New Developments in Lexical Functional Grammar.

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This article provides a brief introduction to a number of key advances in LFG since the late 1980s. A description of the framework itself is given in Neidle (this volume), which provides an overview of the 1982 version of the theory, together with a sketch of a major subsequent development, Lexical Mapping Theory.
LFG as a framework for linguistic description has its roots in the desire to elaborate a fully explicit, mathematically precise and computationally oriented model of linguistic structures which would support a psychologically plausible model of human linguistic processing. Since that time, LFG has been applied to the description of a wide variety of different languages, and has enjoyed a significant degree of influence in computational linguistics.
A very striking aspect of LFG is its stability as a framework. The fundamental architecture of the theory has remained constant since the late 1970s. A very important facet of LFG syntax, which signals it out from many other syntactic theories, is the representation of different dimensions of the syntax (c-structure and f-structure, or external and internal syntax) by means of different formal entities: the architecture combines a context free grammar formalism (for c-structure) with attribute value structures (for f-structures). These (and other) different dimensions are related by structural correpondence functions, or projections, the most familiar of which is the function mapping c-structure nodes into f-structure, ϕ.
As the theory has progressed, light has been cast on the nature of other structures and work has proceeded on the mapping functions. This brief review, which focusses on LFG syntax, touches on the nature of one dimension (in addition to f-structure and c-structure), namely argument structure, and the argument structure to f-structure projection. In section 1 we discuss recent work in Lexical Mapping Theory, which concerns both the nature of argument structure and the mapping from argument structure of f-structure.
Much other work in LFG has been concerned with extending the description languages of LFG (for c-structure and f-structure), and on the c to f-structure projection. The rest of this review of recent development focusses on this, and on the range of syntactic analyses made available in the LFG architecture. We pick out for particular attention three aspects of this work: that on principles of c-structure organisation and the mapping to f-structure; that on the extension of the f-structure description language to include functional uncertainty equations and some linguistic analyses which exploit this; and the role of empty categories in the syntax.
The work on anaphoric binding, which we touch on in section 2.3, presupposes the existence of a projection relating f-structure to semantic structure. Space precludes any significant discussion of semantic interpretation in LFG, or of computational aspects of the theory, although both areas have been the focus of significant work in recent years.

1 Lexical Mapping Theory

1.1 Capturing Lexical Regularities

Since the late 1980s a good deal of work has focussed on the mapping from (semantic) roles to (grammatical) functions, responsible for projecting predicate argument structures into the syntax. An important tenet of LFG is that the syntax is monotonic (this is expressed in the Principle of Direct Syntactic Encoding). From this requirement it follows that all grammatical relation changing operations (or relational alterations) are lexical. [1]

In LFG of the 1982 model, the lexicalisation of relational alternations had a serious effect on the size of the lexicon, because all surface configurations of roles had to be expressed by alternative lexical forms, related by lexical redundancy rules which remapped grammatical functions. The grammatical function assignment was simply lexically specified on a case by case basis, along the lines of (1), (which shows the number and type of participants and expresses an ordering over them) although the assignment to (semantic) roles was notationally suppressed in the notation for semantic forms (2):

(1)
$$\begin{array}{llll} \text{`lean <} & \text{AGENT} & \text{THEME} & \text{LOCATION>'} \\ & \uparrow \text{SUBJ} & \uparrow \text{OBJ} & \uparrow \text{OBL} \end{array}$$

(2) $(\uparrow\text{PRED}) = \text{`lean} < (\uparrow\text{SUBJ})\ (\uparrow\text{OBJ})\ (\uparrow\text{OBL}) >\text{'}$

The Dative Shift alternation might be formulated as follows in such a model:

(3) $(\uparrow \text{OBJ}) \rightarrow (\uparrow \text{OBJ2})$
$(\uparrow \text{OBL}_{to}\ \text{OBJ}\ ) \rightarrow (\uparrow \text{OBJ})$

Lexical Mapping Theory attempts to replace the stipulated mapping between the (predicate) argument structure and functional structure in (1) by a more explanatory approach. In LMT, canonical and non-canonical linkings are accounted for by a small number of classification and mapping principles. Early work, as described in Neidle (this volume), (see (Levin 1986, Bresnan and Kanerva 1989, Bresnan and Moshi 1990, Bresnan and Zaenen 1990)) used a small set of thematic roles, ordered by a universally valid thematic role hierarchy.

More recent work has extended the approach to a number of lexical alternation phenomena, but has also questioned the assumption that thematic roles are the relevant descriptive device to capture those elements of the semantics which are relevant to the mapping of participants to the syntax. Recent work by Zaenen (1993), Alsina (1992a, 1992b) and others has replaced theta roles with Dowty's Proto-Agent and Proto-Patient properties.

1.2 Using Dowty Roles

1.2.1 Unaccusativity

In many languages intransitive verbs may be partitioned into two groups (the unergatives and the unaccusatives) according to a number of aspects of their syntactic behaviour. These aspects include choice of auxiliary, partitive cliticisation, participle formation, the interpretation of null pronominal subjects, impersonal passivization, secondary result predication and many others. A key aspect of this distinction is that the single argument of unaccusative verbs often seems to exhibit object properties at some level of syntactic representation. Deep unaccusativity

[1] The principle of monotonicity is related to two facets of LFG: (i) the surface-oriented nature of syntax and (ii) the fact that partial information about the f-structure is contributed by (potentially many) different parts of the constituent structure, and must combine in a well behaved manner.

refers to the case where this single argument like both an underlying object and a surface subject, and may be accounted for in a two level syntax by assuming movement of the NP from object to subject position. At first sight, deep unaccusativity appears to be something of a challenge for LFG, but Bresnan and Zaenen (1990) show that it is simply accounted for in LMT — the unaccusative predicates are those which an argument which is classified [-r] by the LMT syntactic underspecification features (on the basis of the thematic role) is mapped to subject, by the mapping principles (see Neidle (this volume) for details of classification using the features +/-r and +/-o and mapping).

(4) John arrived
    arrive < theme >
    -r

Bresnan and Zaenen suggest that only [-r] arguments can be the focus of result predication, thus accounting for the fact that result predications may be formed on the objects of transitive verbs, the subjects of unaccusative verbs and the so-called fake reflexives and non-thematic objects of unergative intransitive verbs (by definition, non-thematic arguments are not semantically restricted, and therefore [-r]).[2]

(5) John hammered the metal flat
    The river froze solid
    They shouted themselves hoarse
    She drank the teapot dry

In subsequent work on Dutch, Zaenen (1993) shows that, by replacing thematic roles by Dowty proto-roles, and thus taking a slightly more abstract view of the argument structure, various semantic correlates can be found for the shared syntactic behaviour of different classes of verbs, namely the unaccusative verbs and a class of psychological predicates with stimulus subjects.
She first shows that auxiliary selection and prenominal ge-participle formation in Dutch are diagnostic of the unaccusative/unergative distinction in that language, and that they are semantically grounded in the property of lexical Aktionsart (specifically, telicity). Lexically telic predicates occur with *zijn*, while lexically atelic predicates occur with hebben.

(6) Hij heeft gezwommen
    he has swum

(7) Hij is weggezwommen
    He has swum away

Similarly, prenominal ge-participles are only derivable from intransitive telic predicates (ie. those that take *zijn*).
The lexically telic verbs can be semantically characterized as those in which one participant role undergoes a change of state or position, and this observation permits the syntactic distinctions at issue (auxiliary selection and ge-participle formation) to be grounded in the Dowty proto-patient properties:

[2]Recall that non-thematic arguments appear outside the <> in semantic forms — see Neidle for details.

	Proto-Agent Properties	**Proto-Patient Properties**
	volition	change of state
(8)	sentience	incremental theme
	causes event	causally affected
	movement	stationary
	independently referential	possibly referential

Zaenen goes on to show that these same syntactic tests partition the class of psychological predicate with experiencer objects, but that different semantic properties seem to characterize the subclasses. [3] Specifically, those psychological predicates which occur with *zijn* and form *ge-* participles modifying a noun corresponding to the subject (the stimulus) are generally stative, not controllable (essentially, not volitional) and not potentially causative. The former property is illustrated by embedding under *dwingen*:

(9) Hij dwong me hem te bevallen
He forced me to please him

(10) Hij dwong me je te ergeren
He forced me to irritate you

Zaenen brings these classes of *zijn* taking verbs together, observing that they have themelike or non agentive subjects (viewed in terms of proto-role properties, the experiencer object psychological predicates which take *zijn* have subjects which lack proto-agent properties). This may be captured by assigning intrinsic classification features [+/- r, +/-o] on the basis of protorole properties rather than thematic roles:

(11) If a participant has more patient properties than agent properties, it is marked -r
If a participant has more agent properties than patient properties, it is marked -o

1.2.2 Morpholexical Operations

The use of LMT to replace the relation changing rules of early LFG alters grammatical function assignment to roles, but leaves unaltered the the lexical semantics or the predicate argument structure of the verb. That is, only morphosyntactic operations (to do with variable encoding) were accounted for.
In work on the Hungarian locative alternation, Ackerman (Ackermann 1990) shows how the theory can be extended to deal with morpholexical relations which extend, redistribute or alter the semantic properties of predicates.

(12) A paraszt (rá=)rakta a szénát a szekérre
the peasant (PV=)loaded-3SG/DEF the hay-ACC the wagon-SUBL
The peasant loaded the hay onto the wagon

(13) A paraszt tele=rakta a szekeret szénával
the peasant (PV=)loaded-3SG/DEF the wagon-ACC hay-INSTR
The peasant loaded the wagon full with hay

He uses the classification and mapping principles (using the underspecification features +/-o, +/-r) of LMT but, like Zaenen, combines this with a level of role structure based on Dowty's proto-role properties rather than thematic roles. The

[3] The experiencer subject verbs in fact consitute a third class.

key point is that the argument with the greatest number of Proto-Patient properties is assigned -r. He argues that the verbal prefixes in the Hungarian locative alternation associate the Proto-Patient properties of incremental theme and change of state with the location (*tele*) and the locatum (*rá*) respectively and hence effectively determine which of these two arguments is intrinsically classified [-r] and consequently maps to the OBJ.

Ackerman's own formulation of this idea is somewhat curious in that he assumes (without argumentation) that the arguments of a basic predicate are assigned underspecification features in some way **before** prefixation takes place, and that these assignments are then overwritten ([-r] gets reassigned as [-o]). This gives a non-monotonic aspect to the approach, requiring one to specify that the classification feature coming along with the prefix is to take precedence, and relies on a form of default unification. This is odd, especially given that the machinery is there to support an alternative approach in which the assignment of underspecification features takes place on the fully formed word by counting up (possibly weighted) proto-role properties.

1.3 Complex Predication

Work on complex predication in LFG has begun to liberate the mapping theory (relating role structure to functional structure) from the confines of the lexical domain ((Butt 1995, Alsina 1992a, Alsina 1993)). I use complex predicate to refer to cases in which one f-structure PRED corresponds to two semantic predicators; that is, there is one head at functional structure but two heads at (semantic) role structure. When this is the case, there is a structural mismatch between the two levels which the mapping theory must be extended to account for. In many languages, causatives are complex predicates in this sense. In the Chichewa example in (14), the causative morpheme and verb stem are each semantic predicators which fuse to form one f-structure domain (with a SUBJ *farmer*, OBJ *poem* and an OBL *lion*.

(14)	Mlīmi	a-ku-lémb-éts-a	ndakatulo	(kwá	mkângo)
	1-farmer	1s-PR-write-CST-FV	9-poem	to	3-lion

The farmer is having the poem written (by the lion)

Alsina argues that causatives involve argument structure composition, with an argument of the causative predicate being identified or fused with an argument of the embedded predicate. This 'complex' role structure may then be mapped to the functional structure without any alteration of the classification and mapping principles. Interestingly, both Alsina (1993) (for Romance causatives) and Butt (1995) (for Urdu light verbs) argue that precisely the same sort of complex predication occurs where the semantic predicators are lexical items, rather than morphological structures, as for example in the Catalan (15):

(15)	Els	pagesos	fan	escriure	un	poema	al	follet
	the	farmers	make	write	a	poem	to-the	elf

The farmers are making the elf write a poem.

If this is right then we must permit argument structure and PRED value composition in the syntax as well as in the morphology — this in turn releases the mapping theory from the domain of the strictly lexical.

2 Internal and External Syntax

Recall that LFG postulates a single level of syntax, with different aspects of the (surface-oriented) syntax represented in distinct, simultaneous or parallel dimensions, c-structure and f-structure, related by a projection or mapping ϕ from c-structure nodes to f-structures. The function ϕ is many to one (many pieces of c-structure can contribute information about the same f-structure) and into (there may be pieces of f-structure which do not correspond to any c-structure node. In this section we look at a number of recent developments concerning the relation between, and role of, these two syntactic dimensions.

2.1 Principles

In early LFG the c-structure to f-structure projection for a language was effectively stipulated by the grammar writer on a case by case basis by means of functional annotations to phrase structure rules (see Neidle (this volume) for details. While this captured the variability of the mapping across languages (with some languages encoding grammatical functions configurationally, and some morphologically, with a relatively or even totally free word order) it was inadequate in various respects. Firstly, general principles across languages, where they exist, were not captured (the annotations were language specific), and secondly, cross-categorial generalisations within a single language were not expressed (although this could be simulated to a certain extent by the introduction of metavariables over category labels).
In some very recent work, Bresnan (1996) replaces this approach with a set of encoding principles, which she argues are of universal validity. She proposes that there are two orthogonal sets of principles at work universally determining c-structures and ultimately the mapping to f stucture. These are **predicate argument locality** and **endocentricity**.
Endocentricity refers to the set of c-structure principles known as X$'$ syntax. Bresnan assumes three bar levels (with adjunction) and the existence of both lexical (N, V, A and P) and functional categories (C, I and D). Note however that in LFG the functional categories are viewed as specialised subclasses of the lexical categories, and the surface c-structure is directly admitted by the principles of endocentricity viewed as node admissibility conditions. The mapping to f-structure (the f-annotations in earlier LFG) follow from the Principles of Endocentric Structure-Function association, which are:

(16) c-structure heads are f-structure heads
specifiers of functional categories are the syntacticized discourse functions (TOPIC, FOCUS and SUBJ) or absent
complements of functional categories are f-structure co-heads
specifiers of lexical categories are a sublclass of adjuncts or absent
complements of lexical categories are the non-discourse argument functions (OBJ, OBJ_θ, OBL_θ, XCOMP, COMP)
constituents adjoined to maximal projections are non-argument functions

Some languages organise their external syntax in terms of an orthogonal principle, predicate-argument locality, using a flat, exocentric phrase structure ($S \rightarrow C^*$). In such languages the mapping to functional structure is effectively determined morphologically (rather than configurationally) either by case or agreement marking.
The principles of endocentricty and predicate argument locality, then, serve to constrain the range of possible c-structures, and permit a more adequate approach to structure-function association in LFG. In recent work on weak crossover, Bresnan (?) further suggests that the mapping function ϕ may also be subject to an additional constraint, namely the **Principle of Lexical Expression**, which states that:

> The mapping ϕ from c-structure to f-structure must satisfy this condition: for every c-structure node N there is a lexical element w such that

$\phi(\mathrm{N}) = \phi(\mathrm{w})$.

This principle reflects the strong surface orientation of LFG syntax and constrains the postulation of null constituents in the external syntax, as we shall see below.

2.2 Empty Categories and Unbounded Dependency Constructions

As outlined in Neidle (this volume), in early LFG, very much under the influence of the approach taken in contemporary transformational grammar, a constituent structure oriented account was given of unbounded dependencies. The crucial features of this account (see Neidle for details) were:
(i) that c-structure nodes corresponding to the canonical "gapped"position were posited
(ii) that constraints on the filler gap relationship were expressed in terms of c-structure configurations
(iii) that the displaced element (e.g. topicalised, or fronted in an interrogative structure) was the value of two attributes in the f-structure, a within clause grammatical function and a so-called discourse oriented function
In later work, Kaplan and Zaenen (1989) observed that the original LFG proposal was much influenced by the (necessarily) constituent structure oriented accounts available in transformational grammar, and showed that it was not necessary to express the filler gap constrains in c-structural terms.
They extended the LFG description language to permit a further type of equation, know as a functional uncertainty equations. The function argument expressions is extended to permit the use of regular expressions (denoting sets of strings) in the argument position. This means that the grammar writer to abbreviate what may be an infinite disjunction of identities between the value of the discourse oriented function (TOPIC or FOCUS) introduced at the "fronted" node and a within clause function. This is illustrated below (the f-structure is abbreviates to show only essential details).

(17) the man *who Mary likes*

(18)

S'

NP
$(\uparrow \text{TOPIC}) = \downarrow$
$(\uparrow \{\text{XCOMP,COMP}\}^* \text{ GF}) = \downarrow$
who

S
$\uparrow = \downarrow$

NP
$(\uparrow \text{SUBJ}) = \downarrow$
Mary

VP
$\uparrow = \downarrow$

V
$\uparrow = \downarrow$
likes
$(\uparrow\text{PRED}) = \text{`like<} (\uparrow\text{SUBJ})(\uparrow\text{OBJ})\text{>'}$

(19)
$$\begin{bmatrix} \textbf{TOPIC} & [1] \\ \textbf{SUBJ} & \begin{bmatrix} \textbf{PRED} & \text{`mary'} \end{bmatrix} \\ \textbf{PRED} & \text{`like} < (\uparrow \text{SUBJ})(\uparrow \text{OBJ}) >\text{'} \\ \textbf{OBJ} & \begin{bmatrix} \textbf{PRED} & [1]\text{`who'} \end{bmatrix} \end{bmatrix}$$

The functional uncertainty equation $(\uparrow \text{TOPIC}) = (\uparrow \{\text{COMP,XCOMP}\}^* \text{ GF})$ annotating the fronted NP node specifies that the f-structure associated with this node is the value of both the path TOPIC and of βsome path in the (infinite) set {XCOMP, COMP, XCOMP SUBJ, COMP SUBJ, XCOMP OBJ, COMP OBJ, XCOMP XCOMP SUBJ,....}. Given this way of relating the fronted NP to a within clause grammatical function, the c-structure representation of an empty node is clearly superfluous. Island constraints on unbounded dependencies can be stated over PATHS in the f-structure (by constraing the functional uncertainty expression appropriately) as easily as they can be stated over configurations of c-structure nodes. Moreover, as Kaplan and Zaenen observe, a category based account gets into trouble with data such as (20):

(20) a. That he might be wrong he didn't think of
b. *That he might be wrong he didn't think
c. *He didn't think of that he might be wrong
d. He didn't think that he might be wrong

On a constituent matching approach, in which fronted NPs must correspond to empty NP slots in the c-structure, and fronted S' to empty S', (20a) would be predicted ungrammatical and (20b) grammatical. The functional approach, on the other hand, is able to make the correct predictions in these cases.
This approach to unbounded dependency constructions appears to remove the motivation for null constituents in gap positions, since the constraints on filler gap constructions are no longer stated in terms of c-structure configurations, and the within clause f-structure of the 'displaced' constituent can be indicated without introducing an empty node. The use of functional uncertainty for unbounded dependency constructions, then, permitted the complete elimination of null constituents from LFG. No null categories are postulated in the theory for the various sorts of empty pronominal in (21) — since the c-structure to f-structure mapping is not an onto function, the theory admits f-structures which have no c-structure image (see (Kaplan and Bresnan 1982) for further discussion of null pronominals):

(21) a. Giving an oral presentation always troubles John (coreferential PRO)
b. Sharing rides to work is a responsible thing to do (PRO ARB)
c. Vió a Juan
saw-3S-PAST to Juan

He/she saw John

The Principle of Lexical Expression, given above, prevents the postulation of null c-structures corresponding to the pronominals in (21), for it requires that every c-structure node be "sanctioned" by a lexical element. This does not, however, prevent the postulation of empty nodes in unbounded dependency constructions (since the filler maps into the same piece of f-structure as the putative empty node).
In very recent work on weak crossover, Bresnan (1995) shows that, contrary to the prevailing assumption in lexicalist approaches to syntax, there is evidence for empty constituents in unbounded dependency constructions. She argues that there are *two* conditions on the binding of pronominals by operators, a syntactic rank condition, which makes reference to the rank of phrases on a functional hierarchy (SUBJ > OBJ > OBL > COMP/XCOMP...) and a linear order condition. The former prevents an operator binding a pronoun which outranks it, while the latter prevents an operator binding a pronoun which f-precedes it [4]
Because English is a configurational, SVO language, these two properties often coincide, but they do not always do so. Consider the following data from Bresnan (1995):

(22) ?*Everyone$_i$ in the room, I talked about his$_i$ coursework with

[4] The precise definition of f-precedence is irrelevant to the point at issue, but is as follows, where μ is the projection we are calling ϕ (Bresnan 1995): f_1 f-precedes f_2 if and only if there are c_1 and c_2 such that c_1 is a rightmost element in $\mu^{-1}(f_1)$, c_2 is a rightmost element in$\mu^{-1}(f_2)$, and c_1 precedex c_2.

(23) Everyone$_i$ in the room, I talked about the coursework with

If there is no empty category within the PP in the topicalisation in (22), then the operator - pronoun binding indicated violates neither the syntactic rank condition nor the linear precedence condition. If, on the other hand, there is an empty category, the operator chain (the fronted material and the empty category) will in fact be f-preceded by the pronominal, in violation of the linear order condition. A similar argument can be made on the basis of the following data (in terms of syntactic rank, the OBL PP outranks the XCOMP AP):

(24) ?*To whom$_i$ did Mary seem proud of him

(25) * Clinton seems proud of her$_i$ to every woman appointee$_i$

(26) Clinton seems to every woman appointee$_i$ to be proud of her$_i$

That is, the contrast in grammaticality between (24 and 26) follows from the conditions on pronominal operator binding if there is an empty node corresponding to the fronted material in (24), in which case the pronominal would f-precede the operator.

2.3 Using Functional Uncertainty

The extension of the LFG description language to permit regular expressions over paths has also opened the way to the development of a lexicalist theory of anaphoric binding (Dalrymple 1993, Dalrymple et al. 1990, Dalrymple and Zaenen 1991). This approach rejects the mainstream view which divides referential NPs into three groups, full referential expressions (names), which may not be syntactically bound; pronouns, which may be syntactically bound but must be disjoint in reference within a certain local syntactic domain; and anaphors, which are required to be syntactically bound within a certain (local) domain. In Dalrymple's (1993) fully lexicalist approach, the familiar Binding Theory is no longer stipulated as an external well-formedness condition on grammars, but instead Binding equations are directly associated with lexical items. This in theory permits many more than three types of NPs to be recognised. For example, the reflexive *himself* in English, which must be bound within its clause (that is, within the minimum domain containing a PRED and SUBJ) is associated with a constraint which says just that in the lexicon. In LFG, an f-structure which contains a PRED and all its subcategorised arguments is called a *nucleus* and a nucleus containing a SUBJ function is a *complete nucleus.* Intuitively, the anaphor (in this case *himself*) is associated with a constraint which says it can bind to any piece of f-structure within the minimal f-structure which contains it, a PRED and a SUBJ (ie, within its minimal complete nucleus). A pronoun, such as *him*, on the other hand, may bind to (take as antecedent) any piece of f-structure within the f-structure(s) which contains it, excluding those f-structures within the minimal nucleus (the locality disjointness condition). Binding constraints such as these are expressed using functional uncertainty equations which essentially express an infinite disjunction over the possible f-structures which may contain the anaphor or pronoun. The uncertainty equations differ from those presented above in that they give **paths out** rather than **paths in** (and hence this is known as Inside Out Functional Uncertainty). Thus the expression (XCOMP$^+$ $\uparrow$) abbreviates all the f-structures from which $\uparrow$ (call it f1) is reachable by traversing a path of one or more XCOMPS. Clearly such descriptions can be used to specify the f-structures within which a pronoun or anaphor may appear: an anaphor which must be subject bound and is limited to OBJ position might be associated in the lexicon with the functional uncertainty expression in (27) to pick out its antecedent:

(27) ((GF* OBJ $\uparrow$) SUBJ)

In this approach, the theory of binding is viewed as essentially a set of (lexical) constraints (using functional uncertainty) constraining the mapping into the semantics: expressions such as these are pick out pieces of f-structure, and then the equation itself states that the anaphoric element and the antecedent (so described) will map into the same element in the semantics. The full equation, then, uses the mapping function σ which maps f-structure into semantic structure. The following should be read as saying that the OBJ and the SUBJ have the same semantics:

(28) σ ((OBJ $\uparrow$) SUBJ) = σ ($\uparrow$)

3 Summary

LFG is a surface oriented lexicalist linguistic theory. Different aspects of the syntax are expressed by means of different structures, which are related by mapping functions or projections. The basic architecture of LFG has remained remarkably stable over the years. Work in Lexical Mapping Theory has developed a theory of the mapping between argument structure and f-structure. The f-structure description language has been extended to permit sets of strings in paths, and this has made possible a number of new linguistic analyses. In other work, it is proposed that the structure-function association may follow from a small set of universal principles. A number of other recent advances (most notably to do with the computational interpretation of LFG and with semantic interpretation) are not mentioned here.

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