Standard Modern and Pontic Greek Person Restrictions: A feature-free Dynamic Account

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Abstract

In this paper we argue that the Person Case Constraint, generally presumed to be an irreducible morpho-syntactic constraint on clitic pronoun combinations and argued by several to provide evidence of feature-driven syntactic operations, is a direct consequence of processing considerations. Adopting the Dynamic Syntax (DS) perspective of Cann et al. (2005) in which syntax is defined as the monotonic incremental growth of semantic structure, with structural underspecification and update as the core syntactic notion, we argue that the PCC is wholly due to restrictions on tree-growth imposed by the logic of finite trees: that these should underpin observed gaps in possible clitic combinations is due to clitics being calcified reflexes of previously available tree-growth update-sequences whose variability is the source of word order variation. Our language of primary focus is modern Greek and dialectal variants. More specifically, we argue that the PCC is the consequence of a tree-logic restriction that only one unfixed node can be present in a tree at any stage in the tree growth process. We thus argue for a feature-free account of the PCC contra the current trend in syntactic analyses (Anagnostopoulou, 2003, 2005; Bejar & Rezac, 2003; Bianchi, 2006; Adger & Harbour, 2007; Nevins, 2007 among others). Strong evidence for such a feature-free account comes from Pontic Greek, a dialect where no 3rd person clitic clusters are allowed. Contrary to current analyses, which would preclude such data, the analysis presented is shown to directly predict the Pontic Greek data, thus pointing towards a feature-free account of the PCC.

1 Introduction

The PCC is a clitic co-occurrence restriction, which states, in its "strong PCC" variant, that a dative clitic cannot co-occur with a 1st/2nd person accusative clitic. The restriction is found across a remarkable number of both related and unrelated languages, from Romance and Greek to Kiowa and Basque (see Rezac, 2008b for Basque data and Adger & Harbour, 2007 for Kiowa). The Spanish and Standard Modern Greek (SMG) data are illustrative:

(1) *Le   me   ha dado
      it.CL-DAT me.CL has given
      'S/he has given me to him.' [Spanish]

(2) *Mu   se   exi δosei
      me.CL-DAT you.CL-ACC has given
      'He/She/It has given you to me.' [SMG]

Another weaker version of the PCC has been claimed to exist in some varieties of Catalan, Italian and Spanish (see Bonet, 2007; Bianchi, 2006 and Cuervo, 2002 respectively).Under this looser version, the ban is not against datives in general but only against 3rd person datives, precluding clusters of a 3rd person dative plus a 1st/2nd person accusative clitic but allowing combinations of a 1st/2nd person dative plus a 1st/2nd person accusative:[1]

(3) Te   m'   ha recomanat   la Mireia
      you.CL me.CL has recommended the Mireia
      'Mireia has recommended me to you/you to me.' [Catalan-Bonet, 2008]

(4) Lui mi   ti   presento
      he me.CL you.CL introduces
      'He introduces me to you/ you to me.' [Some varieties of Italian]

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[1]There is another version of the constraint exhibited in Romanian in which case sequences of a dative clitic and a 1st person accusative are licit while sequences of a dative plus a 2nd person accusative are ungrammatical. Furthermore, no PCC restrictions arise with postverbal singular clitics but do however arise with postverbal plural clitics (Savescu 2007, 2009), Nevins & Savescu, 2008).

(5) *Gli   mi   ha dato
     them.CL-DAT me.CL-ACC has given
     'He/She has given me to them.' [Some varieties of Italian]

In SMG, only the strong version of the constraint is attested and the analogous SMG clitic sequences
are all ungrammatical, with the same facts holding for Grecia Salentina Greek (GSG) and Cypriot Greek
(CG):

(6) *Mu   se   eδose
     me.CL.DAT you.CL.ACC gave
     'S/He/It gave you to me .'[SMG]

(7) *Eδoke mu   se
     gave me.CL.DAT you.CL.ACC
     'S/He/It gave you to me .'[CG]

(8) *Mu   se   edike
     me.CL.DAT you.CL.ACC gave
     'S/He/It gave you to me. '[GSG]

What is common in all versions of the PCC just presented is that the illicit PCC combinations always
involve at least one 1st/2nd clitic. This fact has given rise to feature based accounts where the PCC is
taken to be the result of feature checking failure of a feature that 1st/2nd person accusative clitics have
but 3rd person clitics do not (as in Anagnostopoulou 2003, 2005; Adger & Harbour, 2007 among others).
An intriguing exception not mentioned in the literature comes from PG. In this dialect, clusters of 3rd
person clitics are banned:

(9)   a. *Edek   aton   a
          gave.GAVE him.CL it/these.CL
          'I gave it/these to him' [Chatzikyriakidis, 2010]

(10) a. *Edek   ats   a
          gave.GAVE them.CL it/these.CL
          'I gave it to them' [Chatzikyriakidis, 2010]

(11) a. *Edek(en) a   a
          gave.GAVE it/them.CL it/these.CL
          'I gave them/it to it/them' [Chatzikyriakidis, 2010]

This is puzzling under a feature based account since the illicit combinations are exactly the clusters
that should be allowed under any recent minimalist account of the PCC. If co-occurring clitic forms are

no more than possible morphological listings in the repository of the idiosyncratic, the lexicon, such gaps are wholly puzzling. And though there is systematicity to the restriction, given the cross-language prohibition, a mere typological generalization of the licit combinations would be inappropriate.

Adding to the elusiveness of finding a basis for the distribution of thesee idiosyncratic gaps, there appears to be no principled interface explanation for these gaps (Monachesi, 2005). Semantically, for example, it is well-known that by substituting one of the two clitics of the illicit cluster, grammaticality is restored, a phenomenon noted in the literature as a repair (Bonet, 2007; Rezac, 2008a, among others):

(12)   Me   sistisan   se sena
        me.CL-ACC introduced to you.ACC
        'They introduced you to me.' [Greek]

(13)   Je t'   ai   presenté   à lui
        I   you.CL have introduced to him
        'I introduced you to him.' [French]

For some, the failure to find any such basis from interpretational considerations is taken to confirm the need for an independent component of morphology (Bonet, 1991, 1994; Heap, 2005). Within minimalism, resisting this move, such failure of any straightforward correspondence with some identifiable interpretable feature has been taken as evidence for uninterpretable features, and more. Indeed the Person Case Constraint has been used as data to bolster core minimalist concepts, otherwise argued to be problematic. Amongst these are the concepts of 'Minimal Move' or 'Last Resort', which have been the subject of severe criticism as requiring transderivational considerations in the evaluation of wellformedness whose formal power is notorious (Johnson and Lappin, 1999). Taking up such criticisms, Rezac (2008a) rightly acknowledges the weakening of the explanatory force of the formalism itself which any such mechanism opens up. Nonetheless, Rezac argues, the PCC poses just one restricted case where a subcomponent (that of syntax) has to be seen as intruding into morphophonological mechanisms, and specifically with respect to uninterpretable features. For Rezac indeed, the transderivational concept of repair is directly reflected in the core grammar as the heart of the explanation of PCC constraints and the way a language can sidestep them, a debarred feature-complex having to be repaired by the deletion of the uninterpretable [+person] feature and addition of a case specification, transforming a pronominal clitic into a nonfocussed strong pronoun. Besides these general theoretical questions as regards the need of transderivational repair, all minimalist analyses agree that the PCC is the result of feature checking failure, with various formalizations depending on the analysis (see Anagnostopoulou, 2003, 2005; Bejar & Rezac, 2003; Adger & Harbour, 2007; Nevins, 2007; Michelioudakis, 2009 among many others). However, the crucial distinction between these analyses is the decision as to which clitics have which features. For example, in Anagnostopoulou (2003) it is assumed that 3rd person datives carry a person feature even though specified as minus, [-PERS], whereas such a feature is, supposedly contrarily, not present in 3rd person accusative clitics, an assumption that has been questioned even on minimalist grounds (Bianchi, 2006; Nevins, 2007; Michelioudakis, 2009). However Adger & Harbour's (2007) and Michelioudakis' (2009) assume that all indirect objects carry a participant feature (shown in Chatzikyr-

iakidis, 2009, 2010 not to be more than a preference). Furthermore, analyses like Nevins (2007) over-generate (see Chatzikyriakidis, 2010). No detailed review of these analyses is going to be given here, for, as we shall see, new Pontic Greek (PG) data directly conflict with them all (see Chatzikyriakidis, 2009, 2010 for detailed reviews). In what follows, and contrary to all minimalist accounts, we argue for an alternative feature-free account based on the notions of incrementality and treegrowth. Under such an account the PCC will be taken to be the result of an entrirely general processing constraint, a tree-logic restriction according to which no more than one structure with the same underspecified address is possible in a tree structure. This constraint, the "no more than one unfixed node at a time" constraint will be further backed by the new evidence from PG, which follow from this restriction, confirming, we shall argue, the need of a feature-free account of the phenomenon.

2   Grammars for Free Word Order languages: the case of Latin

The account to be provided is in the Dynamic Syntax (DS) framework, whose novel property is that the concept of structural underspecification and context-dependent growth of interpretation, intrinsic to processing in real time, is taken as the core syntactic notion. The grammar is accordingly defined as a constraint-based system of mechanisms for building up interpretation for a sequence of words in the order in which they appear.These processes of interpretation are defined as driving incremental development of a tree structure corresponding to one interpretation of that string, where the labels on the nodes of the tree reflect sub-parts of that emergent interpretation. In the simple case, demonstrated by (14), the starting point of the process is a tree with just a rootnode and a requirement to construct some propositional formula; the endpoint is a fully decorated binary branching tree structure encoding functor-argument structure, whose rootnode is the propositional formula established and whose daughter nodes are decorated by its sub-formulae:[2]
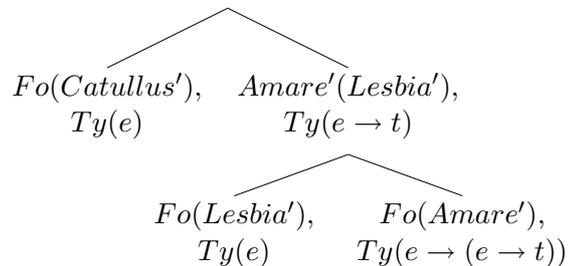
(14)   Parsing *Catullus Lesbia Amavit* 'Catullus loved Lesbia'

Initial Step   Final Output

$?Ty(t), \diamond \qquad \leadsto \qquad Ty(t), (Fo(Amare'(Lesbia')(Catullus')), \diamond$

$Fo(Catullus'), \qquad Amare'(Lesbia'),$
$Ty(e) \qquad\qquad Ty(e \rightarrow t)$

$Fo(Lesbia'), \qquad Fo(Amare'),$
$Ty(e) \qquad\quad Ty(e \rightarrow (e \rightarrow t))$

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[2]We illustrate with Latin as this is the source from which the Romance clitics emerged, whose patterns have formed the core of the PCC debate. Fo is a predicate that takes a logical formula as value, Ty a predicate that takes logical types as values, Tn a predicate that takes tree-node addresses as values, e.g. $Tn(0)$ being the rootnode. The $\diamond$ is a pointer, indicating the node currently under development. In this paper, we ignore tense. See Cann, forthcoming; Chatzikyriadis forthcoming.

The mechanisms reflect growth of information against an arbitrary structural context, itself defined in terms of partial trees: starting- and end- points of any interpretation process can be a partial tree. The sequence of transitions to yield such predicate-argument displaying trees is the sole basis of syntactic explanation: well-formedness holds just in case there is at least one possible route through that process strictly following the order of words that leads to a complete propositional tree, each string in principle allowing more than one such string-interpretation pairing.[3]

The formulation of this process involves an evolving context that incrementally grows along with progressive development of the representation of content. General so-called *computational actions* and *lexical actions* are both expressed in terms of growth along any of the dimensions associated with decorations on the trees defined by the system. The only essential difference between them is that computational actions are optional and not triggered by particular phonological (or orthographic) input. *Lexical actions*, like their general counterpart, constitute macros of actions, relative to a triggering condition, induce actions such as making tree relations, going to the node introduced, decorating it with type and formula decorations as appropriate, etc. There is no one-to-one correspondence between word and node in the tree. Verbs, for example, project a macro of structure-inducing actions, applying to a proposition-requiring node as the input condition, so that the result of parsing the verb is the projection of a full, albeit skeletal, template of predicate-argument structure, with, in Latin, license to identify all such nodes either from context or from the construction process. *Computational actions*, on the other hand, are generally available strategies for inducing and developing partial structures relative to context. There are four principal types. At the core is a procedure for building weak structural relations, the underspecified nature of the information made available being the hallmark of early stages of a parse process: such underspecified structures are subject to subsequent enrichment. This construction of relatively weak structural relations allows for local and nonlocal variations. There are also rules of substitution which assign some pronoun-induced metavariable with a value from some antecedent. There are rules inducing the pairing of trees, in which one partial tree is taken as context relative to which subsequent update can take place in a distinct so-called *LINKed* tree. The pairing is induced by the transition imposing a requirement of the sharing of a term in both the tree newly to be constructed and its just constructed context tree. Finally, there are rules which determine the bottom-up compilation of content on these constructed trees (by labelled type-deduction) to yield a complete tree from the decorations provided to its parts. As in other frameworks, variation across languages resides largely in the lexicon, with languages varying as to how tree-growth is distributed across lexical and computational actions. For example Latin verbs project the construction of a subject node licensing substitution from context for that argument, whereas English verbs do not. English therefore requires a computational action to introduce this node, to be decorated by independent lexical input. [4]

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[3]Quantification is expressed in terms of variable-binding term operators, will all DPs being of type e. The underlying logic is the epsilon calculus, in which term-expressions contain an epsilon binder, ϵ, a variable, and a restrictor: e.g. $\epsilon, x, Man'(x)$. Since in Latin, nouns project full specification of terms, the structure defined to be projected by *servum* would be a subtree of which the quantifying term is the topnode, dominating a subtree decorated with binder, variable, and restrictor specification. We leave all details aside.

[4]Generation is defined in exactly the same terms of growing representations of content, using identical mechanisms. The informal intuition is that the rules of constructing representations of content apply in production as in parsing, the only difference being that whereas the parser may not know in advance the interpretation to be constructed, the producer in contrast must do so (Purver et al., 2006).

Given that DS is a constraint-based system underpinning decisions made dynamically in language processing, there are multiple sequences of transitions for all string-interpretation pairings. The upshot is a family of structural strategies reflecting the core dynamics of a system of language processing.

Central to the modelling of the growth process is the logic of finite trees (LOFT: Blackburn and Meyer-Viol, 1994) with two basic modalities, $\langle\downarrow\rangle - \langle\downarrow\rangle\alpha$ holds at a node if α holds at its daughter – and its inverse, $\langle\uparrow\rangle$ (more specifically, $\langle\downarrow_0\rangle$ for argument daughters, $\langle\downarrow_1\rangle$ for functor daughters, with inverses $\langle\uparrow_0\rangle, \langle\uparrow_1\rangle$). An additional LINK modality captures trees to be paired. Domination relations are definable, as is standard, through Kleene star operators, e.g. $\langle\uparrow_*\rangle Tn(a)$ for some node identified as dominated by treenode $Tn(a)$. Domination relations are definable over other operators ($\langle\uparrow_1^*\rangle Tn(a)$ picking out a functor spine); and compound concepts such as $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle\langle\downarrow_0\rangle Tn(a)$ are defined to pick out a set of arguments for a given predicate (those between which the defined locality relation holds). Corresponding tree-growth strategies can then be defined in terms making reference to these. For example, structural underspecification involves licensing the construction from some node $Tn(a)$ of an "unfixed" node $\langle\uparrow_*\rangle Tn(a)$. "Locally unfixed" nodes are similarly constructable as displaying $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a)$, constrained by this characterisation to be within a single predicate-argument domain. Analogous underspecification can be defined for tree-node decorations, for example with metavariables $\mathbf{U}, \mathbf{V}$... ranging over possible formula values for context-dependent expressions (pronouns, ellipsis sites etc).
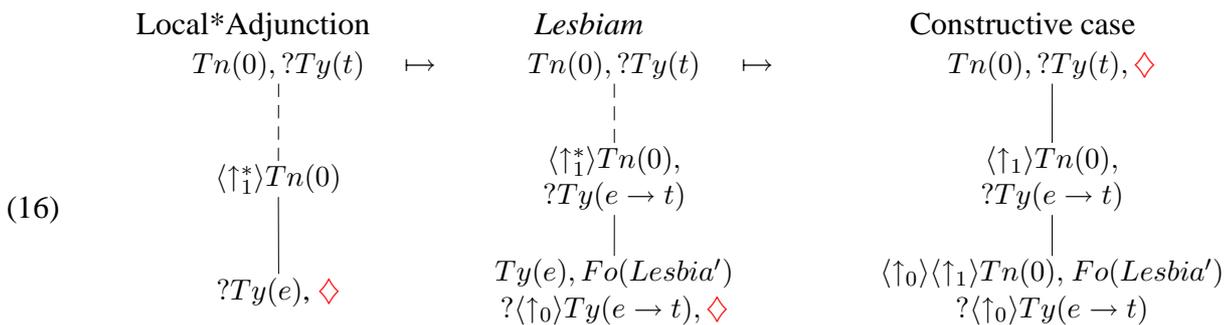
To achieve the requisite growth, for any decoration X, a corresponding requirement $?X$ is defined, with all requirements having to be satisfied for any successful output. All aspects of tree development that impose partial specifications are associated with a requirement for update: constructed domination relations with $\langle\uparrow_*\rangle Tn(a)$ holding at a node are associated with a requirement for a fixed value at that node $?\exists x Tn(x)$; analogously for formula values, $?\exists x Fo(x)$ is the requirement imposed on a node decorated with some metavariable $Fo(\mathbf{V})$. Requirements may be modal, hence realizable at some later point in the derivation: in particular case specifications. An accusatively marked expression projects onto the immediate argument-daughter node of some emergent predicate-requiring node the output filter that its mother node be of predicate type, $?\langle\uparrow_0\rangle Ty(e \rightarrow t)$, a constraint which may be imposed at some early point (eg. processing a left-placed accusative-marked noun phrase), but nevertheless matched by the requisite type-decoration at that mother node relatively late in the derivation. Hence, within a system of modally projected labeled binary branching trees representing content, structural, lexical and morphological constraints are all expressed in terms of possible forms of tree growth. In consequence, what are taken to be discretely defined morphological or syntactic properties are here expressed simply as requirements on growth of semantic representation. There is a constraint of monotonicity of tree growth; accordingly, internal consistency for any set of decorations on individual nodes is required. Further, nodes are uniquely defined by their relative position to all other nodes in a tree, a property definitional in any tree logic. From this wholly uncontentious assumption, an important consequence emerges when partial trees are defined, in particular for trees in which there may be nodes related solely by a dominate relation. For any partial tree, there can, by definition, only be one structurally underspecified relation of a type at a time, for any attempt to construct additional such nodes will not be distinguishable: such reiteration can only yield back the very same tree node. This is a wholly general property of tree development, not particular at all to different types of terms that might decorate nodes in a tree: it is, as we shall see, the heart of the PCC.

2.1 Latin Scrambling

Before turning to the PCC, we need a grounding in how general strategies for tree-growth determine string-interpretation pairings. For example, the defined strategies for tree-growth update can be implemented to license free ordering of major constituents in a clause without any rules of re-ordering or null strings, with nodes for an emergent structure being able to be constructed in a range of linear orders, subject to constraints imposed by such tree-growth limits.The apparent storing up of argument nodes without a fixed hierarchical position within the emergent tree until the skeletal template projected from the verb becomes available (as in verb-final languages) might seem to be incompatible with any tree-growth restriction imposing unique identifiability of nodes. However, this is made possible by presuming on a constructive use of case whereby an output filter is taken to trigger a process of structural enrichment so that a fixed relation is induced between the argument node in question and its dominating node. For example, a locally unfixed node can be introduced and decorated with some formula value together with an output filter requirement that its immediately dominating node be of predicate type (the characterization of accusative case); and, because this filter can be satisfied at any subsequent point in the growth process, this tree-relation can be fixed immediately. This move of enrichment then allows the construction of a second case-distinguished node by the same means without risk of collapsing two instances of the underspecified tree-relation, again replacing the introduced underspecified relation (with output filter as a constraint) with its fixed counterpart (meeting that constraint). Such a sequence of steps is indeed essential if a sequence of case-marked DPs is to be processed. So in processing (15) an opening sequence of steps might be as in (16):

(15)   [Latin]

Lesbiam   Catullus   amabat
Lesbiam.ACC Catullus.NOM loved
Catullus loved Lesbia

(16)

Local*Adjunction	*Lesbiam*	Constructive case
$Tn(0), ?Ty(t) \quad \mapsto$	$Tn(0), ?Ty(t) \quad \mapsto$	$Tn(0), ?Ty(t), \diamond$
$\langle\uparrow_1^*\rangle Tn(0)$	$\langle\uparrow_1^*\rangle Tn(0),$ $?Ty(e \to t)$	$\langle\uparrow_1\rangle Tn(0),$ $?Ty(e \to t)$
$?Ty(e), \diamond$	$Ty(e), Fo(Lesbia'),$ $?\langle\uparrow_0\rangle Ty(e \to t), \diamond$	$\langle\uparrow_0\rangle\langle\uparrow_1\rangle Tn(0), Fo(Lesbia')$ $?\langle\uparrow_0\rangle Ty(e \to t)$

With this object-argument relation having become fixed as in (16) , a second step of constructing a locally unfixed node can now take place, commensurate with only one structurally underspecified relation being constructed at any one time, and the parsing of *Catullus* is, likewise, taken to fix the value of the

underspecified tree relation of the node introduced to host the subject term, but this time as $\langle\uparrow_0\rangle Tn(0)$, satisfying the nominative-induced requirement $?\langle\uparrow_0\rangle Ty(t)$:

(17)

$$
\begin{array}{ccc}
Tn(0), ?Ty(t) & \mapsto & Tn(0), ?Ty(t), \Diamond
\end{array}
$$
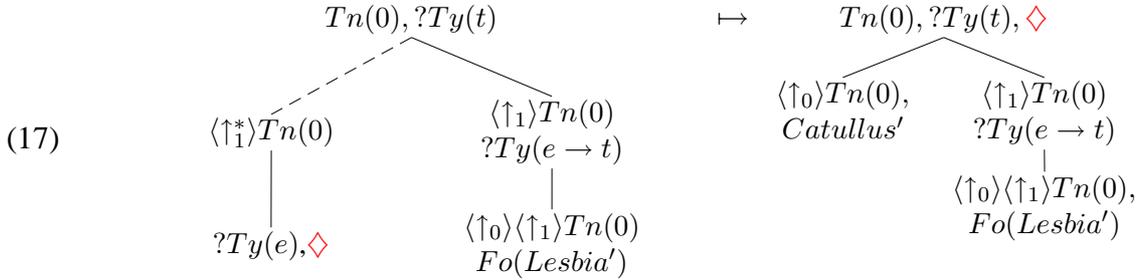
Quite generally, parsing a sequence of DPs prior to a verb may involve an arbitrary sequence of macros each inducing the construction of a locally unfixed node and its immediate structural enrichment , yielding an interim partial tree in which there is a set of argument nodes, but no provided predicate. The actions of the verb then serve to fill out the remainder of the propositional structure to yield the appropriate output tree, with the restriction of only one unfixed node at a time remaining satisfied.Hence, derivations yielding an interpretation of (15) can be built up incrementally.

This is, recall, by no means the only type of tree-growth sequence available for parsing initial NPs in a string, for the essence of a constraint-based grammar underpinning the dynamics of real-time processing is its licensing of more than one possible sequence of transitions. The first expression *Lesbiam* might alternatively be taken to decorate an unfixed node that is not constrained to be updated within a local domain (it is characterized by the $\langle\uparrow_*\rangle$ modality), the outcome remaining entirely unspecified apart from the fact that it is within a given tree (and not across trees). In this case, by assumption, the case specification serves merely as a filter on update that is not immediately enriched to a fixed position, and in consequence no other unfixed node can be introduced by this step. As a discrete operation, the building of a locally unfixed node nevertheless remains available for the processing of some matrix subject DP that might follow (*Catullus* in (15)), this being constructed using the distinct modality $\langle\uparrow_1^*\rangle$.

Such a derivation, involving the construction of an unfixed node without locality constraint, is needed essentially for dependencies that are not local, and is the basis within DS for modelling long-distance dependency:

(18)   Stercilinum   magnum stude   ut   habeas
        dunghill.ACC big.ACC ensure.IMP.SG that have.2.PS.SING
        'See that you have a large dung hill'. [Latin]

There is one further general tree-construction strategy – the mechanisms for the building of paired LINKed structures, where structures may be twinned through the enforced anaphoric sharing of some term via an attendant requirement that the newly introduced proposition-requiring tree have somewhere within it a copy of that term (specified as $?\langle\downarrow_*\rangle Fo(\alpha)$). This process is defined in DS for construal of relative clauses, clausal adverbials, and also external topic constructions Cann et al. (2005).

(19)   Building Link transitions for relative-clause and left-dislocation construal

$$\langle L \rangle Tn(0), Fo(\alpha), Ty(e) \qquad Tn(0), ?Ty(t), ?\langle \downarrow_* \rangle Fo(\alpha)$$
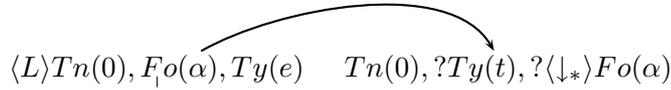
The significance of this process for present purposes is that it provides a basis for modelling datives functioning as adjuncts including ethical datives:

(20)   quid mihi Celsus agit?
         what me.DAT Celsus.NOM.SG do.3.SG.PRES
         'How, pray, is Celsus?' (Lit. 'What to me Celsus does?') [Latin]

In (20) for example, parsing the interrogative *quid* may proceed via the construction of an unfixed node, and the dative pronoun take up the option to license a node LINKed to the main propositional node.[5] Once this *linked* structure is duly decorated, the pointer will return to the primary structure, and the parse of the main clause can proceed.

The consequence of this flexibility is that a number of moves are available at any stage of a parse sequence. These, we claim, directly underpin clitic patterns of combination, for clitics as a class reflect a diachronic shift from general to lexically triggered tree-growth strategies so that limits on clitic combinations are, by definition, subject to whatever limits apply to these general strategies. For a framework to posit a set of opening strategies, all in advance of any lexical processing, might seem a mere itemization of different construction types, hence a relatively unconstrained grammar, with in consequence no more than a stipulatory characterization of clitic patterns. However to the contrary, it is the general dynamics of local-structure growth relative to context which leads us to expect the types of variation that come over time to be encoded in a lexical item. First there is the building of a locally unfixed node, the core structure-building operation for incremental processing, enabling the construction of an argument term prior to the processing of an expression providing the head predicate item. Syncretic clitics encode this structural operation, their case specification otherwise inducing only an attendant constraint on how their metavariable should be substituted (individual-denoting, i.e. singular, animate, 1st/2nd person etc). Second, there are case specifications associated with the clitic which directly reflect case in the earlier system as an output filter on tree growth with no reflex of the incrementality of the online update process. These, we shall argue, are notably evidenced in Greek where, despite fully distinctive morphosyntactic forms, the clitics behave with respect to the PCC like the partially syncretic Romance systems. Thirdly, there are cases where the clitic reflects the incremental sequence of actions associated with what we have called constructive use of case (following Nordlinger, 1998), so in the synchronic system this projects direct construction of the relation in question, for example the accusative 3rd person pronoun clitic of Romance systems. Fourthly, it comes as no surprise that some clitic sequences reflect the option of building paired terms as an ordered pair, for in the earlier system there were DP pairings

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[5]This mechanism will equally apply in the parsing of subjects allowing two neuter DPs which are syncretic, one as a LINKed decoration .

in which a sequence of constructive-case-determining actions were grouped together. These form the phenomenon called multiple long-distance dependency in Latin where a sequence of DPs can be apparently re-ordered together. This is expected, given DS assumptions, for nothing prevents the building of an unfixed node whose update is not locally restricted from feeding into the building of a locally unfixed node, with this in its turn allowing the construction via constructive use of case of pairs of terms requiring resolution within the same local domain (Kempson & Kiaer 2010). Such an effect might then become part of a clitic system resulting in a single lexical entry, in Spanish even as orthographically a single word with idiosyncratic semantic specification. Finally, a clitic, being an anaphoric element, can be associated with a nonstructural relation to its immediate surrounding environment. Such a clitic would, in the DS terminology be taken to decorate a linked structure, reflecting its nonstructural relation to other expressions with which it occurs. This is arguably displayed by ethical datives, often said to be adjuncts (Michelioudakis, 2007). So, while the sequence of tree-growth actions which individual clitics trigger may be idiosyncratically dissimilar – considered item by item – nonetheless, the set of sequences which they severally reflect is exactly the range of updates which the general concept of tree growth lead us to expect. There is only one further option in the diachronic shift, which is that in the transition, some items might become split into emergent homonymous forms thereby triggering more than one of these strategies; and, as we shall see, this constitutes the further alternative that adds to the potential for individual language/dialect idiosyncrasy.

As so far set out, this is a mere narrative whose plausibility is promoted in virtue of the clitics' behaviour jointly constituting a coherent set. In due course, the PCC effects will provide the strong confirmation which, we shall argue, clinches this account. Meanwhile we need to show, in broad terms, how these five types of strategy could come to be associated with individual clitics and clitic clusters – in the characteristic early positioning when the verb is finite, yet largely immediately post-verbal when the verb is nonfinite.

2.2   The Historical Shift from Free Order Languages to Clitic Clustering systems

It is not the purpose of this paper to argue in detail for the diachronic dynamics of the Romance languages in their emergence from Latin (Bouzouita (2008b) gives a detailed DS account of the transition from Medieval via Renaissance Spanish to Modern Castilian Spanish). However, given the process-directed perspective of the DS formalism, we expect that the stringent pressure imposed by making production decisions in real time would be central to any such account; and it is notable that the positioning of clitics broadly in second position (shifting in most Romance languages from a relatively strict second position to an immediately preverbal position) reflects the very general loosely labelled *given-before-new* tendency widely reported in free positioning subsystems of languages. Cann & Kempson (2008) and Bouzouita (2008a,b) have argued that in Latin this is broadly due to the ever-present need to keep context search for construal of anaphoric expressions as small as possible, minimizing cognitive costs (broadly following Relevance Theory assumptions, Sperber & Wilson, 1986). In the shift from Latin to Spanish, this prevalence of relatively early placement of anaphoric expressions became routinely associated with those environments inducing this positioning, routinization itself being a cognitive economy in replacing item-by-item decision-making by default selection. More specifically, there was routinized dif-

ferentiation of strong, stressed pronouns (preferring initial position within a clausal sequence), and weak, unstressed pronouns tending, as the remainder class, towards second position, which equally reflected a pressure to minimize context-search while unable to occur in the initial position demanding stress. With unstressed pronouns becoming progressively prosodically atrophied, the split between weak and strong pronouns led to lexically discrete clitic pronouns in Medieval Spanish (amongst other Romance languages). The lexical tree-growth actions itemized for these clitics were defined to be triggered only in specific second-position environments (Bouzouita 2008 a,b), and relative to these, the tree-growth updates matched update transitions that were independently available in the language, in particular inducing unfixed nodes to which output-filter case specifications or constructive-case updates were added, or inducing LINKed-structure specifications. In the meantime, with progressive atrophying and subsequent collapse of the case system for all except personal pronouns it is these lexical units, through regularly repeated use, whose morphological presence in a string came to induce not merely suitable decorations for some node independently constructed, but also the tree growth actions necessary to induce the specific structure associated with that particular decoration. Indeed, as Bouzouita argues, the enclitic positioning is also a calcified reflex of the earlier context-driven routinisation whereby, requiring something else to induce a new propositional structure, the clitic occurs immediately thereafter, for nonnegative verbal environments with nothing preceding the verb will yield enclisis. From hereon, we adopt this view as background, and also the assumption that the tree growth update actions induced by any one clitic will, in the regular case, be just one individual sequence of actions amongst the options that had earlier been generally available (i.e. non-ambiguity is the default).

2.3 The Strong PCC version

Our focus now is on the consequence of such an account: with this assumption of an induced diachronic shift, there is an immediate consequence for clitic combinations. Given that each individual clitic is taken to be a frozen reflex of one (or peripherally more than one) strategy for growth of interpretation, whatever is an absolute constraint on tree growth will necessarily be a constraint on possible clitic combinations. In this connection, recall that in virtue of nodes in a tree being uniquely identified by their relation to other nodes in a tree, two putative instances of an underspecified relation are indistinguishable and so collapse into one, with any incompatible set of decorations being debarred as a form of growth. Hence in any well formed sequence of partial trees, no more than one such transition can even be constructed unless the result, yielding the same unfixed node, adds a compatible set of specifications.

From this limitation on tree growth, the PCC follows in total. No clitic pronouns which merely induce the construction of a locally underspecified relation can co-occur. Arguably, expressions encoding a dative specification constitute such a case, for dative construals shift between argumental and adjunct status. Hence any unitary characterization of the dative has to be in terms of an underspecified type specification which will not update to a fixed structural relation if their lexical specification is to directly match the update information they provide. A similar problem confronts syncretic case specifications. First/second person specifications, which in almost all Romance languages fail to provide morphological forms that distinguish accusative and dative, only project some locally underspecified structural relation. The accusative Spanish clitic *lo*, however, like its counterpart in other Romance languages, can be seen

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as reflecting the immediate update of the locally unfixed node to the direct object structural relation. Putting the latter assumptions together we get the strong PCC facts. A first or second person accusative will never co-occur with a dative clitic in a clitic sequence, since together they would project a single node with inconsistent formula specifications:

(21)

Lexical entry for *me/te*

IF	$?Ty(t), Tn(a)$	
THEN	IF	$[\downarrow_1^+]?Ty(x)$
	OR	
	IF	$+NONFIN$
	THEN	$\texttt{make}(\langle\downarrow_1^*\rangle);$
		$\texttt{go}(\langle\downarrow_1^*\rangle);$
		$\texttt{make}(\langle\downarrow_0\rangle);$
		$\texttt{go}(\langle\downarrow_0\rangle)$
		$\texttt{put}(?\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a), Ty(e);$
		$Fo(\mathbf{U}_{Speaker'/Hearer'});$
		$?\exists\mathbf{x}.Fo(\mathbf{x});$
		$?\exists\mathbf{x}.Tn(\mathbf{x}),)$
		$gofirst(?Ty(t))$
	ELSE	abort
ELSE	abort	

Lexical entry for *lo*

IF	$?Ty(t)$	
THEN	IF	$[\downarrow_1^+]?Ty(x)$
	OR	
	IF	$+NONFIN$
	THEN	$\texttt{make}(\langle\downarrow_1\rangle);$
		$\texttt{go}(\langle\downarrow_1\rangle);$
		$\texttt{make}(\langle\downarrow_0\rangle);$
		$\texttt{go}(\langle\downarrow_0\rangle)$
		$\texttt{put}(Ty(e),$
		$Fo(\mathbf{U}_{Male'/Neuter'}),$
		$?\exists\mathbf{x}.Fo(\mathbf{x}));$
		gofirst(?Ty(t))
	ELSE	abort
ELSE	abort	

Notice that in both specifications, two embedded IF restrictions are posited. The first one '$[\downarrow_1^+]?\exists x.Ty(x)$' ensures proclisis. What this statement captures is that the clitic cannot be parsed if case any of the functor nodes bears a type value, a statement true only if a verb has already been parsed.[6] The second trigger +NONFIN (non-finite) encodes the presence of a non-finite feature in the type t requiring node as its trigger. This trigger will effectively capture enclisis with non-finite verbs.[7] If one of these two restrictions are satisfied, then the clitic actions can be induced. In the case of *me/te*, a locally unfixed node is projected and decorated with a type value and a formula metavariable carrying person presuppositions (denoted as subscripts). The third-person dative *le* is defined as inducing the very same actions except that its person specification is male/neuter, so it too induces an underspecified relation. Accusative *lo*, however, projects a fixed structure, building the functor node and the argument relation from that functor node, decorating the resulting argument node with a type value and a formula metavariable.

Now we take the sequence *me-te*, predicted for the strong version to be ungrammatical. After parsing

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[6]The restriction formally reads: All functor nodes below me bear a type requirement. Assuming that when a type value is projected, the equivalent requirement will be eliminated, if one of the functor nodes does not bear a type requirement then this would mean that a verb has been parsed. This will be true even if no nodes exist below the initial node, due to the universal modality denoted as square brackets.

[7]Note that no serious account of imperatives or infinitives and gerunds is offered: the feature +NON-FIN is used here for illustration purposes pending a DS analysis of non-finites.

me we get a structure in which there is an unfixed node decorated with a metavariable required to pick out the speaker. But once *te*, subsequently, is parsed, the supposedly two unfixed nodes collapse into the same node by treenode identity, with incompatible decorations:

(22)

<div align="center">

After parsing *me*   parsing *te* in *me-te*:

$Tn(a), ...?Ty(t), \color{red}{\Diamond}$ $Tn(a), ...?Ty(t), \color{red}{\Diamond}$

$\langle\uparrow_1^*\rangle Tn(a),?\mathbf{Ty(x)}$ $\langle\uparrow_1^*\rangle Tn(a),?\mathbf{Ty(x)}$

$\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a),$ $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a),$

$Ty(e), Fo(\mathbf{U}_{Speaker'})$ $Ty(e), Fo(\mathbf{U}_{Speaker'}), Fo(\mathbf{U}_{Hearer'})$

$?\exists\mathbf{x}.Fo(\mathbf{x}), ?\exists\mathbf{x}.Tn(\mathbf{x}).$ $?\exists\mathbf{x}.Fo(\mathbf{x}), ?\exists\mathbf{x}.Tn(\mathbf{x}).$

</div>
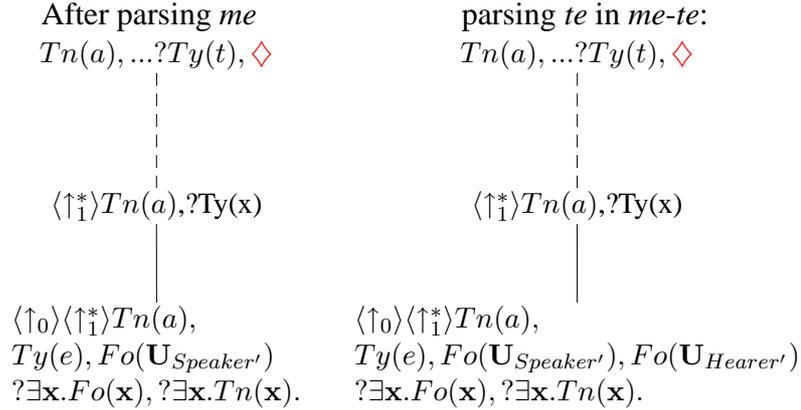
But such a parse will never be successful since that single node will be decorated with metavariables, $\mathbf{U}_{Speaker'}$, $\mathbf{U}_{Hearer'}$, for which no consistent update will be possible. Assuming that the $\mathbf{U}_{Speaker}$ metavariable gets updated by a compatible value standing for the speaker, the $\mathbf{V}_{Hearer}$ metavariable standing for the hearer will not, and vice versa. [8] With that reasoning, Hence sequences like *me/te* will be ungrammatical. The PCC thus arises due to the restriction of the tree logic system that no more than one unfixed node with the same underspecified node identification can be present in any partial tree under development. Notice that repair strategies involving substitution of one of the clitics with a strong pronoun are correctly predicted to be grammatical from our analysis. Standard DS assumptions with respect to strong pronouns (see Kempson et al., 2001; Cann et al., 2005 for English; Chatzikyri-akidis, 2010 for Greek) assume strong pronouns to behave like full DPs,, their triggering being a type e requiring (argument node) node and not the top type-t-requiring node as displayed by clitics. Strong pronouns can thus be parsed as decorating unfixed nodes, which at first sight might seem to that predict strong pronouns should not cooccur with clitics inducing an underspecified tree relation, given the 'no more than one unfixed node' constraint. However, this is not so, since strong pronouns, given their positioning possibilities, namely the fact that they can appear outside their domain of interpretation (left dislocation,CLLD), will be parsed on an unfixed ($\langle\uparrow^*\rangle$) but not a locally unfixed node ($\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$), hence not the tree relation associated with such clitics.[9]

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[8]R. Cann personal communication points out that the possibility of talking to oneself, means that these constraints are not extensionally inconsistent. But, within the system itself, these constraints are taken to be complementary, operating with a goal tree as additional constraint, the other without.

[9]The same reasoning can be used in accounting for weak pronouns such as Italian *loro*, 'them', and their behaviour with respect to the PCC. Italian *loro* will be dealt with in the same way as full DPs, involving a type-e-requiring node trigger. It is thus predicted to be able to be parsed on an unfixed node outside its local domain, hence not giving rise to PCC restrictions.

It might seem nonetheless that this account cannot be adequate, since in SMG case syncretism is not exhibited, at least in singular clitics, nonetheless PCC effects arise (observed by Adger & Harbour, 2007). It turns out however that the case of SMG falls naturally within the set of possibilities one can expect to find within such a system. The general tree-growth system, recall, defines case merely as an output filter; using that specification to induce incremental update to a fixed structural relation was merely a response to the constraint of tree growth itself. So, amongst the structures we expect individual clitics to display, is one in which the clitic encodes the actions associated with that output filter specification, distinguishing this from the constructive case scenario in which any such underspecified tree relation is immediately enriched. Given the overall claim that clitic systems severally display the full set of strategies available in incremental processing of DP sequences, it would be more puzzling if such a possibility did not occur. Thus we assume that, in Modern Greek, just as in languages which exhibit syncretic morphology, both dative (morphologically genitive) and first/second person clitics project unfixed nodes. The crucial difference between the two types of language is that in SMG but not in Spanish, for example, the lexical specification of the clitic includes an additional filter determining which structural relation must be matched in that final output. Hence, the only difference between the Spanish entries (21) and the SMG entries (23)-(24) is the existence of a case filter in (23)-(24):[10]

(23)

SMG genitive clitics (prov.)

IF $?Ty(t)$
THEN   IF $[\downarrow_1^+]?Ty(x)$
         OR
         IF $+NONFINITE$
         THEN $\mathtt{make}(\langle\downarrow_1^*\rangle);$
                $\mathtt{go}(\langle\downarrow_1^*\rangle);$
                $\mathtt{make}(\langle\downarrow_0\rangle);$
                $\mathtt{go}(\langle\downarrow_0\rangle)$
                $\mathtt{put}(?\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a), Ty(e);$
                $Fo(\mathbf{U_x}), ?\exists\mathbf{x}.Fo(\mathbf{x});$
                $?\exists\mathbf{x}.Tn(\mathbf{x});$
                $?\langle\uparrow_0\rangle(Ty(e\to(e\to t))));$
                $gofirst(?Ty(t))$
         ELSE   abort
ELSE abort

Mod Greek 1st/2nd person accusative clitics

IF $?Ty(t)$
THEN   IF $[\downarrow_1^+]?Ty(x)$
         OR
         IF $+NONFINITE$
         THEN $\mathtt{make}(\langle\downarrow_1^*\rangle);$
                $\mathtt{go}(\langle\downarrow_1^*\rangle);$
                $\mathtt{make}(\langle\downarrow_0\rangle);$
                $\mathtt{go}(\langle\downarrow_0\rangle)$
                $\mathtt{put}(?\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a), Ty(e);$
                $Fo(\mathbf{U_{Sp'/Hr'}}), ?\exists\mathbf{x}.Fo(\mathbf{x});$
                $?\exists\mathbf{x}.Tn(\mathbf{x});$
                $?\langle\uparrow_0\rangle(Ty(e\to(e\to t))));$
                $gofirst(?Ty(t))$
ELSE   abort

ELSE abort

(24)   Lexical entry for 3rd person accusative clitics in Modern Greek

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[10]Note that the following entries do not capture word order inside the cluster. A minimal modification in the triggering point of genitive and 1st person clitics will give us dative-accusative ordering in Greek. See Chatzikyriakidis, 2009 for an alternative account of the PCC plus clitic ordering in SMG and GSG.

<pre>
IF $?Ty(t)$
THEN   IF $[\downarrow_1^+]?Ty(x)$
        OR
        IF $+NONFINITE$
        THEN $\mathtt{make}(\langle\downarrow_1\rangle);\mathtt{go}(\langle\downarrow_1\rangle);$
                $\mathtt{make}(\langle\downarrow_0\rangle);\mathtt{go}(\langle\downarrow_0\rangle)$
                $\mathtt{put}(Ty(e),Fo(\mathbf{U}),?\exists\mathbf{x}.Fo(\mathbf{x}),gofirst(?Ty(t)))$
ELSE   Abort
</pre>

Crucial to (23) are the case filters '$?\langle\uparrow_0\rangle(Ty(e\rightarrow(e\rightarrow t)))$' and '$?\langle\uparrow_0\rangle(Ty(e\rightarrow t)$', indicating a two-place and one-place predicate respectively at their mother node on the output tree.[11] In other words the restrictions identify the node as having, in the output, to be the indirect object for genitive clitics and the direct object node for 1st/2nd person accusative clitics, but do not fix this treenode address rightaway. However such an analysis will make the wrong predictions for genitive clitics, since a genitive clitic in Modern Greek can occur with mono-transitive verbs, in which case it is construed as the only internal argument:[12]

(25)   a.   Tu   milo
            him.GEN talk
            'I talk to him.'
       b.   Tu   tilefonisa
            him.GEN telephoned
            'I phoned him.'

In DS terms, constructing a dative clitic as the sole internal argument of a mono-transitive verb would ensure dative clitics can occupy the structural position that in general direct objects occupy. Positing a case filter specifically taken to fix an indirect-object construal will undergenerate, since these cases would be blocked. But even if we do not accept that the structural position of datives in the above examples is the same as direct objects, there are furthermore benefactive/malefactive, possessive interpretations of dative clitics in Greek, and these indeed trigger the PCC, hence acting as optional arguments:

(26)   a.   Mu   to   arostisan to peδi
            me.CL-GEN it.CL-ACC made-sick the child
            'They made the child sick (and this affects me negatively)' or 'They made my child sick.'
       b.   *Mu   se   arostisan (esena)
            me.CL-GEN you.CL-ACC made-sick you

---

[11]The metavariable subscript x found in the entry for genitive and 3rd person accusative clitics is an underspecified value that stands for the potential values these clitics can take. We will not spell out the exact values x can take.

[12]There are a number of double accusative verbs in Modern Greek, suggesting that the case filter analysis for accusatives is on the wrong track. However, as shown in Chatzikyriakidis (2010), accusative clitics are always interpreted as direct objects in double accusative constructions on the assumption that the recipient in these constructions is the direct object and not the theme (Tzartzanos, 1940: 66; Kordoni, 2004).

'They made you sick (and this affects me negatively).'

An analysis of optional arguments in the line of Marten (2002), whereby verbs come as type-underspecified, will also need dative clitics to be locally underspecified with no case filter present. This being so, it seems that there should be no case filter at all defined for dative clitics in Modern Greek since more than one structural position is available for them. In effect, we abandon the tentatively suggested specification in (23), and we return to an analysis of genitive clitics in Modern Greek in essence identical to the one we have given for syncretized clitics in Spanish and Italian i.e. as lacking any fixing of an associated tree relation.

It might be argued that this analysis is overly weak as, though such output-filter case specifications allow for underspecified tree-relations to be constructed, yet possibly collapse and be debarred, it fails to debar their successive enrichment by abduction (as in Latin), predicting wrongly that 1st/2nd person accusative clitics co-occur with genitives in Modern Greek, totally contrary to fact.[13] Countering this argument, notice that this problem does not arise if output filter specifications are the necessary trigger for such enrichment processes. Enrichment processes, quite generally, require a license, such as metavariables with a formula requirement in the case of pronouns and ellipsis sites.[14] In the case of genitive clitics, we finally propose that there is no filter on output as to what the argument relation might be – there is simply lack of any such information, hence no filter specification to trigger the abduction process. But, this being so, given the required genitive-accusative ordering of Modern Greek clitics, once the genitive is parsed, one locally unfixed node will remain when a 1st/2nd person accusative clitic is parsed. Accordingly, the accusative will induce a locally unfixed node and this will inexorably be superimposed on the node initiated by the genitive. The pragmatically driven abduction step might then fix the node as the direct object, in the light of that output filter, but any such parse would abort since this one fixed node will carry the presuppositions for two distinct formula values, these being pronominals and debarring any local co-identification.[15] We thus end up with a fixed node, with conflicting metavariable presuppositions:
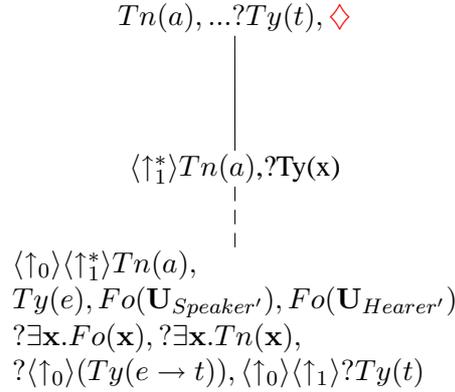
(27)   After parsing *me* in *su-me*:

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[13]This problem was pointed out to us by Ronnie Cann.

[14]Unrestricted license for content or structural enrichment would vastly over-generate, and is not available.

[15]The opposite order in a PCC construction given the case filter analysis for 1st/2nd person accusatives, namely accusative-genitive, will be captured by the same mechanisms that ban the accusative-genitive ordering in non PCC combinations. We have not given an account of ordering in this paper. However, assuming an account in line with Chatzikyriakidis, 2009 where genitive clitics involve a restriction on their entry that aborts in case any fixed node exists will give us the desired results.

$$Tn(a), ...?Ty(t), \textcolor{red}{\diamond}$$

$$\langle\uparrow_1^*\rangle Tn(a), \mathbf{?Ty(x)}$$

$$\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a),$$
$$Ty(e), Fo(\mathbf{U}_{Speaker'}), Fo(\mathbf{U}_{Hearer'})$$
$$?\exists\mathbf{x}.Fo(\mathbf{x}), ?\exists\mathbf{x}.Tn(\mathbf{x}),$$
$$?\langle\uparrow_0\rangle(Ty(e \to t)), \langle\uparrow_0\rangle\langle\uparrow_1\rangle?Ty(t)$$

Hence, we retain the account of the 1st/2nd person accusative clitics of Modern Greek as doing no more than imposing a filter on output determining some case specification with no incremental update. This, though a stipulation, is buttressed by the full paradigm of 1st/2nd person clitics. Though singular 1st/2nd person clitics are non-syncretic, their plural counterparts are syncretized with respect to case (*mas*.1PL, *sas*.2PL), so the nonsyncretism which we have taken to be definitive of an output-filter specification is in contrast to 3rd person clitics that are non-syncretic across the board. If a unitary analysis of first/second person clitics in Greek is to be provided, there are then two choices, either to encode plural clitics as projecting fixed nodes, or to encode singular clitics as projecting unfixed nodes despite their non-syncretic forms. The first option is clearly on the wrong track, since it will predict that plural 1st/2nd person clitics can only be interpreted as either direct or indirect objects but not both. On the other hand, the second option can be naturally encoded given what we have said, assuming that 1st/2nd person accusative clitics, even though unfixed, can be defined as projecting a case-filter on output while nevertheless not incrementally fixing the structural relation.[16]

2.4 The weak version of the PCC

There remains the supposed weak PCC to account for. The account so far can't be right for those languages in which 1st/2nd person clitics can co-occur; and these include some speakers of Spanish (Ormazabal and Romero, 2007), Italian (Bianchi, 2006; Cardinaletti, 2008) and Catalan (Bonet, 2007). According to such speakers, co-occurrence of a 1st/2nd person clitic is allowed. What is still banned is a combination involving a 3rd person dative clitic and a 1st/2nd person accusative. These cases seem to be an apparent counterexample to the analysis we propose, since, by assuming that *me/te* and *mi/ti* project unfixed nodes, we predict wrongly that sentences like (3) and (4) repeated below as (28) and (29) should be ungrammatical:

(28)   Te   m'   ha recomanat   la Mireia
        you.CL me.CL has recommended the Mireia
        'Mireia has recommended me to you/you to me.' [Catalan-Bonet, 2008]

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[16] Adger & Harbour (2007) also explain syncretism in the Greek case by referring to the non-syncretic plural forms, albeit with different argumentation. See Adger & Harbour (2007) for the relevant argumentation.

(29) Lui mi   ti   presento
      he me.CL you.CL introduces
      'He introduces me to you/ you to me.' [Some varieties of Italian]

However there is evidence that the analysis we have posited is on the right track, and the structural constraint assumed just obscured by the existence of polysemy of the dative in some languages. It is well-known that the dative is inherently underspecified as to construal between argument and adjunct forms of construal. There are furthermore, at least in the languages we are examining, the so-called ethical datives, in which the expression that is dative marked is weakly linked to the predicate. Most such cases are associated with first or second pronouns, indicating that the utterance participants are affected in some way by the event denoted by the verb and its arguments ((30) is from Jaeggli 1986):

(30) Juan me   le   arruinó a la vida a esta chica
      Juan me.DAT her.DAT ruined   the life to that girl
      'To my disappointment, Juan ruined that girl's life.'

But why are ethical datives relevant? The first thing one notices when dealing with ethical datives is that they often seem to escape the PCC. In the literature on ethical datives (Rooryck, 1988; Joitteau & Rezac, 2008; Franco & Huidboro, 2008 among others), it is assumed that unlike benefactive/malefactive and possessive datives, ethical datives are non-arguments, co-occurring with argumental datives, which Cuervo (2002) illustrates with the scene-setting declaration of (31) triggering the response (32):[17]

(31) me   le   llevé auto (a Emilio)
      me.REFL him.DAT took the car Emilio.DAT
      'I took the car from him for myself' (I took Emilio's car).

(32) En serio se   te   lo   llevaste?
      really   him.DAT you.REFL it.ACC took
      'Really, you took it from him for yourself?'

In a lexicalist framework, such an assumption would have to be realized by associating the two forms of construal with two distinct lexical specifications. A natural implementation within the DS framework is, accordingly, to construct ethical datives as involving a LINK transition, which will build a type e node standing for the speaker or hearer of the discourse (see Cann et al., 2005 for a characterization of hanging topic left dislocation in these terms). Unlike left dislocated topics though, no requirement for a shared term will be imposed on the tree which the LINK transition initiates. The hypothesis that ethical datives induce a decoration on such constructed LINKed structures provides us with a straightforward explanation of why the PCC does not arise in a PCC context where one of the clitics construed as dative is an ethical dative. Similarly, the entry for 1st/2nd person pronouns will have to have a disjunctive entry

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[17]These data presume on the realization of 3rd person dative in modern Spanish in any clustering with the form of *se*, familiarly called 'spurious *se*' since Perlmutter 1971.

specifying that, on one construal the clitic is specified as argumental but without further itemisation, on another construal that it can be used to induce a LINK transition:

(33)   Lexical entry for datives with a separate trigger for the ethical construal

IF $?Ty(t), Tn(a)$
THEN   IF $[\downarrow_1^+]?\exists x.Tn(x)$
        OR
        IF $Mood(Imp)$
        THEN $\mathtt{make}(\langle\downarrow_1^*\rangle)$;
                $\mathtt{go}(\langle\downarrow_1^*\rangle)$;
                $\mathtt{make}(\langle\downarrow_0\rangle)$;
                $\mathtt{go}(\langle\downarrow_0\rangle)$
                $\mathtt{put}(?\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a), Ty(e)$;
                $Fo(\mathbf{U_x}), ?\exists\mathbf{x}.Fo(\mathbf{x})$;
                $?\exists\mathbf{x}.Tn(\mathbf{x})$;
                $?\langle\uparrow_0\rangle(Ty(e \rightarrow (e \rightarrow t))))$;
        ELSE $\mathtt{make}(\langle L\rangle); \mathtt{go}(\langle L\rangle)$;
                $\mathtt{put}(Ty(e), Fo(\mathbf{U}_{Speaker'/Hearer})), ?\exists x.Fo(x); \mathtt{go}(\langle L^{-1}\rangle)$
ELSE   abort

Assuming a cluster of a 1st person dative clitic along with a 2nd person accusative clitic where the 1st person is interpreted as an ethical dative, the above entry predicts that such a structure should be grammatical since the structural restriction on unfixed nodes does not come into force. The reason is that the ethical dative is construed as decorating a node LINKed to the top node of the primary tree:

(34)   Parsing *me te*
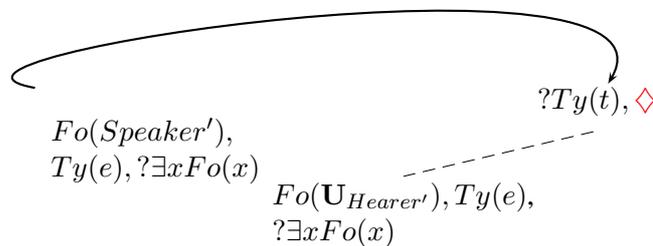
What is still left unaccounted for, however, is an explanation of the weak variant of the PCC, i.e. languages which permit 1st/2nd person clitic combinations that are both construed as arguments of the verb. The first thing we should note is that the weak variant of the PCC has limited generality for the

languages that it is claimed to hold, accepted by only few speakers (Spanish (Cuervo, 2002; Ormazabal and Romero, 2007), Italian (Bianchi, 2006; Cardinaletti, 2008) and Catalan (Bonet, 2007)), a restrictive distribution signally ignored by minimalist analyses. But this being so, the general accounts severally proposed by Anagnostopoulou (2005) for the weak PCC in general or Cardinaletti (2008) for Italian are too strong, as these would predict that speakers accepting a number of 1st/2nd person combinations should generally accept these combinations in all environments. However, as pointed out by Ormazabal and Romero (2007) for Spanish, the grammaticality judgments of such combinations do not only depend on the combinations themselves but on other factors such as the semantics of the verb. The same seems to be true of Italian, as judgements from native Italian speakers we have consulted have given us contradictory judgments with respect to a number of *mi*/*ti* clusters combined with a number of different verbs:[18]

(35) a. Lui mi ti presento (average acceptability judgement: 0)
          he me you presents
          'He presents me to you/ you to me.'
      b. Lui mi ti affido   (average acceptability judgement: 0)
          he me you entrusts
          'He entrusts me to you/you to me.'
      c. Mi ti ha dato (average acceptability judgement: 3)
          me you has given
          'He/She has given me to you/you to me.'
      d. Mi ti presenteranno (average acceptability judgement: 4.5)
          me you will-present
          'They will present me to you/you to me.'

Notice in particular, the marked contrast of judgements of acceptability for *presentare* in the future as compared to the same verb in the past. If the above data are correct, then the constraint is far from clearcut and should not be attributed to a general feature of the grammar.
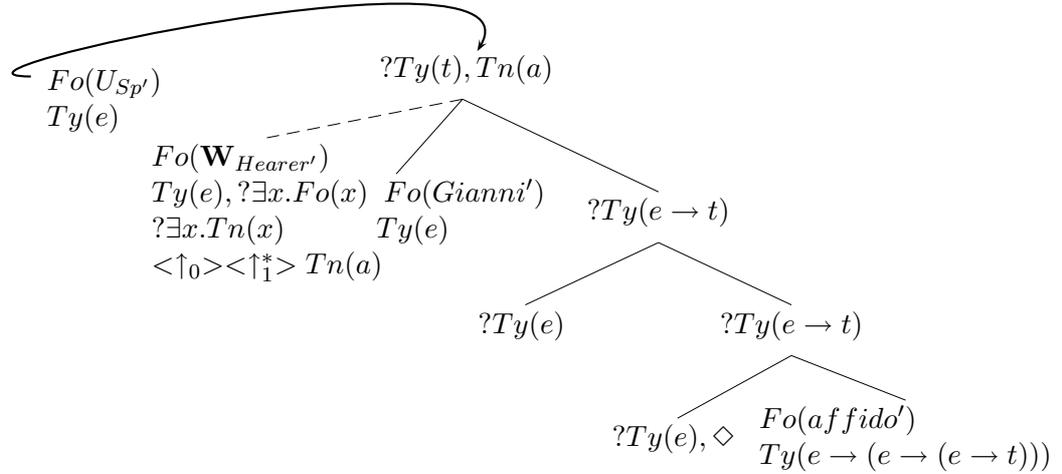
In DS, there is a way to reflect the described situation in a relatively principled way. Having analyzed ethical datives which escape the PC as decorating a node of a LINKed structure, it follows that ethical datives in a cluster would also escape the PCC. Let us then assume that *me-te* combinations are licit just in case one of the two clitics makes use of this alternative. Upon such an analysis, for a verb such as *affido* in (35-d), the parse after the processing of *affido* would yield:[19]

(36)

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[18]The native Italian speakers were asked to judge the grammaticality of a number of sentences within a scale from 0 to 6. The average judgments displayed with each example show the different grammaticality judgments depending on the nature of the verb in each case.

[19]In the following structure a value from context has been provided for the subject pronoun *lui*, namely 'Gianni'.

$$Fo(U_{Sp'})$$
$$Ty(e)$$

$$?Ty(t), Tn(a)$$

$$Fo(\mathbf{W}_{Hearer'})$$
$$Ty(e), ?\exists x.Fo(x)$$
$$?\exists x.Tn(x)$$
$$<\uparrow_0><\uparrow_1^*> Tn(a)$$

$$Fo(Gianni')$$
$$Ty(e)$$

$$?Ty(e \to t)$$

$$?Ty(e)$$

$$?Ty(e \to t)$$

$$?Ty(e), \diamond$$

$$Fo(affido')$$
$$Ty(e \to (e \to (e \to t)))$$

At that point, the unfixed node can unify with either one of the argument nodes. However, an open slot would still remain in one of the argument nodes and the parse would not continue. This might seem to leave the DS account in not much better a situation than its competitors. However, there is a simple and suitably lexical solution, which is that, for the speakers that accept such combinations, the verbs in question license their arguments as having a variant in which the arguments are assigned a context-licensing meta-variable (like the subject argument node which is invariably so decorated). This variant would allow the argument in question to be identified from context, hence from the term decorating the linked structure (indeed given the option taken to use the clitic itself as inducing and decorating a term in a paired linked structure, such an option would be essential to a wellformed outcome). There would thus be an essential pairing between availability of this LINK option for such speakers and appropriate polysemy of the associated verb. For those speakers that, to the contrary, do not accept any of the *mi-ti* clusters, no such variant is available. With this analysis, the variability of 1st/2nd person co-occurrence relative to a general preclusion of such pairs is correctly reduced to a lexical polysemy effect, while retaining the tree-growth restrictions in their general form. In consequence, Italian locative *ci*, unlike first person plural *ci*, as an adjunct will introduce a LINK relation not subject to the one unfixed node at a time constraint. Personal *ci* however is parsed much as *mi/ti,* with PCC effects predicted. The same reasoning applies to partitive clitics, which do not trigger the PCC. These will be embedded inside an argumental type e node, requiring a distinct modality to capture their e-internal configuration. This new modality, even though unfixed, will thus not collapse with the unfixed node projected by *mi,ti*.

One might counter-argue that such an analysis conflicts with the behaviour of ethical datives in Greek, in which the PCC is active with ethical datives as well. Such a fact would suggest that ethical datives in Greek have not developed polysemy and should be captured by the underspecified modality posited for argumental dative clitics in Greek, in effect being parsed as optional arguments in the sense of Marten (2002) (Michelioudakis, 2007; Chatzikyriakidis, 2010).

2.5 The PCC in PG: Evidence for a a feature free account

None of what has been set up so far would seem to address the problems posed by PG clitic distributions. To recapitulate, PG licenses enclitic pronouns only, with a set of constraints unique among the Greek dialects. In particular, PG exhibits a person restriction previously unattested in the PCC literature, since it disallows combinations of two 3rd person clitics while allowing 1st/2nd person clitic combinations:

(37) *Edek   aton   ato/a
       gave.GAVE him.CL it/these.CL
       'I gave it to him' [Chatzikyriakidis, 2010]

(38) *Edek   ats   ato/a
       gave.GAVE them.CL it/these.CL
       'I gave it to them' [Chatzikyriakidis, 2010]

(39) Eδikse/eδeknise m   ese(n)
       showed.3SG   me.CL you.CL
       'S/He/It showed you to me.' [PG]

(40) Eδikse/eδeknise s   eme(n)
       showed.3SG   you.CL me.CL
       'S/He/It showed me to you.' [PG]

Furthermore, clitic clusters of a 1st/2nd dative person plus a 3rd person clitic are licit in PG:

(41) a. Eδek   m   ato/a
           gave.3SG me.CL it.CL
           'S/He/It gave it to me.'
      b. Eδek   s   ato/a
           gave.3SG you.CL it.CL
           'S/He/It gave it you.'

There is more to be said however, since in cluster environments only one out of the four possible forms for 1st/2nd person clitics are possible (forms *m/s*):

(42) Eδeke   m   ato/a
       gave.3SG me.CL it.CL
       'S/He/It gave it to me.'
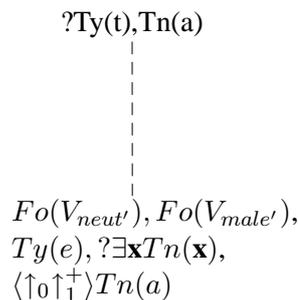
(43) Eδeke   s   ato/a
       gave.3SG you.CL it.CL

'S/He/It gave it you.'

(44) *Eδek(e) *eme(n)/*em/*me(n) ato/a
       gave.3SG me.CL   it.CL
       'S/He/It gave it to me.'

(45) *Eδek(e) ese(n)/es/se(n) ato/a
       gave.3SG you.CL   it.CL
       'S/He/It gave it you.'

It is obvious that such a state of affairs will be problematic under recent minimalist accounts (Anag-nostopoulou, 2003, 2005; Rezac, 2008a; Adger & Harbour, 2007; Nevins, 2007; Michelioudakis, 2009 among others), since clusters of 3rd person clitics are allowed in all these systems. In striking contrast, PG yields strong confirmation for the DS-style of account in which the PCC is grounded in the central treegrowth restriction. PG is syncretic across the board: all clitics, even 3rd person ones, exhibit one morphological form (morphologically marked as accusative) for both the accusative and the dative. Following standard DS assumptions, we would thus anticipate that an account of PG clitics as projecting locally unfixed nodes should yield their preclusion. We will duly encode PG clitics, accordingly, as projecting locally unfixed nodes in the same manner as the encoding of syncretized clitics in Spanish and SMG. But this is all we need in order to predict that clusters of two 3rd person clitics are illicit. Parsing two 3rd person clitics in PG will involve the projection of two supposedly distinct locally unfixed nodes. However, such a thing is not possible given the "one unfixed node at a time restriction": thus the two nodes in question collapse into one via treenode identity. Such a derivation would yield a single node with incompatible metavariable presuppositions, and is debarred:

(46) Parsing *aton ato/a* 'him/it'. The two nodes collapse into one

$$?Ty(t), Tn(a)$$

$$Fo(V_{neut'}), Fo(V_{male'}),$$
$$Ty(e), ?\exists \mathbf{x} Tn(\mathbf{x}),$$
$$\langle \uparrow_0 \uparrow_1^+ \rangle Tn(a)$$

Thus, the system naturally and correctly predicts that clusters of two 3rd person clitics should not be possible in PG. However, such an account will predict clusters not to be possible in general in PG, contrary to fact. As we have already seen, clusters of a 1st/2nd plus a 3rd person clitic are licit in PG, as shown in examples like (42). So, how are the licit clusters going to be allowed given the account proposed? Remember that the only 1st/2nd person forms that can be used in clitic clusters are the forms *m/s*, while the other three possible forms for 1st/2nd clitics are illicit as shown in (43). What is intriguing

is that the forms *m/s* cannot be used in single clitic constructions as witness the examples below:

(47) *Entoke   m
       gave.3SG me.CL
       'S/He/It hit me.'

(48) *Edeke   m   avuto to vivlio
       gave.3SG me.CL this   the book
       'S/He/It gave me this book.'

It might be claimed that the reduced forms *m/s* in cluster constructions like *m ato/s ato* are the result of "ekthlipsis", in which case the final vowel of a word disappears in the presence of the beginning vowel of the next word. In clusters of a 1st/2nd plus a 3rd person clitic, the final vowel of the form *me*, i.e. *e*, disappears in the presence of the beginning vowel *a* of the 3rd person form *ato*, giving rise to the form *m ato*. If "ekthlipsis" was at play here, we would expect the same phenomenon to occur in (48), where the reduced form *m* is followed by a word beginning with the same vowel the form *ato* begins with. Yet (48) is ungrammatical. With the lexical entries for clitics in PG to hand, there is, however, a wholly natural explanation for this phenomenon. As we have already seen, clitics in PG are taken to project locally unfixed nodes. Under this approach no cluster should be possible in PG, since more than one unfixed node with the same underspecified address will be present in that case. This is the crucial point in the account provided. The three forms used in single clitic constructions project locally unfixed nodes and thus cannot combine with any other clitic form. Now, given that *m/s* can appear only in clitic clusters, where they can be only interpreted as indirect objects, it seems natural to pursue an analysis along lines independently argued for the analogous Spanish *selo* (Cann & Kempson 2008): the licit clitic clusters are parsed as one single lexical entry, in which the contribution of the *m/s* forms is to identify themselves with the indirect object node and further project a type value and a formula metavariable in that node.[20] Then, the second clitic in the cluster can actually build a locally unfixed node. The construction becomes totally unproblematic, since it is not subject to the "no more than one unfixed node at a time" constraint. The lexical entry we propose for licit clitic clusters in PG is shown below:

(49) Lexical entry for PG clitic clusters

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[20]Recall that local pairing of DPs is a generally available strategy made extensive use of so-called scrambling languages, and its emergence in clitic systems accordingly not unexpected.

$$\begin{array}{lll}
\text{IF} & ?Ty(t), Tn(a) & \\
\text{THEN} & \text{IF} & \langle\downarrow_1^+\rangle Ty(x) \\
& \text{THEN} & (\texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle);) \\
& & \texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle) \\
& & \texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle); \\
& & \texttt{make}(\langle\downarrow_0\rangle)); \texttt{go}(\langle\downarrow_0\rangle); \\
& & \texttt{put}(Ty(e), Fo(U_{Sp'/Hr'}), ?\exists\mathbf{x}.Fo(\mathbf{x})); gofirst(?Ty(t)); \\
& & (\texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle);) \\
& & \texttt{make}(\langle\downarrow_1^+\rangle)); \texttt{go}(\langle\downarrow_1^+\rangle); \\
& & \texttt{make}(\langle\downarrow_0\rangle)); \texttt{go}(\langle\downarrow_0\rangle); \\
& & \texttt{put}(?\langle\uparrow_0\rangle\langle\uparrow_1^+\rangle Tn(a)); \\
& & \texttt{put}(Ty(e), Fo(V_{x'}), ?\exists\mathbf{x}.Fo(\mathbf{x}), \texttt{go}(\langle\uparrow_0\rangle\langle\uparrow_1\rangle)); \\
& & gofirst(?Ty(t)) \\
& \text{ELSE} & \text{abort} \\
\text{ELSE} & \text{abort} &
\end{array}$$

We can further assume that the second clitic in these clusters also builds fixed structure, since fixing the first clitic in the indirect object node will leave only one possibility of update to the second one. Assuming that the second clitic in the cluster projects fixed structure will give us the same results. Thus, the two entries are pretty much equivalent:

(50)   Alternative entry for PG clitic clusters

$$\begin{array}{lll}
\text{IF} & ?Ty(t) & \\
\text{THEN} & \text{IF} & \langle\downarrow_1^+\rangle Ty(x) \\
& \text{THEN} & (\texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle)); \\
& & \texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle); \\
& & \texttt{make}(\langle\downarrow_1\rangle)); \texttt{go}(\langle\downarrow_1\rangle); \\
& & \texttt{make}(\langle\downarrow_0\rangle)); \texttt{go}(\langle\downarrow_0\rangle); \\
& & \texttt{put}(Ty(e), Fo(U_{Sp'/Hear'}), ?\exists\mathbf{x}.Fo(\mathbf{x}); \\
& & \texttt{go}(\langle\uparrow_0\rangle\langle\uparrow_1\rangle)); \texttt{make}(\langle\downarrow_0\rangle)); \texttt{go}(\langle\downarrow_0\rangle); \\
& & \texttt{put}(Ty(e), Fo(V_x), ?\exists\mathbf{x}.Fo(\mathbf{x})); \\
& & gofirst(?Ty(t)) \\
& \text{ELSE} & \text{abort} \\
\text{ELSE} & \text{abort} &
\end{array}$$

Thus, the account proposed captures in an overall neat and straightforward way the idiosyncratic ban on 3rd person clitic clusters in PG.[21] The last thing we need to account for is combinations of two 1st/2nd person clitics. As already mentioned, PG allows clusters comprised of a 1st plus a 2nd person clitic:

[21]Note that there is an interesting repair for the unavailable PG clusters, involving a 3rd person clitic functioning as a direct object and the element *ki*, the exact nature of which, i.e. whether it is a locative or derived from the deictic pronoun *ekinos/kinos*, 'that one' as suggested to us by Sitaridou (p.c). Such a repair is easily predicted within the system proposed

(51) Eδikse/eδeknise m   ese(n)
     showed.3SG   me.CL you.CL
     'S/He/It showed you to me.' [PG]

(52) Eδikse/eδeknise s   eme(n)
     showed.3SG   you.CL me.CL
     'S/He/It showed me to you.' [PG]

Such a situation is easily explicable following the reasoning already used to explain clusters of a 1st/2nd plus a 3rd person clitic. Notice that in the forms in (51) and (52) the reduced forms *m/s* are used. These are the only forms that can be used in these cases as well. Thus, the licit clusters are not subject to the "one unfixed node at a time constraint", since the forms *m/s* will project fixed structure, and the clusters are predicted.[22] However, the question is why similar clusters did not develop for 3rd person clitic clusters: why are clusters comprised of two 3rd person clitics, with one of the two clitics in a reduced form (say *a* 'it'), not possible? Why is a cluster of the form *aton a* 'him it' not possible? Looking at the distributional properties of the reduced forms of 3rd person clitics, one notices a major difference compared to the reduced 1st/2nd person clitic forms. Unlike the reduced forms *m/s* that cannot appear on their own, i.e. in single clitic constructions, the reduced 3rd person form *a* can appear on its own in single clitic constructions as either a direct or an indirect object:

(53) Ehasen a
     lost3SG it.CL
     'S/He/It lost it.'

(54) Eδeken a   kat
     gave3SG it.CL something
     'S/He/It gave it (e.g. the child) something.'

Given the above facts, these reduced forms have their own lexical entry according to which they project locally unfixed nodes. It is for this reason that a clitic cluster comprised of two 3rd person clitics cannot be formed, even in the case where one of the two clitics exhibits the reduced form *a*.[23]

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in the following way: If *ki* is the same element as the homophonous locative adverb, then a LINK analysis will be put forth, thus the 'one unfixed node at a time constraint' is not operative in this case. In case *ki* derives from the deictic pronoun *ekeinos/kinos* the fact that it can only be interpreted as an indirect object, points towards a fixed node analysis, thus the constraint is again not operative (see Chatzikyriakidis, 2010 for details).

[22]Notice that an account of the weak PCC constructions in PG along the same lines given for the equivalent constructions in languages like Italian given in the previous section cannot be maintained in PG for two independent reasons. Firstly, there are no ethical datives in PG and furthermore, at least for the speakers accepting these constructions, such combinations are licit across the board and not only for a specific number of verbs.

[23]In a similar vein, data from Gascon further vindicate this analysis. Gascon is case syncretic with 3rd person clitics, except that in clitic clusters the clitic standing for the direct object must change to neuter (Nicol, 2005), since two identical clitics are not allowed (as the system proposed would predict). Furthermore, the neuter clitic is marked for accusative and, given the DS perspective, being not syncretic, it would naturally be modellable as inducing the construction of a fixed node.

3 Conclusions

In this analysis as sketched, individual clitics in individual languages reflect one (or more) types of strategy available for inducing tree growth for argument nodes within a local propositional domain. These range over building an unfixed node and fixing it; building an unfixed node and merely decorating it with an output filter; building a LINK transition onto a node to be decorated by a term; building a cluster of argument nodes. This style of analysis applies across both the Romance and Greek cases, the idiosyncracy of Pontic Greek in particular proving to be wholly unproblematic given the mechanisms of tree-growth posited. An unmissable property of this list of structural environments licensed for association with the clitics is that the basis of explanation is ineliminably in terms of progressive tree growth reflecting online processing dynamics. While the details have to be specified item by item, with some, notably the dative, involving polysemy, the underlying generalization is not only in terms of incremental interpretation growth, but it is expressible only at the level of some total set of strategies for processing argument expressions with relatively free word order, as it is only at this level that the claimed correspondence between these effects and properties of clitics can be established. Furthermore, moving to such a level only makes sense if the explanation is made within a diachronic perspective, as it is only within a diachronic perspective that any explanation is available for why the range covered by mechanisms for construal of locally free argument-order in one language might correspond to the range of effects that a set of clitics can display in another, in particular the fact that such a range of actions should shift to becoming available only to a restricted set of forms severally distributed across that set. Hence, indeed, the shift from a very free set of choices available in an earlier language to a highly restricted lexical set in some later diachronically related language. We have explicitly argued for this diachronic perspective with respect to the Romance case (following Bouzouita 2008a), since this is a very well-known case in which the source language lacks the very clitics which emerge in the subsequent Romance systems, and, on this basis, we have simply assumed that the same style of explanation should be extended to a synchronic account of Greek dialect variation, even though, with classical Greek already displaying a clitic system (see Taylor, 2002 for Classical Greek, Pappas, 2006 and Chatzikyriakidis, 2010 for Koiné Greek), there is much more to be said about the source from which the subsequent clitic-displaying systems emerged.[24] Confirmation of such methodology is the way in which the otherwise puzzling PG display of the PCC constraint can be seen as just one of the possible systems one might expect, an outcome strikingly not shared by minimalist accounts of the PCC.

It might be argued that this style of explanation cannot in principle be a basis for a synchronic account of pronominal clitic distributions in a language, since no child acquiring that system has such a perspective. That this is so is of course true. Nonetheless, the PCC is a constraint on POSSIBLE clitic combinations; and, according to the analysis proposed, the constraint is a consequence of structural properties underpinning all tree growth, hence in any system, and this IS displayed in a system that each child acquires. It is indeed the generality concept of tree growth reflecting the parsing process which has opened up such

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[24]For a preliminary sketch of the positioning system of Koine Greek and the transition to the medieval dialects, see Chatzikyriakidis, 2010. However, an analogue to the account just sketched for the Latin scrambling system has not been given yet. The account presented relies on the assumption that Ancient Greek scrambling uses the same strategies used in Latin scrambling, namely the 3 different uses of case (unfixed case,constructive case and case as a filter on output) and the LINK strategy. Until such research is done, this account cannot be fully complete.

new possible avenues of explanation for clitic phenomena.

In closing, we suggest that such a basis for explanation is of yet more general structural significance. With such explanations to hand, the need to advocate an independent morphology component (or even sub-component) within which supposed clitic templates or feature-specific sub-vocabularies are posited to express the requisite generalizations is seriously undermined. ALL explanations putatively requiring morphology-internal template/feature specifications promise to be replaceable by an explanation solely in terms of growth of representations of content. The over-arching system within which this PCC account is proposed is thus optimal in minimizing the number of discrete levels of representation or type of vocabulary that have to be independently defined in the grammar. In some real sense, we suggest, the account proposed conforms to the spirit of the general minimalist methodology.

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