Unary phrase structure rules and the Cognitive Linguistics Lexical Linking theory
Paul Kay[1]
Stanford University
2014

Introduction

My comments will be restricted to the bearing of Müller and Wechsler's (M&W's) paper on the issue of argument structure within constructional approaches to grammar. In particular these comments will compare the unary phrase structure approach advocated by M&W to the influential approach of Adele Goldberg (1995). The latter approach has been widely accepted in the majority fraction of the construction grammar community, which also participates in the Cognitive Linguistics tradition initiated by R. Langacker (1987) and G. Lakoff (1987). I will refer to the linking theory of this tradition as the Cognitive Linguists Linking Theory (CLLT). I take its original and clearest expression to be that proposed in the seminal work of Adele Goldberg (1995). I will have three points to make. (1) The Cognitive Linguistics Linking Theory is not a phrasal theory and the CLLT Argument Structure Constructions (ASCs) are in fact lexical rules, albeit of a type or types superficially unlike the unary phrase structure (UPS) rules favored by M&W. (2) Despite the important insights contributed by Goldberg's work to our understanding of the interaction between semantics and syntax in determining argument structures, the CLLT approach is limited in its empirical coverage because of its dedication to a thematic role hierarchy as the unique determinant of syntactic obliqueness. An approach embracing UPS rules and allowing for syntactic obliqueness on its own terms does not suffer this disadvantage. (3) When some mechanical details of the CLLT theory are filled in, it appears to be equivalent to a set of UPS lexical rules: the kind of lexical rules advocated by M&W.

CLLT Argument Structure Constructions are lexical rules

Notwithstanding explicit statements by Goldberg and others to the contrary[2], the CLLT approach is lexical rather than phrasal. Employment of the word "construction" does not in itself guarantee that a bit of grammar so characterized will contain information about phrase structure.[3] Some CLLT ASCs associate a verb's semantic roles with grammatical functions (gfs): subject, object, object 2 (occupied by the theme of a ditransitive argument structure), or oblique. Others, such as Passive and Middle, do not mention grammatical functions, let alone specify phrase structure. The mechanism(s) governing lexeme- or word-internal mappings from semantic roles to grammatical functions have been the concern of lexical linking theories at least since Bresnan & Kanerva (1989) and the issue continues to be energetically studied on the strictly lexical plane (e.g., Davis & Koenig 2000 and earlier work by these authors). There are no phrasal properties specified in Goldberg's ASCs. In a simple English declarative clause the constructions that license the non-subject arguments as sisters to the verb and the subject argument as sister to the phrase containing the verb and its non-subject arguments must in Goldberg's (monostratal, constraint-based) system specify phrase structures (standardly but not necessarily represented as trees) whose nodes are occupied by the constituents bearing the appropriate grammatical functions. These latter phrasal constructions are assumed to refer to the grammatical functions that are assigned by the ASCs and to license phrase structure configurations that put the constituents bearing the various grammatical functions in their proper places. For example, in an English non-subject constituent question the same assignments of grammatical functions to semantic arguments hold as in a corresponding declarative clause or echo question, but the relations of phrasal sisterhood holding among them are different.[4] The ASCs themselves do not contain information about phrase structure.

---

1 I would like to thank Hans-Martin Gaertner, Adele Goldberg, Stefan Müller and Stephen Wechsler for comments on an earlier draft. Standard disculpations apply.

2. See for example Goldberg's communication reported in (Kay 2005, fn. 5), fn.4 below, and Bergen and Chang (2005 p.9).

3. In fact the appellation "Argument Structure Construction" has been used to label UPS lexical rules (Kay 2005, Kay and Sag 2012).

4. I am speaking here of languages like English. In languages that rely more on morphology than phrase structure to express grammatical relations, or whose syntactic phrases correspond less closely to

Goldberg (2006: 10) states that her ASCs do not determine word order. She has reportedly characterized ASCs in oral presentation as phrasal constructions that impose dominance relations without respect to the ordering of constituents[5], but although this is reported as an explicit statement of their author, it is not an accurate description of the ASCs Goldberg proposes. Relations of syntactic dominance are not expressed in Goldberg's ASCs, which syntactically specify no more than grammatical functions. An array of grammatical functions does not determine dominance relations. For example, in any approach that assumes gfs as primitives, in all three sentences of 1 *Kim* is the subject, *Sandy* is the object and the NP headed by *peach* is the object2 (*pace* the 'indirect object' terminology). In 1a the subject is the only constituent immediately dominated by the highest node; in 1b the object is the only constituent dominated by the highest node, and in 1c the object2 is the only constituent immediately dominated by the highest node.

(1)   a.   Kim gave Sandy a peach. [contrived example] [6]
       b.   Sandy, Kim gave a peach. [contrived example]
       c.   Which peach did Kim give Sandy. [contrived example]

ASCs that assign grammatical functions
The first type of CLLT lexical rule creates a mapping of a set of semantic *participant* roles supplied by a verb with a set of *argument* roles furnished by a construction. The mapping obeys a Semantic Coherence Principle, according to which each participant role "can be construed as an instance of" the argument role it is mapped to.[7] The construction may furnish argument roles in addition to those it matches to participant rules of the verb; probably few readers of this comment have never come across an example featuring the sneezing of a napkin off a table. An example of an ASC that includes grammatical functions is the Ditransitive Construction, reproduced in Figure 1.

---

semantic units, or which allow freer variation in word order, there may be special problems with the CLLT approach – as with many approaches -- in relating functional to phrasal units. (See Müller 2006, 2007 for some interesting problems of this kind posed by the relatively loosely constrained word order of German. Radically non-configurational languages like Warlpiri or Wambaya raise even more complex issues. For a recent treatment of the latter in the HPSG tradition, see Bender 2008).

5. Müller (2007) reports,

> In her lecture, Goldberg discussed the Ditransitive Construction, which consists
> of subject, verb, obj1, and obj2:
>
> (3) V SUBJ OBJ1 OBJ2
>
> She claimed that this construction is phrasal but does not make any statement about the
> constituent order. The constituent order facts follow from the ways this construction interacts
> with other Constructions. For simple sentences with ditransitive verbs (3) interacts with the
> Subject-Predicate Construction and with the VP Construction (Kay and Fillmore, 1999, p. 8, p.
> 13).

We will look more closely below at some of what is involved in cashing out the interaction of Goldberg's ASCs with phrase-structural constructions like those of Kay & Fillmore 1999. (The semi-formalization of Kay & Fillmore 1999 has now been replaced by the more careful formulation of SBCG (Sag 2010, Boas & Sag 2012). The latter does not postulate gfs as such but rather specifies as its argument structure (ARG-ST) value a list of arguments ordered from least to most oblique, with the subject identified by a separate feature as the external argument (XARG).

6. Numbered examples without stars are attested on the web unless otherwise indicated.

7. Goldberg's formulation of the Principle allows that the instance relation may apply in either direction. The possibility in which the argument role is construable as an instance of the participant role does not appear to be exploited.

```
┌─────────────────────────────────────────────────────────────┐
│  Sem          CAUSE-RECEIVE   < agt     rec    pat >          │         Fusion of roles
│                   |R             |        ┊      |   ◄──────────────────
│  R: instance,     PRED         <                 >            │
│    means                                                     │
│                     ↓            ↓       ↓      ↓             │
│  Syn                V          SUBJ    OBJ   OBJ₂             │
└─────────────────────────────────────────────────────────────┘
```
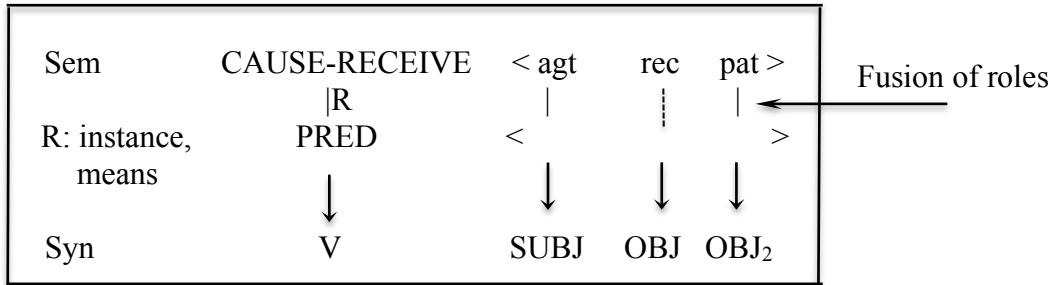
Figure 1. Goldberg's Ditransitive Construction (1995: 50, Fig. 2.4)

The participant roles are furnished in the middle row by combination with a verb. The dotted line descending from "rec" (representing the Recipient argument role) indicates that the construction will furnish that role whether or not the verb furnishes a matching role. Without going into further detail at this point regarding the various features of the diagram, it is evident that no phrasal information is provided. The syntactic information represented consists entirely in the assignment of grammatical *functions* to semantic argument roles. It is applicable equally to a sentence like *Kim gave Sandy a book*, in which the object and the object2 are (arguably) sisters and a sentence like *Which book did Kim give Sandy?* in which they are not.

ASCs can add a grammatical function specification not corresponding to any verbal participant, as in *Sandy threw Kim the ball (cf. Sandy threw the ball.)* A case in which an added argument is present in *no* verb that unifies with the ASC is represented by the *Way* Construction. Here the construction contributes an OBJ function, which is never matched by a verbal participant (*He shouldered/whistled **his way** across the room*). It further specifies that the OBJ function be satisfied by a noun phrase coindexed with the NP satisfying the SUBJ function. Goldberg offers separate diagrams corresponding to the means and manner interpretations of the *Way* Construction. The manner (e.g., *whistled*) interpretation is shown in Figure 2.

```
┌─────────────────────────────────────────────────────────────┐
│  Sem          MOVE          < theme          path  >         │
│                 |manner         |              |             │
│  R: instance,   PRED          <                 >            │
│    means                                                     │
│                   ↓             ↓      ↓        ↓            │
│  Syn             V          < SUBJᵢ  OBJ_{way,i}  OBL >      │
└─────────────────────────────────────────────────────────────┘
```
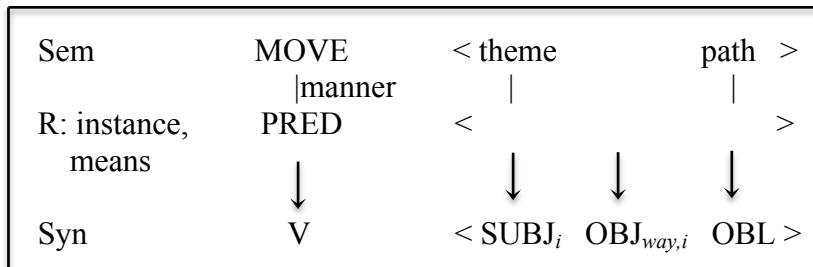
Figure 2. Goldberg's *Way* Construction, Manner Interpretation (1995: 210, Fig. 9.4)

This ASC might appear to come closer to specifying an aspect of phrase structure, but still only the gfs are specified. We know that there is a possessive NP[*way*] somewhere that is not licensed by the verb alone, but we have no information on where in phrasal structure it is located. To license an actual clause or verb phrase there will still be needed a construction determining where objects go in relation to the verb and its other complements, if any. The *Way* Construction in this formulation is again a lexical rule; it specifies grammatical functions but no phrase-structural properties.

1.2 ASCs that don't assign grammatical functions
The Passive and Middle ASCs don't assign grammatical functions. Goldberg's diagram for the Passive ASC is given in Figure 3.[8]

---

8. The diagram for the Middle construction would be identical, since these diagrams don't include morphological information or other indication of voice.

```
┌─────────────────────────────┐
│  role₁   role₂   (role₃)    │
│         |                   │
│  Deprofile                  │
│                             │
│       role₁ > roleₙ  (n≠1)  │
└─────────────────────────────┘
```
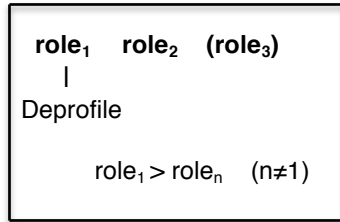
Figure 3. Goldberg's Passive Construction (1995: 57, Figure 2.12)

The roles in question are argument roles, and the evident intent is to block the highest (e.g., agent) argument from receiving a grammatical function. For example, in an initially ditransitive argument structure that has undergone passivization, the recipient argument receives the subject function, since the agent has been deprofiled (i.e. made ineligible for subject or object function). The numerical subscripts on each role designation refer to the relative position of the roles on an assumed thematic role hierarchy (Fillmore 1968, Jackendoff 1972), given in (2). "Passive applies only to verbs which are associated with two or more roles, one of which is higher than the others" (Goldberg 1995: 57).

(2) agent, cause > recipient, experiencer > instrument > patient, theme > location, source, goal
     (Goldberg 1995: 57)

Again, we see that the type of CLLT ASC depicted does not provide phrasal information. Both types of CLLT ASCs are lexical rules.

Empirical problems with CLLT lexical rules that do not arise with UPS lexical rules
The reliance of the CLLT approach on an assumed thematic role hierarchy creates some empirical problems. First, the hierarchy itself has been widely criticized. Bender (2013) recently summarized the situation as follows:

> As Dowty (1991) points out, no one has ever proposed a comprehensive set of thematic roles for any single language nor a rigorous set of operationalizable definitions. [Footnote: Dowty 1991 cites Blake 1930 as having made the most progress towards a comprehensive set. Blake's proposal included 113 roles.]

The problems can be divided into cases in which the hierarchy fails to make a prediction, those in which the hierarchy makes the wrong prediction, and those in which the hierarchy makes conflicting predictions.[9]

Davis and Koenig (2000: 57) observe that many languages derive causative verbs from verbs inherently containing an agent, according the subject role to the causer and the original agent to object or oblique. The hierarchy has nothing to say about this. They cite the Finnish example

(3)   Vitsi naura-tt-i   nais-i-a   (Davis & Koenig ex. 2)
        joke laugh-CAUS-PST woman-PL-PART
        'The joke made the women laugh.'

English has transitive verbs like *abut*, *border, adjoin, equal* (said of quantities), *intersect, outweigh, exceed, resemble* which offer no apparent difference in thematic role between the two arguments. It appears in these cases that perspective, point of view, information structure, or other non-thematic factors determine (or in any case correlate with) grammatical function assignment.

---

9 This section relies heavily on Davis & Koenig (2000).

(4) a. The old rectory had abutted the churchyard but the new one was a mile away.
     b. 24 packets of Splenda equals one cup of sugar.
     c. The number of Islamic glass jetons that still exist indicates the original number vastly exceeded the number needed as coin weights.
     d. This 50-acre natural wetlands adjoins the Ohio River in New Albany, Indiana, and is directly across the river from Louisville, Kentucky.
     e. Does it seem that no matter what you do, the bad outweighs the good in your marriage?

While defending the notion of a thematic role hierarchy as a source for linking of semantic roles to syntactic functions, Fillmore (1977) nonetheless acknowledged -- citing Chomsky's (1965: 162) example (5) -- that there appear to be language specific subject selection principles and further that "Still other Subject Selection principles appear to be word specific" (Fillmore 1977: 179).

(5) a. I regard John as pompous.   (Chomsky 1965, cited by Fillmore 1977)
     b. John strikes me as pompous.

The thematic role hierarchy makes the wrong prediction in cases of many uses of verbs with presumably patient/theme subject and agent or instrument object, such as *undergo, suffer,* and *endure*.

(6) a. Prior to that time, the biblical text underwent deliberate emendations to bring its message into accord with the political and religious convictions of the various factions writing and editing individual texts.
     b. We just suffered an attack from a hacker with a new exploit.
     c. Daniel endured persecution from three other leaders who devised a law to rob him of religious freedom.

The hierarchy appears to make conflicting predictions in the well-known case of psych-verb pairs such as *like* and *please, fear* and *frighten* (Lakoff 1970, Postal 1971, and much subsequent literature). Presumably the external stimulus of an emotion and the experiencer occupy distinct theta roles. Whichever is taken to be the higher role will predict a grammatical function assignment (or whatever is taken to determine subject and object) the reverse of that assigned by the converse verb.[10]

---

10. There has been controversy about whether the passives of experiencer-object verbs are true verbal passives or merely adjectival, hence whether the apparent objects are really objects. Belletti and Rizzi (1988) argued that passives of *worry*-type verbs in Italian are adjectival. Grimshaw (1990) and Pesetsky (1995) have argued that English experiencer-object verbs have verbal passives, Grimshaw holding that there is a restriction to agentive predicates and Pesetsky arguing for a weaker constraint, causality. On the basis of data from a regional dialect of American English and additional tests, Tenny (1998) supports Pesetsky's position on the whole, while indicating some additional factors that appear to influence a cline of relative acceptability. Tenny proposes as tests that adjectival passives should fail to co-occur not only with (1) agentive/causal *by* phrases, but also (2) manner adverbs and (3) progressive aspect. The following examples cover all three of these tests and indicate that experiencer-object verbs occur in true verbal passives and thus that converse pairs of psych verbs provide valid counterexamples to linking via any version of the thematic role hierarchy.

    i. … in the event he discovered that plaintiff's wife's horse was being frightened by the ringing of the bell. (progressive, causal *by* phrase)
    ii. Our revelations come just days after Lloyds was publicly shamed by a record £28million fine imposed by City watchdog, the Financial Conduct Authority… (manner adverb, causal *by* phrase)
    iii. Friendship requires mutual liking, where liking involves being attracted to, having a preference for, being pleased by, or enjoying the other person. (progressive, causal *by* phrase)
    iv. The Koi had returned after being viciously frightened by Elvin … (progressive, manner adverb, causal *by* phrase)

Davis and Koenig observe that constraints on role combinations consistent with the hierarchy, both positive and negative, suggest that the roles are not semantically independent of each other. Recipients, as against mere goals, seem to require an agent, both empirically and intuitively. It is hard to imagine a transitive verb with thematic roles of experiencer and patient and none has been proposed. The hierarchy alone would seem to predict the existence of such verbs.

The thematic hierarchy and the CLLT Passive and Middle Constructions
Aside from these general drawbacks to the thematic hierarchy, there are particular problems in Goldberg's employment of it to govern the operation of Passive. Whether or not "only' is intended as "all and only" in the statement, "Passive applies only to verbs which are associated with two or more roles, one of which is higher than the others," any pair of converse verbs both of which occur in both transitive and passive configurations stand as counterexamples. These include not only the psych verbs already mentioned, but also pairs like *lead-follow, precede-follow, chase-flee,* including the rare cases (if there are more than one) where two senses of a homonymous transitive verb denote converse relations: *comprise-comprise*.

(7)   a.   "I ... just screamed and chased him topless through the store,"…
          b.   A local woman who said she was chased by a man with a large knife described to Local 6 how she escaped.
          c.   Over 140,000 people have fled the region as a result …
          d.   The carnage was fled by few and witnessed by pretty much everyone …

(8)   a.   As to who comprised this new reading public, Jeffrey..guessed in 1812 that there were 20,000 upper-class readers in Great Britain. [OED]
          b.   The Rabbinic system was comprised by a set of timeless models and exemplary patterns …
          c.   The house comprises box-room, nine bed-rooms, bath-room, etc. [OED]
          d.   Where can I find out the changes that are comprised by an update?

A different kind of problem arises in considering how the mechanics of combining Passive with other ASCs might work. Except for the *Way* construction, all the examples of argument-augmenting processes that Goldberg considers co-occur with passive, middle, or both.

(9)   a.   She was delivered the news May 7 by Superintendent Robert Avossa… (Ditransitive, Passive)
          b.   The ball was kicked to the Tar Heels' twenty-seven. (Caused Motion, Passive)
          c.   I was driven crazy by a dog, (Resultative, Passive)
          d.   Steam potatoes for about 15-20 minutes or until a fork drives through it [sic] easily. (Caused Motion, Middle)
          e.   … denim wears thin easily and bleeds indigo dye ... (Resultative, Middle)

How will the combination of Passive and, say, Ditransitive, as exemplified in 9a, be implemented in the CLLT approach? More generally, how are the differing assignments of gfs to semantic arguments in active versus passive or middle cases of argument-affecting AFCs implemented?

A personal communication from Goldberg was reported in (Kay 2005):

> The possibility of dative shifted and passive phenomena co-occurring is seemingly not permitted by [Goldberg (1995)], whose ASCs assign grammatical functions such as subj, obj and obj2 directly to semantic arguments, with the Distinguished Argument (logical subject) assigned subj function. This appearance of ruling out clauses that are both, say, dative-shifted and passive is deceiving. Goldberg (pc) has in mind… to permit, for example, the same Passive and Middle ASCs to (possibly) occur in Caused Motion, Ditransitive, simple Transitive, Resultative, etc.

contexts. … she posits an inheritance hierarchy of constructions with leaves such as Active Ditransitive, Passive Ditransitive, [11], Simple Passive, Caused Motion Middle, and so on.

This is consistent with Goldberg (2006: 10), the oral statement of Goldberg reported by Müller (2007) in footnote 4, and those of Bergen and Chang (2005: 9), who specify that their concern is with specifically the Active Ditransitive Construction. However, none of these sources, nor any other CLLT source that I have found, spells out the details of how grammatical functions (gfs) get assigned in combinations of Active, Passive, or Middle ASCs on the one hand with Ditransitive, Caused Motion, or Resultative, etc. ASCs on the other.

We note first that the assignment of OBJ2 to patient occurs in both active and passive ditransitive clauses.[12] OBJ2 cannot be a gf given out by the thematic hierarchy because there are many verbs with <SUBJ, OBL> and <SUBJ, OBJ, OBL> gf arrays, including all those instantiating caused-motion or caused location scenarios. So the assignment of OBJ2 to the patient argument role must be part of the Ditransitive ASC, as shown in Figure 4. On the other hand, I assume that the version of the Ditransitive Construction given by Goldberg (p. 50, Figure 2.4) and reproduced in Figure 1 was intended by her as the Active Ditransitive Construction, since the gfs assigned to the agent and recipient arguments are appropriate only to the active, not to the passive, case. I consequently propose the diagram in Figure 4 as closer to Goldberg's intent for a Ditransitive Construction that is available to license both active and passive gf assignments
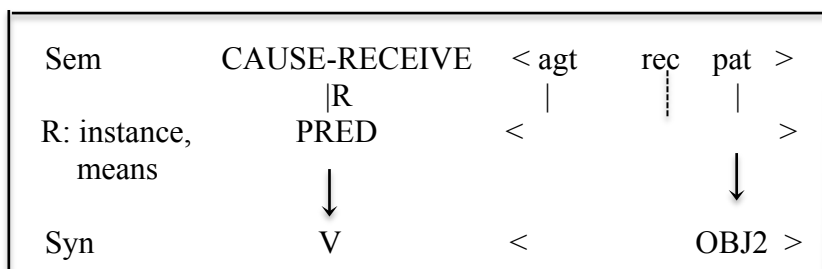

Figure 4. Goldberg's Ditransitive ASC (revised to license both active and passive gf assignments)

Secondly, we note that Passive, as depicted in Figure 3 and as described in Goldberg's text is a *process*. It has an *input* (specifying some number n of roles) and an *output* (specifying n–1 roles). It is equivalent to a UPS rule with n roles in the daughter constituent and n–1 roles in the mother. The question then arises: what structure serves as the input to Passive? There are three possibilities: (1) the verb, e.g., *deliver*, (2) the ASC, e.g., the Ditransitive ASC, and (3) the combination of verb and ASC. The answer is (3) the combination of verb and ASC, since the verb has to be visible to Passive to enable a morphological operation and the ASC has to be visible to Passive because the thematic hierarchy ranks only argument roles, and passive deprofiles the highest role. Figure 5 depicts the verb *deliver* combined with the Ditransitive ASC.

---

11. The expression Passive Ditransitive may sound to some self-contradictory and the expression Active Ditransitive, pleonastic. I nevertheless defer to this usage to simplify exposition.

12. The post-verbal NP in a passive ditransitive clause must be an object2 because passives are intransitives and so by definition lack direct objects.

```
Sem         CAUSE-RECEIVE    < agt      rec      pat  >
               |R               |        ┆        |
R: instance    DELIVER        <d…er               d…ee  >
                 ↓                                  ↓
Syn            deliver        <                   OBJ2  >
```
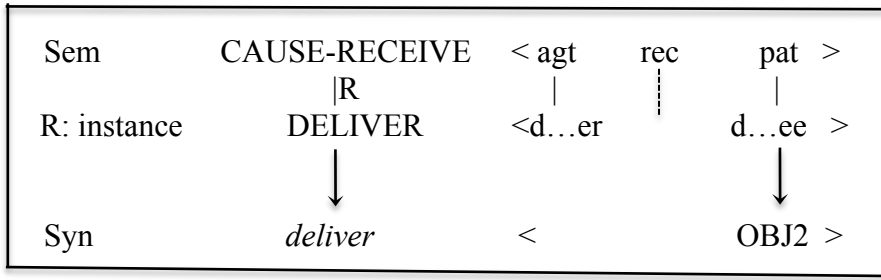
Figure 5. The verb *deliver* inserted in the Ditransitive ASC

Applying Passive to the structure depicted in Figure 5, we get that shown in Figure 6, where the agent argument and its associated participant role have been deprofiled.[13]

```
Sem         CAUSE-RECEIVE    < rec        pat    >
               |R               ┆          |
R: instance    DELIVER        <            d…ee  >
                 ↓                           ↓
Syn            deliver        <            OBJ2  >
```
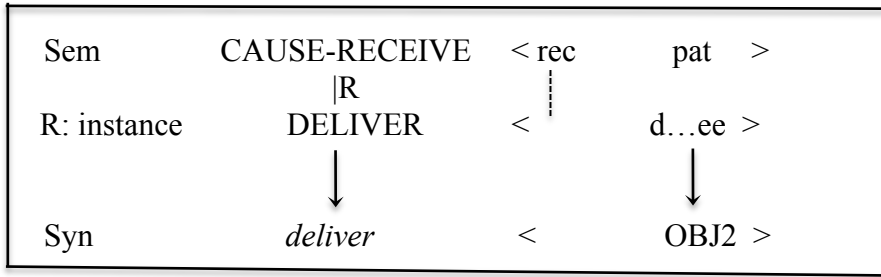
Figure 6. The verb *deliver* inserted in the Ditransitive ASC and passivized.

Finally, the thematic hierarchy assigns the SUBJ gf to the highest-ranking argument, as shown in Figure 7.

```
Sem         CAUSE-RECEIVE    < rec        pat    >
               |R               ┆          |
R: instance    DELIVER        <           d…ee >
                 ↓              ↓           ↓
Syn            deliver        <SUBJ      OBJ2  >
```
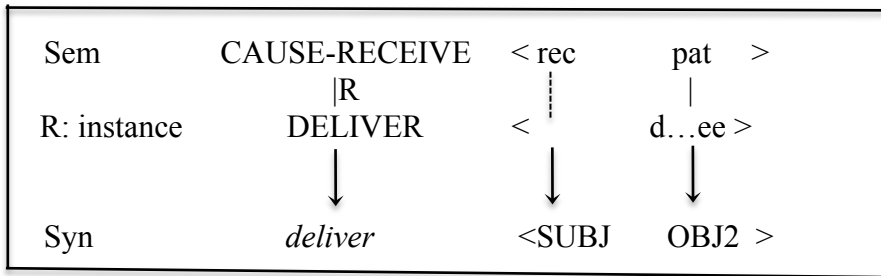
Figure 7. The verb *deliver* inserted in the Ditransitive ASC, passivized, and assigned SUBJ gf by the thematic role principle.

In the active ditransitive case, *deliver* combines with the ASC of Figure 4 and without further ado the thematic role hierarchy deals out SUBJ and OBJ roles to agent and recipient arguments, respectively, as shown in Figure 8.

---

13. Deprofiling makes an argument ineligible for subject or object role but leaves open the possibility of realizing the demoted logical subject in a *by*-phrase.

```
Sem          CAUSE-RECEIVE    < agt     rec      pat  >
                   |R                |          ┊         |
R: instance        DELIVER      <d…er              d…ee  >
                     ↓              ↓         ↓        ↓
Syn            deliver         < SUBJ   OBJ    OBJ2  >
```
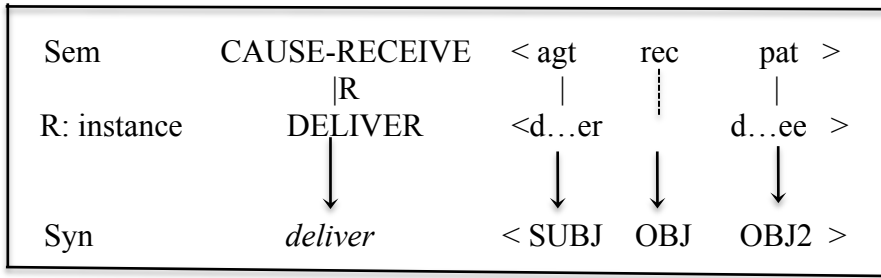
Figure 8. The verb *deliver* inserted directly in the Ditransitive ASC and dealt SUBJ and OBJ gfs by the thematic role hierarchy.

We have spelled out a few details of how gfs have to get assigned to semantic arguments in the CLLT system. How have we done that? By telling a completely procedural story. First the verb's role array combines with that of an ASC. Then Passive applies, or fails to apply, to the result of the preceding step. Then the thematic role hierarchy deals out grammatical functions in order. Both Passive and the activity of the thematic hierarchy are processes with an input and an output. The English ASCs featured in (Goldberg 1995) can or must add arguments. In other languages there are lexical processes that remove arguments.[14] The way processes of this kind, involving a sequence of rules that add, subtract, or change something, are encoded in monostratal, constraint-based, non-derivational theories -- as the CLLT is intended to be embedded in – is as a series of unary constructions, that is, a series of UPS rules of the kind that M&W advocate. The only apparent alternative to a set of UPS lexical rules would be to posit Active Ditransitive and Passive Ditransitive constructions that share nothing with each other or with other active and passive structures, respectively, a practice that would lead to literally hundreds of argument structure constructions (See Müller 2007) and miss all generalization that could be made about, e.g., passive structures and ditransitive structures and which Goldberg clearly intends to capture in proposing separate and independent Ditransitive, and Passive constructions, for example. Something equivalent to a body of UPS rules appears to be the only way that the generalizations Goldberg intends to capture in her ASCs can be implemented.

Conclusions
First, the CLLT is a lexical rule theory, not a phrasal theory. No mention is made of phrase-structure in the depictions of ASCs. ASCs cannot be interpreted as representing relations of phrasal dominance without precedence despite an occasional statement to the contrary. We considered above an example of a ditransitive declarative clause, an otherwise identical topicalized clause, and a similar filler-gap clause (1). The assignments of grammatical functions to thematic roles were the same in all three examples but the dominance relations were different.

Secondly, the CLLT approach can be made viable for the lexicon in general only when it abandons or supplements its exclusive reliance on a thematic role hierarchy. We saw several instances where the thematic hierarchy failed to make any prediction, made the wrong prediction, or made conflicting predictions.

Setting aside the observation regarding the thematic hierarchy and considering a more restricted range of data, we saw that examination of the detailed operation of the CLLT implies a process equivalent to a set of unary phrase structure rules of the kind advocated by Müller and Wechsler. In realizing the important insights of Goldberg and other CLLT workers into the semantics of argument linking, introduction of unary phrase structure lexical rules, if adopted, will increase the predictive power of the CLLT.

---

14. For example, one class of French reflexives changes inherent causatives to inchoatives, removing the agent argument. *Améliorer* means 'make better'; *s'améliorer* means, not 'make oneself/itself better', but 'become better'. *Effrayer* means 'frighten'; *s'effrayer* means, not 'frighten oneself', but 'become frightened'.

References

Belletti, Adriana & Rizzi, Luigi (1988). Psych-verbs and theta-theory. *Natural Language and Linguistic Theory* 6: 291-352.

Bender, Emily. M. (2008). Radical non-configurationality without shuffle operators: An analysis of Wambaya. In *Proceedings of the 15th International Conference on Head-Driven Phrase Structure Grammar.* Stefan Müller (ed.)*,* Stanford, CA: CSLI Publications. 6-24.

Bender, Emily.M. (2013) *Linguistic Fundamentals for Natural Language Processing: 100 Essentials from Morphology and Syntax.* San Rafael, CA: Morgan & Claypool.

Bergen, Benjamin., & Chang, Nancy. (2005) Embodied construction grammar in simulation-based language understanding. *Construction grammars: Cognitive grounding and theoretical extensions*. J.O. Östman & M. Fried (eds.) Amsterdam: John Benjamins .147-190.

Boas, H. C. & Sag, I.A. (eds.) (2012) *Sign-Based Construction Grammar.* Stanford, CA: CSLI Publications.

Blake, Frank R. (1930). A semantic analysis of case. In J. T. Hatfield, W. Leopold, and A. J. F. Zieglschmid, (eds.), *Curme Volume of Linguistic Studies (Language Monographs 7),* Baltimore MD: Linguistic Society of America. 34–49

Bresnan, Joan, & Jonni M. Kanerva. (1989) "Locative inversion in Chicheŵa: a case study of factorization in grammar." *Linguistic inquiry* 20(1): 1-50.

Chomsky, Noam (1965) *Aspects of the Theory of Syntax.* Cambridge, MA: MIT Press.

Davis, Anthony R., & Jean-Pierre Koenig (2000) "Linking as constraints on word classes in a hierarchical lexicon." *Language* 76.1: 56-91.

Dowty, David R. (1991). Thematic proto-roles and argument selection. *Language*, 67(3), 547–619.

Fillmore, Charles J. (1968) The case for case. *Universals in Linguistic Theory*, Emmon Bach and Robert Harms (eds.). New York: Holt, Rinehart and Winston. 1-88.

Fillmore, Charles, J. The case for case reopened (1977) In Cole, Peter, and Jerrold Murray Sadock, eds. *Syntax and semantics: grammatical relations*. Vol. 8. Academic. [Pagination is to reprinted version in Fillmore, Charles J. (2003) *Form and Meaning in Language.* Stanford, CA: CSLI Publications.]

Goldberg, Adele E. (1995) *Constructions*. Chicago, U. of Chicago Press.

Goldberg, Adele E. (2006) *Constructions at Work.* Oxford: Oxford University Press.

Grimshaw, Jane (1990). *Argument Structure*. Cambridge, MA: MIT Prcss.

Jackendoff, Ray (1972) *Semantic interpretation in generative grammar.* Cambridge, MA: MIT Press.

Kay, Paul (2005) Argument structure constructions and the argument-adjunct distinction. In *Grammatical Constructions: Back to the Roots.* M. Fried and H. Boas (eds.) Amsterdam: Benjamins. pp. 71-98.

Kay, Paul & Charles J. Fillmore (1999) Grammatical constructions and linguistic generalizations: the *What's X doing Y?* construction. *Language* 75: 1-33.

Kay, Paul & Ivan A. Sag (2012) Cleaning up the Big Mess: Discontinuous dependencies and Complex determiners. in Boas, H. C. & Sag, I.A. (eds.) (2012).

Lakoff, George. (1970). Irregularity in syntax. NY: Holt, Rinehart &Winston.

Lakoff, George (1987) *Women, fire, and dangerous things: What categories reveal about the mind*. University of Chicago, Chicago

Langacker, Ronald W. (1987). *Foundations of Cognitive Grammar: theoretical prerequisites. Volume 1* (Vol. 1). Stanford University Press.

Müller, Stefan (2006) Phrasal or lexical constructions. *Language* 82(4), pages 850–883.

Müller, Stefan (2007) Phrasal or lexical constructions? Some comments on underspecification of constituent order, compositionality, and control. *Proceedings of the 14th International conference on Head-Driven Phrase Structure Grammar.* (S. Müller (ed.). Stanford, CA: CSLI Publications. 373-393.

Müller, Stefan & Stephen Wechsler (2014) Lexical approaches to argument structure. *Theoretical Linguistics.* (this issue).

Pesetsky, David (1995). *Zero Syntax: Experiencers and Cascades*. Cambridge, MA: MIT Press.

Postal, Paul M. (1971) *Crossover Phenomena.* New York.: Holt, Reinhart and Winston.

Sag, Ivan A. 2010. English Filler-Gap Constructions. *Language*, Volume 86.3: 486-545.

Tenny, Carol (1998) Psych verbs and verbal passives in Pittsburghese. *Linguistics* 36-3: 591-597.