

Call #: P11.N87 c.1 v.49 pt.1 2018

Print Date:7/13/2020 3:53 PM

Forth-Ninth Annual Meeting of the North East Linguistic Society Journal Title: NELS 49: Proceedings of the

Volume: 49

Barcode:116641051

Location: JRL / Gen

Issue: part 1 Month/Year: 2019

Pages: 63-72

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ODYSSEY REQUEST

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Article Title: Do-support as spellout of split

head chains

Cited In:

ILLiad TN: 2515494

Notes:

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NELS 49: Proceedings of the Forty-Ninth Annual Meeting of the North East Linguistic Society

October 5-7, 2018 Cornell University

Volume One

Edited by Maggie Baird and Jonathan Pesetsky

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Published by GLSA (Graduate Linguistics Student Association) Department of Linguistics University of Massachusetts Integrative Learning Center, 4th Floor 650 North Pleasant Street Amherst, MA 01003 U.S.A.

glsa@linguist.umass.edu glsa.hypermart.net

ISBN-10: 9781698805931

Editors' preface

We would first and foremost like to thank the organizers of NELS 49, Shohini Bhattasali, Jacob Collard, Forrest Davis, Miloje Despic, Sireemas Maspong, Hitomi Minamida, Mary Moroney, Joseph Rhyne, Brynhildur Stefánsdóttir, John Whitman, Draga Zec, and Lingzi Zhuang, as well as everyone in the Linguistics Department at Cornell University who made the conference possible.

For their guidance and advice throughout the editing process, we are grateful to Andrew Lamont, Shay Hucklebridge, Max Nelson, as well as all the preceding editors whose work has incrementally created the style sheets and author guidelines.

We thank the Department of Linguistics at UMass, Amherst for financial support. We thank all the authors who generously contributed their papers and made the editing process fun and painless. And lastly, we thank you, our readers, for your continued interest in the volumes. Without you, they would not exist.

. Maggie Baird and Jonathan Pesetsky Amherst, October 2019

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Do-support as spellout of split head chains*

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1. Introduction

Traditional analyses of do-support share two core properties: i) they link do-support with the inability of the verb to form a relation with an inflectional head, such as T (e.g. via head movement or lowering), and ii) they posit a constraint that requires the inflectional head to combine with a verb (Lasnik 1981, Halle and Marantz 1993, Bobaljik 1995). Based on crosslinguistic data, we argue against both aspects of the traditional view. First, it incorrectly predicts that V-to-T movement and do-support should not cooccur in a language (section 3). And second, it does not capture crosslinguistic generalizations about which inflectional heads are supported by do (section 4). In section 2, we develop an analysis of do-support as the outcome of chain splitting, in which a relation between V and T is successfully established and only later split. The successful formation of a head chain (containing V, T, and possibly other heads) accounts for the fact that languages with V-to-T movement may exhibit do-support, and derives the attested do-insertion positions from independent properties of head chains in a given language.

2. Analysis: Do is inserted in split head chains

We assume that heads in the clausal spine form a *head chain*. The precise mechanism of head chain formation is orthogonal. Possibilities include head movement, agreement (e.g. Bjorkman 2011), or a mirror-theoretic complementation line (e.g. Svenonius 2016). The entire head chain is pronounced as an inflected verb in one of the positions it contains. Following previous work, we implement this by positing a diacritic (*) on the head in which the entire head chain is pronounced (Svenonius 2016, Arregi and Pietraszko 2019). In English, for example, the head chain is pronounced in v in declarative clauses – a position

^{*}We would like to thank Rajesh Bhatt and audiences at UMass and NELS for helpful feedback and discussion. All errors are ours.

¹In Arregi and Pietraszko 2019, we propose that head chains are formed via Generalized Head Movement – a syntactic relation that unifies head raising and lowering. The analysis of *do*-support we present here does not rely on our particular implementation of head chain formation.

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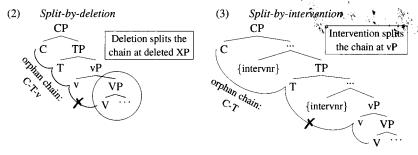
in which the verb follows negation and certain adverbs (1a). In contrast, verbs in French are pronounced in T, preceding negation and adverbs (1b). Another position in which head chains may be pronounced is C. This is the case e.g. in V2/V1 clauses in Germanic languages, such as matrix interrogative CPs in English (1c).²

- (1) a. English declarative clause

 [TP T [vP V* [VP V ...]
 - b. French declarative clause $\begin{bmatrix} TP & T^* & V & V & V \end{bmatrix}$

As we see in (1c), a head chain main contain more than one *-head. We propose that head chains are always pronounced in the highest *-position.

We propose that lexical head chains (i.e. those containing a lexical V, rather than an auxiliary) may split in certain structural contexts. Splitting of a successfully formed head chain is the result of applying one of the following rules. Split-by-deletion (2) is triggered when part of the head chain is deleted (via ellipsis or copy deletion in phrasal movement). The split occurs at the deletion site. Split-by-intervention (3) takes place under different structural conditions, namely when a specifier intervenes between heads in the chain. In English, the set of interveners includes subjects and negation, but not adverbs. Split-by-intervention always splits the chain at vP, no matter the position of the intervener.



Both operations create a new head chain which does not contain a lexical verb (C-T-v in (2), C-T in (3)). We refer to such chains as *orphan chains*. We propose that *do*-support is the spellout of an orphan chain. Under this view, there is no independent *do*-insertion

mechanism, nor do we need to identify the inflectional head that requires do-support. The chain is pronounced in whatever position is marked as * in a given language/construction.

Finally, languages may parametrically activate both, one or neither of the chain splitting rules. A partial typology is shown in (4). In English, both Split-by-deletion and Split-by-intervention are active. Danish and other Mainland Scandinavian (MSc) languages have Split-by-deletion (causing do-support in VP ellipsis and topicalization), but no Split-by-intervention (responsible for the absence of do-support caused by negation or V1/V2). A language with only Split-by-intervention would exhibit do-support only in intervention contexts. While we haven't found a clear example of this pattern, Monnese (discussed in section 3) is a language in which there is positive evidence only for Split-by-intervention. The absence of Split-by-deletion effects might be either due to the rule being inactive or due to the absence of VP ellipsis/topicalization, which, to our knowledge, haven't been reported in the languages. Languages in which both rules are inactive are languages without do-support.

(4)		English	MSc	Monnese	languages w/o do-support
	Split-by-deletion	/	1	?	X
	Split-by-intervention	✓	Х	1	X

3. Do-support is not due to failure of Head Movement or Lowering

Under the traditional view, do-support arises when the verb doesn't combine with an inflection. This accounts for a well known asymmetry between English and French: unlike English, lexical verbs in French surface in T, bleeding do-support. This theory thus predicts that do-support should not be possible in a language in which lexical verbs surface in T. In this section we report data from Monnese showing this prediction to be wrong, and demonstrate how Split-by-intervention derives this puzzling pattern.

3.1 Monnese has both V-to-T movement and do-support

In Monnese, both auxiliaries and lexical surface to the left of adverbs, that is, both move to T under the traditional account (Benincà & Poletto 2004:59):

Like English, Monnese exhibits Subject-Auxiliary Inversion (SAI) in interrogative clauses, i.e. a finite verb surfaces in C (Benincá and Poletto 2004:63-68). Given than both lexical verbs and auxiliaries move to T, we expect that both should surface in C in questions (by T-to-C movement). This is, however, only true for auxiliaries (7). With lexical verbs, do surfaces instead in C (8).

²We assume that C in not part of the head chain in declaretive clauses.

³We assume that full and contracted negation in English are both specifiers. Furthermore, traces, such as the vP-internal trace of the subject, do not count as interveners. See Bobaljik 1995.

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(7) kwal è -t tʃerkà fora? (8) which have.2SG-you searched out 'Which have you chosen?'

ke **fe** -t majá? what **do.2**SG-you eat.INF 'What do you eat?'

 $[_{CP} \ C+T+Aux \ [_{TP} \ DP < T+Aux > \dots$

[CP C+**T+do** [TP DP <T+?> ...

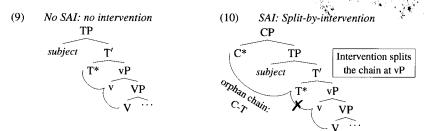
Note that the support verb in C is inflected for tense and agreement, suggesting T is in C in (8). This rules out the interpretation of (8) as a construction in which V moves to T and do is inserted directly in C.

This asymmetry between auxiliaries and lexical verbs shows that *do*-support cannot be linked directly to the absence of V-to-T movement.⁴ In order to account for the appearance of *do* in (8), the traditional analysis would require that V-to-T occur in declarative but not in interrogative clauses. Since the locus of difference between the two clause types is in the C domain, such an analysis would involve a countercyclic derivation where V-to-T movement is precluded by derivationally subsequent T-to-C movement.

3.2 Monnese do-support arises due to Split-by-intervention

In this subsection, we show how Split-by-intervention derives do-support in Monnese SAI. Our analysis directly implements the observation that Monnese shares properties with both English and French. Like English, Monnese has an active rule of Split-by-intervention, causing lexical chains to split in SAI contexts. However, like French, lexical verbs surface in T (in our terms, T is a *-position). The Monnese pattern is allowed under our account because Split-by-intervention is not linked to the surface position of finite verbs in any way.

In declarative clauses, C is not part of the head chain, and thus the subject does not intervene between its heads (9). The inflected verb is pronounced in T*. Interrogative C is part of the chain and is a *-position, causing the appearance of a verb in this position in questions. The subject is now an intervener, causing a split of the chain at vP.(10).



After splitting, only the lower chain (v-V) contains a lexical verb⁵ The higher chain (C-T) is an orphan chain and is pronounced as fe 'do.2SG' in the highest *-position, namely C.

This analysis correctly predicts that the pronunciation position of the lexical verb in questions is lower than its position in declarative clauses:

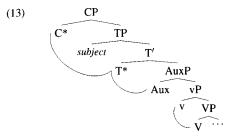
(12)

(11) 1 tfàkola mia
he speak.3sG not
'He doesn't speak.'
(Benincà & Poletto 2004:60)

fe -t mia majal '1 pom? do.2SG -you not eat.INF the apple 'Do you not eat the apple?' (Bjorkman 2011:190–191)

In declarative CPs, there is no split and the verb is pronounced in T*, preceding negation. The split in interrogative clauses traps the verb inside vP, where it must follow negation.⁶

Auxiliary and lexical verbs form independent head chains (13). Head chains containing an auxiliary verb are not targeted by chain splitting rules, effecting the spellout of an auxiliary in C, the highest *-position.



4. Do-support is not an idiosyncratic requirement of particular heads

In this section, we provide an additional argument for the analysis, based on the prediction that the syntactic position of do in Germanic languages follows directly from the interaction of chain splitting (either by deletion or intervention) with independent parameters of verb position. This shows that do-support is not due to idiosyncratic properties of particular heads, such as affixal requirements.

4.1 Mainland Scandinavian: Do in C or v

In the absence of an auxiliary, predicate ellipsis in Mainland Scandinavian (Danish, Norwegian, Swedish) trigger the spellout of orphan chains as *do*, whose surface position (C or v) follows from independent parameters on verb position in these languages (we illustrate the MSc generalizations with Danish throughout this section). In these languages, the finite verb surfaces in C under V2 (14a), and in v otherwise (14b) (examples from Vikner 1995:47; see also Taraldsen 1985, Holmberg and Platzack 1995).

⁴Bjorkman (2011) draws a similar conclusion from these facts. The account she offers treats *do*-support in English and Monnese SAI contexts in a non-uniform way, unlike the analysis in the next subsection.

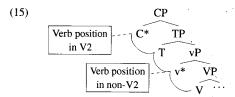
⁵Chains with no *-heads are pronounced in the highest position by default (see Arregi and Pietraszko 2019).

⁶Negation in Monnese is does not cause a split. We assume, following Benincá and Poletto 2004, that negation is adverbial in this language.

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- (14) a. Om morgenen drikker Peter ofte kafe. in the morning drinks Peter often coffee 'Peter often drinks coffee in the morning.'
 - b. Vi ved at Peter ofte **drikker** kaffe om morgenen. we know that Peter often **drinks** coffee in the morning.'

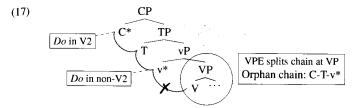
Like English, MSc has C^* and v^* . The finite verb surfaces in C^* in V2 sentences (the highest *-position). In other sentences, the head chain does not include C, and the verb surfaces in v^* .



In the absence of an auxiliary, predicate ellipsis triggers *do*-support, and *do* surfaces in exactly the positions that the verb does in the nonelliptical source, i.e. C (16a) or v (16b) (examples from Houser, Mikkelsen, and Toosarvandani 2011;249–252; see also Sailor 2009, 2018, Platzack 2012, Thoms 2012, Bentzen, Merchant, and Svenonius 2013).

- (16) a. Mona og Jasper vaskede bilen, eller rettere Mona gjorde Δ
 Mona or Jasper washed the car, or rather Mona did.
 'Mona or Jasper washed the car, or rather Mona did.'
 - b. Der er en forventning om, at vi skall gå videre, selv om det snarere there is an expectation about that we shall go further even if it rather vil være en stor skuffelse end katastrofalt, hvis vi ikke gør Δ will be a big disappointment than catastrophic if we not do 'We are expected to go further. That said, it would be a great disappointment, not a catastrophe, if we don't.'

We propose that MSc has Split-by-deletion, and that the elided constituent is VP (VPE), which determines the site of the split:



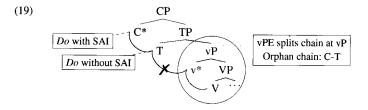
The orphan chain contains both pronunciation positions (C* and v*), which correctly predicts the surface positions of do. Thus, do appears in those positions for the same reasons other verbs do, and in the same contexts, which obviates the need to stipulate that v and C in these languages have affixal properties that trigger do-support.

4.2 English: Do in C or T

Unlike MSc, the position of do in English is different from that of finite main verbs. We argue that this follows from the site of chain splitting (either by deletion or intervention), which is vP. In the absence of an auxiliary, the main verb typically surfaces in a low position, which we take to be v (Emonds 1970, Pollock 1989). On the other hand, in predicate ellipsis constructions, do surfaces in C in SAI contexts, and in T otherwise:

- 18) a. I know that Sue washed the car, but **did** Mary Δ ?
 - b. Sue washed the car, and Mary **did** Δ , too.

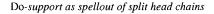
English has vP ellipsis (vPE), and by Split-by-deletion, the orphan chain excludes v*. Since the usual position in which the verb surfaces is missing, do surfaces in C or T; depending on whether the head chain includes C or not:



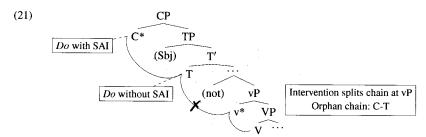
English also has Split-by-intervention under SAI and negation. Do surfaces in C or T:

- (20) a. **Did** Mary wash the car?
 - b. Mary did not wash the car.

As shown in previous sections, the split is always at vP in cases of intervention, which, as in vPE, forces do into a higher position. The lower head chain is pronounced in v*:



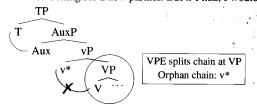
(Chalcraft 2006:5)



4.3 VP ellipsis under auxiliaries: Do in v

The low target of ellipsis in MSc (VP) leads to the correct prediction that these languages have *do*-support under auxiliaries (example from Houser, Mikkelsen, and Toosarvandani 2011:271, see also Platzack 2012, Thoms 2012, Bentzen, Merchant, and Svenonius 2013):

(22) Nu fisker jeg ikke efter en partner. Men hvis jeg havde **gjort** Δ_{VP} , havde jeg ... now fish I not after a partner but if I had **done** had I 'I'm not looking for a new partner. But if I had, I would ...'



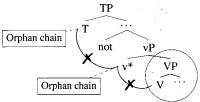
T forms a head chain with the auxiliary instead of the main verb, which is in a head chain with v*. VPE results in an orphan chain with only v*, which is where do surfaces. Dosupport under auxiliaries is also possible in British English, which we take as evidence that this dialect has VPE (in addition to vPE) (example from Thoms and Sailor 2018:1; see also Chalcraft 2006, Haddican 2007, Aelbrecht 2010, Baltin 2012, Thoms, to appear):

(23) Kim isn't running for office now, but she has **done** Δ_{VP} in the past.

4.4 Do in both T and v in the same sentence

Since British English has VPE and both types of splits, the analysis correctly predicts sentences with two instances of *do*-support:⁷

John said he would help, but he **does**n't usually **do** Δ_{VP} .



VPE splits the chain at VP, and the resulting orphan T-v* chain is further split by intervention. Thus, the sentence contains two orphan chains, each of which is realized as do.

5. Conclusion

Do-support is due to splitting of successfully formed head chains, caused by intervention or deletion. Splits result in orphan chains that are realized as do. The account correctly predicts that do-support is possible in grammars in which lexical verbs normally surface in T, as attested in Monnese. Furthermore, the variety of positions in which do surfaces crosslinguistically follows from independently motivated properties of splits and parameters of verb position, thus voiding the need to postulate idiosyncratic constraints on functional heads, such as affixal requirements.

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 $^{^{7}}$ Many speakers who accept do-support under auxiliaries reject these double-do sentences. We assume that, for these speakers, VPE (as opposed to vPE) can only be licensed by auxiliaries.

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Focus size in non-prosodically focus-marking languages*

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1. Introduction

In intonational focus languages like English, focus is marked by stress, pitch accenting and post-focal deaccenting. In many other languages, however, focus is encoded by a specific syntactic position or a morphological marker, and the focus patterns we see in these languages are often very different from what we are used to in the English cases. In this paper we take a closer look at the different focus configurations in three West African languages: Hausa, Buli and Gùrùntùm. Though the focus marking patterns in these languages are well described, they have thus far not been linked to formal focus semantics theories. We thus propose a model that allows us to formally compute the focus semantics of those languages.

We start from the general observation that the same marking can encode different focus patterns, i.e. the same sentence form is ambiguous regarding the different focus sizes it signals. In English, for example, a nuclear pitch accent on the object can indicate narrow object focus, but also any focus "bigger" than the object, i.e. VP or sentence focus. That the same form can express either a narrow focus or a broader focus is referred to as 'focus projection' in the literature (Selkirk 1984, 1995, Rochemont 1986). We will continue to use the terms 'projection' and 'ambiguity' descriptively throughout this paper, although our theoretical modelling does not use syntactic F-markers and thus knows no ambiguities or projections. The sentence in (1) can be an answer to 'What did Mary buy a book about?', 'What did Mary buy?', 'What did Mary do?', and 'What happened?' (small caps indicate prosodic prominence):

(1) Mary bought a book about BATS.

(Selkirk 1995:554)

In this paper we show that Hausa, Buli and Gùrùntùm differ significantly from English in the way that focus projection works. One immediate consequence is that none of them

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^{*}We would like to thank our consultants Hasiyatu Abubakari, Stephen Adaawen, Mary Bodomo, Agoswin Musah, Abdul-Razak Sulemana and Asangba Reginald Taluah. This work was supported by the Austrian Science Fund (FWF), project grant P29180-G23, 'Unalternative Constraints Crosslinguistically'.