1 TAG and ‘Restructuring’

- There are various processes which are generally local—i.e. clause internal—which treat certain combinations of two clauses as a single domain. For example:

  1. Long distance clitic climbing (out of nonfinite complement ‘clauses’) in Romance
  2. Long distance Scrambling (out of nonfinite complement ‘clauses’) in Germanic

- One traditional way to do this is to put the two clauses together and then perform the ‘long movement.’ Notice that in TAG this is literally impossible, if the two ‘clauses’ correspond to two elementary trees. ‘Movement’ can only happen within a single elementary tree.

- In principle, the long movement could be handled by adjoining the higher clause into the lower one. This requires that the higher verb project a recursive tree whose root/foot category is one that occurs ‘below’ the displaced expression: “Defective Complement.”

2 Tonia’s analysis of clitic climbing

- Clitic climbing in Spanish

  (1) Juan lo quiere ver
      J it wants to see
      ‘Juan wants to see it.’

  (2) Juan te lo quiere permitir ver
      J you it want to permit to see
      ‘Juan wants to permit you to see it.’

  - If the clitics start with their verbs—te permitir and lo ver—then adjoining quiere to permitir and permitir to ver gives the wrong order of clitics.

  - Not having the clitics start with their verbs makes it impossible to regulate their distribution.
Tonia’s analysis using Multicomponent TAG:

When there is clitic climbing, two things happen:

1. The elementary tree for the verb that launches the clitic has two components. The component containing the verb projects only to VP. The part containing the clitic is an auxiliary tree with root and foot node T.

(3) Tree set for *see* with climbing

\[
\text{T} \\
\text{lo}_k \quad \text{T}^* \\
\text{VP} \\
\text{V}_k \quad \text{t}_k \\
\text{ver}
\]

(4) Tree set for *permit* ‘permit’ with climbing

\[
\text{T} \\
\text{te}_k \quad \text{T}^* \\
\text{VP} \\
\text{V}_k \quad \text{t}_k \quad \text{XP} \\
\text{permitir}
\]

2. The elementary tree for the trigger verb selects a ‘defective complement’:

(5) Tree for *want*

\[
\text{TP} \\
\text{DP} \\
\text{T} \\
\text{Juan} \\
\text{T}_j \\
\text{VP} \\
\text{quierer} \\
\text{t}_j \quad \text{VP}
\]

- When two clitics climb, the two components of one tree-set need to substitute and adjoin into the two components of another tree-set.

(6) a. 

\[
\text{VP} \\
\text{V}_k \quad \text{t}_k \\
\text{ver} \\
\text{VP} \\
\text{t}_k \quad \text{XP} \\
\text{permitir}
\]

b. 

\[
\text{T} \\
\text{lo} \quad \text{T} \\
\text{T} \\
\text{te} \quad \text{T}
\]

Consequently Tonia cannot use *Tree Local* MC-TAG, and must use *Set Local* MC-TAG. SL-MCTAG is not a mildly CS formalism. It is spicily CS. TAG people no like spicy.
• However the analysis does give an extremely elegant account of “Bandwagon effects.” If a clitic in the lowest clause climbs to an intermediary clause, then no clitic can climb any further unless they all do.

This follows three premises:

1. When a verb launches a clitic, it projects only to VP, not to TP
2. Climbing clitics adjoin to T
3. Set-Local MC-TAG
   The components of a tree-set can only be combined with the components of a single other tree-set.

Thus when ver is the complement of permitir, any floating clitic associated with ver will have to adjoin to a T node in the permitir tree-set. There are therefore two outcomes:

1. If permitir doesn’t launch a clitic itself, it will project its TP—which is where the ver clitic will land.
2. If permitir does launch a clitic, the ver clitic will attach to it, and they will travel together.

3 Problems for Bleam

• The difference between climbing and no climbing is not just in whether the embedding verb selects TP or VP. It is also the case that the lower verb has two entirely different trees depending on whether or not it launches a clitic. This seems inelegant.

• More serious problem: the trigger verb may be a Raising verb:

(7) Luis las suele comer
    L them tends to.eat
    ‘Luis tends to eat them.’

Under the usual TAG analysis the suele ‘tend’ tree must adjoin into the comer ‘eat’ tree. But Bleam will need the clitic from the comer tree-set to adjoin into the suele ‘tend’ tree. The principles of MC-TAG forbid this kind of ‘circular’ derivation.

• Similar problem:

(8) Que te quiere mostrar Juan
    What you want show Juan
    ‘What did Juan want to show you?’
The _wh_-extraction requires adjoining ‘want’ into ‘show.’ But Bleam’s analysis of the clitic requires us to adjoin it into the ‘want’ tree.

• Idea: A verb that launches a clitic has _three_ components in its tree set, one for the verb, one for the clitic, and one for its subject:

\[
\begin{align*}
(9) & & \text{VP} & & \text{T} & & \text{TP} \\
 & & \text{V} & & \text{t}_k & & \text{las} & & \text{T}^* & & \text{DP} & & \text{T} \\
 & & \text{comer} & & & & \text{Luis} \\
(10) & & \text{T} & & \text{VP} \\
 & & \text{T} & & \text{V} & & \text{t}_j & & \text{VP} \\
 & & \text{suele}_j & & \text{PRES} \\
\end{align*}
\]

But there is no legal way to combine these tree-sets in the desired way:

– We can substitute the VP portion of the _comer_ ‘eat’ set into the _suele_ ‘tend’ tree.
– But then MC-TAG forbids a ‘circular’ substitution of the _suele_ ‘tend’ tree into the subject portion of the _comer_ ‘tend’ tree.
– And of course we can’t _adjoining_ the subject portion onto the root of the _suele_ ‘tend’ tree, because the subject portion is not recursive.

4 **Analogous problem with German Scrambling**

• Interaction of Topicalization and scrambling into a higher clause:

\[
(11) \quad \text{Dieses Buch hat den Kindern bisher noch niemand zu geben versucht.} \\
       \quad \text{This book has the children-DAT heretofore still nobody to give tried} \\
       \quad \text{‘This book, no one has of yet tried to give to the children.’}
\]
How do you get the Scrambled DP—here the Dative argument of ‘give’—to surface inside the matrix clause, when that adjoins into its complement?

(Compare: How does from the lower clause to surface after the clitic from the higher clause?)

5 Problems in English Raising

• How does the subject of the like tree end up between parts of the seem tree?

(13) Does John seem (to be certain) to like pork?

It must be that does heads its own component in the tree-set for seem. But then this situation is different from the general case, outside of Raising verbs.

• The seem tree-set will sometimes need a component for a wh-DP.
(14) To whom does John seem to be certain to like pork?

We will need to stipulate extrinsically that the *wh* ends up higher than *does*, and that both end up higher than *seem*.

- Wh-extraction out of complex Raising constructions violates locality conditions on MC-TAG:

(15) What does John seem to be certain to like?

Here *does*, from the *seems* tree set, will have to substitute into the C associated with the like tree. But at the same time, *seems* has to adjoin onto *certain*. This violates the principles of (Tree- or Set-) Local MC-TAG.

6 Response #1: TAG as sets of c-command relations

- Frank and Vijay-Shanker redefine TAG as follows:
  1. Elementary “trees” are collections of c-command relations.
  2. Combination proceeds by “substituting” one collection of c-command relations at a node in another collection.

(16) a. ([DP A], T), ([DP k A], [DP t k]), ([T to], VP), (VP,[T to]), ([DP t k], V), ([V like], [DP pizza]), ([DP pizza], [V like])

b. ([T PRES], VP), (VP, [T PRES]), ([V seems], T), (T, [V seems])

c. Substitute T in set (b) into the lower T in (a)
  ([DP A], T b), ([DP k A], [DP t k]), ([T a to], VP a), (VP a,[T a to]), ([DP t k], V), ([V like], [DP pizza]), ([DP pizza], [V like]) ([T b PRES], VP b), (VP b, [T b PRES]), ([V b seems], T b), (T _b, [V b seems])

- The source tree will include some node *n* of category α that substitutes into an α node in the target tree. In the target tree, there will be a subtree with the substitution node *f* on its frontier, rooted by a node *r* of category α. This is a recursive subtree in the target node.

Any material above *n* in the source tree, and above *r* in the target tree, is called “floating” material.
Derivational CETM
The floating elements of a derivation must constitute a single extended projection.

This will force the TP sister of \([C \text{ does}]\) to be identical to the TP root associated with like.

6.1 Cyclic raising

(17) Does John seem to be certain to like pizza.

• The T of the like ‘tree’ substitutes into the T frontier in the certain ‘tree,’ leaving John floating. The T node of the result then substitutes into the T frontier node of seems.

• This is the only licit derivation given a further condition:
  “The structure containing the substitution node must be elementary.”

6.2 Super raising

(18) John seems it is certain to like pork.

• The DCETM will force John and it to be specifiers of the same TP. Assume this is bad.

6.3 Clitic climbing

• Clitic climbing is done almost exactly like Tonia suggested—only the clitics are “floating,” and there may also be a floating subject. Trigger verbs take VP complements.
6.4 Bandwagon effects

- The DCETM will force floated clitics to attach to a T as soon as one is available.

7 Response #2: Segmented TAG

7.1 Basic idea

- Seth Kulick suggested a broad revision of TAG with roughly these two properties:

  1. Verbs generally project full and integrated clauses, not recursive auxiliary trees or multicomponent sets

     \[
     \begin{array}{c}
     CP \\
     \text{C} \\
     \text{does}_k \\
     \text{to} \text{VP} \\
     \text{seem} \\
     \end{array}
     \]

     (19)

     \[
     \begin{array}{c}
     \text{CP} \\
     \text{C} \\
     \text{does}_k \\
     \text{TP} \\
     \text{VP} \\
     \text{seem} \\
     \end{array}
     \]

  2. The effects of Adjoining are captured by splicing in the recursive portion of a tree—from some frontier nonterminal upward—and superimposing the remainder onto the target.

     \[
     \begin{array}{c}
     \text{CP} \\
     \text{DP}_j \\
     \text{what} \\
     \text{to} \text{VP} \\
     \text{like} \\
     \end{array}
     \]

     (20)

     \[
     \begin{array}{c}
     \text{CP} \\
     \text{DP}_j \\
     \text{what} \\
     \text{to} \text{VP} \\
     \text{like} \\
     \end{array}
     \]

\[1\text{I’m not sure about other uses of multicomponent derivations, like extraction out of NP.}\]
(21)  

a. Adjoin in the recursive portion:

```
          T
         /\  
        T  VP 
         \  
          to V  
            \  
             like t

          T
         /\  
        T  VP 
         \  
          t_k V  t
            \  
             seem
```

b. Identify the remainders:

```
           CP
          /\  
         CP  C  
           \  
             DP_j  
               \  
                what

           DP
          /\  
         T  C  
           \  
             TP  
               \  
                C  
                  \  
                    TP  
                      \  
                        does_k  
                          \  
                            T

           John
```

c.

```
           CP
          /\  
         DP_j  C  
           \  
             what

           C
          /\  
         TP  
           \  
             does_k  
               \  
                 DP  
                   \  
                     John  
                       \  
                         T  
                           \  
                                VP  
                                  \  
                                    t_k V  t
                                      \  
                                        like  
                                          \  
                                            DP_j
```

• Principles:

1. As usual, a context-free derivation.

2. When you adjoin a recursive subtree into a target node:

   (a) The top features of the target node unify with the top features of the root of the source subtree

   (b) The bottom features of the target node unify with the bottom features of the foot of the source subtree

3. Loosely speaking:

   You can’t “superimpose” structurally analogous branches that have content.
4.

7.2 Multiple intermediate structures
• Multiple Raising verbs

1. First the seems tree is joined with the certain tree
   (a) The T subtree of seem adjoins at the T of certain.
   (b) The CP, C, and TP nodes of those two trees are identified
2. Then the certain tree is joined with the like tree. Keep in mind, internal nodes of the certain tree have been elaborated, in a previous step. But none of that information is available to the derivation.
   (a) The T subtree of certain adjoins at the T of like
   (b) The CP, C, and TP nodes of those two trees are identified

• Ruling out super-raising:

The certain tree can’t join with the like tree, because both have Specifiers for TP.

• In general, the ban on superimposing occupied branches will deliver Minimality effects.

7.3 Clitic climbing
• Desideratum: A single difference that determines whether the clitic climbs or not.

Resolution: The only difference is in the size of the complement to the trigger verb. The verb that launches the clitic is assigned the same tree either way.
• Given that the verb with the clitic gets the same tree either way, it must presumably be in T either way. But then the clitic can’t be adjoined to T, since it wouldn’t be able to separate from the verb. Hence clitics are treated top features on T.

(22)

 Treating clitics as features means leaving their phonological expression to independent principles of morphology. Thus the syntax (TAG) doesn’t need to account for ordering.

Recall that ordering was the original problem that Tonia faced in applying TAG to the data.

• The clitic will climb when the embedding verb selects $\bar{T}$. Remember,

(23)  a.  

It will not climb when the verb selects a larger complement, of category $\kappa$—under the (stipulated) assumption that the clitic feature does not percolate up to $\kappa$.

• Notice, this approach has no problem with Raising verbs.
Bandwagon effects

For Tonia, this followed from the locality of MC-TAG (plus the assumed representation of the clitics, etc.). For Kulick, it follows from the context-free nature of the derivation (plus the assumed representation of clitics, etc.)

- Climbing out of ver can only happen if the next verb up selects a defective T complement
- But adjoining permitir into ver at T can only result in the ver-clitic getting as high as the T-node of permitir.
- The content of that node will stay together, no matter what else happens in the derivation. It will either surface in the permitir clause, or in the quiere clause, depending on whether or not quiere selects a defective (i.e. T) complement.

7.4 Long-distance Scrambling in German

- Scrambled NPs are treated as adjoining to IP.
  Trigger verbs are treated as selecting IP complements.

- When the trigger verb adjoins in, the “segments” of the Target IP node—which house Scrambled NPs—can be freely ordered, relative to any upper segments of the source IP node.

See Kulick’s dissertation for many interesting but complicated details.
• Notice that long-distance Scrambling will behave differently than long-distance clitic climbing, because the various scrambled NPs, unlike the clitics, occupy separate nodes.

7.5 Getting the right dependencies

• In the following... think-seem-like

(24) What does Frank think that Seth seems to like?

• Standard TAG analysis

- Using Kulick’s “Segmented TAG”:

• For more on the issue of ‘getting the right dependencies,’ and a solution formally different from Kulick’s, see Dras, Schuler, & Chiang, “Multi-component TAG and Notions of Formal Power.”