the iterated reading is not unique to Progressive sentences containing VP complements of the achievement class. Perfective verbs of all Aktionsart classes allow iterated readings in Progressive sentences. For example, the Progressive-form accomplishment sentence *She was fixing the fence* and the Progressive-form activity sentence *She was running* both have habitual readings, which are particularly robust in conjunction with frame adverbials like *that summer*.

On the assumption that habitual events have the same temporal and causal representations as event chains, habitual Progressive predications have a straightforward analysis. Since the Progressive construction selects for the activity type as its complement, and a habitual event radical, e.g., *They pick-up donations on Tuesdays*, constitutes an activity, predicate-argument structures denoting habitual events unify directly with the Progressive construction. Combination of the Progressive with a tense construction, e.g., the Present, will yield constructs like (49):

(49) They are picking up donations on Tuesdays.

Notice that adverbial expressions which denote event repetition, e.g., *on Tuesdays*, or large intervals, e.g., *last summer*, can impose iterated-event readings upon situation radicals which might otherwise qualify as simplex events. However, as argued above, the Progressive itself is not responsible for any such implications of iteration, since those implications are present whether or not the Progressive is used, as in (50):

(50) They picked up donations on Tuesdays.

The Progressive construction simply requires a participial complement denoting an activity, and iterated events qualify as such.

4.3. Tense Constructions: The Present in French and English

As has been widely noticed, the French Present construction has a wider range of uses than its English counterpart. I will argue that the divergent uses are contexts of coercion. One such use is that in which the Present construction expresses partitive (i.e., ‘Progressive-style’) meaning in combination with an event radical, as in (51-52):

- (51) Faîtes pas attention, Mademoiselle. Il vous **taquine!**

“Don’t pay any attention to him, miss. He’s teasing you.”
(Binet, *Les Bidochon* 2, p. 7).

- (52) Eh bien, à present, je me sens mieux. Le moral **revient.**

“Well, now I feel better. My morale is coming back.” (Binet, *Les Bidochon* 8, p. 42)

The coerced stative interpretation in (51) is derived by selection of an intermediate rest from the temporal representation of the input activity radical *Il vous taquiner* (‘He tease- you’). The coerced stative interpretation in (52) is derived by an indirect type-shift: the input achievement representation is augmented up to an accomplishment representation via addition; the added activity representation then becomes available for selection. Thus, (52) has the same slow-motion conceptualization as its Progressive translation—the return is not immediate, but has an onset phase. The French Present construction is also used to denote a present-contiguous state phase when combined with either a state-phase or activity radical, as in (53-54), respectively:

- (53) Comme moi, alors! Sauf que moi, c’**est** une affaire réglée depuis quinze jours.

“Same here! Except in my case the thing [surgery] has been a done deal for fifteen days.” (Binet, *Les Bidochon* 7, p. 25)

- (54) Raymonde: Ça commence à s’éclaircir!
Robert: C’est une chance! Depuis une heure qu’on **attend!**

“Raymonde: It [the waiting room] is beginning to clear out. Robert: That’s a stroke of luck—considering we’ve been waiting for an hour.” (Binet, *Les Bidochon* 7, p. 15)

The coerced stative readings in (53-54) involve the application of selection to the input temporal representation: the state denoted by the construction represents a posterior rest selected from the temporal

representation of the input state phase or activity. The French Present construction is also used to coerce stative readings of iterated events via selection, yielding habitual and generic readings of event-chain radicals. These readings are exemplified for French in (55-56):

- (54) Ils **disent** neuf heures à tout le monde. Comme ça, si t'as pas la chance de passer dans les premiers, tu **attends** des heures!

“They tell everyone to come at nine. That way, if you don't have the luck to get in first, you wait for hours.”
(Binet, *Les Bidochon* 7, p. 15)

- (55) La pratique régulière du jogging **prolonge** la vie de deux à huit ans!

“Regular jogging prolongs life from two to eight years!”
(Binet, *Les Bidochon* 11, p. 36)

As shown by the Present-tense translations in (55-56), the English Present can also coerce stative readings of event chains. However, neither the partitive nor present-contiguous state-phase readings are currently expressed by the Present construction in English. Bybee, Perkins and Pagliucca (1994) attribute this fact to a split in the system of reporting devices in English, arguing that English now has two exponents of Present meaning: the simple Present and the Present Progressive, the latter of which “appears to have been generalizing and taking over some of the functions of the Present for several centuries” (p. 144). While I believe that this assessment of the facts is basically correct, I have a different view of the semantic implications of these facts. According to Bybee, Perkins and Pagliucca (1994:152), the Present Progressive and Present tense participate in a privative opposition, in which the Present tense is the unmarked member: “the Simple Present carries no explicit meaning at all; it refers to the default situation from which other tenses represent deviations”. Because of its bleached semantics, the Present can “absorb the meaning inherent to normal social and physical phenomena, and this meaning if described and broken down explicitly, consists of habitual occurrence and behavior as well as ongoing states” (ibid). The analysis appears to raise more questions than it answers. First, why should states be more “normal” than ongoing events? Second, why should a meaningless construction require a disjunctive definition, involving both ongoing states and habituals? But even leaving

these concerns aside, one could not describe the aspectual constraints which the Present exhibits, and the coercion effects which it performs, if one did not view it as meaning something. I propose that the Present tense is a concord construction in both French and English. In both languages, the Present construction both denotes and invokes a state type. Unlawful combinations are ‘amnestied’ as per the Override Principle. The Present construction is shown in Figure 10.

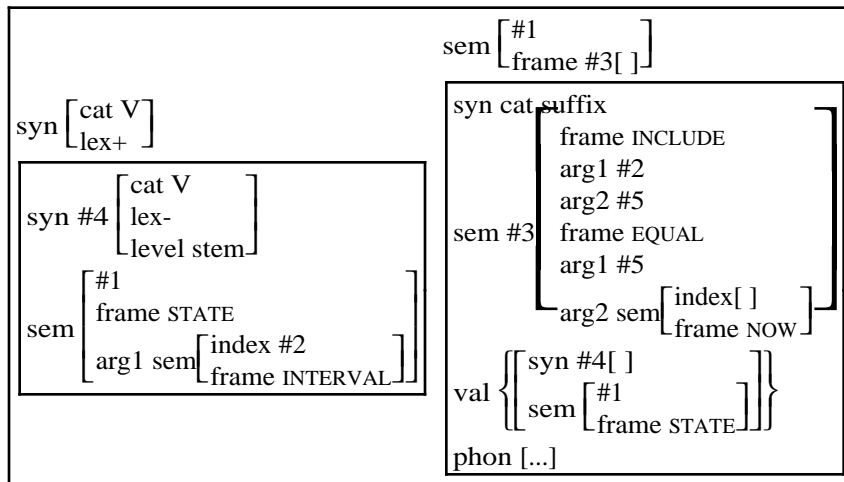


Figure 10. The Present construction

As shown in this figure, the Present construction signifies a deictic relation; the *sem* value of the Present suffix includes the frame *equal*, which expresses an identity relation between reference time and the time of coding. Accordingly, this frame has two arguments, a *reference time* (indexed by the unification variable #5) and the (deictically indexed) time of speaking. The frame *include*, which similarly has two arguments, expresses an inclusion relationship between the situation denoted by the verbal head (which carries the unification index #1) and reference time (an interval which carries the unification index #5). The verbal head of the construction denotes a state, as indicated by its frame value. The *state* frame has one argument, an interval, since states are properties of times rather than individuals (Herweg 1991). As shown, the Present is a concord construction: the verbal head is a state and its complement (the tense suffix) contains a valence requirement calling for a state.

The analysis of the Present provided here differs from previous attempts to address the source of typological variation in the semantic range of the Present tense. Cooper 1986, for example, argues that the English present tense is “exotic” in requiring a higher degree of coincidence between speech and situation times than does Present inflection in other languages: “the semantic location of the present in other languages requires the discourse [time] to temporally overlap the event [time] rather than be identical with it” (p. 29). The current proposal locates the relevant typological variation elsewhere. Under this proposal, Present constructions are intrinsically state selectors. The selection behavior of the Present is a logical entailment, since speech time is a ‘shallow’ interval that does not provide the conditions necessary for verification of an event.

The difference between the English Present and its analogs in other languages comes down to the coercive potential of each cognate construction: while all Present constructions denote stative types, the English Present limits the type shifts that input event radicals can undergo. These limitations are not predicted by the Override Principle and therefore appear to be construction-particular and idiosyncratic. Since constructions denote in the manner that words do, we expect that constructions, like words, should carry use conditions that do not follow directly from their referential properties but which instead reflect ecological pressures, e.g., Gricean blocking effects (Michaelis 1998: ch. 3). What makes the English Present idiosyncratic is that it is not a general-purpose stativizer. Those type shifts which it fails to perform happen to be those which are effected by dedicated morphosyntactic patterns, the Perfect and Progressive constructions. The emergence of these two shift constructions, via possessive and locative periphrases, respectively, increased the overall transparency of the type-shifting system in English, but contrary to what we might expect, the newly developed stativizers did not merely narrow the functional range of the Present. When the Perfect obtained a continuative meaning in Early Middle English, as exemplified in (57), it in fact took over a function previously performed by the Past, as shown in (58-59):

- (57) An ye, mine leove sustren, habbeþl moni dei icravet
on me after riwle.

“And you, my beloved sisters, have for many days
desired a rule from me.” (*Ancrene Wisse* 6, c. 1220)

- (58) A Ic wite wonn minra wræcsifla.

“Always I [have] suffered the torment of my exiles.”
(*The Wife’s Lament* 5, c. 970)

- (59) For flat so>e stod a flan writen hu hit is iwur>en.

“For that truth [has] remained always in writing,
about how it happened.” (*Layamon’s Brut* 11468, c.
1200)

Unlike the Perfect, whose current use conditions were largely in place by the 13th century (Carey 1994), the Progressive is a relatively recent innovation (Joos 1964). As of Shakespeare’s time, the alternation between Present and Present Progressive was apparently conditioned only by metrical considerations (Dorodnikh 1989:107), as when the Present is used to convey Progressive meaning in Romeo’s question *What light through yonder window breaks?*. According to Joos (1964:146) the Progressive attained its current usage only in the 19th century, when it came to be used in passive predications, e.g., *The lamps were being lighted*, and thereby replaced the earlier middle-voice form, e.g., *The lamps were lighting*. Again, however, it would be somewhat shortsighted to analyze this development as having occurred at the expense of the Present. This analysis seems to be what Bybee, Perkins & Pagliuca (1994:144) have in mind when they say that “the Progressive appears to have been taking over some of the functions of the Present for several centuries”. As discussed above, the English Present indeed differs from its French analog in failing to trigger Progressive-style coercion effects. However, the English Imperfective Past differs from *its* French analog, the *Imparfait*, in the very same respect: as we have seen, the basis of Vlach’s (1981) *when*-test is precisely the fact that in English, a Past main clause cannot be construed as denoting an event which was ongoing prior to the time at which the event denoted by a perfective *when*-clause took place. This is shown by (60): sentence (60a) has only a temporal-succession reading, as contrasted with (60b), in which a stativizing construction is used to provide the relevant temporal-overlap reading:

- (60) a. When she came home, Myron swept the floor.
 b. When she came home, Myron was sweeping the floor.

Thus, it appears inappropriate to refer to the Progressive, or the Perfect, as having taken over functions of the Present, or, for that matter, both Present and Past. The function of a tense construction is to denote a specific relationship between speech time and reference time. While tense constructions may have aspectual selection restrictions, these constructions do not serve to encode aspectual categories in the way that the Progressive construction, for example, denotes a state type. As we have seen, the aspectual sensitivities of tense constructions may be exploited for the purpose of aspectual type-shifting. However, since these type-shifting functions are derivative of tenses' indexical meanings, they may be gained or lost without affecting the semantic analysis of the tense or tenses at issue.

5 Conclusion

Coercion effects, which have proven troublesome to models of semantic licensing based on lexical projection, have been viewed as providing support for modular grammatical architectures, because they involve meanings which are not linguistically expressed. These same phenomena have here been interpreted in a very different way, as evidence for syntactic patterns which, like words, denote types of entities and events. In contrast to the modular model proposed by Jackendoff (1997), the construction-based model is not based upon a division between strict (projection-based) composition and enriched (interpolation-based) composition: composition in the construction-based model is uniformly based upon word-construction integration. The mechanism of integration, unification, allows for both partial and complete superimpositions of structures, and thereby captures both word-construction match (instantiation) and its by-product, word-construction mismatch (implicit type-shifting). While the modular model accounts for coercion effects by decoupling syntax and semantics, the construction-based model covers the same array of data—and more—by taking syntactic heads out of the licensing business: syntax and semantics come together not via projection mechanisms but as the twin poles of the sign. While signs are generally presumed to have phonetic substance, we have seen that the form of a sign may instead be a skeletal sentence structure. In this way, we have accounted for the fact that templates, like functors, alter what words designate.

The construction-based model of coercion can be viewed as a down payment on a historic debt. The progenitors of formal syntax promised to reveal how human creative capacity is manifested in linguistic behavior. In fact, their adoption of the label *creativity* now strikes one as a cruel joke at the expense of humanists. Linguistic creativity in the Chomskyan sense has, of course, has nothing to do with human aspirations, or, for that matter, ordinary linguistic creativity—the ability to use language in coherent but unconventional ways. It is simply a property of a mechanism, the generative engine. The symbolic model of syntax promises to put humans, and human achievement, back into the picture by focusing on what humans do best: exploiting the expressive potentials inherent in form.

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