



Wh-clitic-doubling and wh-Cliticisation

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Abstract: This article explores a pervasive phenomenon in Berber whereby the extraction of dative arguments (of verbs, nouns and prepositions) gives rise to two occurrences of *wh*. One is a *wh*-word located in Spec,C and the other a *wh*-clitic in the dative form located in C (*wh*-clitic-doubling). Close examination reveals that the *wh*-word in Spec,C functions as an operator base-generated in its scope position and the dative *wh*-clitic in C provides it with a derivational link to the variable in the dative position it binds (*wh*-Cliticisation). *Wh*-clitic-doubling and *wh*-Cliticisation amount to direct evidence for Cliticisation as a derivational interpretive mechanism of Grammar that obviates the need for indexing (Lebeaux 1983, Chomsky 1986, 1995). They also provide evidence for the conclusion in Kayne (1989) that Cliticisation is an instance of Head-Movement, more precisely, feature-based Head-Movement.

Keywords: *wh*-clitics, *wh*-clitic-doubling, *wh*-Cliticisation, *wh*-Movement, operator-variable links.

Resumen: Este artículo explora un fenómeno generalizado en bereber, en virtud del cual la extracción de argumentos dativos (de verbos, sustantivos y preposiciones) produce dos tipos de palabras *qu-*, una situada en la posición de especificador del SC, y otra en la posición CL2 (doblado del clítico *qu-*). Un examen detallado revela que la palabra *qu-* que se encuentra en la posición de especificador del SC se genera en la base de este sintagma y que la relación entre su variable-operador y la posición del argumento se establece por medio de la cliticización *qu-* al SC. Esto proporciona sólida evidencia para el estatus de la Cliticización como mecanismo derivacional interpretativo de la Gramática, algo que de manera abstracta han asumido estudios previos, tales como los de Lebeaux (1983) y Chomsky (1986, 1995). Proporciona, asimismo, evidencia de la conclusión presentada por Kayne (1989) de que la Cliticización es un ejemplo de movimiento de núcleo, más precisamente, movimiento de núcleo basado en los rasgos.





The wh-word to the left of Comp is also prosodically dependent insofar as the Comp-complex *wh-Comp=wh_{DAT}* is pronounced as one prosodic word. However, it is not a (syntactic) clitic because syntactic clitics are normally pro-clitics in Berber (Ouhalla 1988, 2005). For current purposes, we will assume the distinction between prosodic clitics and syntactic clitics outlined in Klavans (1980, 1985) and subsequent literature. The former are a function of the mapping of syntactic structure onto prosodic structure and involve linear adjacency. Rightward attachment of the wh-word in Spec,C to the *wh-Comp=wh_{DAT}* complex is an instance of this process. Syntactic clitics are subject to displacement from the positions associated with their grammatical function and therefore do not involve (linear) adjacency relative to their host. Displacement of the dative wh-clitic *=mi* to C is an instance of this process, referred to here as wh-Cliticisation and understood as an instance of Clitic Placement in the transformational sense of Kayne (1975). Syntactic clitics are designated with the symbol =.

Wh-clitic-doubling is found in other Berber varieties, although it may be partly hidden by prosody-driven processes that distort the underlying form of the Comp-complex. Example (2) is from Tashelhiyt and involves the extraction of a dative argument of a noun (possessor). The Comp-complex has pretty much the same form, with Comp flanked by two wh-words, the second of which is the dative wh-clitic *=mi*. It differs in that the wh-Comp has the form [ad] rather than [ay], which we take to be insignificant.

- (2) **m-a(d)=mi** i-ḥsa [tanddamt]? (Tashelhiyt)
 WH-COMP=WH_{DAT} he-learn poetry
 'Whose poetry does he know by heart?' (El Moujahid 1993:394)

A slightly different situation is found in Tarifit. As shown in (3), the Comp-complex has the form *immi*, which appears to lend itself to more than one analysis depending on how the morpheme *i* in the initial position is parsed.

- (3) a. **i-m=mi** i-uša lktab? (Tarifit)
 to-WH=WH_{DAT} he-gave book
 'To whom did he give the book?'
 b. **i-m=mi** i-ḡra tabrat?
 to-WH=WH_{DAT} he-read letter
 'To whom did he read the letter?'

One possibility is that the initial *i* corresponds to the wh-Comp *a(y)*, which is generally pronounced as [i(g)] in Tarifit (Cadi 2006, El Hankari 2010, Ouhalla



1988). This would mean that the Comp-complex has the form $i=mmi$, consisting of the wh-Comp $i(g)$ and a prosodically augmented form of the dative wh-clitic, but no wh-word corresponding to Spec,C. However, there are good reasons to exclude this parsing. Although null wh-words corresponding to Spec,C are common in relatives (see below), this is not the case in wh-questions. Moreover, although the wh-word corresponding to Spec,C and Comps are subject to variation across varieties and operator-variable constructions (see below), the dative wh-clitic has a constant form and distribution. The more plausible parsing is one where the vowel in the initial position is the dative preposition i 'to' seen in the non-extraction contexts (4)-(6), including the one that involves possessors of nouns (5) (more on this below). Accordingly, the Tarifit Comp-complex has the form $i-m=mi$, which consists of the dative wh-PP $i-m$ 'to-wh' corresponding to Spec,C and the dative wh-clitic $=mi$, with a null Comp in between.

- (4) uši-x lktab i-Fatima (Tamazight)
gave-I book to-Fatima
'I gave the book to Fatima.'
(Ouali 2006:113)
- (5) i-ḥsa [tandamt i-Sidi Ḥmmu]. (Tashelhiyt)
he-learn [poetry to-Sidi Ḥmmu]
'He knows the poetry of Sidi Ḥmmu.'
(El Moujahid 1993:396)
- (6) uši-x lktab i-ufrux (Tarifit)
gave-I book to-boy
'I gave the book to the boy.'

It is possible to abstract away from variation across varieties and assign the relevant Comp-complex a uniform underlying representation along the lines in (7). The constituent corresponding to Spec,C can be either a dative wh-PP of the form 'to-wh', as in Tarifit, or a merely a non-Case-marked wh-DP, as in Tamazight and Tashelhiyt. The Comp $a(y/i(g))$ is subject to partial or total deletion, possibly an effect of the Doubly Filled Comp Filter. The third constituent is the dative wh-clitic $=mi$ in the C=CL position, which is not subject to deletion and has a constant form across varieties³.

³ To the extent that the proposed uniform structure of the Comp-complex is plausible, we hope it justifies the reporting of some of the data here in an adapted form, where adaptation involves the parsing of the Comp-complex into its constituent morphemes. Comp-complexes are reported in the literature in various different ways that result in disguising underlying patterns of the type sought here.





(7) [CP ([PP to] [DP wh](l)) [C' [C a(y)/i(g)] = [wh_{DAT}] [TP ...

The Doubly Filled Comp Filter effects that manifest themselves in a complementary distribution between wh-words in Spec,C and Comps are more evident in relatives. The Tamazight example (8) includes the relative re-Comp *da* and the dative wh-clitic =*mi*, but lacks the wh-word corresponding to Spec,C. On the other hand, the Tashelhiyt and Tarifit examples (9)-(10) lack a re-Comp and instead include the wh-word corresponding to Spec,C in addition to the dative wh-clitic =*mi*. Whether this variation involves deletion or null categories or indicates the involvement of Head-raising in some relatives (Kayne 1994) is unclear and irrelevant to current purposes. What is clear and crucially relevant is that all three examples show the dative wh-clitic =*mi* in the C=CL position.

- (8) argaz [da=**mi** i-sğa lktab] (Tamazight)
 man COMP=WH_{DAT} he-bought book
 'The man for whom he bought the book.' (Sadiqi 1997:164)
- (9) afrux [**m=mi**=t nni-x] (Tashelhiyt)
 boy WH=WH_{DAT}=it_{ACC} told-I
 'The boy to whom I told it.' (Dell & Elmedlaoui 1989:184)
- (10) argaz [**i-m=mi** sği-n lktab] (Tarifit)
 man [to-WH=WH_{DAT} bought-they book]
 'The man for whom they bought the book.'

The situation in clefts is pretty much the same, bearing in mind that clefts tend to share their Comp and other properties with wh-questions rather than relatives (11)-(13) (Cadi 2006, El Hankari 2010, Ouali 2006, 2011, Ouhalla 1988, Sadiqi 1982, 1997). Worth singling out is the Tarifit example in (13), where the cleft constituent appears in the dative form and the Comp-complex consists of the animate wh-word *u* 'who' and the dative wh-clitic =*mi*, presumably separated by a null wh-Comp.

- (11) argaz a=**mi** i-fa iqaridn. (Tamazight)
 man COMP=WH_{DAT} he-gave mone
 'It was to the man that Hmad gave the money.' (Sadiqi 1997:216)
- (12) rrays ad=**mi** t-fka ijjiġn. (Tashelhiyt)
 singer COMP=WH_{DAT} she-gave flowers
 'It was to the singer she gave flowers.' (El Moujahid 1993:442)
- (13) i-rmusakin **u=mi** i-uša tmnyat. (Tarifit)
 to -poor WH=WH_{DAT} he-gave money
 'It was the poor that Hmd gave the money to.' (Cadi 2006:309)

It is our judgement that the examples cited so far already contain sufficient information to exclude the possibility that the dative wh-clitic is a copy of the



wh-word in Spec,C. This possibility arises in the context of the Copy Theory of Movement, whereby the extraction of arguments from within vP operates through the left-edge of vP , where it leaves a copy that normally deletes (Chomsky 1995). According to this scenario, the dative wh-clitic may be the copy left on the edge of vP by wh-Movement of the wh-word in Spec,C. The copy does not delete and instead cliticises to C for some reason. The two wh-constituents in wh-clitic-doubling are not exact copies of each other as can be seen in many examples above. The differences include the fact that while the dative wh-clitic is invariably in the dative form across varieties, the wh-word in Spec,C shows a dative marker in Tarifit, but not in Tamazight and Tashelhiyt. They also include the fact that the wh-word in Spec,C shows in an animacy effect in Tarifit but the dative wh-clitic does not. Moreover, it is unclear if and how Cliticisation of the copy to C is a substitute for deletion, particularly in view of the fact it brings the copy closer to the antecedent in Spec,C. Rather, dative wh-clitic-doubling shows the significant role of wh-Cliticisation to C in syntactic derivation relative to wh-Movement to Spec,C and its preponderance in Berber is a reflection of the fact that the language relies on wh-Cliticisation (= Linking) rather than wh-Movement for extraction. This will become clearer as more data are examined⁴.

2. Wh-clitic-doubling

It is tempting to treat dative wh-clitic-doubling as an instance of the more general phenomenon of dative clitic-doubling, available across Berber varieties (Cadi 2006). Doubling by the dative pronominal clitic can be seen in (14)-(15).

⁴ Wh-clitic doubling is partly reminiscent of the distribution of wh-words in multiple wh-questions in some Slavic languages, where one wh-word is situated in Spec,C and the others in the CL2 position associated with C (Boškovič 2001, 2002). However, Berber wh-clitic-doubling differs in that it involves two occurrences of the same wh-word. As such, it is more reminiscent of partial wh-Movement (Horvath 1997, Fanselow 2006, Mc Daniel 1989). Here again, while partial wh-Movement is characteristic of long-distance extraction, wh-clitic-doubling is characteristic of local extraction. Long-distance extraction generally makes use of the resumptive strategy in Berber varieties such as Tamazight and Tashelhiyt (Boukrhis 1998, El Moujahid 1993).





- (14) uši-x=as lktab i-Fatima (Tamazight)
 gave-I=her_{DAT} book to-Fatima
 'I gave the book to Fatima.' (Ouali 2006:112)
- (15) ur(d)=as uši-x lktab i-Fatima (Tarifit)
 NEG=her_{DAT} gave-I book to-Fatima
 'I did not give the book to Fatima.'

In view of the general availability of dative clitic-doubling in the language, it is conceivable that dative wh-clitic-doubling is merely a manifestation of this more general phenomenon. The fact that the doubling clitic is of the wh-type in operator-variable constructions would follow from an Agree-based analysis of clitic-doubling of the kind outlined in Ouali (2006, 2011). When the dative complement is not a wh-phrase, it is doubled by a pronominal dative clitic (pron-clitic-doubling), and when it is a wh-phrase, it is doubled by a wh-clitic (wh-clitic-doubling). Arguably, this analysis would also correctly rule out doubling of a dative wh-phrase by a dative pronominal clitic in relevant varieties such as Tamazight (16). These examples were previously considered in the context of resumption reduced to binding (Ouhalla 1993), but they can equally conceivably be considered as instances of a mismatch in a chain-link (Ouali 2006, 2011).

- (16) m-a=mi (*=as) i-uša lktab? (Tamazight)
 WH-COMP=WH (*=her_{DAT}) he-gave book
 'Who did he give the book to?' (Ouali 2006:123)

However, there are at least three major differences between the two types of dative clitic-doubling. One is that while both constituents are in the dative form in pron-clitic-doubling, only the wh-clitic is consistently in the dative form in wh-clitic-doubling in Tamazight and Tashelhiyt. The second difference is that dative pron-clitic-doubling is optional in the sense that the relevant sentences can feature either of the two dative constituents in isolation and the presence of the dative PP does not necessarily require the presence of a dative pronominal clitic (17a&b) (Boukhris 1998, Cadi 2006). In contrast, dative wh-clitic-doubling is obligatory in the sense that the presence of both wh-constituents is required, bearing in mind that relatives have a null wh-word in Spec,C.

- (17) a. ur uši-x lktab i -ufrux. (Tarifit)
 NEG gave-I book to -boy
 'I did not give the book to the boy.'
- b. ur(d)=as uši-x lktab.
 NEG=him_{DAT} gave-I book
 'I did not give him the book.'



The third difference is more subtle and involves the clitic position targeted by pronominal clitics, including the dative one, compared to the clitic position targeted by the *wh*-clitic. A useful way of explaining this difference is to invoke a debate in the literature on Berber as to whether clitics and Cliticisation target a high position in the C-domain (Ouhalla 1988) or a lower position in the T-domain (Boukhris 1998, Sadiqi 1992). The latter view is based on, among other things, the rather straightforward fact that in sentences that include functional heads of the T-domain such as Tense and sentence Negation, clitics appear to the right of these functional heads, as shown in (18a-b). The fact that clitics appear attached to a *Comp* element in sentences that do not include intervening functional heads in the T-domain such as (18c) is merely a (misleading) prosodic effect whereby the clitic seeks an adjacent prosodic host to its left. These contexts mask the fact that Cliticisation targets a lower position in the T-domain rather than a higher position in the C-domain.

- (18) a. *is ur dad=tn clu-x?* (Tamazight)
Q NEG FUTURE=them_{ACC} see-I
'Will I not see them?'
b. *is ur lli=tn ucu-x?*
Q NEG PART=them_{ACC} see-I
'Will I not see them often?'
c. *is=tn cli-x?*
Q=them_{ACC} saw-I
'Did I see them?' (Boukhris 1998:318)

El Hankari (2012) undertakes an evaluation of both views and reaches the conclusion that they are both correct, but for different sets of data. We will adopt this conclusion here, though from a different angle. We make a distinction between two types of clitics and Cliticisation. One type targets the T-domain, and mostly involves clitics linked to argument positions within VP but not to an operator in the C-domain. Typical examples of this type are the pronominal clitics in (17b) and (18a-c). The other type targets the C-domain and involves clitics linked to an operator in *Spec,C*. The most notable example of this type is the dative *wh*-clitic, although there are others discussed below. As shown in (19), the dative *wh*-clitic appears to the left of functional heads such as sentence Negation and Tense, suggesting that it targets the C-domain directly skipping over all intervening heads in the T-domain.





- (19) argaz [da=**mi** ur mad f-x iqaridn] (Tamazight)
 man [COMP=**wh**_{DAT} NEG FUTURE give-I money
 'The man to whom I will give money.' (Sadiqi 1997:165)

We conclude from the noted differences that dative wh-clitic-doubling is not reducible to dative clitic-doubling in general, while not excluding the possibility that there may be a significant link between the two instances of dative clitic-doubling. We will not pursue this line here as the focus is mainly on wh-clitic-doubling and operator-variable constructions.

In view of the proposed classification of clitics and Cliticisation, the question whether Cliticisation is an instance of XP-Movement or Head-Movement (Kayne 1989) arises in an arguably stronger way. The possibility that Cliticisation involves a combination of XP-Movement followed by Head-Movement is conceivable on the view that clitics are heads that do not take a complement (i.e. they are both heads and XPs). A version of this mixed derivational scenario is applied to Berber in Boukhris (1998), whereby pronominal clitics move as XPs to the edge of *v*P and subsequently attach to the nearest functional head to their left, yielding the pattern seen in (18a-c). Extended to wh-clitics, the analysis could be understood to mean that they target the edge of TP and subsequently attach to the nearest constituent to their left, yielding the pattern seen in (19). According to this analysis, sketched in (20a&b), the first leg of Clitic Placement in (20b) might as well as be an instance of wh-Movement, in which case it would remain unclear why it does not target Spec,C instead. Stipulating that Spec,C is already filled with the other wh-word would amount to circular argumentation that fails to explain the essence of wh-clitic-doubling.

- (20) a. [_{CP} C [_{TP} Neg/T [_{vP} =**[pron]** [_{vP} *v* [[_{VP} ... =**[pron]** ...
 b. [_{CP} [**wh**] [_C C [_{TP} =**[wh**_{DAT}] [_{TP} Neg/T [_{vP} *v* [[_{VP} ... =**[wh**_{DAT}] ...

The facts discussed here are consistent with the view in Kayne (1989) that clitics move as heads and target head positions in the T-domain and C-domain. At the same time, the fact that the wh-clitic targets the C-domain directly, skipping over functional heads in the T-domain, clearly indicates that Cliticisation is not subject to the Head Movement Constraint (HMC). This would follow if Cliticisation = Head-Movement were feature-based and therefore discriminatory with respect to the head positions it targets. Presumably, the ability of the wh-clitic to target the C-domain directly is a function of the wh-



feature it bears and shares with the C-domain of operator-variable constructions. This reasoning turns out to have interesting consequences when combined with more recent views concerning Head-Movement. These include the view that processes such as V-raising to T and T-lowering to V are essentially instances of morphological merger subject to (linear) adjacency (Halle and Marantz 1993) and the implication that the HMC is an artefact of these processes rather a genuine constraint on syntactic movement. If so, Cliticisation is the quintessential, perhaps only genuine, instance of syntactic Head-Movement⁵.

(21) Cliticisation = Feature-based Head-Movement

As far as *wh*-Cliticisation (to C) is concerned, the justification for its existence in addition to *wh*-Movement turns out to rest on the fact that it applies in contexts that exclude *wh*-Movement (to Spec,C), although it resembles *wh*-Movement in that it is essentially a mechanism for deriving operator-variable links. This is what will transpire from the discussion of *wh*-clitic-doubling contexts in the subsequent sections.

3. Dative objects of verbs and the dative *wh*-clitic

El Moujahid (1993) and Sadiqi (1992) explicitly link the dative *wh*-clitic =*mi* to the dative marker *i*- 'to' seen in (4)-(6). El Moujahid (1993:395) and Cadi (2006:309) go one step further and gloss the dative *wh*-clitic as *qui- à*, consisting of the *wh*-word *m* 'wh' and the dative preposition *i* 'to.' This analysis implies that =*mi* is a PP-clitic, which is not implausible in view of the fact that Berber has PP-clitics on a productive basis and in fairly transparent forms (Boukhris 1998, Dell & Elmedlaoui 1989, Ouhalla 1988). Berber PP-clitics can be pronominal, consisting of a preposition and a pronominal object clitic located in the T-domain, as in (22). They can also be of the *wh*-type, consisting of a

⁵ We will not address here the fact that syntactic clitics appear as enclitics on their host in Berber, which appears inconsistent with the claim in Kayne (1989, 1994) that clitics left-adjoin to their host. A possible way of dealing with this is to adopt the view that linear order is not a property of Syntax and the order of clitics relative to their host is determined at PF on the basis of prosodic considerations. However, Ouhalla (1995) argues that the Berber facts are consistent with left-adjunction of clitics to their host once certain prosodic considerations of the language that distort this underlying order are taken into consideration (see also Ouali 2006, 2011).





dative position. The wh-clitic and wh-Cliticisation have the function of derivationally linking the wh-operator in Spec,C to the variable it binds. The derivation is shown in (29), which eschews the issue whether wh-Cliticisation out of *v*P involves the intermediate step of adjunction to *v*P on a par with wh-Movement.

(29) [CP [wh] [C' C=**wh**_{DAT}] [TP ... [VP read [DP letter] [DP ~~=wh~~_{DAT}]]...]

According to the analysis outlined in (29), wh-Cliticisation applies in contexts where the operator is base-generated in its scope position and has the function of linking the operator to the variable it binds. In other words, wh-Cliticisation does the job that would otherwise require indexing, routinely assumed for contexts where the operator is base-generated in its scope position. As such, wh-Cliticisation is in complementary distribution with wh-Movement, which applies in contexts where the operator is base-generated in the variable position and the operator-variable link is derived by wh-Movement of the operator to its scope position (Spec,C). These conclusions are summarised in (30a&b).

- (30) The derivation of operator-variable links
- a) Wh-movement in contexts where the operator is base-generated in the variable position.
 - b) Wh-Cliticisation in contexts where the operator is base-generated in its scope position.

Berber is a language that makes use of the option of base-generating the operator in its scope position, possibly a function of the fact that its wh-words lack a Case-feature and therefore cannot be merged into Case/variable positions. This is with the exception of the dative wh-clitic, which clearly bears an additional dative Case-marker. This property will become more evident as more contexts of wh-clitic-doubling are discussed, including seemingly non-dative contexts that involve so-called wh-words traditionally thought of as listed items that undergo wh-Movement. These wh-words turn out, on closer inspection, to have a compositional form that includes an occurrence of the wh-clitic. An early example is *maymi* reported in Cadi (2006) to be used to convey 'why' in a dialect of Tarifit, shown in (31). This wh-word has pretty much the same form as the Comp-complex in contexts that involve extraction of a dative argument of verbs such as (27), analysable as *m-ay=mi* corresponding to *wh-Comp=wh*_{DAT}. Other dialects of Tarifit have a version of this wh-word that has the form *mimi*, where the Comp-constituent has the more familiar Tarifit form *i*:



m-i=mi 'wh-Comp=wh_{DAT}.' Although it is unclear how the meaning 'why' arises, there seems little doubt that *maymi/mimi* is a Comp-complex derived in the C-domain by wh-Cliticisation of the dative wh-clitic to C, the Spec of which is filled by a base-generated wh-word as in (29). Other instances of these so-called wh-words are shown below to have equally compositional forms that include an occurrence of a wh-clitic, and where meanings such as 'why' and 'when' are more transparently compositional.

- (31) **maymi** i-ffǵ ? (Tarifit)
 why he-left
 'Why did he leave?' (Cadi 2006:299)

4. Dative objects of prepositions and prepositional clitics

As indicated above, Berber has wh-PP-clitics found in contexts that involve the extraction of the object of a preposition such as the ones repeated in (32a&b). These wh-PP-clitics include the dative wh-clitic as the object of the preposition consisting with the fact that objects of prepositions in general are in the dative form.

- (32) a. **m-a=[ag=mi]** i-dda? (Tamazight)
 WH-COMP=[with= WH_{DAT}] he-leave
 'Who did he leave with?'
 b. **argaz a=[x=mi]** i-tizar.
 man COMP=[on= WH_{DAT}] he-look.for
 'It is the man he is looking for.' (Boukhris 1998:398)

Before addressing the role of these wh-PP-clitics in the extraction of objects of prepositions, it is useful to explore their internal structure and derivation. We will assume that they are derived by (wh-)Cliticisation of the dative wh-clitic to P along the lines shown in (33) (Ouhalla 1988, 2005). Following the reasoning in Riemsdijk (1978), displacement of the wh-object to P(P) can be seen to have the function of transporting the wh-feature of the wh-object to P(P). Some languages do this by wh-Movement to Spec,P, while others, such as Berber, do it by (wh-)Cliticisation to P in-keeping with the general tendency of the language to make use of wh-Cliticisation rather than wh-Movement.

- (33) [PP [P P=[_D WH_{DAT}]] [_{DP} [_D wh_{DAT}]]]

The derivation in (33) has two critical consequences. One is that wh-PP-clitics can undergo CL-Placement as complex prepositional heads of the form [P P=[Wh]], which in the present context amounts to wh-Cliticisation to C. In view





of this, the term wh-PP-clitic is a misnomer and should perhaps be replaced with the more accurate term P[wh]-clitic. The second consequence is that P[wh]-clitics carry a wh-feature that enables them to link up with a wh-operator in Spec,C much like the dative wh-clitic in contexts that involve extraction of dative arguments of verbs discussed above. In other words, P[wh]-Cliticisation is an instance of wh-Cliticisation. Accordingly, examples (32a&b) have the derivation shown in (34), where P[wh]-Cliticisation has the function of linking the wh-operator base-generated in Spec,C to the dative position inside PP occupied by the variable it binds.

(34) [CP [wh] [C [C]=[P with=wh_{DAT}] [TP ... [VP go [PP ~~with~~=[P wh_{DAT}]]] ...

The strategy of extracting objects of prepositions shown in (32a&b) sheds significant light on the better known and more common strategy shown in (35)-(36a&b), where the preposition in the C=CL position is bare, missing the wh-object. As shown in (35) and (36b), the bare P appears to the left of the functional heads of the T-domain, including sentence Negation and Tense in (36b), confirming it is located in the C=CL position.

- (35) tafruxt [=f ra=awn sawl-x] (Tashelhiyt)
 girl [=on will=you talk-I]
 'The girl about whom I shall talk to you.' (Dell & Elmedlaoui 1989:183)
- (36) a. **m-i=(a)g** t-qqim? (Tarifit)
 WH-COMP=with she-sat
 'Who did she sit with?' (El Hankari 2010:194)
- b. ajatir m-i=xf ara ur t̄t̄assa-n
 carpet WH-COMP=on were NEG sleeping-they
 'The carpet on which they were not sleeping.'

The bare P in this context is widely described in the literature on Berber as 'une préposition orpheline,' which establishes a link between it and P-stranding. This perceived link formed the basis for the derivational scenario outlined in Sadiqi (1982) and Ouhalla (1988), which assumes that the object of P is extracted by wh-Movement to Spec,C and the resulting problem of P-stranding, whatever it is, is dealt with by P-Cliticisation of stranded P to C. However, the pattern in (32a&b), overlooked at the time, suggests a simpler and more consistent derivational scenario, whereby P has a null wh-object, recoverable under (partial) identity with the wh-word in Spec,C. The derivation is shown in (37) based on the Tarifit wh-question (36a), which is identical to the derivation in (34) apart from the fact that the wh-object of P is null. According to this analysis,



seemingly bare P has the form P[wh] and its Cliticisation to C is an instance of wh-Cliticisation.

(37) [CP [wh] [C' [C]=P with[wh_{DAT}] [TP ... [VP sit [PP with [DP=wh_{DAT}]]] ...

The analysis outlined in (34) and (37) is consistent with and provides additional evidence to the conclusion here that the Berber relies on wh-Cliticisation to C rather than wh-Movement to Spec,C in extraction. To the extent that PP-pied-piping of the type found in English (e.g. *With whom did she sit?*) is an instance of wh-Movement to Spec,C, this also explains its absence in Berber. The conclusion is also reflected in the internal structure of some wh-phrases traditionally thought to be listed items, which on closer inspection turn out to include an occurrence of a P[wh]-Clitic. The pattern that involves a wh-PP-clitic can be found in Tarifit *mrimi* 'when' seen in (38a), which includes an instance of the locative temporal preposition *ar* 'at/in' seen in (38b). This preposition is situated in a Comp-complex of the form *wh-Comp-wh_{DAT}* familiar from independent contexts that involve extraction of the object of a preposition such as (32a&b). Accordingly, Tarifit *mrimi* 'when' and the wh-questions that include it such as (37a) have the structure and derivation shown in (34), where *mrimi* 'when' is assembled, derived in the C-domain and the temporal meaning reduces to something like 'at[time] what.'

- (38) a. Q. **m=[r=mi]** t-kka zg-idas? (Tarifit)
 WH-COMP=[at=WH] she-wake from-sleep
 'When did she wake up?'
 b. A. ar- uššši/sbah/xmsa.
 in/at afternoon/morning/five o'clock

On the other hand, the pattern that involves a bare P can be found in the Tarifit wh-word *mixf* and arguably also *mağa*, both of which used to convey the meaning 'why' (39a). For example, *mixf* clearly incorporates the preposition *x(f)* 'on/about' seen in (39b) in addition to the wh-Comp *i* and the wh-word *m* in the initial position. The Comp-complex *wh-Comp=P* is the one familiar from independent contexts that involve extraction of the object of a preposition shown in (35)-(36a&b) with the derivation shown in (37). The meaning 'why' is





compositionally derived from the complex ‘what on/about?’ and possibly ‘what for’ for *mağa*⁷.

- (39) a. **m-i=xf** tmnaqar-n? (Tarifit)
 WH-COMP=on argue-they
 ‘Why are they arguing?’
 ‘What are they arguing about?’
 b. tmanaqar-n x-tinƣašin.
 argued-they on-money
 ‘They are arguing about money.’

5. Dative arguments of nouns (possessors)

As indicated above, wh-clitic-doubling is found in contexts that involve the extraction of a dative argument of a noun (El Moujahid 1993). The relevant Tashelhiyt example is repeated in (40).

- (40) **m-a=mi** i-ħsa [tanddamt]? (Tashelhiyt)
 WH-COMP=WH_{DAT} he-learned [poetry]
 ‘Whose poetry does he know by heart?’ (El Moujahid 1993:394)

In his discussion of this context, El Moujahid (1993) points out that possessors can appear either in the dative form or the genitive form, as shown in (41a-b), but only the dative form can be extracted. This is arguably more evident in focus-constructions such as (42a-b). In view of the fact that Berber makes use of wh-Cliticisation for extraction, the inability of the genitive form of possessors to

⁷Carrying the deconstructionist approach to Berber wh-words to what may appear to be an absurd level, Tarifit *min* ‘who, what’ appears analysable into the wh-word *m*, the wh-Comp *i* and the semantically vacuous genitive preposition *n* ‘of’ arranged in the familiar pattern *wh-Comp=P*. This implies that the derivation of sentences such as (i), which involve extraction of a direct object, includes wh-Cliticisation of genitive P[wh] to C, with the wh-word in the initial position base-generated in Spec,C. If this reasoning is on the right track, the only context left where wh-Movement might apply is the one that involves subject-extraction (ii). However, although the Comp-complex in local subject-extraction contexts does not show an occurrence of P[wh], it is known to trigger anti-agreement, the implications of which are yet to be fully understood (El Hankari 2010, Ouali 2006, 2011, Ouhalla 1993, 2005).

- (i) **m-i=n** t-zra? (Tarifit)
 WH-COMP=of she-saw
 ‘Who/what did she see?’
 (ii) u-ig i-qqim-n diha?
 WH-COMP he/it-sit-PTCP there
 ‘Who is sitting there?’



extract can reasonably be thought of as a function of the fact that the language lacks genitive clitics (of the Romance type). The exclusive reliance on wh-Cliticisation for extraction also accounts for the absence of the DP-pied-piping strategy used by various languages for the extraction of possessors, including English (e.g. *Whose poetry does Brahim know by heart?*) on the reasonable view that pied-piping is an instance of wh-Movement.

- (41) a. i-ḥsa [tanddamt i-Sidi Ḥmmu]. (Tashelhiyt)
 he-learned [poetry to-Sidi Ḥmmu]
 'He knows Sidi Ḥmmu's poetry by heart.'
- b. i-ḥsa [tanddamt n-Sidi Ḥmmu].
 he-learned [poetry of-Sidi Ḥmmu]
 'He knows Sidi Ḥmmu's poetry by heart.' (El Moujahid 1993:395-6)
- (42) a. **i-Sidi Ḥmmu** a(d) i-ḥsa [tanddamt]. (Tashelhiyt)
 to-Sidi Ḥmmu COMP he-learn [poetry]
 'It is Sidi Ḥmmu's poetry he knows by heart.'
- b. ***n-Sidi Ḥmmu** a(d) i-ḥsa [tanddamt].
 Of-Sidi Ḥmmu COMP he-learn [poetry]
 'It's Sidi Ḥmmu's poetry he knows by heart.' (El Moujahid 1993:398-9)

Example (40) has the structure and derivation shown in (43), where the dative wh-clitic undergoes wh-Cliticisation from the possessor position inside DP to C though D (the escape hatch out of DP). Wh-Cliticisation through D is consistent with the fact that Berber lacks definite articles, although the question whether wh-Cliticisation out of DP operates through D needs closer examination than we are able to offer here.

- (43) [CP [wh] [C' C=[wh_{DAT}] [TP ... [VP learn [DP =~~wh~~_{DAT}] [NP poetry =~~wh~~_{DAT}]]...]

Sadiqi (1997:166-7) discusses another possession context that gives rise to wh-clitic-doubling, shown in (44). This context differs in that it involves possessors of inalienable nouns such as 'man' = 'husband.' The Tarifit equivalent is given in (45a) along with an example that includes a body-part noun (45b).

- (44) tamṭut [da=**mi** i-mmut wargaz] (Tamazight)
 woman [COMP=WH_{DAT} he-died man]
 'The woman whose husband died.' (Sadiqi 1997:166)
- (45) a. tamṭut [**i-m=mi** i-mmut wargaz] (Tarifit)
 woman [to-WH=WH_{DAT} he-died husband]
 'The woman whose husband died.'
- b. **i-m=mi** qss-n azakuk?
 to-WH=WH_{DAT} cut-they hair
 'Whose hair did they cut?'





rendition of the meaning of *mrz* is 'wound x's HEAD,' where the body-part noun is HEAD and the human victim of wounding is the possessor of HEAD. This suggests the lexical representation roughly shown in (51) modelled on the one in (50), which includes the understood body-part noun HEAD⁸.

(51) LCS *mrz*: [x WOUND HEAD y]

According to the analysis outlined in Guerssel (1986), the body-part component is lexically incorporated into the verb and consequently does not project as a syntactic constituent. A plausible slight variation on this analysis could exploit the mounting evidence for the presence in syntactic structures of silent nouns (Kayne 2005). According to this analysis, the verbs that take a single dative object project *v*P's of the form shown in (52), where the object includes a silent (body-part) noun that selects the 'dative object' as a possessor argument⁹.

(52) ... [_{VP} X [_{VP} [V WOUND] [_{DP} D [_{NP} [N HEAD] [y]_{DAT}]]]]...

Given (52), the context with verbs that select a single object in the dative form turns out to be a possession context on a par with the others discussed above. Focusing on the examples that involve the extraction of the dative object such as the wh-question (49d), they have the structure and derivation shown in (53).

(53) [_{CP} [wh] [_C C=[wh]_{DAT}] [_{TP} T [_{VP} v [_{VP} CUT [_{DP} ~~[wh]_{DAT}] [_{NP} [N THROAT] =[wh]_{DAT}]]]]]]...~~

⁸ Other instances of this class such as *qqs* 'sting', *qqd* 'burn' and *gms* 'cover' may involve the body-part noun BODY. This is indicated by the fact that *qqd* has the precise meaning of 'touching someone's body with a hot object such as a needle,' a method used in traditional healing.

⁹ Guerssel's (1986) analysis, which assumes lexical incorporation of an inalienable noun into the verb, is more suitable for other instances of such verbs such as Tarifit *sfunzar*, which has the meaning 'wound someone in the nose' or, more accurately, 'cause someone's nose to bleed.' The verb clearly incorporates the noun *anzar* 'nose' in addition to the causative prefix *s-* and the morpheme *f(u)-* the exact identity of which is unclear. The verb can be said to project the *v*P shown in (i), which differs in that the body-part noun is overt rather than silent. The dative object is a possessor of the body-part noun. The verb *mrz* too is likely to have the more precise meaning 'x CAUSE [BLEED [HEAD [y]_{DAT}]],' where the CAUSE component is abstract on a par with equally causative verbs with an abstract CAUSE such as *arz* 'break,' *qqn* 'close,' *arzm* 'open' (Guerssel 1986).

(i) ... [_{VP} X CAUSE [_{VP} [V BLEED] [_{DP} D [_{NP} [N NOSE] [y]_{DAT}]]]]...



Another *wh*-clitic-doubling context that, on closer inspection, turns out to involve hidden inalienable possession involves objects of locative prepositions such as the one in the Tarifit example (54). The latter is modelled on the Tashelhiyt example repeated in (55), reported in Dell & Elmedlaoui (1989) to require a resumptive pronoun in the object position of the locative preposition.

- (54) *urthu i-m=mi i-t-ttas swadday* (Tarifit)
fig.tree to-WH=WH_{DAT} he-sleeps under
'The fig tree he sleeps under.'
- (55) *aswik [m=mi i-ggan ddaqay-s]* (Tashelhiyt)
walnut [WH=WH_{DAT} he-sleeps under-it_{DAT}]
'The walnut tree he sleeps under.'

The background of Dell & Elmedlaoui's description is the fact, discussed above, that prepositions the object of which is extracted normally cliticise to C rather than take a resumptive pronoun. In view of this, the preposition in (55) and similar locative ones appear to be exceptions to this general pattern. However, Guerssel (1987) discusses numerous properties of these locative prepositions in Tamazight which show that they are nouns rather than prepositions. Ouhalla (1988:216-219) shows further that their Tarifit versions, repeated in (56a-d), include a morpheme in the initial position that corresponds to a light directional-locative preposition with the meaning 'by' seen in independent contexts such as (57a-b).

- (56) a. *s-wadday* 'under' (Tarifit)
b. *s-daraɕ* 'over/above'
c. *s-dixr* 'inside'
d. *z-dat* 'in front of'
- (57) a. *i-kka ss-a/ss-iha.*
he-passed by-here/by-there
'He passed by here/there.'
- b. *i-ffg s-uzir.*
he-left by-noon/day
'He left by noon/day.'

In view of the fact that the items in question are all locative, the combination of the properties mentioned points to a structure in line with more recent findings about locative prepositions across languages (see contributions to Cinque & Rizzi 2010). The structure is shown in (58) and takes the form of a PP headed by the locative-directional preposition 'by' that takes a DP-complement headed by a place noun, and where what appears superficially as the object of preposition is actually the dative possessor of the place noun. Variation on this underlying





structure revolves around whether locative-directional P is overt, as in Tarifit, or null, as in Tamazight and Tashelhit.

(58) [PP s 'by' [DP D [NP [N' *wadday* '(the) under' [DP =as] 'it_{DAT}'] ...

On this analysis, the extraction context in (54)-(55) turns out to be a possession context, where the operator-variable link corresponds to the possessor of the place noun. The derivation of the Tarifit version (54), which does not involve a resumptive pronoun, is as shown in (59).

(59) 'the tree' [CP [wh] [C C=[wh_{DAT}] [TP ... [VP sleep [PP P [DP [wh_{DAT}] [NP under [DP [wh_{DAT}]]]...]

The occurrence of the resumptive pronoun in the Tashelhiyt version (55) is part of a more general pattern in the Tashelhiyt dialect reported in Dell and Elmedlaoui (1989), which also includes examples such as the one repeated in (60). A full explanation requires delving into the broader issue of resumption relative to wh-Cliticisation and indexing, which we leave to future research¹⁰.

(60) ifrxan [m=mi zri-x tigmimi nn=sn]. (Tashelhiyt)
 boys [who=WH_{DAT} saw-I house of-them
 'The boys whose house I saw.' (Dell & Elmedlaoui 1989:184)

7. Conclusion

Wh-clitic-doubling is a manifestation of the involvement of wh-Cliticisation (to C) in the derivation of operator-variable links. Wh-Cliticisation applies in contexts where the operator is base-generated in its scope position and has the function of linking the operator to the variable it binds. Wh-Cliticisation is in complementary distribution with wh-Movement (to Spec,C), which applies in contexts where the operator is base-generated in the variable position, and where the operator-variable link is a function of wh-Movement. Wh-clitic-doubling and wh-Cliticisation amount to direct evidence for Cliticisation as an interpretive mechanism of Grammar that obviates the need for indexing (Chomsky 1995, Lebeaux 1983). They also amount to evidence for the conclusion in Kayne (1989) that Cliticisation is an instance of Head-Movement, more precisely, an instance of feature-based Head-Movement. Berber is a language where wh-operators are base-generated in their scope

¹⁰ For derivational accounts that reduce resumption to movement in Syntax or at LF, see Aoun and Benmamoun (1998), Aoun, Choueiri and Hornstein (2001) and Ouhalla (2001).





position, leading to a situation where it relies mostly, if not exclusively, on wh-cliticisation for extraction. This is reflected not only in contexts that involve the extraction of dative arguments (of verbs, nouns and prepositions), but also in various wh-words, which turn out to have a compositional form that includes an occurrence of a wh-clitic.

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