

Constraining Argument Merger through Aspect

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1 Introduction

The essential insight to be accounted for with regard to complex predicates goes back to first examinations of Romance causative constructions in terms of *Clause Union* within the framework of RG (Relational Grammar), most notably in Aissen and Perlmutter (1983) (see also Gibson and Raposo (1986), Davies and C. Rosen (1988)). The central issue to be resolved is the non-isomorphy problem in complex predicates: a biclausal predicate-argument structure corresponds to a monoclausal syntactic structure, rather than to a syntactically expressed matrix verb with an embedded complement.² The LFG (Lexical-Functional Grammar) approach to complex predicates presented here retains the fundamental insights of the work in RG, but provides an analysis in a nonderivational framework. This allows for more linguistic versatility than was possible in the original RG approach and renders a more complete analysis of the problem posed by complex predicates. LFG provides a particularly good vehicle for the treatment of complex predicates, as it postulates several mutually constraining levels of syntactic representation, underpinned by a rigorously defined formalism, and has seen the proposal of a simple but powerful theory of linking from predicate-argument structures to grammatical functions.

As part of the analysis, the notion of *Argument Fusion* is formulated at a(argument)-structure and is taken to characterize complex predicate formation (clause union), whether it be syntactic, as is the case with Romance Causatives or the Urdu³ Permissive (see section 3.1), or morphological, as is the case with Urdu causatives (see section 4). In an attempt to formulate a restrictive, crosslinguistic theory of complex predicate formation, Argument Fusion is viewed as the a-structure analog to syntactic control. This strict view of Argument Fusion is in direct conflict with previous analyses presented for morphological causatives in Bantu and Marathi (Alsina and Joshi 1991, Alsina 1992), where Argument Fusion is taken to be subject to parametrization across languages, based on semantic factors such as affectedness. As part of a reanalysis of similar causative data from Urdu it is suggested that by taking into account the influence of compositional aspect (e.g. Tenny (1987), Krifka (1992)) a more constrained view of Argument Fusion and a more elegant and systematic account of the interaction of affectedness and specificity with argument structure can be formulated. The notion of Argument Fusion in combination with a consideration of aspectual influence allows a view of linking theory which includes both thematic and aspectual factors (in the spirit of Grimshaw's (1990) proposals for argument structure) and has as a consequence a cleaner characterization of the syntax-semantics interface, particularly with regard to the interaction of lexical information with nonlexical aspect.

¹I would particularly like to thank Alex Alsina, Joan Bresnan, Mary Dalrymple, Tracy King, Gillian Ramchand and members of the LFG-list for many interesting discussions and input, Tilman Höhle and Dieter Wunderlich for asking skeptical stimulating questions, and two anonymous reviewers for further helpful comments and criticisms.

²See also Evers (1975) for an analysis of German coherent constructions in terms of clause union within an early transformational approach.

³The South Asian language Urdu is closely related to Hindi, which is mostly spoken in India. In this paper, the data is primarily drawn from the dialect of Urdu spoken in Lahore, Pakistan and that of Hindi-speaking informants from New Delhi, India.

2 Previous Approaches to Complex Predicates

2.1 State of the Art

With the advent of Baker's (1988) theory of incorporation, the treatment of complex predication lost the flexibility and intuitive rightness that characterized much of the work on Clause Union in RG. In particular, the assumption of the Mirror Principle in combination with the UTAH (Uniformity of Theta Assignment Hypothesis) predicted that morphological processes exactly mirrored syntactic processes, i.e., that morphological elements were subject to the same movement constraints (e.g., head-to-head movement) as syntactic elements, and that each θ -role must always have a syntactic realization (see also Marantz's (1984) principle M). While Baker proposes ingenious solutions which appear to generalize over a number of crosslinguistic phenomena, the rigid requirements of the UTAH lack the flexibility needed for an insightful account of complex predicates.

Furthermore, while Baker makes a very strong claim as to the underlying syntactic similarity of applicatives and causatives, his approach does not explain why applicatives (and passives) only involve one event, while causatives involve two (event of causation, and the caused event). Neither can his account be extended to provide a semantics of Noun Incorporation which captures the parallels to Germanic bare plural constructions (van Geenhoven 1995, 1996).

These facts are clearly reflected in the amount of work done in recent years that takes the notion of an independent level of argument structure seriously. The work cuts across differing syntactic theories, so there is some variation in the approaches to mapping between argument structure and grammatical relations. However, there is a shared intuition that certain generalizations must be stated at an independent level of argument structure (S. Rosen 1989, Grimshaw 1990, Jackendoff 1990, T. Mohanan 1994a, Alsina 1996, Neeleman 1994, Butt 1995, Sag and Manning 1995, Manning 1995). In fact, as the behaviour of the Urdu Permissive in contrast with an instructive construction clearly illustrate (see section 3.1), the crucial generalizations to account for the contrast between these two constructions can only be stated in terms of a theory of linking that takes argument structure to be encoded at an independent level of representation.

In a sense then, if one took the liberty of reinterpreting the initial stratum in RG as representing argument structure, and the final stratum as grammatical relations, the strata in the middle reflect the *mapping* or *linking* principles (Kiparsky 1987) formulated in more recent theories. Thus, we seem to be back to the initial insights formulated in Aissen and Perlmutter (1983).

2.2 Argument Merger

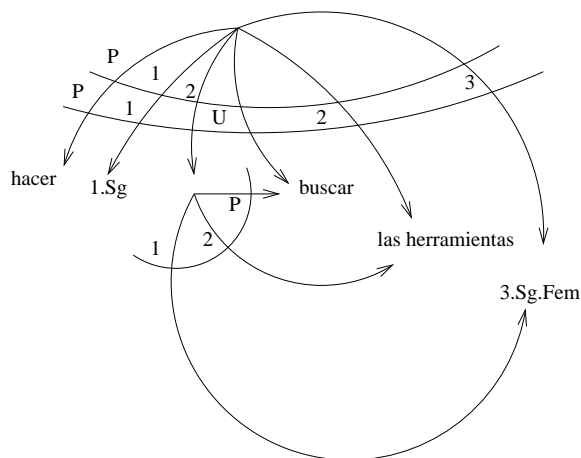
The examples in (1) and (2) illustrate well-known examples of Spanish causativization.

- (1) **la** hice correr
her.Acc I-made run
'I made her run.'
- (2) **le** hice buscar las herramientas
her.Dat I-made seek the tools
'I made her look for the tools.'

The clitics *la* and *le* in clause initial position indicate that *clause union* must have taken place (clitic climbing) so that all the arguments of the embedded predicate now function as arguments of the matrix predicate. Figure (3) provides the analysis of (2), as proposed by Aissen and Perlmutter (1983:384) within RG. The matrix verb *hacer* 'make' requires two arguments: a causer argument

(the 1 arc), and a predicate (the 2 arc). The arguments of this embedded predicate, *buscar* ‘seek’ are “unified” with the arguments of the matrix predicate, as indicated by the U. Figure (3) thus represents a complex predicate with three arguments.

(3) Original RG Clause Union Analysis



Though this early RG analysis provides a basic and intuitive insight into complex predicate formation in terms of a rather simple and clean idea, Aissen and Perlmutter (1983) struggle with the problem of variable case assignment on the causee. In (2), the clitic *le* representing the causee is realized in the dative case for the transitive verb. In the causativized intransitive in (1), however, the causee is accusative. This alternation does not follow from any independent principles, but must be stipulated as given in (4), where 2-arcs receive the accusative, and 3-arcs the dative case (Aissen and Perlmutter (1983:384)).

- (4) a. The final 1 of a finally intransitive complement heads a 2-arc in the matrix clause.
 b. The final 1 of a finally transitive complement heads a 3-arc in the matrix clause.

S. Rosen (1989) in her treatment of Romance causatives within a Government-Binding (GB) approach makes use of an explicit level of argument structure and builds on the idea of *Argument Merger* proposed in Grimshaw and Mester (1988) for Japanese *suru* ‘do’. However, despite the overall strength of her proposal, she has to resort to essentially the same stipulations as Aissen and Perlmutter in order to model the case alternation in causatives within her framework: the embedded agent must be specially marked with a +C in order to ensure the assignment of dative/accusative case, depending on the valency of the embedded predicate.⁴

⁴Contrary to a reviewer’s comment that stipulations about transitivity may be needed in all argument structure approaches, the analysis proposed by Alsina (1993) involving argument fusion and LFG’s linking theory overcomes a number of disadvantages of previous approaches and does not need to stipulate anything special for transitive vs. intransitive embedded predicates (see section 2.4). It is beyond the scope of this paper to summarize the rather extensive and detailed argumentation of Alsina (1993, 1996), however, I should note that examples in which intransitive vs. transitive versions of the same verb, e.g. *manger* ‘eat’, are embedded under a causative by no means present a counterexample to an argument structure approach. There is nothing inherent in the argument structure approach which prevents one from modeling optionally intransitive predicates at argument structure. As will become clear in the section on aspect, I do not subscribe to the view that argument roles enter directly into a process in which semantic entailments are calculated. Argument structure under the view presented in this paper is very much a syntactic level of representation.

2.3 Lexical Semantics and Syntax: a one-to-one relationship?

S. Rosen distinguishes between *Full Merger* for Italian and *Partial Merger* for French and Spanish and correlates this with the absence or presence of an embedded IP node. Under her view, as under Baker's view, argument structure and phrase structure thus exhibit a very close relationship, reflecting some fundamental beliefs about the correspondence of thematic arguments to their syntactic realization. Under Baker's approach, the UTAH encodes this belief. In other approaches, the Theta Criterion in combination with the Projection Principle ensures the one-to-one relationship of arguments to syntactic projections. In LFG, it is the Principle of Function-Argument Biuniqueness.

UTAH (Uniformity of Theta Assignment Hypothesis)

Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure (Baker 1988:46).

Theta Criterion

Every term of LF that requires a theta role is associated with one and only one position to which theta roles are assigned, and each theta role determined by the lexical properties of a head is uniquely associated with one and only one argument (reformulation taken from Baker (1988:37)).

Function-Argument Biuniqueness

$G = g_1, \dots, g_n$ is a possible grammatical function assignment to $P(1, \dots, m)$ if and only if the mapping from $1, \dots, m$ to G defined by $i \mapsto g_i$ is injective (one-to-one and into) (Bresnan (1982:163)).

A notable exception to this generally accepted view is found in Jackendoff (1990), who explicitly argues for the need of having two arguments link to one and the same syntactic NP. In fact, overwhelming evidence from languages such Chinese, Dutch, German, and Hindi/Urdu (Li 1995, Neeleman 1994, T. Mohanan 1994a, Butt 1995, Alsina 1995) points to the fact that the restrictions expressed by Function-Argument Biuniqueness or the Theta Criterion must be weakened. At the very least, they cannot apply in quite the way envisioned to date. For example, Alsina (1993:81–82) instead proposes an Argument-To-Function Uniqueness condition. I adopt this condition here.⁵

Argument-to-Function Uniqueness

There cannot be two distinct syntactic functions with the same argument value.

The adoption of this more flexible constraint entails that more than one argument may correspond to a single syntactic function, thus opening the door for argument fusion.

2.4 Argument Fusion

The assumption of the weaker principle of Argument-to-Function Uniqueness frees Alsina (1993) from the need to attempt a strict one-to-one mapping from arguments to syntactic positions. Following T. Mohanan (1988) for Malayalam, he posits both the traditionally accepted two place causative, and an additional three place causative. These are illustrated in (5) and (6). The two place causative accounts for constructions with optional oblique causees in Romance, while the

⁵Alsina (1995) goes even further and proposes to abolish even this unidirectional constraint based on data from Catalan reflexives, but this more extreme position is not taken in this paper.

three place causative is taken to form the causatives in (1) and (2). Note that in the three place causative two arguments are assumed to map to the same syntactic constituent. This is indicated by the bar connecting them, and can be thought of as *Argument Fusion*, which combines two arguments, rendering only one of them visible for linking purposes.

Two Place Causative

(5) CAUSE < ag PRED < ... θ ... >>

Three Place Causative

(6) CAUSE < ag $\overbrace{\text{pt}}{\hspace{1.5cm}}$ PRED < ... θ ... >>

The case marking alternations observed in (1) and (2) now follow from independent principles of LFG's linking theory in which arguments are linked to grammatical functions, and the further assumption that in Romance the dative case is assigned to the thematically most prominent internal argument (Alsina 1993).

This non-stipulative account of case marking is a nice result of the type of *Argument Fusion* or *Composition* engendered by (6). As already noted, it does violate the Principle of Function-Argument Biuniqueness in LFG. And it is exactly because (6) would violate the corresponding constraint in GB, that S. Rosen avoids the notion of Argument Fusion and the concomitant responsibilities of formulating appropriate restrictions on it. Similarly, approaches to Romance complex predicates within HPSG such as Monachesi (1995) or Sag and Manning (1995) avoid the question of Argument Fusion. These approaches rely on the mechanism of *Argument Composition*, first introduced by Hinrichs and Nakazawa (1990) for a treatment of verb clusters in German, which is similar to the original RG clause union analyses and the notion of Argument Merger first introduced by Grimshaw and Mester (1988) in that a matrix predicate (e.g., a restructuring verb in Romance) is simply postulated to subcategorize for a further predicate, and by extension, for all the arguments of that predicate. The possibility of *identifying* two arguments with one another, as illustrated above, never arises.⁶

However, as Alsina (1993) and Butt (1995) have argued for Romance Causatives and Urdu complex predicates, respectively, a satisfactory analysis of the wide range of data involved cannot be achieved without such a notion. Once this position is granted, some questions which arise immediately must necessarily be considered. How can Argument Fusion be thought of formally? What restrictions operate on Argument Fusion: can any argument simply be fused with any other argument, and if so, is this supported by linguistic phenomena?

In this paper, I make a first attempt at formulating a restrictive theory of complex predicate formation. Building on earlier work, I propose defining characteristics of complex predicates, and formulate restrictions on the types of argument merger that are available. Ultimately, the enterprise should yield an intuitive and simple account of complex predicates crosslinguistically. Within the scope of this paper, I first briefly recapitulate evidence for Argument Fusion from the Urdu Permissive, which serves as an excellent case in point for the need to recognize argument structure as an independent level of representation (see Butt (1994, 1995) for an extensive discussion). Building on the insights provided by the Urdu Permissive, I then examine Urdu causatives in light of Alsina's

⁶Note that the RG approach does not constitute an instance of Argument Fusion because there is no instance in which a given argument is introduced by more than one predicate. Contrary to a reviewer's reading of (3), despite the fact that *las herramientas* 'tools' in (2) ends up being represented as the 2 argument of the complex predicate, it is only introduced to the unified clause by the embedded predicate, not by the causative *hacer* 'make'. This is in marked contrast to the three place causative adopted by Alsina.

(1992, 1993) approach and propose a restrictive view of Argument Fusion in conjunction with the integration of aspectual information into the theory of linking, which has the desirable result of rendering some of the linking mechanism more intuitively transparent.

3 Complex Predicate Formation

3.1 The Urdu Permissive

Data from agreement, anaphora, and control very clearly show that the Urdu Permissive in (7)⁷ must be analyzed as a complex predicate. Furthermore, a comparison of the Permissive with the superficially similar *Instructive* in (8) shows that phrase structure cannot be taken to determine complex predicate status.

- (7) anjum=ne saddaf=ko haar **banaa-ne** **di-yaa**
 Anjum.F=Erg Saddaf.F=Dat necklace.M=Nom make-Inf.Obl give-Perf.M.Sg
 ‘Anjum let Saddam make a necklace.’

- (8) anjum=ne saddaf=ko [haar **banaa-ne=ko**] **kah-aa**
 Anjum.F=Erg Saddaf.F=Dat necklace.M=Nom make-Inf.Obl=Acc say-Perf.M.Sg
 ‘Anjum told Saddam to make a necklace.’

The contrast between these two constructions demonstrates that complex predicate formation is best analyzed at the level of argument structure. Note that this point has also been made by Manning (1992) and Alsina (1993) for Romance complex predicates, and by T. Mohanan (1994a) for Hindi N-V complex predicates. However, the Urdu Permissive contrasted with the Instructive provides some of the clearest and most forceful evidence in favor of an argument structure analysis.

The evidence comes from control, anaphora and agreement phenomena. Only the agreement data are recapitulated here, with respect to which the Permissive robustly behaves like a simple predicate, while the Instructive must be analyzed as a matrix verb with an embedded infinitival complement. In Urdu a verb can only agree with one of its own nominative arguments (see T. Mohanan (1994a) for details). If both the subject and the object are nominative, then the verb agrees with the subject.⁸ When there is no nominative argument in the clause, the verb is inflected with the default masculine singular *-aa*. A verb can never agree with an argument outside of its own domain of predication.

The lack of agreement between the feminine object *ciṭṭ^hii* ‘letter’ and the finite verb of the Instructive in (9) indicates that the object cannot be a matrix argument. Rather, it must be the argument of the embedded infinitive ‘to write’.

- (9) anjum=ne saddaf=ko [ciṭṭ^hii lik^h-ne=ko] **kah-aa**
 Anjum.F=Erg Saddaf.F=Dat note.F=Nom write-Inf.Obl=Acc say-Perf.M.Sg
 ‘Anjum told Saddam to write the note.’

The Permissive in (10) does not display the same pattern as the Instructive. In both (10a) and (10b) the finite verb agrees with the object.

⁷Abbreviations used are as follows. F = feminine; M = masculine; Erg = ergative; Nom = nominative; Gen = genitive; Dat = dative; Acc = accusative; Inst = instrumental; Loc = locative; Inf = infinitive; Obl = oblique; Perf = perfect; Impf = imperfect; Stat = stative; Pron = pronoun; Sg = singular; Pl = plural. A ‘-’ indicates a morpheme boundary, while a ‘=’ separates a clitic from a lexical item.

⁸The nominative case marker in Urdu is phonologically null.

- (10) a. anjum=ne saddaf=ko **ciṭṭ^hii** lik^h-ne **d-ii**
 Anjum.F=Erg Saddaf.F=Dat note.F=Nom write-Inf.Obl give-Perf.F.Sg
 ‘Anjum let Saddaf write a note.’
- b. anjum=ne saddaf=ko **xat** lik^h-ne **di-yaa**
 Anjum.F=Erg Saddaf.F=Dat letter.M=Nom write-Inf.Obl give-Perf.M.Sg
 ‘Anjum let Saddaf write a letter.’

Because the finite verb agrees with *ciṭṭ^hii* ‘letter’ in (10a), this noun cannot be an embedded object, but must be analyzed as a matrix object.⁹ The Permissive thus behaves as if it were a simple clause headed by a single predicate.

The agreement, anaphora, and control facts remain constant under scrambling as well. While this in itself is a strong indication for a nonstructural (and nonderivational) analysis of complex predicates, even more interestingly, phrase structural properties such as scrambling, negation, and coordination do not differentiate between the two constructions. A purely structural and derivational account could still, no doubt be formulated, however, the more fruitful avenue of research would seem to lie in pursuing an analysis which allows for an independent level of argument structure, and which relates phrase structure representations to grammatical functions nonderivationally, as is the case in LFG.

3.2 Complex Predicate Analysis

The essential, defining characteristics of complex predicates, as evidenced by the Permissive, can be stated as follows.

(11) **Defining Properties of Complex Predicates:**

- The argument structure is complex (two or more predicative heads contribute arguments).
- The grammatical functional structure is that of a simple predicate. In particular, it contains only a **single** subject.
- The phrase structure may be either simple or complex. It does not necessarily determine the status of a complex predicate.

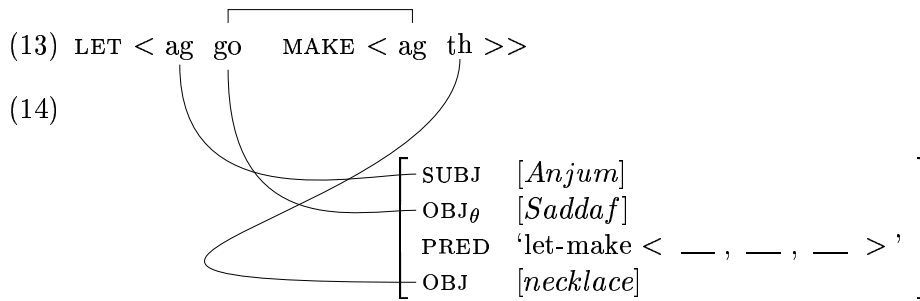
As LFG encodes grammatical relations at a separate level from phrase structure, the differences and similarities between the Permissive and the Instructive can easily be accounted for in terms of f(unctional)-structure and c(onstituent)-structure properties. The fact that the Permissive is a complex predicate while the Instructive is not is expressed through the relationship between a-structure and f-structure. As shown in the abbreviated f-structure¹⁰ representation in (14) for the Permissive, a single domain of predication at f-structure corresponds to complex predication at a-structure.¹¹ Thus, there is only one subject, one object and one indirect object: the Permissive is *flat* at f-structure, but complex at a-structure.

- (12) anjum=ne saddaf=ko haar **banaa-ne** **di-yaa**
 Anjum.F=Erg Saddaf.F=Dat necklace.M=Nom make-Inf.Obl give-Perf.M.Sg
 ‘Anjum let Saddaf make a necklace.’

⁹For details on infinitive agreement see Butt (1993a, 1993b). Infinitives generally involve what appears to be “long distance agreement”, but which must actually be analyzed as an instance of successive local agreement. The agreement facts of the Permissive cannot be analyzed similarly.

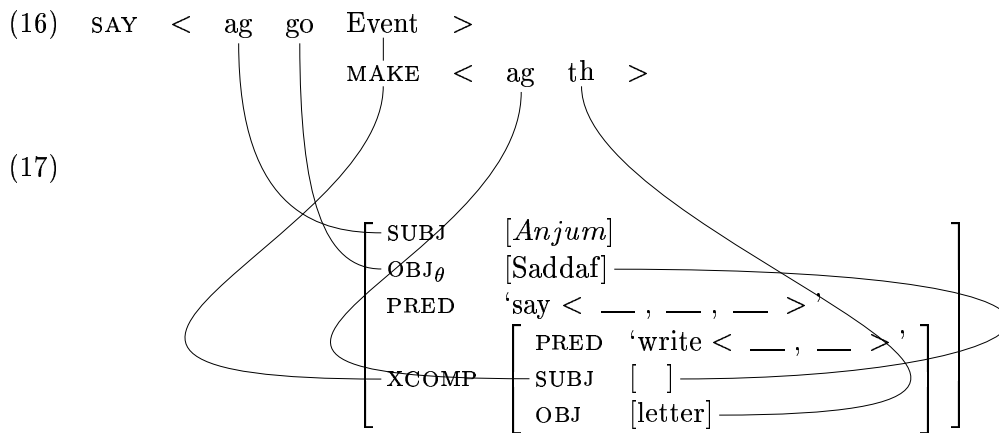
¹⁰The f-structure is abbreviated in that it displays only some basic information. A complete f-structure would list values for number, case, gender, tense, etc.

¹¹See section 3.3 on why the second argument of the Permissive is rendered as a goal in (13).



The f-structure in (16) for the Instructive, on the other hand, contains two argument taking PREDs. The PRED 'say' takes an XCOMP as one of its arguments. This XCOMP represents a second, embedded domain of predication of the PRED 'write'. The Instructive is thus represented by a complex a-structure which corresponds to a complex f-structure.

(15) anjum=ne saddaf=ko ciṭṭ^hii lik^h-ne=ko kah-aa
 Anjum.F=Erg Saddaf.F=Dat letter.F=Nom write-Inf.Obl=Acc say-Perf.M.Sg
 'Anjum told Saddaf to write a letter.'



As LFG defines f-structure and c-structure as independent, but mutually constraining levels of representation, a given sentence may have more than one c-structure realization, as long as the requirements of completeness and coherence are met at f-structure (see Bresnan (1982)). The data from agreement, anaphora, and control, which indicated that the Permissive and the Instructive differ from one another, are completely accounted for at f-structure, while the data from coordination, scrambling, and negation can be accounted for at c-structure.

3.3 Light Verbs

Under the approach to complex predicates taken here, argument structure must be viewed as an **interface** between lexical semantics and syntax. I follow T. Mohanan (1994a) in assuming that a-structure, while linked to lexical semantics, is not itself a semantic level of representation. This is in line with more structural approaches, such as Hale and Keyser (1993). However, as discussed previously, I assume that the encoding of arguments at argument structure is not necessarily isomorphic with their syntactic realization.

A further idea found in many analyses of complex predicates, and one that is adopted here as well, is that complex predicate formation is triggered by *light verbs*, a term first used by Jespersen

(1954) to characterize verbs which appear to have been semantically “bleached”. The predicates are incomplete and subcategorize for another predicate (Alsina 1993, Butt 1995). I assume that the predicates are incomplete in the sense that the event structure denoted by the light verb is incomplete, and must be combined with the event structure of the main verb. While it is beyond the scope of this paper to delve into the semantics of events, the idea of an incomplete event is supported by the fact that the two events involved in causation or permission are cognitively separable and yet difficult to modify individually, as illustrated by the contrast in (18).

- (18) a. ??anjum=ne saddaf=ko aaj haar banaa-ne kal
 Anjum.F=Erg Saddaf.F=Dat today necklace.M=Nom make-Inf.Obl yesterday
 di-yaa
 give-Perf.M.Sg
 ‘Anjum yesterday let Saddaf make a necklace today.’
- b. anjum=ne saddaf=ko aaj haar banaa-ne=ko kal
 Anjum.F=Erg Saddaf.F=Dat today necklace.M=Nom make-Inf.Obl=Acc yesterday
 kah-aa
 say-Perf.M.Sg
 ‘Anjum told Saddaf yesterday to make a necklace today.’

Light verbs thus trigger a merger of argument structures which results in a single predicational element, with a single, albeit internally complex, event structure.

I now return to the question: why Argument Fusion? Why postulate a potentially unrestricted formal device as part of complex predicate formation instead of sticking simply to notion of argument structure merger without the concomitant identification of two arguments? The position taken in this paper is that one needs both concepts, just as both the fundamental syntactic notions of Equi (control) and Raising are needed. In particular, as Neeleman (1994) also observes for Dutch and German *consider* constructions, an adequate account of the Urdu Permissive must take into account that the permittee in (18a) plays two roles: the recipient (goal) of the permission, and the agent of the embedded action. Note that the Permissive *de* in fact derives from the ditransitive main verb ‘give’. As all goals are marked by dative case in Urdu, including “experiencer” subjects (K.P. Mohanan and T. Mohanan 1990), the dative case marking on the permittee follows immediately from an account allowing for a three place permissive light verb in conjunction with Argument Fusion.

It could be argued that in the process of “semantic bleaching” the permissive form might have lost all of its arguments except the permitter. However, this is not supported by the behaviour of another light verb derived from ‘give’, illustrated in (19).

- (19) anjum=ne g^har banaa di-yaa
 Anjum.F=Erg house.M=Nom make give-Perf.M.Sg
 ‘Anjum built a house.’

As an *Aspectual* light verb, *de* is used to signal telicity, and selects the case marking on the subject (see Butt (1995)). Unlike the Permissive, it does not retain any other arguments. As shown in Butt (1995), the Aspectual light verbs in fact provide further evidence for an Argument Fusion approach, since an alternation between ergative and nominative case marking on subjects of complex predicates formed with these light verbs can be explained straightforwardly under the assumption of Argument Fusion.

4 Urdu Causatives

A further case in point for the adoption of an Argument Fusion approach to complex predicates comes from causatives. In this section, I first detail the rather complicated pattern in Urdu and present the relative strength of an account which allows for Argument Fusion (Alsina and Joshi 1991, Alsina 1992). However, the particular formulation of Alsina and Joshi’s account raises a question as to the viability of such an essentially unconstrained process. I address some of the formal issues involved and propose an alternative account of Urdu causatives. This account relies on the notion of Argument Fusion as well, but does so in a constrained and systematic fashion.

4.1 The Data

Hindi/Urdu has two causative morphemes *-aa-* and *-vaa-*, which are historically derived from the Sanskrit allomorphs *aya* and *apaya* (Masica 1991). Saksena (1980, 1982a, 1982b) details a complex system of causativization and analyses the variation in case marking on causees (accusative *ko* vs. instrumental *se*) in terms of whether the causee is an *affected agent* or not.

The fact that there are two causative morphemes available in Hindi/Urdu has led some researchers (e.g., Kachru 1980) to posit two stages of causativization, the first represented by *-aa-*, and the second by *-vaa-*. However, as Saksena (1982b) shows, the data in Hindi/Urdu do not actually allow themselves to be sorted into such a neat pattern. Rather, some notion of involved vs. non-involved causer, plus a notion of affectedness of the causee must be taken into account. In the data presented below, I abstract away from a number of complications in the system which determine when *-aa-* vs. *-vaa-* is chosen (e.g., morphophonological reasons, historical gaps, the notion of involved or non-involved causer) and concentrate on the patterns Saksena details with regard to the choice of *ko* or *se* case marking on the causee.

The basic pattern of causativization is illustrated in (20) and (21).¹² In these cases,¹³ the causee (*house*, *Saddaf*) always appear as direct objects and can be either nominative (unmarked), or accusative (*ko*). This case alternation on direct objects in Urdu is in fact associated with specificity (Butt 1993b).¹⁴

- (20) a. *makaan* *ban-aa*
house.M=Nom be made-Perf.M.Sg
'The house was built.'
'Das Haus entstand.'
- b. *anjum=ne* *makaan* *ban-a-yaa*
Anjum.F=Erg house.M=Nom be made-Caus-Perf.M.Sg
'Anjum built a house.'
- (21) a. *saddaf* *b^hag-ii*
Saddaf.F=Nom run-Perf.F.Sg
'Saddaf ran.'

¹²It appears that in the grammar of modern speakers, the “causativized” form in the (b) examples is actually not registered as such: the complex predicates have been reanalyzed as simple transitives (see also Saksena (1982b) on the lexicalization of such forms).

¹³Note that the passive English gloss given for (20) is not entirely accurate: the *ban* in fact has no passive interpretation, as is illustrated by the German gloss. An English analog is a verb such as *appear*.

¹⁴The examples presented here are all past tense, realized through “perfective” morphology. Urdu is a split-ergative language in which the ergative is roughly correlated with unergatives, transitivity and perfective morphology.

- b. anjum=ne saddaf=ko b^hag-**a**-yaa
 Anjum.F=Erg Saddaf.F=Acc run-Caus-Perf.M.Sg
 ‘Anjum chased Saddaf away (made her run).’

Most transitives display a different pattern. The causee here is not directly affected by the caused action and can only appear as an oblique argument with the instrumental *-se*.

- (22) a. anjum=ne paodaa kaat-aa
 Anjum.F=Erg plant.M=Nom cut-Perf.M.Sg
 ‘Anjum cut a/the plant.’
- b. anjum=ne saddaf=se/*ko paoda kaat-**a**-yaa
 Anjum.F=Erg Saddaf.F=Inst/Acc plant.M=Nom cut-Caus-Perf.M.Sg
 ‘Anjum had Saddaf cut a/the plant.’

For another set of transitives (other members of this class include *drink*, *learn*, *see*) the agent can be said to be affected by the action, and only a direct (affected) object causee is allowed.

- (23) a. saddaf=ne k^haanaa k^ha-yaa
 Saddaf.F=Erg food.M=Nom eat-Perf.M.Sg
 ‘Saddaf ate food.’
- b. anjum=ne saddaf=ko/*se k^haanaa k^hil-**a**-yaa
 Anjum.F=Erg Saddaf.F=Acc/Inst food.M=Nom eat-Caus-Perf.M.Sg
 ‘Anjum made Saddaf eat food (gave Saddaf food to eat).’

Finally, there are some transitives which allow both oblique and direct object causees, depending on how “affected” the causee is judged to be from situation to situation (other members of this class are *read*, *write*, *sing*).

- (24) a. saddaf=ne masaalaa cak^h-aa
 Saddaf.F=Erg spice.M=Nom taste-Perf.M.Sg
 ‘Saddaf tasted the seasoning.’
- b. anjum=ne **saddaf=ko** masaalaa cak^h-**va**-yaa
 Anjum.F=Erg Saddaf.F=Acc spice.M=Nom taste-Caus-Perf.M.Sg
 ‘Anjum had Saddaf taste the seasoning.’
- c. anjum=ne **saddaf=se** masaalaa cak^h-**va**-yaa
 Anjum.F=Erg Saddaf.F=Inst spice.M=Nom taste-Caus-Perf.M.Sg
 ‘Anjum had the seasoning tasted by Saddaf.’

The reading that (24b) must receive is that there was a situation in which *Anjum* wanted *Saddaf* in particular to taste the seasoning. In (24c), on the other hand, the emphasis is placed on the seasoning: it is important that the seasoning be tasted, whether this is done by *Saddaf* or some other random person is immaterial. Thus, in (24b) it is *Saddaf* who is “affected”, while in (24c) it could instead be the seasoning.

4.2 Parameters on Argument Fusion

The data presented above may appear to come in a bewildering variety, but the account proposed by Alsina and Joshi (1991) for very similar data from Marathi and Chicheŵa can in fact be extended successfully to the Urdu data. This approach actually appears to be the only analysis to date which can account for the full range of data in Hindi/Urdu. Furthermore, it also manages to integrate Saksena’s (1982b) original intuition as to the relevance of an “affected agent” into a formal theory of linking. The key to the account posited by Alsina and Joshi (1991) and Alsina (1992) is the assumption of a three place causative in conjunction with the possibility of Argument Fusion. Alsina and Joshi also continue to assume the traditional two place causative for a case alternation which encodes the relative affectedness of the causee in Malayalam causativized unergatives.

Data from Chicheŵa corresponding to the Urdu alternation in (24) are shown in (25)–(26).

- (25) Kadzĩdzi a-na-phĩká maũngu (Chicheŵa)
 owl SUBJ-PAST-cook pumpkins
 ‘The owl cooked pumpkins.
- (26) a. Nũngu i-na-phĩk-ĩtsa **kadzĩdzi** maũngu OBJECT CAUSEE
 porcupine SUBJ-PAST-cookCAUS owl pumpkins
 ‘The porcupine made the owl cook the pumpkins.
- b. Nũngu i-na-phĩk-ĩtsa maũngu **kwá kádzĩdzi** OBLIQUE CAUSEE
 porcupine SUBJ-PAST-cookCAUS pumpkins by owl
 ‘The porcupine had the pumpkins cooked by the owl.

Like Urdu, Chicheŵa allows a choice in the realization of the causee. Again, the relevant distinction to be made between (26a) and (26b) appears to be in terms of the affectedness of the causee. In (26a), the affectedness of the direct object *owl* is emphasized, in (26b), on the other hand, the pumpkins must be interpreted as being the most affected argument.

Alsina and Joshi analyse these effects in terms of different possibilities for the fusion of arguments. The possible parameters that languages may set are shown in (27). The analyses for (26a) and (26b) are shown in (28a) and (28b), respectively.

(27) *Parameters*

The patient of the causative predicate may fuse with

- a. the logical subject of the base predicate or
- b. the logical object (affected argument).

(28)

- a. phik-itsa ‘cause’ < ag pt ‘cook’ < ag pt >> (OBJECT CAUSEE)
 cook-CAUS
- b. phik-itsa ‘cause’ < ag pt ‘cook’ < ag pt >> (OBLIQUE CAUSEE)
 cook-CAUS

In (28a), the causee is also the patient of the cause predicate. Hence, it qualifies as an affected causee and is realized as an object. In (28b), on the other hand, fusion has taken place according to

Parameter *b* of (27). The causee here is now not also simultaneously the patient of causation, so the it is realized as an oblique argument and the pumpkins surface as the direct object. Note, however, that there is an inconsistency in the use of the three place causative. In (28a) the causer acts upon the patient of causation in order to bring about a certain event. That is, (26a) is reasonably interpreted as describing a situation in which the porcupine acts upon the owl, so that the owl then goes and cooks the pumpkins. In (28b), on the other hand, the causer porcupine acts upon the patient of causation, which is also the patient of the embedded predicate, the pumpkins. That is, according to (28b), (26b) should actually be interpreted so that the porcupine acts upon the pumpkins directly in order to be bring about their cooked state, leaving the owl, the actual cooker of the pumpkins, somewhat in limbo.

This point is actually indicative of a larger, technical problem with the theory of argument composition presented by Alsina and Joshi. The postulation of Parameters on Argument Fusion opens the door to any kind of combinations of arguments: one could imagine additional parameters sensitive to volitionality, benefaction or experiencerhood. Such semantic factors governing the parameters on argument fusion preclude the formulation of any restrictive theory of complex predicate formation. Furthermore, while the notion of *affectedness* plays a large role, it is not defined in a satisfactory manner. What does it mean to be affected? In fact, as much recent work on the interaction between aspect and argument structure has actually focused on just this question (e.g., Tenny (1987), Krifka (1992)), the investigation of a connection to possible aspectual influences in causativization is not only desirable, but necessary.

Before moving on to a reanalysis of Urdu causatives, I address the issues raised by Argument Fusion and resolve the technical problems that may be brought up with respect to such a seemingly non-monotonic addition to an otherwise monotonic framework. I then go on to present a very restrictive view on Argument Fusion which finds a parallel in the notion of syntactic control.

5 Formal Considerations

5.1 Linking

An immediate objection to the notion of Argument Fusion can be made from both a formal and a semantic point of view in that the notion may be incoherent with respect to both of these areas. However, I argue that Argument Fusion must actually be understood to be the argument structure analog to syntactic control, and be viewed as an instance of the type of Θ -identification proposed by Higginbotham (1985). The notion is coherent and formally unproblematic under this view.

Both here and in the bulk of the literature on argument structure, its representation has been in form of a list of roles. Consistent with general LFG-architecture, argument structure can, however, alternatively be viewed as an Attribute-Value Matrix (AVM). In this paper, I propose a representation which naturally integrates the principles of linking theory as formulated in LFG (Bresnan and Kanerva 1989, Alsina and Mchombo 1989, Bresnan and Moshi 1990, Bresnan and Zaenen 1990).¹⁵

The linking theory relies primarily on the Thematic Hierarchy shown in (29), which is based on argumentation from Kiparsky (1987).

(29) **Thematic Hierarchy:**

agent < beneficiary < experiencer/goal < instrument < patient/theme < locative

¹⁵For recent reformulations of the linking theory along the lines of Dowty's (1991) proto-roles, see Alsina (1993, 1996) and Zaenen (1993).

The thematic arguments are associated with the features [\pm o(bject)] and [\pm r(estricted)]. These features in turn provide the constraints for the mapping from a(rgument)-structure to f-structure. The correspondence between grammatical functions and features is shown in (30).

(30) Grammatical Functions	Features
SUBJ	[$-r$, $-o$]
OBJ	[$-r$, $+o$]
OBJ $_{\theta}$	[$+r$, $+o$]
OBL $_{\theta}$	[$+r$, $-o$]

The association of the features with thematic roles is governed by two classification systems: *Intrinsic* and *Default Role Classifications*, whereby the *Intrinsic* Classification has come to be viewed as part of the argument structure representation in more recent developments within linking theory (Bresnan and Zaenan 1990, Alsina 1993).

Intrinsic Role Classifications

Patientlike roles: [$-r$]

Secondary patientlike roles: [$+o$]

All others: [$-o$]

Default Role Classifications

Highest thematic role: [$-r$]

All others: [$+r$]

The essential function of the features is to ensure that agents are usually mapped onto subjects ([$-o$]), while patients/themes ([$-r$]) are mapped onto objects. Thus, the [\pm o] feature sets the subject apart from other arguments by marking all the roles that might be mapped onto objects. The [\pm r] feature refers to the restrictedness of the semantic interpretation of a given grammatical function: subjects and direct objects are not restricted in terms of the thematic roles they may be associated with, while indirect objects and obliques do have a semantically restricted interpretation.

Now, given that the initial set of classificatory features is considered to be intrinsic, i.e., part of the predicate-argument structure, a reasonable rendering of an argument structure representation as in (31), taken from Bresnan and Zaenen (1990:48) would be as in (32).

(31) *pound* < ag pt >
 [$-o$] [$-r$]

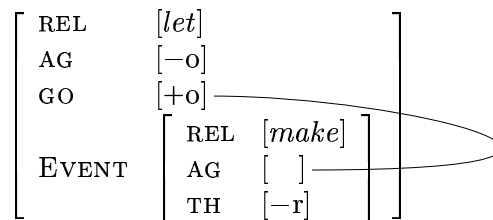
(32)

$$\left[\begin{array}{ll} \text{PRED} & \text{'pound < } _ \text{ , } _ \text{ >'} \\ \text{AG} & [\mathbf{-o}] \\ \text{PT} & [\mathbf{-r}] \end{array} \right]$$

While the linking theory was originally viewed as applying to lexical items within the lexicon, it has been successfully extended to apply beyond the lexicon (e.g., Bresnan and Zaenen (1990) for an account of resultatives). In particular, it can also be applied to dynamic complex predicate

formation in the syntax, as argued for in Butt (1995) and Alsina (1993, 1996) for Urdu and Romance, respectively.¹⁶ The argument structure of the Permissive and Argument Fusion between the permittee and the agent of the embedded predicate can thus be rendered as in (33).¹⁷

(33)



Argument Fusion is thus taken to be the a-structure analog to functional control, the formal properties of which are well defined and understood within LFG (Kaplan 1995, Kaplan and Bresnan 1995). Note that the embedded agent role in (33) does not have an inherent specification. In addition to the [-o] option, which functions as the elsewhere case for the determination of intrinsic features, I assume that when a role is subject to control as a-structure as in (33), it may not carry a separate specification.

5.2 Parallelism to Syntactic Control/Raising

Having arrived at a formal understanding of Argument Fusion, the next immediate question which must be addressed is the potentially unrestricted nature of the combinatory possibilities that become available. If, as in Alsina and Joshi's approach to causatives, any argument from one a-structure could potentially be fused with any argument from another embedded a-structure, is it still possible to formulate a restrictive theory which allows the statement of strong and potentially falsifiable predictions? The answer here must clearly be in the negative, as any number of parameters in addition to the affected argument of Alsina and Joshi (1991) may be subsequently introduced.

In this section, I put forward some very strong restrictions on the combinatory possibilities of argument structures. As suggested above, I propose that complex predicate formation at argument structure is analogous to (and probably historically derived from) syntactic control/raising (see Sells (1993) for a similar idea). Accordingly, only the highest embedded argument should ever be available for fusion. This restriction is also in accordance with Neeleman's (1994) structural approach to complex predicates, in which he motivates θ -percolation only for the highest θ -role (based on independent argumentation from Williams (1980)). In our terms, the restriction argued for by Neeleman can be formulated as in (34).

(34) **Restriction on Argument Fusion:**

Only the highest θ -role may escape its domain of predication, and thus become eligible for Argument Fusion.

¹⁶But see Frank (1996) for an alternative view, where argument structure composition of syntactically independent items is carried out within a version of the lexicon that is taken to encompass more than the encoding of lexical and sublexical properties.

¹⁷A goal in Urdu as inherently classified as [+o], unless it appears as the highest argument. In the latter case it is marked as [-o]. This allows a mapping to subject in experiencer constructions, and an object argument in ditransitives.

Parallel to syntactic control/raising, I thus admit the following two combinatory possibilities for argument structures.

Argument Fusion

The highest embedded argument is fused with the lowest matrix argument (analagous to syntactic control (PRO)).

Argument Raising

The arguments of the matrix a-structure are unified with the arguments of the embedded a-structure (c.f. Grimshaw and Mester’s (1988) *Argument Transfer* for Japanese *suru*, Monachesi’s (1995) use of *Argument Composition* within HPSG for Romance restructuring verbs).

Both Argument Fusion and Raising are amply documented. The Urdu Permissive, for example, is an instance of Argument Fusion. Neeleman (1994) argues for a complex predicate, rather than a small clause, analysis for Dutch and German *consider*-constructions and thus provides a well documented example of Argument Raising, as well as positing the equivalent of Argument Fusion as defined here for Dutch resultatives. Table (35) summarizes the correlations between complex predicate formation, argument structure combination, and syntactic control/raising.

(35)	Control	Raising	Complex Predicate
syntax (f-structure)	PRO controlled	Exceptional Case Marking	No
a-structure	argument controlled (fusion)	arguments unified (raising)	Yes

Note that although I cite the notions of *Argument Transfer* and *Argument Composition* as being closely related to the notion of Argument Raising, the phenomena for which these analyses were originally proposed do not necessarily provide well documented instances of Argument Raising as formulated here, i.e., as leading to complex predicate formation (see (11)). Matsumoto (1996), for example, strongly challenges an Argument Transfer analysis for Japanese *suru*. Similarly, it is not clear whether Romance restructuring verbs should be viewed as an instance of Argument Raising, or rather, as argued in Butt (1995), as an instance of Argument Fusion. The phenomena of German verbal complexes for which Argument Composition was originally introduced (Hinrichs and Nakazawa 1990), in fact, show no evidence of being instances of complex predicate formation (see Rambow 1996).

Also note that I make a very clear distinction between what I have described as complex predicates in terms of (11), and further constructions such as applicatives, passives, or serial verbs. While these constructions must also involve argument structure combinations, there does appear to be a difference as to the kind of combination. Applicatives and passives involve argument addition and reduction, respectively, while serial verbs are most commonly characterized by *object sharing* (Baker 1989), and therefore are not subject to the restriction in (34). It appears that the crucial factor differentiating the constructions must be stated in terms of event structure: passives and applicatives only involve one event, unlike the Urdu Permissive, or causatives, in which there is an event of causing/letting and the caused/permitted event. Serial verb formation, on the other hand, seems to be governed by restrictions on *complex event-bundling* (Durie 1993). For example, in Sranan *buy take fish* is a good “normal/expected” complex event, but *sell take fish* is not. This issue of differences in event structure needs to be explored in much more detail and remains subject to further research.

Within the scope of this paper, I now move on to a reexamination of Urdu causatives and propose an analysis which builds on the original insights of Alsina and Joshi (1991) and Saksena (1982), but avoids the unconstrained nature of Alsina and Joshi's approach by incorporating the restricted notion of Argument Fusion presented above.

6 Causatives, Aspect, and Affectedness

6.1 Interactions

An alternative approach to the notion of affectedness, which both Saksena (1982) and Alsina and Joshi (1991) demonstrated to be directly relevant for an analysis of causatives, is offered by the literature on clausal aspect. The notion of affectedness has been shown to play a large role in the determination of clausal aspect (e.g., Tenny 1987), and considerable effort has been put into formalization over the years (e.g., Dowty 1979, Verkuyl 1972, Krifka 1992).

Interestingly enough, other recent work on complex predication has noted an interaction between aspect, affectedness, and the licensing of arguments (e.g., English *have* (Ritter and Rosen 1993) and Chinese resultatives (Li 1995)). The accounts posited for these phenomena independently arrive at very much the same conclusions: they suggest that the licensing of arguments in the syntax is determined through an interaction of aspect with an *underspecified* thematic structure (compare Grimshaw's (1990) *Thematic* and *Aspect Tiers*).

While these approaches provide interesting evidence for the role of aspect in complex predication, a precise integration of aspectual information into a theory of projection (linking in our terms) has not so far been undertaken. This is not surprising, as the representation of aspectual information within the syntax is as yet not well understood. However, this is precisely the issue taken on in Ramchand (to appear). Based on data which illustrate an interaction between aspect and argument structure in Scottish Gaelic, Ramchand extends Krifka's (1992) system of role types (defined primarily for verbs of creation and consumption) to account for a broader field of predication. This system is further combined with a theory in which verbs provide an underspecified θ -grid whose arguments are licensed in the syntax through roles assigned by the aspectual head of the construction (situated in AspP). Note that this is exactly within the spirit of the approach argued for independently by Li (1995) and Ritter and Rosen (1993). In particular, Ramchand also sketches an analysis to Urdu causatives, in which the affectedness of causees is accounted for through the interaction between aspect and argument structure. The crucial difference between Ramchand's approach and the analysis presented in Alsina and Joshi (1991) and Alsina (1992) is that Ramchand does not rely exclusively on lexical information provided by the predicates, but rather has lexical (thematic role) information interact with structurally determined aspectual roles. Ramchand, in fact, maintains that an approach within linking theory, where lexical information is placed in correspondence with grammatical functions cannot account satisfactorily for the full range of interactions between case marking, syntactic position, and semantic interpretation of argument NPs.

In this section, I propose to show that lexically determined thematic information can be placed into a relationship with clause based considerations of aspectual interpretation within the already existing LFG formalism, without necessarily presupposing an explicitly structural approach as that advocated by Ramchand, or assumed by Ritter and Rosen (1993). As LFG assumes an architecture of grammar in which several differing levels of representation are independent, but co-present in the sense that they are explicitly related to one another by the projection architecture (Kaplan 1995, Kaplan and Wedekind 1993), a very natural analysis can be developed for Urdu causatives in which the linking of lexical thematic information to grammatical functions is also sensitive to

aspectual information encoded at a different, semantic, level of representation.

6.2 Lexical and Compositional Aspect

It has long been noted that verbs can be classified into several different types. The verb *break*, for example, entails a result state in which some object is broken where it previously was not, while a verb like *run* simply denotes an activity without necessarily entailing a resultant state. Vendler’s (1967) classification of verbs in terms of the *Aktionsart* types *state*, *activity*, *achievement*, *accomplishment*, along with the very careful tests Dowty (1979) formulates have come to represent a standard in examinations of verbal aspect. However, it has also long been recognized that verbal aspect cannot be based on the lexical semantics of the verb alone, but must take into account clausal influences such as adverbials, quantifiers, or the semantics of NP arguments (Verkuyl 1972). A well-known example with respect to the latter is the alternation between (36a) and (36b), where the former must be interpreted as an achievement, and the latter as an activity.

- (36) a. Yassin ate an apple (*for an hour)/(in an hour). TELIC
 b. Yassin ate apples (for an hour)/(*in an hour). ATELIC

Verkuyl (1993) and Krifka (1992) have proposed an explicit semantics for the interaction between verbal predication and argument NPs, with special emphasis on verbs of creation and consumption. The basic intuition behind their respective formalisms is a mapping of created/consumed objects on to a spatial-temporal axis. Notions like affectedness are then captured by constructing a mapping between an event denoted by a verb and its object. While a precise characterization of the respective semantic formalisms employed by Krifka and Verkuyl goes beyond the scope of this paper, the underlying intuition can be summarized roughly as follows. Internal arguments are mapped onto the event structure of a predicate. In (36a), every subpart of the event can be seen as corresponding to a subpart of the apple being consumed: the event is telic, and the object apple is affected. In (36b), on the other hand, such a strict mapping between events and objects is not possible, and different set of event to object correspondences captures the atelic nature of the event.

6.3 Urdu Causatives Revisited

The affectedness effects found for causees in Urdu do in fact interact with aspect. In (37) the causee is realized as a direct accusative object. If the causee here is indeed “affected” in the aspectual sense of Krifka (1992), the construction as a whole should be telic and therefore incompatible with a durative adverbial like *for a long time*, but compatible with a time-span adverbial like *in ten minutes*. As (37a) and (37b) illustrate, this is indeed the case.

- (37) a. *anjum=ne **xansaamō=ko** masaalaa barii d^heer=ke liye cak^h-va-yaa
 Anjum.F=Erg cook.M.Pl=Acc spice.M=Nom big time=for taste-Caus-Perf.M.Sg
 ‘Anjum had the cooks taste the seasoning for a long time.’
 b. anjum=ne **xansaamō=ko** masaalaa das minṭ=mē cak^h-va-yaa
 Anjum.F=Erg cook.M.Pl=Acc spice.M=Nom ten minutes=in taste-Caus-Perf.M.Sg
 ‘Anjum had the cooks taste the seasoning in ten minutes.’

In (38), the causee is realized as an oblique. Under a reading where the causee is not affected, i.e., is not implicated at each stage of the caused event, the tasting event should be atelic. Recall that the oblique *cook* here may be only one of many tasters. As such, this construction should be

compatible with both the durative adverbial in (38a) and the time-span adverbial in (38b). Again, the data bear out the prediction.¹⁸

- (38) a. anjum=ne **xansaamõ=se** masaalaa barii d^heer=ke liye cak^h-**va**-yaa
 Anjum.F=Erg cook.M.Pl=Inst spice.M=Nom big time=for taste-Caus-Perf.M.Sg
 ‘Anjum had the cooks taste the seasoning for a long time.’
- b. anjum=ne **xansaamõ=se** masaalaa das minṭ=mē cak^h-**va**-yaa
 Anjum.F=Erg cook.M.Pl=Inst spice.M=Nom ten minutes=in taste-Caus-Perf.M.Sg
 ‘Anjum had the cooks taste the seasoning in ten minutes.’

Having established the interconnectedness between aspect, affectedness and case marking in Urdu causatives, I now offer an alternative view of linking, which allows an incorporation of aspectual considerations, while remaining true to the constrained theory of complex predicate formation articulated above.

6.4 Rethinking Linking

6.4.1 Thematic Roles

A strong view of argument structure is that the information represented at this level must be considered to be of a semantic nature, and that a statement of semantic entailments ought to be possible at this level. This expectation is exactly what has given rise to the general dissatisfaction with the use of thematic roles as a representation of argument structure. As Dowty (1991) points out very forcefully, there is simply no general consensus as to which and how many thematic roles there ought to be. It is also not clear exactly what it means to be an *agent* vs. an *instrument*, or a *patient* vs. a *theme*.¹⁹ As a realistic alternative, Dowty formulates the notion of *proto-roles*, which allows the properties of a given argument to vary over a collection of semantic entailments, thus allowing greater flexibility in the assignment of thematic roles, and dispensing with the need to invent a new role for each slightly differing collection of semantic entailments.

Alsina (1993) imports Dowty’s proto-roles in a version of LFG’s Linking Theory, and reformulates the linking principles accordingly. In this paper, I propose to take a different approach and follow Zaenen (1993:147) in assuming that lexical meaning cannot always be characterized directly in terms of entailments. Zaenen takes the collection of Dowty’s proposed agent and patient properties and uses them simply to determine whether a given argument’s intrinsic feature classification will be [–o] (proto-agent), or [–r] (proto-patient), without worrying about semantic entailments until semantic interpretation at the level of the clause.

Zaenen (1993) dispenses with a hierarchy of thematic roles. However, as she is primarily considering intransitives, this is easy to do. I propose to adopt the reduced thematic hierarchy in (39), which is essentially the hierarchy put forward in Kiparsky (1987).

- (39) **Reduced Thematic Hierarchy:**
agent < goal < instrument < theme < locative

¹⁸Note that in (38) the object *masaalaa* ‘spice’ may alternate between nominative and accusative case. If it is marked with the accusative *ko*, the spice must be interpreted as “affected” and is incompatible with the durative adverbial. In (37) the object ‘spice’ may not be subject to such alternation since there is a restriction in Urdu/Hindi against more than one *ko* marked object per clause (T. Mohanan 1994b).

¹⁹Dowty is, of course, not the only one to express the general unhappiness with thematic roles. Other succinct, recent discussions include (but are not limited to) Grimshaw (1990), Jackendoff (1990) and the collection of papers in Butt and Geuder (to appear).

In comparison to the standardly assumed hierarchy in (29) within LFG’s Linking Theory, I take *goal* to be the proto-typical instantiation of *beneficiary* and *experiencer*, and *theme* as the label for a proto-patient. The purpose of the hierarchy continues to be as standardly assumed: to rank the arguments of a predicate. The role names, however, as already argued in Grimshaw (1990), must be seen as abstract labels attached to a ranked list of arguments. I could try to dispense with the labels altogether, but as Grimshaw’s (1990) attempt in this direction showed, the labels are not only handy, but also allow distinctions that cannot be achieved through a mere employment of alphabetical items such as *x*, *y* or *z*.

The thematic roles are viewed as fulfilling a proto-typical role in a given action-schema, but there is no direct evaluation of the roles in terms of semantic entailments. Rather, the parameters involved, such as affectedness, volition (with agents) or instrumentality are properties which can be shown to have a direct syntactic influence, for example in terms of case marking or grammatical function realization. These syntactic realizations may, in turn, give rise to differing semantic interpretations. However, the semantic input from the lexical properties of a predicate takes an indirect, rather than a direct form. The primary purpose of argument structure, under this view, is to help determine the syntactic realization of a predicate’s arguments in terms of grammatical functions and case marking. In this sense, then, argument structure must be viewed as a primarily **syntactic** level of representation.

6.4.2 Aspectual Interpretation of Internal Arguments

Given that aspectual considerations appear to influence the mapping from a-structure to f-structure, as evidenced by the Urdu causatives, how should aspectual notions be integrated? Grimshaw (1990) sketches a proposal for a Causation Hierarchy based on aspectual dimensions in addition to a Thematic Hierarchy, and explicitly assumes an interaction between the two. Similarly, Ramchand (to appear) proposes that the projection of arguments into the syntax must take into account both an underspecified thematic hierarchy provided by the verb and a system of aspectual roles provided by the aspectual head of the clause. Based on Krifka’s and Verkuyl’s pioneering work centering on verbs of creation and consumption, Ramchand (to appear) defines a number of differing aspectual roles for internal arguments,²⁰ for a broader spectrum of verb types, and details their interaction with basic verb types (e.g., states, activities) to yield the aspectual interpretation of the entire clause compositionally. The differing aspectual roles express the nature of the mapping that has taken place (parts of the object mapped onto each stage of the event for creation/consumption verbs; locations of an object mapped onto stages of the event for change of location verbs, etc.).

Ramchand also distinguishes between two basic types of internal arguments: those which enter into a calculation of compositional aspect (Θ_{int}), and those which are aspectually inert (Θ_{mod}). A number of different types of aspectual arguments are proposed and formally defined for result predicates such as *break*, predicates of movement such as *push* and predicates of consumption/creation such as *eat*. The precise distinctions made do not interest us here. Relevant is the very explicit claim made that notions such as “affectedness” can only be introduced by an aspectual role(Θ_{int}), not by an aspectually inert one(Θ_{mod}) .

This follows from the formal difference in how the two types of objects are taken to enter into the calculation of the semantic interpretation. In (40), the object is represented as an explicit argument of the predicate, as an individuated variable. In (41) the object is taken to be related to the predicate through a kind of modification (c.f. de Hoop’s (1992) predicate-modification). The crucial distinction is that only in (40) can the object be related to a time index of the verb and allow

²⁰Roles for external arguments are defined as well, but go beyond the scope of this paper.

a mapping from object to event structure. In (41) there is no explicit representation of the object as an entity that may be related to the event structure of the verb, so the object is aspectually inert.

$$(40) \Phi = \lambda e \exists x [\alpha(e) \wedge \delta(x) \wedge \Theta(e, x)]$$

$$(41) \Phi = \lambda e [\alpha(e) \wedge \beta(\alpha)]$$

This abstract distinction may become easier to follow through the presentation of two examples from Scottish Gaelic, which very clearly support the essential argument being made.²¹ In (42a) and (43a), the direct object is marked with direct case, occurs preverbally, must be interpreted as being affected, and gives rise to a telic reading of the sentence.

(42) a. tha Calum air na craobhan a ghearradh
 be-Pres Calum Asp the trees-Dir OAgr cut-VNOUN
 ‘Calum has cut the trees.’

b. tha Calum a’ ghearradh nan craobhan
 be-Pres Calum Asp cut-VNOUN the trees-Gen
 ‘Calum is cutting the trees.’

(43) a. tha mi air am ball iarraidh
 be-Pres I Asp the ball-Dir want-VNOUN
 ‘I have acquired the ball.’

b. tha mi ag iarraidh a’bhuill
 be-Pres I Asp want-VNOUN the ball-Gen
 ‘I want the ball.’

In (42b) and (43b), on the other hand, the direct object appears postverbally in the genitive, cannot be interpreted as being affected, and the sentence has an atelic reading. In the (a) examples the object is therefore taken to be aspectually relevant, as expressed in (40), in the (b) examples, it must be analyzed as being aspectually inert, as expressed in (41).

6.4.3 Linking

In some languages, like Scottish Gaelic, the contribution of the aspectual head can clearly shown to be distinct from that of the predicate. In other languages, like English, these two sources of information appear to be collapsed into the verbal predicate. Precisely where the information may be encoded does not, however, detract from the fact that thematic information is provided exclusively by the lexical predicate, while aspectual information is sensitive to a collection of information at the clause level. Aspectual information thus should not be encoded as a direct part of linking theory. However, I would like to adopt the fundamental distinction made by Ramchand between aspectually relevant and aspectually inert arguments. In particular, I would like to take into account the fact that only the former can give rise to an interpretation in which the object is affected. The need for a special, stipulative, feature such as [+affected] can thus be avoided at a-structure.

²¹The examples are taken from Ramchand (to appear:93–94). The abbreviation *Dir* stands for ‘direct case’, *OAgr* for ‘object agreement’, and *Asp* for ‘aspectual marker’. The latter is my gloss.

Looking back at the specifications for the intrinsic classification of θ -roles, repeated below, note that these primarily seek to make a distinction between differing types of internal arguments. In particular, the distinction between patientlike $[-r]$ roles and secondary patientlike $[+o]$ roles was primarily posited to account for the rather complicated pattern of double objects in applicative Bantu constructions. While I believe that the analyses presented for these constructions should also ultimately be reanalyzed within the approach adopted here, such a reanalysis is clearly beyond the scope of the paper.

Intrinsic Role Classifications

Patientlike roles: $[-r]$

Secondary patientlike roles: $[+o]$

All others: $[-o]$

The intrinsic property of $[+o]$ for these applicative objects can simply be retained for the moment, as it does not interact directly with the particular set of data examined here. None of the following proposals for the linking of objects in causatives thus have an immediate impact on the analyses presented for Bantu in Bresnan and Kanerva (1989), Bresnan and Moshi (1990) or Alsina and Mchombo (1993).

What I propose is to make a finer distinction between the set of “patientlike” roles, basically themes in terms of the reduced thematic hierarchy in (39), and to incorporate the idea that some arguments may be aspectually contentful, while others are aspectually inert.

Revised Intrinsic Classifications

Themes: $[-r]$ (aspectually inert) or $[+r]$

Secondary patientlike roles: $[+o]$

All others: $[-o]$

This slight amendment to the linking theory has the effect of linking object themes to either OBJ ($[-r]$) or OBJ $_{\theta}$ ($[+r]$). Recall that the $[-r]$ in linking theory was intended to indicate semantic unrestrictedness, while $[+r]$ indicates that the object is restricted to express some particular semantic information. Standardly, this type of information has been expressed in terms of thematic roles, so that one could differentiate between simple OBJs, OBJ $_{beneficiary}$ or OBJ $_{go}$. Thus, the semantically restricted object was annotated to indicate which precise thematic role it was linked to. Alsina (1993) argues very clearly that this method of labeling semantically restricted objects is redundant. Given the architecture of LFG, where the various levels of representation are co-present and related to one another via the projection architecture it is simply redundant to express information already represented at a-structure again at f-structure, i.e., in terms of grammatical functions like OBJ $_{\theta}$. Alsina thus dispenses with the distinction and allows only OBJs.

I am essentially in agreement with Alsina’s line of argumentation, but retain the notational distinction between OBJ and OBJ $_{\theta}$ at f-structure for ease of exposition. I assume along with Ramchand that objects come in two differing general varieties: those that contribute a semantics to the compositional semantic interpretation of the clause and those that do not (aspectually inert). These are taken to correspond to $[+r]$ (OBJ $_{\theta}$) and $[-r]$ (OBJ), respectively. Note, however, that it is not the thematic roles themselves which contribute the semantics of the object. Rather, the $[+r]$ of a semantically restricted OBJ $_{\theta}$ simply indicates that this is an object which may enter into the compositional semantics of the clause. The precise semantic interpretation of the clause is

not represented at a-structure, or f-structure, but at s(ematic)-structure (see Halvorsen (1983) or Dalrymple et al. (1993) for some proposals on the representation of semantics in LFG) and the interaction between argument structure, the syntactic realization of arguments, and the interpretation at s-structure is modeled through LFG's projection architecture.

A simple example of a contrast is given in (44) and (45).

(44) Yassin ate an apple.

(45)	a-structure	EAT	<	ag	th	>>
				[-o]	[+r]/[-r]	
		Default		[-r]	[+o]	
		GF				
				SUBJ	OBJ _θ /*OBJ	

(46) Yassin ate apples.

(47)	a-structure	EAT	<	ag	th	>>
				[-o]	[-r]/[+r]	
		Default		[-r]	[+o]	
		GF				
				SUBJ	OBJ/*OBJ _θ	

In both cases the theme could carry either a [+r] or [-r] feature. However, only one of the feature realizations can lead to a wellformed semantic interpretation: in the atelic case in (47) it is the OBJ, in the telic sentence in (45) it is the OBJ_θ.

7 An Alternative Analysis of Causatives

At this point, the necessary ingredients are in place for an analysis of the Urdu causative that is also in keeping with restrictive theory of complex predicate formation. With Alsina and Joshi (1991), I assume both the three place and two place predicate for causatives shown in (48).

(48)	a.	‘cause’	<	ag	th	‘pred’	<	ag	...	>>
		b.		‘cause’	<	ag	‘pred’	<	...	>>

The two place causative comes into play when the causer does not act upon somebody to cause an event, as in a three place causative, but initiates the action directly.²² In (48a) Argument Fusion applies and must obey the principle in (34) so that only the highest embedded argument fuses with the lowest matrix argument. The linking from arguments to grammatical functions obeys the revised intrinsic classifications outlined in 6.4.3. The realization of a given argument as a given grammatical function must ultimately be compatible with the aspectual interpretation of the clause.

This interaction can be taken to explain the interesting alternation observed between the *causee* as object or oblique for certain transitives in Urdu and avoids both a stipulative reference to affectedness at a-structure, and the concomitant assumption of parameters on Argument Fusion.

²²The assumption of a two place causative is not necessary for an analysis of the Urdu causative paradigm presented in section 4. However, it may be needed for Romance examples such as *les dieux peuvent faire pleuvoir* ‘The gods can make it rain.’ brought up by one of the anonymous reviewers.

Object Causee

- (49) anjum=ne **saddaf=ko** masaalaa cak^h-va-yaa
 Anjum.F=Erg Saddaf.F=Acc spice.M=Nom taste-Caus-Perf.M.Sg
 ‘Anjum had Saddaf taste the seasoning.’

(50)	a-structure	CAUSE <	ag	th	TASTE <	ag	th >>
			[-o]	[+r]/[-r]		[-r]/[+r]	
	Default		[-r]	[+o]		[+o]	
	GF						
	Case		SUBJ	OBJ _θ /*OBJ		OBJ/*OBJ _θ	Nom/*Acc
				Acc/*Nom			

Oblique Causee

- (51) anjum=ne **saddaf=se** masaalaa(=ko) cak^h-va-yaa
 Anjum.F=Erg Saddaf.F=Inst spice.M=Nom(=Acc) taste-Caus-Perf.M.Sg
 ‘Anjum had the seasoning tasted by Saddaf.’

(52)	a-structure	CAUSE <	ag	th	TASTE <	ag	th >>
			[-o]	[-o]		[-r]/[+r]	
	Default		[-r]			[+o]	
	GF						
	Case		SUBJ	OBL		OBJ/OBJ _θ	Nom/Acc
				Inst			

Case marking in Urdu interacts with semantic interpretation as well. As shown in Butt (1993b), the accusative *ko* marks specific objects in Urdu. Being specific, these objects are semantically restricted and must be realized as OBJ_θ, else semantic interpretation at the clause level will be illformed.²³ Nominatives in Urdu are compatible with either a specific or nonspecific interpretation.

In (50) there are two linking possibilities for both of the themes. However, only one of these possibilities is ultimately compatible with the necessary semantic aspectual interpretation of the clause, and only that possibility is compatible with the case marking on the objects: the causee must be realized as an accusative OBJ_θ and hence become eligible to be interpreted as the affected object of the clause. This leaves the ‘spice’ to be linked to OBJ. In (52), on the other hand, the causee does not enter the aspectual semantics, and must therefore be realized as an oblique. This leaves the ‘spice’ to be realized either as an OBJ, or an OBJ_θ, depending on the aspectual interpretation (if the ‘spice’ is to be considered affected, it must be realized as an OBJ_θ).

Thus the alternation in the case marking on causees and the interaction with the notion of “affectedness” now follows. In (50), but not in (52), the causee interacts with the aspectual semantics of the clause. The other cases in the causative data presented above also follow as simply from Argument Fusion, the three place causative, and the interaction of aspect and argument structure. In particular, the class of “ingestives” always requires an accusative direct object causee because the causee there has no option of being other than affected by the matter that is ingested.

²³Also compare van Geenhoven (1995, 1996) on an analysis of Noun Incorporation in Germanic and West Greenlandic who proposes a semantic distinction between two differing kinds of objects which is very reminiscent of the distinction proposed by Ramchand, but addresses the issue of specificity in much greater detail than can be found in Ramchand (to appear).

8 Passives and Unspecified Objects

The above discussion should have demonstrated very clearly that I do not take OBJ and OBJ_θ to differ in terms of syntax. Along with Alsina (1993), who abolishes the distinction at f-structure, I take the two types of objects to have the same general syntactic properties. There is, however, one area where the two types of objects have traditionally been taken to differ: [+r] objects (OBJ_θ) are precluded from undergoing passivization, since these could never be linked to a subject ([-r,-o]). The question which arises is whether the current proposal with respect to OBJ vs. OBJ_θ makes the prediction that only clauses containing and OBJ, but not an OBJ_θ can be passivized. This is by no means the case. Passivization with the advent of Linking Theory no longer applies directly to grammatical functions, but to the highest argument at a-structure. This argument is simply suppressed.

$$(53) \quad \text{Passive} \quad \begin{array}{c} \hat{\theta} \\ | \\ \emptyset \end{array}$$

Given that most themes will always have either the [-r] or the [+r] option for linking, if passivization applies, it can only apply felicitously to the [-r] option. Given that the theme argument in this case is not linked to an object, and thus cannot enter aspectual semantics as an object, it is only logical that the [+r] option should never be chosen. The interaction of subjects (external arguments) with aspectual semantics must also be taken into account, but is beyond the scope of this paper (see Ramchand (to appear) for a discussion).²⁴

Finally, the distinction drawn here between OBJ and OBJ_θ may be useful in terms of the unspecified object deletion observed for Bantu in Alsina and Mchombo (1993), which was accounted for by (54).

$$(54) \quad \text{Theme Suppression} \quad \begin{array}{c} \text{th} \\ [-r] \\ | \\ \emptyset \end{array}$$

The observation that unspecified objects may be optional follows in my account simply from the idea that OBJ, as opposed to OBJ_θ, is nonspecific because it is aspectually inert, i.e., does not carry any semantic aspectual information with it which may enter into the compositional semantics of the clause. Thus, in parallel with the affectedness effects observed for causatives, the deeper semantic explanation needed for unspecified object deletion is squarely placed at the level of representation most suited to encode it: s(ematic)-structure. At a-structure and f-structure the option between two differing types of objects is merely made available, but not evaluated.

9 Conclusion

The analysis of Urdu causatives presented here takes a step beyond the original insights formulated on the basis of Clause Union. For one, the analysis is in keeping with a restrictive theory of complex predicates in which the pertinent characteristics of a complex predicate are very clearly defined, and in which restrictions on argument structure composition parallel the restrictions found for

²⁴Note that no predictions are made here with regard to the interaction of passivization and causatives. Passivization of a causative is not possible in Urdu, but this may be due to independent morphosyntactic factors, as it does appear to be possible in languages like Japanese and Inuit (anonymous reviewer, p.c.).

syntactic control/raising constructions. The clear formulation of a theory of complex predicates also provides a firm basis for the investigation of similar constructions crosslinguistically, and for a comparison to other constructions, such as applicatives and serial verbs, which involve argument structure processes, but differ in their overall event structure.

The recognition of argument structure as a syntactic level of representation in conjunction with a consideration of aspectual semantics has allowed an alternative view of mapping/linking. In this approach, it is not attempted to code semantic notions such as affectedness or (non)specificity at the already semantically incoherent level of argument structure. Rather, semantic interpretation of a clause is taken to be represented at s(emantic)-structure, and an interaction between semantics and the differing linking possibilities for objects is defined. The encoding of semantic notions at the level where they can be most usefully dealt with, at s-structure, allows a clearer analysis of case alternations on causees, as observed in Urdu causatives. In particular, a very constrained version of Argument Fusion can now apply within a larger theory of complex predicate formation, and allows a principled reformulation/loosening of statements such as Function-Argument Biuniqueness or the Theta Criterion, whose strict requirements on a one-to-one correspondence between predicate-argument structure and the syntactic realization of arguments do not allow a lucid treatment of complex predication.

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