Clause Union – then and now

Miriam Butt
Universität Tübingen

1 Introduction

The notion of *Clause Union* goes back to first examinations of Romance causative constructions 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 essential insight of this work did not only lie in the recognition of the central issue to be accounted for in complex predication, but also in the kind of approach that was adopted. The central issue to be solved with regard to complex predicates is, of course, the syntax-semantics non-isomorphy problem: a biclausal predicate-argument structure corresponds to a monoclausal syntactic structure, rather than to a syntactically expressed matrix verb with an embedded complement. The kind of approach that was taken in RG assumed an explicit level at which predicate valency is represented (expressed in terms of "1"s, "2"s, etc.). This level is placed in correspondence with the surface syntactic structure. In particular, the operations or "laws" (e.g., advancement), which in a sense derive the surface syntactic representation, di allow the necessary flexibility needed for a treatment of the syntax-semantics non-isomorphy problem.

With the advent of Baker's (1988) theory of incorporation, however, 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, were thus subject to exactly the same movement constraints (e.g., head-to-head movement), and that each θ-role must have a syntactic realization (see also Marantz's (1984) principle M). While Baker works out ingenious solutions which seem 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.

This fact is clearly reflected in the amount of work done in recent years. This work takes the notion of an independent level of argument structure seriously. As it cuts across syntactic theories, there is some variation in the approaches to mapping between argument structure and grammatical relations (D-structure), but 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), Mohanan (1994), Alsina (1993), Neeleman (1994), Butt (1995)). 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). The major gain made over the years appears to consist of the fact that we have now investigated phenomena in many more languages, and have several differing realizations of the same underlying idea to choose from. And despite the many more languages and types of complex predicates (e.g., Japanese *suru*, Romance and Bantu Causatives, Applicatives, Noun Incorporation, Chinese Resultatives) that have been investigated, we are no closer to an understanding of the significant similarities and differences between them. While Baker makes a very strong claim as to their underlying syntactic similarity, 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)). On the other hand, approaches which postulate argument structure processes (e.g., Grimshaw and Mester (1988), S. Rosen (1989), Alsina (1992)) do not have an underlying restrictive theory as to precisely which argument structure combinations are allowed.

In this paper, I make a first attempt at formulating a restrictive theory of complex predicate formation. Building on earlier work, I propose a defining characteristic of complex predicates, and formulate restrictions on the types of argument composition that are available. Ultimately, the enterprise should yield an intuitive and simple account of complex predicates crosslinguistically, and should be stated in such a way that a reasonable treatment within computational approaches is made possible. The achievement of the latter goal is particularly desirable, as complex predicates tend to occur very frequently in the languages that allow them (e.g., Romance causatives, German N-V and *coherent* constructions, Japanese *suru*) and most approaches to date must resort to linguistically implausible solutions (e.g., Kaplan and Wedekind (1993), Erbach and Krenn (1994)).

Of course, the ultimate goal of this enterprise cannot be realized within the scope of one paper, but entails taking a careful look at a variety of complex predicates, both syntactic and morphological. As part of the larger investigation, the structure of Urdu causatives are examined in this paper. While these causatives at first seem to go against the restrictions on argument composition suggested by my own previous work on Urdu, and the generalizations uncovered by Neeleman (1994) for Dutch and German complex predicates, I show that an analysis which takes aspectual roles (Krifka 1992) into account not only allows a more intuitive and complete account of the data, but also yields the result that Urdu morphological causatives do indeed underlie the same restrictions on argument structure composition as complex predicates that are formed in the syntax (Butt 1995, Neeleman 1994).

2 A Theory of Complex Predicates

2.1 Previous Insights

The example in (1) illustrates a Spanish causative, as analyzed by Aissen and Perlmutter (1983:384).

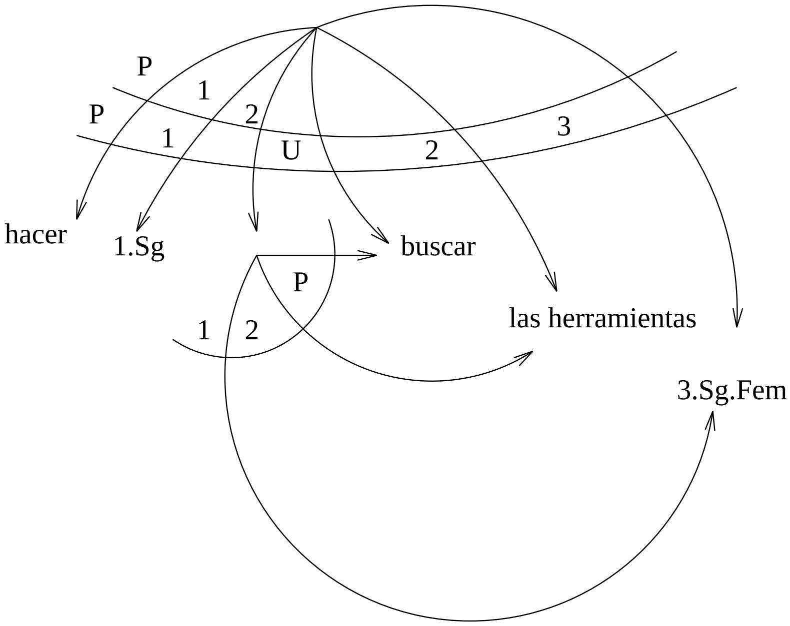
(1) le hice buscar las herramientes
her.Dat I-made seek the tools
'I made her look for the tools.'

The clitic *le* in clause intial position indicates that clause union must have taken place ("clitic climbing") so that all the arguments of embedded predicate now function as arguments of the matrix predicate. The clitic represents the *causee* and is realized in the dative case. In a causativized intransitive, however, the causee is realized in the accusative. This alternation does not follow from any independent principles in Aissen and Perlmutter's approach, but must be stipulated as given in (2).

(2) a. The final 1 of 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.

RG



S. Rosen (1989) in her treatment of Romance causatives within a Government-Binding (GB) approach has to resort to essentially the same stipulation. Alsina's (1993) Lexical-Functional Grammar (LFG) approach, on the other hand, does not have this problem as he assumes a three place causative, illustrated in (3). The alternations in case marking then follow from independent principles of LFG's *Mapping Theory* in which arguments are linked to grammatical functions.

(3) $\textsc{cause} < \text{ag} \;\; \text{pt} \quad \textsc{pred} < \ldots \theta \ldots >>$

The non-stipulative account of case marking is a nice result of the type of *Argument Composition* or *Fusion* engendered by (3). However, this approach to causatives violates the Principle of Function-Argument Biuniqueness in LFG. It is exactly because (3) would violate the corresponding constraint in GB, the Theta Criterion, that S. Rosen avoids the notion of Argument Fusion.

Function-Argument Biuniqueness
G= $g_1, \ldots, g_n$ is a possible grammatical function assignment to $P(1, \ldots, m)$ if and only if the mapping from $1, \ldots, m$ to G defined by $i \mapsto g_i$ is injective (one-to-one and into).

On the other hand, overwhelming evidence from languages such Chinese, Dutch, German, and Hindi/Urdu[1] (Li (1995), Neeleman (1994), Mohanan (1994), Butt (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. A part of the goal of this paper is to explore the ways in which the restrictions must be weakened.

An example of the Urdu *permissive*, which confirms the Argument Fusion approach advocated by Alsina, is shown in (4). Here the dative *-ko* on the causee can only be accounted for non-stipulatively by assuming that the causee is actually an argument of the matrix verb. The case marking facts then follow independently from the linking principles (Butt 1995).

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

LFG

(4) 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.'

(5) LET < ag go PRED < ag pt >>

(6)
$$\left[\begin{array}{ll} \textsc{subj} & [\mathit{Anjum}] \\ \textsc{obj}\text{go} & [\mathit{Saddaf}] \\ \textsc{pred} & \text{'let-make} < \_\_ , \_\_ , \_\_ > \text{'} \\ \textsc{obj} & [\mathit{necklace}] \end{array}\right]$$

Note that the figures in (5) and (6) also express the basic characteristic of a complex predicate: a complex predicate-argument structure corresponds to a monoclausal syntactic realization. In particular, there is only one subject (evidence for this for the permissive comes from control, agreement, and anaphora). Data which contrasts the permissive with a superficially similar *instructive* illustrates very clearly that the difference between complex predicates and control constructions cannot follow from phrase structural differences (evidence from from scrambling, coordination and negation), but must be analysed in terms of an independent level of argument structure. This leads to the following explicit characterization of complex predicates (Butt 1995:162).

(7) **Definition of a Complex Predicate:**

- The argument structure is complex (two or more semantic heads contribute arguments).
- The grammatical functional structure (f-structure) is that of a simple predicate. It is *flat*: there is only a single predicate (a nuclear PRED) and a single subject.
- The phrase structure (c-structure) may be either simple or complex. It does not necessarily determine the status of a complex predicate.

However, as noted above, this is the fundamental insight that was already present in the work done within RG. The next section goes on to formulate parts of a theory of complex predicates which seeks to go beyond the basic fundamental insight in (7), and at the same time restrict the possibilities for the combination of argument structures.

2.2 Restrictions on Clause Union

2.3 Argument Structure as an Interface

Under the approach to complex predicates taken here, argument structure must be viewed as an **interface** between lexical semantics and syntax. This entails that argument structure is linked to a syntactic representation, but cannot be isomorphic with it (Alsina 1993, Neeleman 1994). Under the assumption that causative predication, for instance, will always have the same argument structure, regardless of whether the causative is morphologically or syntactically realized, it is predicted that complex predicates can be formed either in the syntax (e.g., the Urdu permissive) or morphologically, but that their formation is identical at argument structure. This view is confirmed by a comparison of Romance (syntactic) and Bantu (morphological) causatives (Alsina 1993).

A further idea found in most analyses of complex predicates, and one that is adopted here as well, is that complex predicate formation is "triggered" by *light verbs*, which are incomplete predicates in that their *event structure* is not complete. Light verbs subcategorize for another predicate (Butt 1995) and because of the combination of the respective events, the argument structures of the light and main verb must unify (S. Rosen (1989)).

2.3.1 Parallelism to Syntactic Control/Raising

An immediate question that arises from the approach sketched above is the question as to the combinatory possibilities of argument structures. Can they combine in any order? Can any argument potentially be fused/composed with any argument from the other argument structure?

In this section, I would like to put forward some very strong restrictions on the combinatory possibilities. In particular, I would like to suggest 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, interestingly, in accordance with Neeleman's (1994) GB 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 reformulated as in (8).

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

Parallel to syntactic control/raising, the following two argument structure processes are thus postulated. An overview of the possible structures is given in (9).

Argument Fusion
analagous to syntactic control (PRO), but does not result in it: fusion must obey (8).

Argument Raising
unification of argument structures (c.f. Grimshaw and Mester's (1988) *Argument Transfer*).

(9)

	Phrase Structure	**Arg. Structure**	**Complex Predicate**
Control	PRO	Argument Coindexation	No
	No PRO	Argument Fusion	Yes
Raising	ECM	xxx	No
	Single Predication	Argument Raising	Yes

Both Argument Fusion and Raising are amply documented for syntactically formed complex predicates. 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.[2]

Note that I make a very clear distinction between what I have described as complex predicates (result of clause union) in terms of (7), and further constructions such as applicatives, passives, or serial verbs. While these constructions must also involve argument structure processes, there does appear to be a difference as to the kind of process. Applicatives and passives involve argument addition and reduction, respectively, while serial verbs are most commonly characterized by *object sharing* (Baker 1989), and therefore do not underlie the restriction in (8). It appears that the crucial factor underlying these differences is 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

[2]Examples of Argument Raising are also found in Urdu *seem*-constructions. However, a careful examination and discussion of the Urdu and the Dutch constructions goes beyond the scope of this paper.

differences in event structure, as well as the question of how the posited notion of *event fusion* (S. Rosen (1989)) for complex predicates differentiates their event structure from that of straightforward syntactic embedding of a predicate, needs to be explored in much more detail and remains subject to further research.

To return to the table in (9), it seems that the syntactic parallelisms posited carry over quite nicely to complex predicate formation, and are confirmed by data from complex predicates that are formed in the syntax. Of course, under a view of syntactically formed complex predicates, which holds that these are constructions *in flux* on their way to being reanalyzed as compound verbs (Lord 1993), it is only to be expected that this parallelism should hold. The more interesting question that now arises is whether the syntactic parallelisms postulated above also apply to complex predicates that are formed in the lexicon. In the next section, I therefore turn to an examination of a morphololgically formed complex predicate: the Urdu causative.

3 Urdu Causatives

Hindi/Urdu has two causative morphemes *-aa-* and *-vaa-*, which are historically derived from the Sanskrit allomorphs *aya* and *apaya* (Masica 1991). Saksena (1980, 1982) 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.

3.1 The Data

In Hindi/Urdu most transitives can in fact be said to be derived from underlying intransitives through causativization. This pattern is illustrated in (10) and (11) for unaccusatives and unergatives, respectively.[3] In these cases,[4] 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 1993), and is taken up again in a later section.[5]

(10) 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.'

(11) a. saddaf b^hag-ii
Saddaf.F=Nom run-Perf.F.Sg
'Anjum ran.'

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).'

[3]However, it 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.

[4]Note that the passive English gloss given for (10) 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*.

[5]The 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 transitivity and perfective morphology.

Transitives which cannot be said to have derived from an underlying intransitive have an oblique causee. In these cases, in contrast to (10) and (11), the causee is not directly affected and can only appear with the instrumental *-se*.

(12) a. anjum=ne paodaa kaaṭ-aa
Anjum.F=Erg plant.M=Nom cut-Perf.M.Sg
'Anjum cut a/the plant.'

b. anjum=ne saddaf=se/*=ko paoda kaaṭ-**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 yet another class of transitives, usually referred to as "ingestives" (other members of this class include *drink, write, read*), only a direct (affected) object causee is allowed.

(13) a. saddaf=ne k^{h}aanaa k^{h}a-yaa
Saddaf.F=Erg food.M=Nom eat-Perf.M.Sg
'Saddaf ate food.'

b. anjum=ne saddaf=ko/*=se k^{h}aanaa k^{h}il-**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 the "affectedness" of the causee.

(14) 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 (14b) must receive is that there was a situation in which *Anjum* wanted *Saddaf* in particular to taste the seasoning. In (14c), 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 (14b) it is *Saddaf* who is "affected", while in (14c) it is the seasoning.

3.2 Parameters on Argument Fusion?

Analyses of causatives usually postulate a two place causative as in (15). The argument structures of the causative and the embedded verb are merged in some way along the lines of the RG analysis sketched for (1). However, as mentioned previously, none of these analyses can successfully cover the range of data presented above, or account for the case marking alternations non-stipulatively.

(15) CAUSE < ag PRED < ...>>

In recognition of this fact, and in order to account for the very similar Bantu data shown in (17), Alsina and Joshi (1991) and Alsina (1992) argue for a three place causative in addition to (15).

(16) Kadzīdzi a-na-phíká maûngu (Chichewâ)
owl SUBJ-PAST-cook pumpkins
'The owl cooked pumpkins.

(17) a. Nŭngu i-na-phík-ítsa **kadzīdzi** maûngu
porcupine SUBJ-PAST-cookCAUS owl pumpkins
'The porcupine made the owl cook the pumpkins.

b. Nŭngu i-na-phík-ítsa maûngu **kwá kádzīdzi**
porcupine SUBJ-PAST-cookCAUS pumpkins by owl
'The porcupine had the pumpkins cooked by the owl.

Again, the emphasis is on the "affectedness" of the direct object *owl* in (17a), but on the pumpkins in (17b). Alsina and Joshi analyse these affectedness effects in terms of different possibilities for the fusion of arguments. The possible parameters that languages may set are shown in (18). The analyses corresponding to (17a) and (17b) are shown in (19a) and (19b), respectively.

(18) *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).

(19)

a. phik-itsa 'cause' $<$ ag pt 'cook'$<$ ag pt $>>$
cook-CAUS

b. phik-itsa 'cause' $<$ ag pt 'cook'$<$ ag pt $>>$
cook-CAUS

In (19a), the affectedness of the causee is motivated by the fact that it is the patient of the cause predicate. In (19b), on the other hand, fusion has taken place according to Parameter b of (18), thus the pumpkins surface as direct object, and the "logical" causee must be realized in the oblique. In addition to the parameters in (18), Alsina and Joshi (1991) also continue assume the traditional two place causative in (15) for a case alternation which encodes the relative affectedness of the causee in Malayalam causativized unergatives.

This account actually appears to be the only analysis to date which can account for the full range of data in Hindi/Urdu: it is the only analysis which attempts to integrate the notion of "affectedness" into a formal theory of linking.

However, there are several problems with the account. For one, 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.

A further small detail that does not follow is why the owl is actually only "officially" recognized as a causee in (19a), but not in (19b), when it clearly must have a hand in causing the embedded event in some way, be it directly or indirectly. This point is actually indicative of a larger, technical problem with the theory of argument composition presented by Alsina and Joshi. The postulation of Paramaters on Argument Fusion opens the door to any kind of combinations of arguments: one could imagine additional parameters sensitive to volitionality or benefaction. The formulation of a restrictive theory of complex predicate formation is thus not possible. And, finally, the parametric variations on argument fusion according to semantic factors gives up on the parallelism to syntactic control/raising that seems attractive for an understanding of the structure of complex predicates.

4 Aspect and Affectedness

In fact, the affectedness effects found for causess in Urdu do interact with aspect. Consider the following pairs of sentences, in which the type of causativization that is compatible with either an oblique or direct object causee is examined with respect to adverbial modification. In (20) 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 (20a) and (20b) illustrate, this is indeed the case.

(20) a. *anjum=ne **xansaamõ=ko** masaalaa barii d^{h}eer=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 **xansaamõ=ko** masaalaa das minṭ-mẽ 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.'

Conversely, the causee is realized as an oblique in (21). 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 *Saddaf* here may be only one of many tasters. As such, this construction should be compatible with both the durative adverbial in (21a) and the time-span adverbial in (21b). Again, the data bear out the prediction.

(21) a. anjum=ne **xansaamõ=se** masaalaa barii d^{h}eer=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-mẽ 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.'

Interestingly enough, other recent work on complex predication has noted the effects of aspectual interaction on the licensing of arguments with regard to 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 (c.f. 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) is not undertaken. This is not surprising, as the representation of aspectual information within the syntax is as yet not well understood. However, the necessary ingredients appear to be furnished in the approach taken by Ramchand (1993) for an analysis of aspect and argument structure in Scottish Gaelic. Working with the semantics of aspectual roles, which Krifka (1992) defined primarily for verbs of creation and consumption, Ramchand extends the system of role types 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 causatives, in which the affectedness of causees is accounted for through the interaction between aspect and argument structure. The next section attempts to integrate the notion of aspectual roles as formulated in Ramchand (1993) into a theory of linking within LFG, thus yielding up an alternative analysis of causatives which is also compatible with the restricitve theory of complex predicates detailed at the beginning of the paper.

5 An Alternative Analysis of Causatives

5.1 Linking

5.1.1 Mapping Theory as Originally Formulated

The principles for the linking of argument structure to grammatical functions as originally formulated within LFG (Bresnan and Kanerva (1989), Bresnan and Moshi (1990)) were meant to apply only within the lexicon. Dynamic complex predicate formation in the syntax, as argued for in Butt (1995) and Alsina (1993) for Urdu and Romance, respectively, was not considered in the original formulation. Hence it was dubbed *Lexical Mapping Theory* (LMT). Butt (1995), however, shows that the essentials of the Mapping Theory do apply straightforwardly to argument structure composition within the syntactic component as well.[6] The Mapping Theory relies primarily on the Thematic Hierarchy shown in (22).

(22) **Thematic Hierarchy:**
$agent < beneficiary < experiencer/goal < instrument < patient/theme < locative$

The thematic arguments are associated with the features [±o(bject)] and [±r(estricted)]. These features in turn provide the constraints for the mapping from a(rgument)-structure to f(unctional)-structure. The correspondence between grammatical functions and features is shown in (23).

(23)

Grammatical Functions	**Features**
SUBJ	[−r, −o]
OBJ	[−r, +o]
OBJ_θ	[+r, +o]
OBL_θ	[+r, −o]

The association of the features with thematic roles is governed by two classification systems: *Intrinsic* and *Default Role Classifications.*

Intrinsic Role Classifications
Patientlike roles: [−r]
Secondary patientlike roles: [+r]
All others: [−o]

[6] For a recent reformulation of the Mapping Theory along the lines of Dowty's (1991) proto-roles, see Alsina (1993).

Default Role Classifications

Highest thematic role: [−r]

All others: [+o]

While the features themselves at times seem extremely unintuitive (see Alsina (1993) for a discussion), their essential function is to ensure that agents are usually mapped onto subjects ([−o]), while patients/themes ([+o]) are mapped onto objects. Thus, the [±o] feature sets the subject apart from other arguments by marking all the roles that might be mapped onto objects. The [±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.

5.1.2 Aspectual Roles

How can the notion of aspectual roles fit into the above framework? Given that aspectual considerations influence the mapping from a-structure to f-structure, the most natural place for the integration of aspectual roles is precisely within the Mapping Theory. Ramchand defines a number of differing aspectual roles for internal arguments,[7] and details their interaction with basic verb types (e.g., states, activities) to yield the Aktionsart interpretation of the entire clause compositionally. While it is impossible to detail the precise semantic motivation behind the differing aspectual roles for lack of space, the intuition underlying the semantics can be summarized roughly as follows. Under Krifka's (1992) internal arguments are mapped onto the event structure of a predicate. 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.).

Looking back at the specifications for the intrinsic classification of θ-roles, note that these primarily seek to make a distinction between differing types of internal arguments (to provide an analysis for double-object constructions, for example). However, the specifications as given are relatively vague and open to much interpretation. Now consider the role types defined by Ramchand (1993), summarized in Table (24). In essence, these aspectual roles can be viewed as providing semantically well motivated and finer grained specifications for internal roles than the original formulation within Mapping Theory.

Aspectual (Intrinsic) Classification

(24)

Role	Explanation	Feature
$\theta_{+/-}$	Object mapped onto the entire event e.g. *break a glas*	[+r]
$\theta_{\rightarrow}$	Location of object mapped onto event e.g. *push a cart*	[+r]
$\theta_{=}$	Quantized vs. Mass e.g. *eat an apple/apples* (see Krifka (1992))	[+r]
θ_{mod}	No aspectual interpretation e.g. *bread-baking*	[−r]
Else		[−o]

The proposal put forward here, thus, is to view aspectual roles as playing a crucial part in linking a-structure with f-structure. In concrete terms, I propose to replace the Intrinsic Role

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

Classification schema with the specifications in (24). This approach is in accordance with the function of the Aspect Hierarchy proposed in Grimshaw (1990), and with the analyses proposed by Ritter and Rosen (1993) and Li (1995) for English and Chinese, respectively.

5.1.3 Case Marking on Objects

Note that one of the roles, the θ_{mod}, presented in (24) does not have an aspectual interpretation. Ramchand (1993), based on proposals by de Hoop (1992), makes a distinction between two differing object positions in terms of *Weak* and *Strong* Case. These Cases are correlated with differing semantic interpretations. A rough approximation of the semantics that are relevant for Urdu (Butt 1993) can be stated as follows: Strong Case objects are associated with specificity, may be marked with the accusative *-ko*, and may scramble; Weak Case objects are generally interpreted as non-specific, may only appear in the (unmarked) nominative, and must remain adjacent to the verb. In particular, Weak Case objects give rise to atelic *predicate-modifying* readings.

Within the revised Mapping Theory proposed here, Weak Case corresponds to the unrestricted direct OBJ; Strong Case corresponds to the semantically restricted OBJ$_\theta$. At first glance, this mapping may seem counterintuitive, as Weak Case objects which appear to be the special case correspond to the unmarked OBJ. However, under an approach which takes aspectual influences seriously, most objects will have a semantically restricted interpretation – it is the semantically unrestricted objects which constitute the more exceptional case. As such, the original classification of grammatical functions proposed within LFG already makes just the right distinctions.

5.2 Causatives

At this point, the necessary ingredients are in place for an analysis of the Urdu causative that is also in keeping with the restrictive theory of complex predicates formation I would like to pursue. Unlike Alsina and Joshi (1991), I assume that all causatives are three place predicates. In my terms, this entails that all instances of causativization involve Argument Fusion and not Argument Raising. The approach causes some redundancy with the causativization of intransitives, but is able to account for all of the data.[8] Argument Fusion must, of course, obey the principle in (8) so that only the highest embedded argument may fuse with the lowest matrix argument. Finally, the realizaton of the *causee* as object or oblique is determined by the assignment of aspectual roles.

In the following, examples of mapping from argument structure to grammatical functions are shown for the Urdu transitive which allows both direct object and oblique causees. Mapping from a-structure to f-structure is achieved as follows:[9]

- The verb provides the underspecified thematic role information.
- Aspectual Roles are assigned to the θ-roles as appropriate (see below for some elaboration).
- Aspectual (Intrinsic) Classification.
- Default Classification.
- Mapping onto grammatical functions.
- Determination of case marking.[10]

[8]The integration of aspect also provides an account of the Malayalam unergatives that were problematic under Alsina and Joshi's (1991) account.

[9]The formulation of this approach within the linear logic treatment proposed in Dalrymple et al. (1993) remains to be worked out.

[10]The interplay between case clitics and grammatical functions in Urdu is actually more complex than can be detailed here.

Note that I have retained the θ-role labels from the hierarchy in (22) in (26) and (28). As it has never really been clear what the θ-role labels actually *mean*, they can be considered unspecified. However, I do give up on the distinction between experiencers, beneficiaries, and goals, and patients and themes and follow the argumentation in Ramchand (1993) that these distinctions are aspectually determined.

Aspectual roles may, in fact, be assigned to θ-roles in a variety of differing constellations. Whether a given aspectual role is compatible with a given argument must be determined by the denotation of the given NP, and its mapping on to the event structure of the verb. As such, there may be various differing possibilities for the assignment of aspectual roles, but not all will be coherent and will thus be ruled out.

Object Causee

(25) 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.'

(26)

θ-Roles	CAUSE <	ag	pt	TASTE <	ag	pt	>>
Aspect			$\theta_{+/-}$			θ_{mod}	
Intrinsic		[−o]	[+r]			[−r]	
Default		[−r]	[+o]			[+o]	
GF		SUBJ	$\text{OBJ}_{+/-}$			OBJ	
Case			Acc			Nom	

Oblique Causee

(27) 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.'

(28)

θ-roles	CAUSE <	ag	pt	TASTE <	ag	pt	>>
Aspect						$\theta_{=}$	
Intrinsic		[−o]	[−o]			[+r]	
Default		[−r]				[+o]	
GF		SUBJ	OBL			$\text{OBJ}_{=}$	
Case			Inst			Nom/Acc	

In (26) and (28), the θ-roles furnished by the verb and the causative morpheme are quite straightforward. The only role from the Table in (24) that could possibly apply to the causee *Saddaf* is $\theta_{+/-}$: *Saddaf* cannot variably denote either a quantized or a mass entity, neither is she involved in a change of location, and she also cannot give rise to a predicate-modifying reading as she necessarily denotes a specific entity. In (26), the causee receives an aspectual role and is consequently mapped onto a direct object. In (28), on the other hand, the causee is not assigned an aspectual role and must therefore be realized as an oblique. Thus the alternation in the case marking on causees and the interaction with the notion of "affectedness" now follows. In (26) the causee is directly implicated at every stage of the tasting event. In (28), on the other hand, the causee may merely be one of many taster and is thus not directly implicated at every stage of the tasting event. As such, it cannot receive an aspectual role, and cannot be interpreted as affected.

The only roles available for the *masaalaa* 'spice' are θ_{mod} or $\theta_{=}$. In (26), I chose to assign θ_{mod}, in (28) $\theta_{=}$. The major difference that results is one of case marking. A θ_{mod} argument corresponds to Weak Case, and may only appear in the unmarked nominative. A $\theta_{=}$, on the other hand, may interpreted as specific and so may be marked with the accusative as well.

The other cases in the causative data presented above also follow as simply from 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.

6 Conclusion

In conclusion, then, 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 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 as well, but differ in their overall event structure. Finally, the possiblity of Argument Fusion in combination with the integration of aspectual roles into a theory of mapping/linking allows an insightful account of the necessary reformulation/loosening of principles such as Function-Argument Biuinqueness 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 straightforward treatment of complex predication.

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