A Proof-theoretic Approach to French Pronominal Clitics

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Clitics in French
A definition

French Pronominal Clitics

A set of phenomena in which pronominal complements to a verbal host are systematically realized as affixes.

This talk focuses on:

- clitics that are pronouns (not the negation particle *ne*)
- specifically, those that occur as non-subject verbal complements

Partly following Bonami and Boyé (2005), I refer to these (without theoretical bias) as complement FPCs.

Clitics in French

Some Example Data

Clitics occur in complementary distribution with their non-pronominal or non-cliticized counterparts:

(1) a. i. *Marie Jean voit.
'Marie sees Jean.'

b. Marie voit **lui**. 'Marie sees him.'

c. i. Marie le voit.
Marie ACC.3S sees

ii. *Marie voit le.
Marie sees ACC.3S
'Marie sees him.'

(Partly from Sag and Miller (1997) ex. (1).)

Clitics in French
Some Example Data

Clitics "climb" onto tense auxiliaries, and are never realized on past participials they complement:

(2) a. Marie l'a vu.
Marie ACC.3S has seen
'Marie saw him.'

b. *Marie a le vu.
Marie has ACC.3S seen
'Marie saw him.'

Clitics in French
Some Example Data

Clitics do not climb onto verbs that take infinitival complements, but are instead realized on the infinitival itself:

(3) a. Marie veut le voir.
Marie wants ACC.3S to see
'Marie wants to see him.'

b. *Marie le veut voir.
Marie ACC.3S wants to see
'Marie wants to see him.'

Clitics in French

Some Example Data

Clitics also climb onto verbs that take predicative complements, and appear to be involved in certain extraction contexts:

(4) a. i. Pierre reste fidèle à Jean.
'Pierre remains faithful to Jean.'

ii. Pierre lui reste fidèle.
Pierre DAT.3S remains faithful
'Pierre remains faithful to him.'

b. i. Marie connaît la fin de l'histoire.
'Marie knows the end of the story.'

ii. Marie en connaît la fin.
Marie GEN.3S knows the end
'Marie knows the end of it.'

(Both from Sag and Miller (1997) ex. 3.)

Clitics in French

Some Example Data

No syntactic material (except another clitic) can intervene between an FPC and its host verb, a fact which distinguishes a clitic from its canonical counterpart):

(5) a. Marie l'a souvent dit à lui.
Marie ACC.3S has often said to him
'Marie has often said it to him.'

b. Marie l'a dit souvent à lui.

c. Marie le lui a souvent dit.

d. *Marie le lui souvent a dit.

e. *Marie le souvent lui a dit.

Explaining FPCs
Previous approaches

Clitics have been treated in:

- various forms of Transformational Grammar, most recently by Stabler (2001) and Amblard (2006) using Minimalist Grammars
- HPSG, with the works of Abeillé, Godard, Miller, and Sag
- Categorial Grammar by Morrill and Gavarro (1992) for Catalan and by Kraak (1998) for French

Explaining FPCs
A proof-theoretic approach

This approach uses Convergent Grammar (CVG): a proof-theoretic framework similar to Categorial Grammar based on natural deduction

- In CVG, syntax is represented as function/argument dependencies (not necessarily reflective of word order or prosodic form)
- Clitics-as-morphology versus clitics-as-syntax question, central to Sag and Miller's (1997) HPSG account, is less relevant

Explaining FPCs
Similarities

This approach borrows:

- the idea of FPCs as syntactic elements from Amblard and Stabler
- the argument composition approach for certain climbing phenomena from Abeillé, Godard, Miller, and Sag
- the idea of a "stronger" mode of combination for FPC/host attachment from Kraak

Explaining FPCs
Differences

But doesn't borrow everything:

Categorial Grammar

FPCs normally functors over under-saturated verb phrases.

- Causes problems for adverbial placement: here, FPCs are tecto-terms with agreement features and semantic content like ordinary NPs

HPSG (especially Sag and Miller)

FPCs in certain constructions analyzed as extractions

- Adds the need to constrain many situations: here, these constructions also treated as argument composition

Explaining FPCs

CVG introduction: signs and types

Signs are triples of prosodic form (omitted here), syntactic term, and semantic content:

(6) $\vdash \mathsf{saw}, \lambda_y \lambda_x \mathsf{see}'(x, y) : \mathrm{Acc} \multimap_{\mathrm{C}} (\mathrm{Nom} \multimap_{\mathrm{S}} \mathrm{Fin}), \mathrm{Ind} \supset (\mathrm{Ind} \supset \mathrm{Prop}) \dashv$

- Tectogrammatical types Acc, Nom, Fin are accusatives, nominatives, and finite sentences
- Hyperintensional types Ind and Prop are analogs of Montague's e and t
- Implication modes are $\multimap_{\mathrm{C}}$ for complements and $\multimap_{\mathrm{S}}$ for subjects
- Truth-conditional semantics using implicative TLC: $\mathrm{Ind} \supset \mathrm{Prop}$ is analogous to $\langle e, t \rangle$ in Montague semantics

Explaining FPCs

CVG introduction: modus ponens rules

Merge rules recursively create larger terms:

Complement Modus Ponens

If $\Gamma \vdash f,v : A \multimap_{\mathrm{C}} C,B \supset D \dashv \Delta$
and $\Gamma' \vdash a,x : A,B \dashv \Delta'$
then $\Gamma,\Gamma' \vdash (f\ a\ ^{\mathrm{C}}),v(x) : C,D \dashv \Delta,\Delta'$

Subject Modus Ponens

If $\Gamma \vdash a,x : A,B \dashv \Delta$
and $\Gamma' \vdash f,v : A \multimap_{\mathrm{S}} C,B \supset D \dashv \Delta'$
then $\Gamma,\Gamma' \vdash (^{\mathrm{S}}\ a\ f),v(x) : C,D \dashv \Delta,\Delta'$

Explaining FPCs

CVG introduction: example derivation

The following are lexical axioms (*saw* in (6) is repeated here):

$\vdash$ saw,$\lambda_y \lambda_x$see$'(x,y)$: Acc $\multimap_{\mathrm{C}}$ (Nom $\multimap_{\mathrm{S}}$ Fin),Ind $\supset$ (Ind $\supset$ Prop) $\dashv$

$\vdash$ John,john$'$: Acc,Ind $\dashv$

$\vdash$ Mary,mary$'$: Nom,Ind $\dashv$

When combined using the merge rules, they derive:

(7) $\vdash$ ($^{\mathrm{S}}$ Mary (saw John $^{\mathrm{C}}$)),see$'$(mary$'$, john$'$) : Fin,Prop $\dashv$

Explaining FPCs

A CVG account: proclitic merge rule

A new rule for FPCs as a local dependency:

Proclitic Merge

If $\Gamma \vdash a,x : A,B \dashv \Delta$

and $\Gamma' \vdash f,v : A \multimap_{\mathrm{PC}} C,B \supset D \dashv \Delta'$

then $\Gamma,\Gamma' \vdash (\ ^{\mathrm{PC}}\ a\ f),v(x) : C,D \dashv \Delta,\Delta'$

- New proclitic implication mode ($\multimap_{\mathrm{PC}}$) used only for complement FPCs.
- New syntactic type for proclitics: Pcl

Explaining FPCs

A CVG account: simple FPC constructions

Simple cliticization (repeated from (1c-i)):

(1c-i) Marie le voit.
Marie ACC.3S sees

Axioms for canonical and FPC counterparts (semantic types omitted):

$\vdash$ le,b : $\mathrm{Acc} \cap \mathrm{3Sg} \cap \mathrm{Pcl}$,Ind

$\vdash$ voit$_1$,$\lambda_y \lambda_x$see$'(x,y)$:$(\mathrm{Acc} \setminus \mathrm{Pcl}) \multimap_{\mathrm{C}} (\mathrm{Nom} \multimap_{\mathrm{S}} \mathrm{Fin}) \dashv$

$\vdash$ voit$_2$,$\lambda_y \lambda_x$see$'(x,y)$:$(\mathrm{Acc} \cap \mathrm{Pcl}) \multimap_{\mathrm{PC}} (\mathrm{Nom} \multimap_{\mathrm{S}} \mathrm{Fin}) \dashv$

Proofs:

(8) a. $\vdash ({}^{\mathrm{S}}$ Marie (voit$_1$ Jean $^{\mathrm{C}}$)),see$'$(marie$'$, jean$'$) : Fin,Prop $\dashv$

b. $\vdash ({}^{\mathrm{S}}$ Marie ($^{\mathrm{PC}}$ le voit$_2$)),see$'$(marie$'$, b) : Fin,Prop $\dashv$

Explaining FPCs

A CVG account: auxiliary composition

FPC climbing onto tense auxiliaries (repeated from (2a)):

(2a) Marie l'a vu.
Marie ACC.3S has seen

Axioms for composition:

$\vdash \mathsf{a}_A, \lambda_f \lambda_x f(x)$
$:((A \setminus \mathrm{Pcl}) \multimap_{\mathrm{C}} (\mathrm{Nom} \multimap_{\mathrm{S}} \mathrm{Psp})) \multimap_{\mathrm{C}} ((A \cap \mathrm{Pcl}) \multimap_{\mathrm{PC}} (\mathrm{Nom} \multimap_{\mathrm{S}} \mathrm{Fin})),$
$(\mathrm{Ind} \supset (\mathrm{Ind} \supset \mathrm{Prop})) \supset (\mathrm{Ind} \supset (\mathrm{Ind} \supset \mathrm{Prop})) \dashv$

$\vdash \mathsf{vu}, \lambda_y \lambda_x \mathsf{see}'(x,y) : (\mathrm{Acc} \setminus \mathrm{Pcl}) \multimap_{\mathrm{C}} (\mathrm{Nom} \multimap_{\mathrm{S}} \mathrm{Psp}), \mathrm{Ind} \supset (\mathrm{Ind} \supset \mathrm{Prop}) \dashv$

Proof:

(9) $\vdash ({}^{\mathrm{S}}\ \mathsf{Marie}\ (\ {}^{\mathrm{PC}}\ \mathsf{le}\ (\mathsf{a}_{\mathrm{Acc}}\ \mathsf{vu}\ {}^{\mathrm{C}}))), \mathsf{see}'(\mathsf{marie}', b) : \mathrm{Fin}, \mathrm{Prop} \dashv$

Explaining FPCs
A CVG account: infinitivals

FPCs with infinitives (repeated from (3a)):

(3a) Marie veut le voir.
Marie wants ACC.3S to see

Axioms:

$\vdash$ veut,$\lambda_P \lambda_x$want$'(x, P(x))$

: $(\text{Nom} \multimap_{\text{S}} \text{Inf}) \multimap_{\text{C}} (\text{Nom} \multimap_{\text{S}} \text{Fin})$,$(\text{Ind} \supset \text{Prop}) \supset (\text{Ind} \supset \text{Prop}) \dashv$

$\vdash$ voir,$\lambda_y \lambda_x$see$'(x, y)$

: $(\text{Acc} \cap \text{Pcl}) \multimap_{\text{PC}} (\text{Nom} \multimap_{\text{S}} \text{Inf})$,$\text{Ind} \supset (\text{Ind} \supset \text{Prop}) \dashv$

Proof:

(10) a. $\vdash ({}^{\text{S}}$ Marie (veut $({}^{\text{PC}}$ le voir) $^{\text{C}})) : \text{Fin} \dashv$

b. $\vdash$ want$'$(marie$'$, see$'$(marie$'$, b)) : Prop $\dashv$

Explaining FPCs I

A CVG account: non-auxiliary composition

FPCs climbing onto non-auxiliaries (repeated from (4a-ii)):

(4a-ii) Pierre lui reste fidèle.
Pierre DAT.3S remains faithful

Axioms for non-auxiliary composition:

$\vdash$ lui,d : Dat $\cap$ 3Sg $\cap$ Pcl,Ind $\dashv$

$\vdash$ reste,$\lambda_P \lambda_y \lambda_x$remain$'(P(x, y))$
: $((\text{Dat} \setminus \text{Pcl}) \multimap_{\text{C}} (\text{Nom} \multimap_{\text{S}} \text{Adj})) \multimap_{\text{C}} ((\text{Dat} \cap \text{Pcl}) \multimap_{\text{PC}} (\text{Nom} \multimap_{\text{S}} \text{Fin}))$,
$(\text{Ind} \supset (\text{Ind} \supset \text{Prop})) \supset (\text{Ind} \supset (\text{Ind} \supset \text{Prop})) \dashv$

$\vdash$ fidèle,$\lambda_y \lambda_x$faithful$'(x, y)$: $(\text{Dat} \setminus \text{Pcl}) \multimap_{\text{C}} (\text{Nom} \multimap_{\text{S}} \text{Adj})$,
$\text{Ind} \supset (\text{Ind} \supset \text{Prop}) \dashv$

$\vdash$ en,e: De $\cap$ Pcl,Ind $\dashv$

Explaining FPCs II

A CVG account: non-auxiliary composition

$\vdash \text{connaît}, \lambda_f \lambda_y \lambda_x \text{know}'(x, f(y))$

$: ((\text{De} \setminus \text{Pcl}) \multimap_{\text{C}} \text{Acc}) \multimap_{\text{C}} ((\text{De} \cap \text{Pcl}) \multimap_{\text{PC}} (\text{Nom} \multimap_{\text{S}} \text{Fin})),$

$(\text{Ind} \supset \text{Ind}) \supset (\text{Ind} \supset \text{Prop}) \dashv$

Proofs:

(11) a. $\vdash ({}^{\text{S}}$ Pierre $({}^{\text{PC}}$ lui (reste fidèle $^{\text{C}}))) : \text{Fin} \dashv$

b. $\vdash \text{remain}'(\text{faithful}'(\text{pierre}', d)) : \text{Prop} \dashv$

(12) a. $\vdash ({}^{\text{S}}$ Marie $({}^{\text{PC}}$ en (connaît (la fin $^{\text{SP}})$ $^{\text{C}}))) : \text{Fin} \dashv$

b. $\vdash \text{know}'(\text{marie}', \text{end}'(e)) : \text{Prop} \dashv$

No need to constrain:

(13) *Marie lui$_i$ reste certaine que Céline a donné le livre $\_\__i$.

Conclusions

Taking stock: pros

- This CVG account captures the basics of FPC behavior
- Special local valence mode for proclitics characterizes FPCs on a "sliding scale" (in Kraak (1998)'s terms) between syntax and morphology
- Procliticization is kept local, so none of the CVG machinery for unbounded dependencies is invoked
- Lexical axioms can specify when they select FPCs and when not
- Syntax and semantics of canonical verbs/complements and their cliticized counterparts nearly identical
- Composition for auxiliaries and non-auxiliaries treated in a nearly identical way

Conclusions

Taking stock: cons

- Lexicon needs separate entries for canonical and FPC complement selection
  - Possibly missing a linguistic generalization
  - More complex lexicon poses problems for computational implementation
- More vexing problems (FPC ordering, FPCs in causative and passive constructions) remain to be solved

Conclusions
Future work

Future work will focus on:

- Conceiving a general mapping between the similar canonical and cliticized verbal forms
- Extending this approach to FPCs in causative and passive constructions, and accounting for FPC ordering and past-participle agreement
- Describing the idiosyncratics of clitic combination, such as their rigid ordering, using CVG's syntax-prosody interface

References I


Anne Abeillé, Danièle Godard, and Philip Miller.
Causatifs et Verbes de Perception en Français.
In *Actes du Deuxième Colloque Langues et Grammaire, Paris VIII, Saint Denis*, June 1995.


Anne Abeillé, Danièle Godard, and Ivan A. Sag.
Two Kinds of Composition in French Complex Predicates.
Syntax and Semantics: Complex Predicates in Nonderivational Syntax, 30:1–41, 1998.


Maxime Amblard.
Treating clitics with minimalist grammars.
In Shuly Wintner, editor, *Proceedings of the Eleventh Conference on Formal Grammar*, pages 9–20. CSLI Publications, 2006.

References II


Olivier Bonami and Gilles Boyé.
French pronominal clitics and the design of Paradigm Function Morphology.
In G. Booij, L. Ducceschi, B. Fradin, E. Guevara, A. Ralli, and S. Scalise, editors, *Proceedings of the Fifth Mediterranean Morphology Meeting*, pages 291–322, 2005.


Esther Kraak.
French object clitics: a multimodal analysis.
In Glyn Morrill and Richard Oehrle, editors, *Proceedings of the Conference of the European Summer School in Logic, Language, and Information*, Barcelona, 1995.

References III


Esther Kraak.
A Deductive Account of French Object Clitics.
Syntax and Semantics: Complex Predicates in Nonderivational Syntax, 30:271–312, 1998.


Glyn Morrill and Anna Gavarro.
Catalan Clitics.
In Alain Lecomte, editor, *Word Order in Categorial Grammar*, pages 211–232, Clermont-Ferrand, 1992. Editions Adosa.


Carl Pollard.
Higher Order Grammar: A Tutorial.
Unpublished ms., available at
http://www.ling.osu.edu/~hana/hog/pollard2006-synners.p
December 2006.

References IV


Carl Pollard.
Nonlocal dependencies via variable contexts.
In Reinhard Muskens, editor, *Proceedings of the Workshop on New Directions in Type-Theoretic Grammar. ESSLLI 2007*, Dublin, 2007.


Ivan A. Sag and Philip H. Miller.
French Clitic Movement without Clitics or Movement.
Natural Language and Linguistic Theory, 15(3):573–639, 1997.

References V


Edward P. Stabler.
Recognizing Head Movement.
In *LACL '01: Proceedings of the 4th International Conference on Logical Aspects of Computational Linguistics*, pages 245–260, London, UK, 2001. Springer-Verlag.
ISBN 3-540-42273-0.