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Conjoint and disjoint verb forms in Tswana
and other Bantu languages

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1. Introduction

In the context of Bantu studies, a conjoint (henceforth: cj) verb form is a verb form that cannot be found in sentence final position, and cannot be separated from the following phrase by a pause.[2] A disjoint (henceforth: dj) verb form is a form that does not have this limitation, but is not excluded from non-final contexts either, and when in non-final sentence position, is not necessarily separated from the following word by a perceptible pause. Consequently, in the languages that have a distinction between cj and dj verb forms, they contrast in non-final contexts, but not in final position.

The distribution characteristic for cj and dj forms restricts the possible hypotheses about the function of the choice between cj and dj forms. In particular, the possibility of diachronic relationships between the cj/dj distinction and the expression of TAM is not excluded, but synchronically, TAM distinctions cannot be considered as meanings plausibly involved in the choice between cj and dj forms, since it is difficult to imagine a system in which TAM distinctions would be neutralized in the absence of any phrase in post-verbal position. Similarly, dj forms may have a diachronic relationship with the expression of verb focalization – see Section 10, but synchronically, if verb focalization was the intrinsic meaning of dj forms, they should contrast with non-focalizing forms in final position too.[3]

In Tswana (alias Setswana – Bantu S 31), the existence of a cj/dj distinction is obvious in one tense only, the present positive, but a functionally identical distinction does exist in many other tenses. The point is that in the present positive, the distinction is made apparent by the presence vs. absence of the dj marker *a* |a| immediately after the subject index, whereas in all

[1] This version has benefited from Larry Hyman's and Jenneke Van der Vaal's comments on a previous version, and from my discussions with Irina Monich about the paper she presented at the 5th International Conference on Bantu Languages (Monich (2013)).
[2] As pointed out to me by Larry Hyman, this formulation may be problematic in some languages for sentences ending with a relative clause. This is however not the case in Tswana, since Tswana has special relative verb forms with no cj/dj distinction.
[3] Throughout this paper, the term 'focus' is taken in its narrow meaning, not to be confused with a much broader meaning also referred to as 'focus' by some authors, but for which the term 'comment' is used here.

the other tenses in which a dj form must be distinguished from a cj form, the distinction has no segmental manifestation, and is manifested only in tone.

The main aim of this paper is to provide a precise description of the morphological distinction between cj and dj verb forms in Tswana and of its function, in order to make it possible to discuss the following two questions, which will be addressed in Sections 9 and 10:

- To what extent is the distinction between cj and dj verb forms in Tswana functionally similar to the cj/dj distinction found in other Bantu languages?
- Does the available data about the cj/dj distinction in Tswana and other Bantu languages make it possible to put forward a hypothesis about the way this distinction developed in the history of Bantu languages?

The situation of Tswana is in some respects quite puzzling. Functionally, the cj/dj distinction in Tswana is straightforward, in the sense that in all the tenses that have this distinction, there is not the slightest variation in the way it is conditioned, or in its function. But the distinction exists in some tenses only, and there seems to be no feature (either morphological or semantic) common to the tenses that have this distinction, and only to them. In other words, the division of tenses into those that have this distinction and those that do not have it is synchronically arbitrary, and calls for a historical explanation.

Moreover, the functional homogeneity of this distinction across the tenses that have it sharply contrasts with its extreme morphological heterogeneity. The cj/dj distinction has a segmental mark in one tense only. In all the other tenses that have this distinction, it is purely tonal, and its tonal manifestations show no homogeneity. In one tense, the distinction affects the whole tonal contour of the verb stem, and is therefore uncontroversial, whereas in the others, its manifestations are limited to the last syllable of verb forms, which raises the problem of a possible relationship with the tonal processes affecting the syllables that immediately precede a pause.

What is particularly puzzling is that the tonal processes that in some tenses characterize the dj form may be very similar to those characterizing the cj form in other tenses, and vice-versa.

In this paper, I would also like to clear up any misunderstandings or errors of interpretation about the way I presented the cj/dj distinction in my previous publications on Tswana. The point is that, when I started working on this question more than twenty years ago, no satisfying account of the function of the cj/dj distinction in any Bantu language was available. Consequently, in arguing in favor of the recognition of the distinction between the cj and dj forms of Tswana verbs as expressing distinctions in information structure, in the absence of any reference to previous descriptions of more or less similar systems, I used formulations that can be considered ambiguous now, and I did not discuss questions whose importance for a precise account of the cj/dj distinction is obvious now.

Crucially, recent works dealing with the cj/dj distinction in a cross-linguistic perspective (in particular, Jenneke Van der Wal's works) have pointed to cross-linguistic variation in its possible functions, and I would like to clarify the situation of Tswana in this respect.

This paper is based on the same data as my previous publications dealing directly or indirectly with the cj/dj distinction in Tswana, and the analysis has not been radically modified, but the tonal morphology of verbs is presented in this paper within a framework that greatly simplifies the analysis, and the discussion of the function of the cj/dj distinction is couched in such a way as to facilitate the recognition of commonalities and contrasts between

the system of Tswana and the other systems dealt with in the recent literature about cj and dj verb forms in Bantu.

The paper is organized as follows. Section 2 provides basic information about information packaging in Tswana. Section 3 describes the cj/dj distinction in the present positive (the only tense in which the distinction is marked segmentally in Tswana) and analyzes its function. Section 4 shows that the same functional distinction is found in other tenses in which it has a purely tonal manifestation. Section 5 gives the inventory of the synthetic inflected forms of Tswana verbs and describes their morphological structure. Section 6 puts forward a system of rules accounting for the tonal contours of Tswana verb forms. Sections 7 systematically compares the tonal behavior of Tswana verb forms in contexts selecting cj forms with that of the corresponding forms in contexts selecting dj forms. Section 8 discusses the possible correspondences between the tonal patterns of cj and dj forms. Section 9 is about the cj/dj distinction in the other Bantu languages in which this type of distinction has been identified, and Section 10 discusses a possible scenario for the emergence of cj/dj distinctions in Sotho-Tswana and other Bantu languages.

2. The basics of information packaging in Tswana

2.1. The syntactic role of subject and the discourse role of topic

Tswana is characterized by a straightforward correspondence between the constituent structure of the clause and the articulation between topic (what the clause is about) and comment. Subjects can only be interpreted as topics, as evidenced by the fact that interrogative words (such as *mang* [máŋ́] 'who?') and negative words (such as *ope* [úpɛ́] 'nobody') cannot fulfill the subject function.[4] This syntactic restriction must be viewed as a mere consequence of the inability of such words to be interpreted as 'what the clause is about'. When a speaker wants to assign them a semantic role normally assigned in subject position, the only available options with negative words are an inversion construction (with intransitive verbs), or a passive construction (with transitive verbs).[5] With interrogative words, a cleft construction can be used too. In the cleft construction, the interrogative word is the complement of *ke* [kí] 'it is'. In the inversion construction as well as in the passive construction, the interrogative or negative word is included in the verb phrase and loses the control of verb agreement: in the passive construction, verb agreement is governed by a promoted object, and in the inversion construction, there is no subject, and the morphological slot for SIs is filled by and expletive SI of class 17.[6]

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[4] Tswana words are quoted with a phonetic transcription of their pronunciation in contexts that trigger the application of no post-lexical tone rule, i.e., a pronunciation that reflects their underlying structure as directly as possible. This quotation form is different from the transcription of their pronunciation in isolation, which can be deduced from this quotation form by applying the rule of prepausal penultimate lengthening and a tonal rule that converts H H and H L sequences immediately followed by a pause into HL L, resulting in the neutralization of the distinction between final H H and H L sequences. For example, the pronunciation of *mang* [máŋ́] 'who?' and *ope* [úpɛ́] 'nobody' in isolation is [mâːŋ̀] and [ûːpɛ̀], but [máŋ́] and [úpɛ́] in non-prepausal contexts.

[5] On the inversion construction of Tswana, see Creissels (2011).

[6] All the examples are given with their usual notation in current Tswana orthography, and with a phonetic transcription reflecting the pronunciation of a native speaker of the Ngwaketse dialect. The phonetic transcription reflects the penultimate lengthening that automatically occurs in Tswana

(1) a. *Basadi ba apaya seswaa.*
'The women are cooking the seswaa.'
bà-sádí ˈbá-ápáj-à sì-swà:á
CL2-woman CL2-cook-FV(CJ) CL7-seswaa

b. **Mang o apaya seswaa?*
Intended: 'Who is cooking the seswaa?'

c. *Seswaa se apewa ke mang?*
'Who is cooking the seswaa?' lit. 'The seswaa is being cooked by whom?'
sì-swàá ˈsí-ápɛ́-w-à kí ˈmâ:ŋ̀
CL7-seswaa CL7-cook-PSV-FV(CJ) by who

d. *Ke mang o apayang seswaa?*
'Who is cooking the seswaa?' lit. 'It is who that is cooking the seswaa?'
kí ˈmáŋ́ ˈó-ápáy-à-ŋ́ sí-swà:á
it_is who CL1-cook-FV-REL CL7-seswaa

e. **Ope o apae seswaa. / *Ope ga a apae seswaa.*
Intended: 'Nobody is cooking the seswaa.'

f. *Seswaa ge se apewe ke ope.*
'Nobody is cooking the seswaa.' lit. 'The seswaa is not being cooked by nobody.'
sì-swàá χà-sí-àpé-w-í kí ˈô:-pɛ̀
CL7-seswaa NEG-CL7-cook-PSV-FV(CJ) by CL1-none

(2) a. *Basadi ba opela mo kerekeng.*
'The women are singing in the church.'
bà-sádí ˈbá-ɔ́pɛ́l-à mó kérèkê:-ŋ̀
CL2-woman CL2-sing-FV(CJ) there (CL9)church-LOC

b. **Mang o opela mo kerekeng?*
Intended: 'Who is singing in the church?'

c. *Go opela mang mo kerekeng?*
'Who is singing in the church?' lit. 'There sings who in the church?'
χó-ɔ́pɛ́l-à máŋ́ ˈmó kérèkê:-ŋ̀
CL17-sing-FV(CJ) who there (CL9)church-LOC

d. *Ke mang o opelang mo kerekeng?*
'Who is singing in the church?' lit. 'It is who that is singing in the church?'
kí ˈmáŋ́ ˈó-ɔ́pɛ́l-à-ŋ́ ˈmó kérèkê:-ŋ̀
it_is who CL1-sing-FV-REL there (CL9)church-LOC

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before a pause, as well as the falling realization characteristic of H-toned syllables undergoing the rule of penultimate lengthening.

e. **Ope o opela mo kerekeng. / *Ope ga a opele mo kerekeng.*
Intended: 'Nobody is singing in the church'

f. *Ga go opele ope mo kerekeng.*
'Nobody is singing in the church' lit. 'There doesn't sing nobody in the church.'
χà-χó-ópél-í ˈó-pé ˈmó kérèkêː-ŋ̀.
NEG-CL17-sing-FV(CJ) CL1-none there (CL9)church-LOC

2.2. The discourse status of participants represented by SIs or OIs

In Tswana, subjects of verb forms other than the infinitive and the imperative are obligatorily represented by a SI, either alone or coreferent with a noun phrase. Tswana verb forms can also include one, two or three OIs. Apart from relative clauses, in which object relativization requires the uses of a resumptive OI, OIs are never obligatory, and the use of an OI is always motivated by the desire to present the participant it refers to as a topic. No semantic type of object noun phrase requires the presence of a coreferent OI. Even with speech act participants, the use of a free pronoun in object role does not necessarily trigger the presence of the corresponding OI, and the choice marks a difference in information structure, as made explicit by means of non-idomatic translations in Ex. (3). Note that, when an OI and a free pronoun are used simultaneously, the free pronoun is interpreted as a topic or antitopic in dislocated position which adds some emphasis without changing the basic information structure expressed by the construction with just an OI.

(3) a. *Ke a go rata.*
'Towards you, I'm experiencing a feeling of love.'
kì-à-χò-râːt-à
1SG-DJ-2SG-love-FV

b. *Ke rata wena.*
'I'm experiencing a feeling of love directed towards you.'
kì-rát-á wèːná
1SG-love-FV(CJ) 2SG

c. *Wena ke a go rata.*
'As regards you, I love you.'
wènà kí-à-χò-râːt-à
2SG 1SG-DJ-2SG-love-FV

d. *Ke a go rata wena.*
'I love you, as regards you.'
kì-à-χò-rát-á wèːná
1SG-DJ-2SG-love-FV 2SG

To summarize, in Tswana, core arguments (subjects and objects) are indexed if and only if they fulfill the function of topic in the topic / comment articulation. The obligatory indexing of subjects is not contradictory with this rule, since subjects are necessarily topics.

2.3. The question of a possible immediate-after-verb focus position in Tswana

Some Bantu languages that have a cj/dj distinction also have an immediate after verb (henceforth IAV) focus position, and in those languages, the use of a cj verb form signals that the phrase following the verb occupies this position, whereas dj forms are used whenever the IAV focus position remains empty (see Section 9). Before analyzing the function of the cj/dj distinction, it is therefore important to establish whether Tswana has an IAV focus position or not. A distinction must be made between assertive and interrogative clauses.

2.3.1. Lack of an IAV focus position in assertive clauses

When analyzing sentences with a single phrase following a cj verb form, one may get the impression that the phrase in post-verbal position is focalized. However, such cases must be analyzed as involving pragmatic focus effects in a construction that is not by itself a focalizing construction. The consideration of sentences with more than one phrase in post-verbal position shows that it would not be correct to analyze Tswana as a language with an IAV focus position.

In assertive clauses, Tswana has a very rigid linear order of objects and adjuncts: objects precede adjuncts, the relative order of objects depends on Animacy Hierarchy, and any violation of these rules results in agrammaticality, as illustrated by Ex. (4).

(4) a. *Ke tlaa fa Kitso madi kamoso.*
'I will give the money to Kitso tomorrow.
kì-tɬàà-f-á ˈkítsɔ́ mà-dí kámɔ̀ːsɔ́
1SG-FUT-give-FV(CJ) (CL1)Kitso CL6-money tomorrow

b. **Ke tlaa fa madi Kitso kamoso.*

c. **Ke tlaa fa kamoso Kitso madi.*

The relative order of the phrases in post-verbal position in (4a) can only be modified by introducing OIs in the verb form, as in (5), but as explained above, this expresses the topicalization of the participant represented by an OI, and does not necessarily imply the focalization of another element of the construction.

(5) a. *Ke tlaa mpha madi kamoso, Kitso.*
'I will give him the money tomorrow, Kitso that is.'
kì-tɬàà-m̀-pʰ-á mà-dí kámɔ̀sɔ́ ˈkîːtsɔ̀.
1SG-FUT-CL1-give-FV(CJ) CL6-money tomorrow (CL1)Kitso

b. *Ke tlaa a mpha kamoso, Kitso, madi.*
'I will give it to him tomorrow, Kitso, the money.'

kì-tɬàà-á-m̀-pʰ-á	kámɔ̀sɔ́	ˈkítsɔ́	mà:-dí.
1SG-FUT-CL6-CL1-give-FV(CJ)	tomorrow	(CL1)Kitso	CL6-money

The fact that the linear order of the phrases in post-verbal position in Tswana assertive clauses is quite rigid, the only possible apparent modifications implying the right-dislocation of a term in antitopic function, is incompatible with the recognition of an IAV focus position. In Tswana assertive clauses, the only possible focalizing strategy is the use of a cleft construction in which the focalized phrase is the complement of ke [kí] 'it is', and the verb is in the relative form – Ex. (6).

(6) a. *Ke madi ke tlaa a fang Kitso kamoso.*
'It is money that I will give Kitso tomorrow.'

kí	mà-dí	ˈkí-tɬáà-á-f-à-ŋ́	ˈkítsɔ́	kámɔ̀:sɔ́
it_is	CL6-money	1SG-FUT-CL6-give-FV-REL	(CL1)Kitso	tomorrow

b. *Ke Kitso ke tlaa mphang madi kamoso.*
It is Kitso to whom I will give money tomorrow

kí	ˈkítsɔ́	ˈkí-tɬáá-m̀-pʰ-á-ŋ́	mà-dí	kámɔ̀:sɔ́
it_is	(CL1)Kitso	1SG-FUT-CL1-give-FV-REL	CL6-money	tomorrow

2.3.2. Possible vestiges of an IAV position in interrogative clauses

In Tswana, the position of interrogative words is not necessarily identical to that of the corresponding phrases in assertive clauses. As illustrated by Ex. (7), even if this is not a strict rule, interrogative words tend to be placed immediately after the verb, even if they question a constituent that cannot occur in this position in the corresponding assertive clause.

(7) a. *Ò tlaa fa eng Kitso kamoso?*
'What will you give Kitso tomorrow?'

ò-tɬàà-f-á	ìŋ́	ˈkítsɔ́	kámɔ̀:sɔ́
2SG-FUT-give-FV(CJ)	what	(CL1)Kitso	tomorrow

b. *Ò tlaa fa leng Kitso madi?*
'When will you give the money to Kitso?'

ò-tɬàà-f-á	ˈlíŋ́	ˈkítsɔ́	mà:-dí
2SG-FUT-give-FV(CJ)	when	(CL1)Kitso	CL6-money

Given that, in languages that have a special focus position, it is common that interrogative words obligatorily occur in this position, a possible interpretation of this particularity of interrogative words is that it constitutes a vestige of a former system in which Tswana had an IAV focus position.

3. The cj/dj distinction in the present positive and its function

3.1. First observations

In Tswana, the present positive is the only tense in which the cj/dj distinction is marked segmentally, and is therefore always apparent (since when the distinction is purely tonal, there are always contexts in which lexical or post-lexical tonal processes neutralize it). It is consequently easier to analyze the function of the cj/dj distinction in the present positive before checking the existence of an identical distinction (or lack thereof) in other tenses.

The dj form of the present positive is marked by *a* |a| (glossed DJ) inserted immediately after the SI, whereas the cj form has no specific segmental marking. In addition to that, there is a tonal distinction which is not apparent in Ex. (8) but manifests itself in Ex. (9).

(8) a. *Dikgomo di a fula.*
'The cows graze, the cows are grazing.'
dì-qʰòmɔ́ ˈdí-á-fûːl-à
CL10-cow CL10-DJ-graze-FV

b. *Dikgomo di fula kwa nokeng.*
The cows graze at the river, the cows are grazing at the river.'
dì-qʰòmɔ́ ˈdí-fúl-à kwá nɔ̀kêː-ŋ̀
CL10-cow CL10-graze-FV(CJ) there (CL9)river-LOC

The contexts illustrated in Ex. (9), which can conveniently be used as a diagnostic for recognizing the tenses in which a similar distinction is found, show that in some (at least apparently) non-final contexts, the dj form is not only possible, but sometimes even obligatory. When the verb is followed by the additive proclitic *le* |lí| 'and, also, even, with',

– if *le* interpreted as 'too' introduces a pronoun resuming the subject, the verb is obligatorily in the dj form;
– if *le* interpreted as 'with' introduces a noun phrase in the role of comitative adjunct, the verb is normally in the cj form.

(9) a. *Ke a bereka le nna.* / **Ke bereka le nna.*
'I too work / am working.'
kì-à-bɛ́rɛ́k-á lí-ǹːná
1SG-DJ-work-FV ADD-1SG

b. *Ke bereka le ene.*
'I work / am working with him/her.'
kì-bɛ́rɛ́k-à lí-ɛ̀ːnɛ́
1SG-work-FV(CJ) ADD-CL1

When the dj form of the present positive occurs in non-final position and is not separated from the following phrase by a pause, as in (9a), it becomes apparent that, in addition to the presence vs. absence of the dj marker *a*, the distinction also puts into play a tonal distinction

that was not apparent in (8) because of a post-lexical tone rule that converts H H and H L sequences into HL L when they immediately precede a pause.

This is unquestionably a phenomenon that has nothing to do with intonation, and must be analyzed as reflecting distinctions in the tonal structure of verb forms. The point is that an analysis according to which the dj form would simply retain a typically prepausal tonal contour, even when not followed by a perceptible pause, is ruled out by the mere fact that, in this context, it is the *cj* form that shows a ... H L contour, i.e., a contour very similar to the ... HL L type found in prepausal position, whereas the dj form shows a ... H H contour, i.e., a contour that cannot be found in prepausal position.

3.2. Cj/dj and argument structure

The distinction between objects and adjuncts plays no role in the choice between dj and cj forms of Tswana verbs. As illustrated by examples (10) to (13), in clauses with just one phrase in post-verbal position, cj forms are equally usual if the verb is followed by an object or by various semantic types of adjuncts.

(10) a. *Ke reka kgomo.*
'I buy / am buying a cow.'
kì-rɛ́k-á qʰò:mó
1SG-buy-FV(CJ) (CL9)cow

b. *Ke e reka jaanong.*
'I am buying it (the cow) right now.'
kì-í-rɛ́k-à dʒáànô:ŋ̀
1SG-CL9-buy-FV(CJ) now

(11) a. *Ke bereka thata.*
'I work a lot.'
kì-bɛ́rɛ́k-à tʰâ:tà
1SG-work-FV(CJ) much

b. *Ke berekela Kitso.*
'I am working for Kitso.'
kì-bɛ́rɛ́k-ɛ́l-à kî:tsɔ̀
1SG-work-APPL-FV(CJ) (CL1)Kitso

c. *Ke mmerekela malatsi otlhe.*
'I work for him/her every day.'
kì-m̀-mɛ́rɛ́k-ɛ́l-à mà-làtsí ˈô:tɬʰè
1SG-CL1-work-APPL-FV(CJ) CL6-day (CL1)all

(12) a. *Ke kwala lokwalo.*
'I am writing a letter.'
kì-kwál-á lɔ̀-kwâ:lɔ̀
1SG-write-FV(CJ) CL11-letter

b. *Ke lo kwala ka pene.*
'I am writing it with a pen.'
kì-ló-kwál-à ká ˈpê:nɛ̀
1SG-CL11-write-FV(CJ) with (CL9)pen

(13) a. *Ke itse Kitso.*[7]
'I know Kitso.'
kì-íts-í ˈkî:tsɔ̀
1SG-know-FV(CJ) (CL1)Kitso

b. *Ke gò itse sentle.*
'I know you(sg) well.'
kì-χɔ̀-íts-í sí-ǹ:tɬɛ̀
1SG-2SG-know-FV(CJ) CL7-good

3.3. Cj/dj, information structure and constituency

3.3.1. Introductory remarks

We already know that, in Tswana, the distinction between objects and adjuncts is not relevant to the choice between cj and dj forms, and that the use of the cj form cannot be bound to the presence of a focalized phrase in IAV position either, since the structure of Tswana assertive clauses does not include an IAV focus position.

In this Section, I discuss evidence that the choice between cj and dj forms is straightforwardly determined by the distinction between phrases in post-verbal position that enrich or make more precise the comment expressed by the verb, and phrases in post-verbal position that do not contribute to the commment and fulfill the discourse function of afterthought (alias antitopic):

– the dj form is used whenever the comment / verb phrase includes no other element than the verb itself (which implies that a dj verb form can only be followed by extraposed phrases that do not form part of the comment);
– the cj form is used whenever the comment / verb phrase includes at least one element other than the verb itself (which implies that a cj verb form is followed by at least one phrase forming part of the comment, since the verb phrase is strictly head-initial).

3.3.2. Verbs followed by a noun phrase in object role

When the verb is followed by just one noun phrase in object role, it is particularly obvious that the cj form does not indicate that the object phrase is focalized, but simply that it is included in the verb phrase (and therefore forms part of the comment expressed by the verb phrase), whereas the dj form indicates that the object phrase is extraposed and fulfills the discourse function of afterthought (alias antitopic). The crucial observations are that, (a) in

[7] *Itse* [ítsí] takes a final vowel *e* [ɪ] in the forms in which the final vowel for regular verbs is a [*a*], but is perfectly regular in other respects.

this context, the presence of a coreferent OI is impossible with the cj form, but obligatory with the dj form, and (b) a pause can optionally separate the dj form from the following phrase without changing anything in the interpretation of the sentence.

(14) a. *Re thusa Kitso.*
'We help / are helping Kitso.'
rì-tʰús-á ˈkî:tsɔ̀
1PL-help-FV(CJ) (CL1)Kitso

b. *Re a mo thusa(,) Kitso.*
'We help / are helping him, Kitso that is.'
rì-à-mɔ̀-tʰús-á ˈkî:tsɔ̀ (no pause between *thusa* and *Kitso*)
~ rì-à-mɔ̀-tʰû:s-à kî:tsɔ̀ (with a pause between *thusa* and *Kitso*)
1PL-DJ-CL1-help-FV (CL1)Kitso

c. **Re mo thusa Kitso.*
*rì-mɔ̀-tʰús-á ˈkî:tsɔ̀
1PL-CL1-help-FV(CJ) (CL1)Kitso

d. **Re a thusa Kitso.*
*rì-à-tʰús-á ˈkî:tsɔ̀
1PL-DJ-help-FV (CL1)Kitso

Note that cj forms including an OI are agrammatical if the phrase in post-verbal position is coreferent with the OI (since the presence of the OI implies that the coreferent phrase does not form part of the comment), but are grammatical if the verb is followed by an adjunct forming part of the comment, as in (15).

(15) *Re mo thusa ka madi.*
'We help him financially.'
rì-mɔ̀-tʰús-à ká mà:-dí
1PL-CL1-help-FV(CJ) with CL6-money

3.3.3. Verbs followed by adjuncts

When verbs are followed by adjuncts, the use of a dj form is equivalent to the presence of a pause signaling that the phrase following the verb fulfills the discourse function of afterthought. A first difference with the case of objects is that the choice of a dj form is not redundant with another mechanism carrying the same information, such as the insertion of an OI in the case of objects. Another difference is that, *a priori*, objects can always be conceived as forming part of the comment or as afterthoughts, whereas different semantic types of adjuncts behave differently in this respect.

As illustrated by Ex. (16), adjuncts that can easily move to the left edge of the sentence (where they fulfill the role of framing topic) are also commonly found immediately after verbs in the dj form, in the role of afterthought.

(16) a. *Kitso o boa gompieno.*
'Kitso is coming back today.' ('today' forms part of the comment)
kítsɔ́ ˈó-bó-à χóm̀píè:nó
(CL1)Kitso CL1-come_back-FV(CJ) today

b. *Gompieno Kitso o a boa.*
'Today Kitso is coming back.' ('today' fulfills the role of framing topic)
χóm̀píènó ˈkítsɔ́ ó-à-bô:-à
today (CL1)Kitso CL1-DJ-come_back-FV

c. *Kitso o a boa gompieno.*
'Kitso is coming back, today.' ('today' fulfills the role of afterthought)
kítsɔ́ ó-à-bó-á χóm̀píè:nó
(CL1)Kitso CL1-DJ-come_back-FV today

By contrast, adverbs such as *thata* [tʰátá] 'much, very' or *sentle* [sì̀ntɬɛ̀] 'well', which cannot be topicalized and can only be interpreted as restricting the meaning of the verb, can only be preceded by a cj form – Ex. (17).

(17) a. *Lorato o bua thata.*
'Lorato speaks much.'
lòrátɔ́ ˈó-bú-à tʰâ:tà
(CL1)Lorato CL1-speak-FV(CJ) much

b. **Lorato o a bua thata.*

c. *Lorato o bina sentle.*
'Lorato dances well.'
lòrátɔ́ ˈó-bín-á sí-ǹ:tɬɛ̀
(CL1)Lorato CL1-dance-FV(CJ) CL7-good

d. **Lorato o a bina sentle.*

3.3.4. Verbs followed by a le*-phrase*

We now turn to the contrast already mentioned in Ex. (9), repeated here as (18).

(18) a. *Ke a bereka le nna.* / **Ke bereka le nna.*
'I too work / am working.'
kì-à-bɛ́rɛ́k-á lí-ǹ:ná
1SG-DJ-work-FV ADD-1SG

b. *Ke bereka le ene.*
'I work / am working with him/her.'
kì-bɛ́rɛ́k-à lí-è:né
1SG-work-FV(CJ) ADD-CL1

This contrast is a consequence of the polysemy of the additive proclitic *le*, which can co-ordinate nouns, as in (19), introduce comitative adjuncts, as in (20), or mark a parallel between the participant to which the noun phrase or preposition phrase it precedes refers and a participant in another event already mentioned (or retrievable from the context), as in (21).

(19) a. *Mpho le Kitso ba a bereka.*
'Mpho and Kitso work / are working.'
m̀pʰɔ́ ˈlí-kítsɔ́ bá-à-bɛ́rɛ̂ːk-à
(CL1)Mpho ADD-(CL1)Kitso 1SG-DJ-work-FV

b. *Ke bonye Mpho le Kitso kwa Gaborone.*
'I saw Mpho and Kitso in Gaborone.'
kì-bóɲ-í m̀pʰɔ́ ˈlí-kítsɔ́ kwá χàbórôːnì
1SG-work.PRF-FV(CJ) (CL1)Mpho ADD-(CL1)Kitso there Gaborone

(20) *Mpho o tlaa bereka le Kitso.*
'Mpho will work with Kitso.'
m̀pʰɔ́ ˈɔ́-tɬáà-bɛ́rɛ́k-à lí-kîːtsɔ̀
(CL1)Mpho CL1-FUT-work-FV(CJ) ADD-(CL1)Kitso

(21) a. *Le Kitso o a bereka.*
'Kitso too works, Kitso too is working.'
lí-kítsɔ́ ɔ́-à-bɛ́rɛ̂ːk-à
ADD-(CL1)Kitso CL1-DJ-work-FV

b. *Ke bonye le Kitso kwa Gaborone.*
'I also saw Kitso in Gaborone.'
kì-bóɲ-ì lí-kítsɔ́ kwá χàbórôːnì
1SG-work.PRF-FV(CJ) ADD-(CL1)Kitso there Gaborone

Comitative adjuncts are typically used as restrictive modifiers of the verb, and in Tswana, the topicalization of a comitative adjunct is quite unusual (if not completely agrammatical), which explains why *le* introducing a comitative adjunct is normally preceded by a cj verb form. By contrast, *le* marking a parallelism with a participant in another event ('too') allows for a construction in which the sentence ends with a phrase '*le* + pronoun co-referent with a SI or OI', as in (22). As can be expected from the general rule, if such a phrase immediately follows the verb, the dj form must be used, since the *le*-phrase resumes a participant represented by a SI or OI, and therefore necessarily interpreted as a topic.

(22) a. *Kitso o a bereka le ene.*
'Kitso too works.' litt. 'Kitso works, he too.'
kítsɔ́ ɔ́-à-bɛ́rɛ́k-á lí-ɛ̀ːnɛ́
(CL1)Kitso CL1-DJ-work-FV ADD-CL1

b. *Ke a mo dumedisa le ene.*

‘I am greeting him too.’ lit. ‘I am greeting him, he too.’
kì-à-mò-dùmèdìs-à lí-è:né
1SG-DJ-CL1-FV ADD-CL1

In cases when the *le*-phrase in postverbal position can equally be interpreted as introducing a new participant or as coreferent with a SI or OI (which is the case when *le* introduces a 3rd person pronoun of the same class as a SI or OI), the choice between a cj or dj verb form is the only clue to the distinction between *le* ‘with’ and *le* ‘too’ – Ex. (23).

(23) a. *Kitso o a bereka le ene.*
‘Kitso too works.’ litt. ‘Kitso works, he too.’
kítsɔ́ ɔ́-à-bɛ́rɛ́k-á lí-è:nɛ́
(CL1)Kitso CL1-DJ-work-FV ADD-CL1

b. *Kitso o bereka le ene.*
‘Kitso works with him/her.’
kítsɔ́ ˈɔ́-bɛ́rɛ́k-à lí-è:nɛ́
(CL1)Kitso CL1-work-FV(CJ) ADD-CL1

3.3.5. Verbs followed by -otlhe *‘all’ referring to the subject*

At first sight, the construction illustrated by Ex. (24b) may seem to contradict the rule illustrated by Ex. (24a), since in (24b), a cj verb form is followed by a word including a prefix that resumes the SI.

(24) a. *Re a bereka le rona.*
‘We too work, we too are working.’
rì-à-bérɛ́k-á lí-rɔ̀:ná
1PL-DJ-work-FV ADD-1PL

b. *Re bereka rotlhe.*
‘We all work, we all are working.’
rì-bɛ́rɛ́k-à r-ô:tɬʰè
1PL-work-FV(CJ) 1PL-all

There is however a subtle distinction. In (24a), *le rona* [lí-rɔ̀ná] ‘we too’ adds nothing to the involvement of the group of persons designated as ‘we’ in the event denoted by the verb. Crucially, (24a) allows for an interpretation according to which some members of the group of individuals designated as ‘we’ may not work, whereas such an interpretation is not available with (24b). Consequently, *rotlhe* [rótɬʰé] ‘all of us’ must be analyzed as contributing to the comment about the topic ‘we’.

3.3.6. Cj/dj *and the inversion construction*

The inversion construction of Tswana is analyzed in Creissels (2011). This construction, in which the verb includes an invariable (and non-referential) SI of class 17 instead of the SI of

the class to which the inverted subject belongs, provides further evidence of the pragmatic conditioning of the cj/dj distinction, in connection with the topical status of participants represented by SIs or OIs. Ex. (25) illustrates the distinction between post-verbal subjects in an inversion construction expressing information packaging of the 'thetic' type, and post-verbal subjects fulfilling the discourse function of afterthought.

(25) a. *Go bereka Kitso.*
lit. 'There works Kitso.'
χó-bɛ́rɛ́k-á ˈkî:tsɔ̀
CL17-work-FV(CJ) (CL1)Kitso

b. **Go a bereka Kitso.*

c. *O a bereka Kitso.*
'He works, Kitso that is.'
ó-à-bɛ́rɛ́k-á ˈkî:tsɔ̀
CL1-DJ-work-FV (CL1)Kitso

d. **O bereka Kitso.*

In (25a), the de-topicalized subject (which loses the control of verb agreement) is included in the verb phrase, and consequently, the use of a dj verb form would be agrammatical. By contrast, in (25c), the agreement between the verb and the postverbal subject implies that the subject fulfills the discourse function of afterthought, and therefore a cj verb form would be agrammatical.

3.3.7. Conclusion of section 3.3: information structure or constituency?

Buell (2007) analyzes the situation of Zulu, which is very similar to that of Tswana with respect to the distribution of cf and dj verb forms. He asks the question: 'focus or constituency?', and concludes that, since the relevant notion is not focus, it can only be constituency, which may suggest that the conditioning of the cj/dj alternation in languages such as Zulu or Tswana has no direct link with information structure, and must be analyzed in strictly syntactic terms. However, since we are dealing with languages characterized by a straightforward isomorphism between the morphosyntactic *subject-verb phrase* articulation and the *topic-comment* articulation, opposing an explanation based on the delimitation of the verb phrase to an explanation based on the discourse function of the phrase in post-verbal position does not make much sense, and Buell (2007) does not support his claim by showing that an analysis exclusively based on explicitly defined and consistently applied constituency tests might explain aspects of the distribution of cj and dj forms contradicting the treatment proposed here. Consequently, one may argue that an analysis in which morphosyntactic phenomena are viewed as reflecting distinctions in information packaging is not only equivalent, but also more interesting, because of the direct insights it provides into the nature of the cj/dj distinction.

4. The cj/dj distinction in other tenses

4.1. Introductory remarks

In the tenses other than the present positive, either there is no cj/dj distinction, or it is purely tonal. When the cj/dj distinction relies on tone, it may be blurred by tonal rules with a purely phonological conditioning that lead to the neutralization of the distinction in some contexts. But once the neutralizing contexts are distinguished form those in which the distinction can manifest itself, it is not difficult to establish that the two tonal variants of the tenses that mark the cj/dj distinction tonally have exactly the same distribution as the two variants of the present positive analyzed in Section 4, and carry exactly the same implications for information structure.

Among the tenses in which the distinction relies on tone, the perfect positive is the only one in which its manifestations are not limited to the tone of the last syllable of the verb.

4.2. The cj/dj distinction in the perfect positive

As illustrated by Ex. (26) & (27), in the perfect positive, a tonal distinction manifested in the tonal contour of the whole stem interacts with *le*-phrases in post-verbal position exactly like the distinction between the forms of the present positive with and without the dj marker.

(26) a. *Ba berekile le bone.*
'They too have worked.'
bá-bèrék-íl-è lí-bɔ̀ːnɛ́
CL2-work-PRF-FV(DJ) ADD-CL2

b. *Ba berekile le bone.*
'They have worked with them.'
bá-bérék-íl-è lí-bɔ̀ːnɛ́
CL2-work-PRF-FV(CJ) ADD-CL2

(27) a. *Ke tsamaile le nna.*
'I too have gone.'
kì-tsàmà-ìl-è lí-ǹːná
1SG-go-PRF-FV(DJ) ADD-1SG

b. *Ke tsamaile le bone.*
'I have gone with them.'
kì-tsàmá-íl-è lí-bɔ̀ːnɛ́
1SG-go-PRF-FV(CJ) ADD-CL2

More generally, when clauses in the present positive are transposed into the perfect positive, the verb shows the tonal contour illustrated in (26a) and (27a) whenever the *a*-form is used in the present, whereas the tonal contour illustrated in (26b) and (27b) appears whenever the present form does not include the dj marker.

For example, the tonal contour illustrated in (26a) and (27a) is obligatory in immediate prepausal position, or when the verb is followed by an extraposed subject or object in afterthought role, whereas the tonal contour illustrated in (26b) and (27b) is obligatory in the inversion construction, or when the verb is followed by *-otlhe* [ótɬʰé] 'all' referring to the subject – Ex. (28).

(28) a. *Mpho o tsamaile.*
'Mpho has gone.'
m̀pʰɔ́ ˈɔ́-tsámà-ì:l-è
(CL1)Mpho CL1-go-PRF-FV(DJ)

b. *O tsamaile Mpho.*
'He has gone, Mpho that is.'
ɔ́-tsámà-ìl-è m̀:pʰɔ́
CL1-go-PRF-FV(DJ) (CL1)Mpho

c. *Go tsamaile Mpho.*
lit. 'There has gone Mpho.'
χɔ́-tsàmá-íl-é m̀:pʰɔ́
CL17-go-PRF-FV(CJ) (CL1)Mpho

d. *Re tsamaile rotlhe.*
'All of us have gone.'
rì-tsàmá-íl-è r-ô:tɬʰè
1PL-go-PRF-FV(CJ) 1PL-all

4.3. Tenses with a cj/dj distinction marked by the tone of the last syllable of the verb

Using the contexts presented in Section 3.1 (Ex. (9)) as a diagnostic, it is easy to show that the cj/dj distinction is found for example in the present negative. However, in this tense, its only mark is an alternation in the tone of the last syllable of the verb.

(29) a. *Ga ke bereke le nna.*
'I do not work either.'
χà-kí-bérék-ù lí-ǹ:ná
NEG-1SG-work-FV(DJ) ADD-1SG

b. *Ga ke bereke le ene.*
'I do not work with him/her.'
χà-kí-bérék-ú lí-è:nɛ́
NEG-1SG-work-FV(CJ) ADD-CL1

An observation of the contexts in which the distinction between these two tonal variants of the present negative is not neutralized by purely phonological rules shows that, functionally, the distinction is exactly identical to that observed in the present positive: the tonal variant of the present negative illustrated in (29a) has the same distribution as the form of the present

positive including the dj marker *a* |a|, whereas that illustrated in (29b) has the same distribution as the form of the present positive devoid of this formative.

Depending on the particular tenses, different tonal distinctions can be used to mark the same functional distinction. It is particularly puzzling that the tonal contours that mark the cj form in one particular tense may be very similar to those marking the dj form in another tense, and vice-versa, as illustrated by the comparison between the present negative (Ex. (29)) and the future positive (Ex. (30)): in the future positive, in non-prepausal position, the final vowel has a H tone in dj contexts (i.e., in contexts in which the present positive includes the dj marker) and a L tone in cj contexts (i.e., in contexts in which the present positive does not include the dj marker), whereas the final vowel of the present negative has a L tone in dj contexts and a H tone in cj contexts.

(30) a. *Ke tlaa bereka le nna.*
'I too shall work.'
kì-tɬàà-bɛ́rɛ́k-á lí-ǹːná
1SG-FUT-work-FV(DJ) ADD-1SG

b. *Ke tlaa bereka le ene.*
'I shall work with him/her.'
kì-tɬàà-bɛ́rɛ́k-à lí-èːnɛ́
1SG-FUT-work-FV(CJ) ADD-CL1

This observation rules out a general explanation of the contrasts illustrated by ex. (29) and (30) as intonational in nature and triggered by the syntactic boundary between the verb phrase and extraposed constituents. Historically, intonation may have played a role in the emergence of the distinction in the case of tenses such as the present negative, but if intonation only were at play here, it would be expected that all tenses behave in the same way. The fact that there is no uniformity in the tonal behavior of the last syllable of verb forms in cj and dj contexts precludes an intonational analysis of the contrasts illustrated in Ex. (29) and (30), and obliges one to admit that tenses such as the present negative and the future positive do not have the same tonal structure in cj and dj contexts.

It is particularly significant that, as already commented in connection with the present positive, the ... H L tonal melody observed in the cj form of the future positive in Ex. (30b) marks a cj form, i.e. a form that in no case can be followed by a pause, and consequently cannot be related to the rule that converts ... H H sequences in prepausal position into ... HL L, whereas the corresponding dj form, whose tonal structure might *a priori* be likely to result from the morphologization of a typically prepausal realization, has a ... H H tonal structure, and can be found with a final L tone in prepausal position only.

4.4. Tenses showing no tonal contrast in cj and dj contexts

The circumstantial form of the present positive illustrates the case of tenses with identical forms, segmentally as well as tonally, in the contexts that make apparent a possible distinction between a cj and a dj form. In Ex. (31), this form is illustrated as the second element of an analytic tense labeled 'imperfect'.

(31) a. *Ke ne ke bereka le nna.*
'I too was working.'
kì-nè kí-bɛ̀rɛ́k-á lí-ǹːná
1SG-AUX 1SG-work-FV(DJ) ADD-1SG

b. *Ke ne ke bereka le ene.*
'I was working with him/her.'
kì-nè kí-bɛ̀rɛ́k-á lí-ɛ̀ːné
1SG-AUX 1SG-work-FV(CJ) ADD-CL1

As illustrated by Ex. (32), in such tenses, clauses in which the verb is followed by a *le*-phrase equally interpretable as resuming the subject or as representing a distinct participant are always ambiguous between the two readings that, in other tenses, would be distinguished by the choice between a cj and a dj form.

(32) *Ba ne ba bereka le bone.*
'They were working too.', or 'They were working with them.'
bá-nè bá-bɛ̀rɛ́k-á lí-bɔ̀ːné
CL2-AUX CL2-work-FV ADD-CL2

This constitutes an additional proof that the prosodic contrasts observed in Section 4.3 are not intonational in nature, but tonal, and require positing different tonal structures for the verb forms involved. If the contrast were intonational, it would affect the circumstantial present positive in the same way as the indicative present positive or the indicative future positive.

5. The inflected forms of Tswana verbs: inventory and structure

5.1. The inflectional paradigm of Tswana verbs

Tswana verbs have a rich system of inflected forms, and auxiliation is also very productive.[8] The inflected forms of Tswana verbs can conveniently be divided into the following sets: indicative, circumstantial, relative, subjunctive, sequential, imperative, and infinitive.[9] This division is based on syntactic criteria, and is not straightforwardly related to the morphological structure of verb forms.[10]

Indicative, subjunctive, infinitive,[11] and imperative have uses broadly similar to those of the forms traditionally designated by the same labels in European grammars.

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[8] In the analytic verb forms, the auxiliated verb may occur in a sequential form, in a circumstantial form, or in the infinitive – see Creissels (2001).

[9] I designate here as 'circumstantial' the forms designated as 'participial' in Creissels & al. (1997), and I use 'sequential' as a label for the forms labeled 'consecutive' in Creissels & al. (1997). The reason for avoiding the term 'participial' (traditional in South African Bantu studies) is that these forms are in many respects very different from the forms traditionally labeled 'participles' in European grammar. The reason for avoiding 'consecutive' is that misunderstandings may follow from the traditional use of this term as referring to a particular type of adverbial subordination.

[10] On this question, see Creissels (2006).

[11] On Tswana infinitives, see Creissels (2004).

Circumstantial forms are used in subordinate clauses, either in combination with a subordination operator, or as the only mark of the dependent status of the clause they head. In Ex. (33b), the verb of the subordinate clause is in the circumstantial form of the present positive *ke bo ja* [kíbòdʒá] 'me eating it', distinguished from the corresponding indicative form in Ex. (33a) (*ke bo ja* [kìbódʒà] 'I eat it') by its tonal contour only.

(33) a. *Ke bo ja ka jeme le botoro (borotho).*
'I eat it (the bread) whith jam and butter.'
kì-bó-dʒ-à ká ˈdʒémé ˈlí-bɔ́tɔ̀ːrɔ́
1SG-CL14-eat-FV(CJ) with (CL9)jam ADD-(CL9)butter

b. *Ke rata borotho ke bo ja ka jeme le botoro.*
'I like bread when I eat it whith jam and butter.'
kì-rát-á bɔ̀-rɔ́tʰɔ́ kí-bɔ̀-dʒ-á ká ˈdʒémé ˈlí-bɔ́tɔ̀ːrɔ́
1SG-like-FV(CJ) CL14-bread 1SG-CL14-eat-FV with (CL9)jam ADD-(CL9)butter

Relative forms differ from the corresponding circumstantial forms by the addition of a relative marker. They are used in relative clauses, as illustrated by Ex. (33b), and in cleft constructions expressing focalization, as in Ex. (6) above.

(33) a. *Ke sega borotho ka thipa e.*
'I cut the bread with this knife.'
kì-síχ-á bɔ̀-rɔ́tʰɔ́ ká tʰìpâː è
1SG-cut-FV(CJ) CL14-bread with (CL9)knife (CL9)DEM

b. *Thipa e ke segang borotho ka ene e kae?*
'Where is the knife I use to cut the bread?' (lit. the knife I cut the bread with it)
tʰìpá é ˈ kí-síχ-à-ŋ́ bɔ̀-rɔ́tʰɔ́ ká jɔ̀né ˈí-kâːì
(CL9)knife (CL9)ATB 1SG-cut-FV-REL CL14-bread with CL9 CL9-where

Sequential verb forms are used in the non-initial conjunct(s) in clause coordination. The choice between the two sequentials depends on the TAM value expressed by the first clause. In Ex. (34b), the verb of the second clause is in the sequential 1 (or *a*-sequential), whereas in Ex. (35b), it is in the sequential 2 (or *e*-sequential).

(34) a. *Ke rekile ditlhako.*
'I bought shoes.'
kì-rék-íl-é dí-tɬʰàːkɔ́
1SG-buy-PRF-FV(CJ) CL8-shoe

b. *Ke ile toropong ka reka ditlhako.*
'I went to town and bought shoes.'
kì-ìl-é tɔ̀rópó-ŋ̀ kà-rɛ́k-á dí-tɬʰàːkɔ́
1SG-go.PRF-FV(CJ) (CL9)town-LOC 1SGSEQ1-buy-FV(CJ) CL8-shoe

(35) a. *Kamoso ke tlaa reka ditlhako.*
'Tomorrow I shall buy shoes.'
kámòsɔ́ kí-tɬàà-rɛ́k-á dí-tɬʰà:kɔ́
tomorrow 1SG-FUT-buy-FV(CJ) CL8-shoe

b. *Kamoso ke tlaa ya toropong ke reke ditlhako.*
'Tomorrow I shall go to town and buy shoes.'
kámòsɔ́ kí-tɬàà-j-à tòrópó-ŋ̀ kì-rék-ɪ́ dí-tɬʰà:kɔ́
tomorrow 1SG-FUT-go-FV(CJ) (CL9)town-LOC 1SGSEQ2-buy-FV CL8-shoe

The ability to include up to three object indexes (henceforth OIs), depending on the valency of the verb, is common to all tenses. A subject index (henceforth SI) is obligatorily present in the indicative, subjunctive, relative, circumstantial, and sequential. The infinitive includes no reference to a subject, and in the imperative (restricted to the second person), reference to the subject is limited to a number distinction (singular *vs.* plural). Third person SIs and OIs express class agreement.[12]

Polarity distinctions (positive *vs.* negative) are expressed morphologically in all synthetic verb forms, except the sequentials, whose negative counterparts are analytic forms.

TAM variations with a distinction between present, perfect, future, and potential, are found in the indicative, circumstantial, and relative. The infinitive has a slightly different TAM inflection: in the infinitive, 'perfect positive' is expressed analytically; conversely, the infinitive maintains the possibility of a morphological expression of the continuative, whereas in the indicative, synthetic forms including the continuative marker are only very marginally used by Tswana speakers, who recognize these forms but consider them as characteristic of the related language Sotho, and rather express the TAM value 'continuative' by means of analytic forms.

The synthetic tenses of Tswana verbs can be enumerated as follows:[13]

Indicative
present, positive and negative
perfect, positive and negative
future, positive and negative
potential, positive and negative
Circumstantial
present, positive and negative
perfect, positive and negative
future, positive and negative
potential, positive and negative
Relative
present, positive and negative
perfect, positive and negative

[12] The inventory of subject indexes and object indexes is given in Annex 1.
[13] In this enumeration, limited to synthetic verb forms, the apparent gaps are due to the fact that some combinations of features (for example, 'infinitive perfect positive') that could be expected to be expressed by means of a synthetic form can only be encoded by analytic forms. A precise morphological identification of the tenses enumerated here is given in Annex 2.

future, positive and negative
potential, positive and negative
Subjunctive, positive and negative
Sequential
sequential 1
sequential 2
Imperative, positive and negative
Infinitive
present, positive and negative
perfect negative
future, positive and negative
potential, positive and negative
continuative

5.2. A template of Tswana verb morphology

A Tswana verb form consists of a *root* (irreducible lexical element) together with an obligatory suffix (the *final vowel*, or simply *final*) and a variable number of other affixes whose presence depends on a variety of factors, each affix having its position in the string. The root may be immediately followed by derivative suffixes that modify its meaning without altering its valency. *The extended* root is the part of the verb form constituted by the root and such derivative suffixes. The *stem* is the part of the verb form constituted by the root, the final, and all the formatives occupying a position between the root and the final. The formatives that precede the root constitute the *prefixal string*, and those that follow the final are designated as *postfinals*.

Starting from the extended root as the zero point, the order in which the affixes appear can be described as a sequence of positions numbered from –4 (the leftmost possible position) to +5 (the rightmost possible position).

Position –4 is occupied in the indicative present negative and indicative perfect negative by the negation marker *ga* |χa|, otherwise it remains empty.

Position –3 remains empty in the imperative. In the infinitive, which shows both morphologically and syntactically a mixture of nominal and verbal properties, it is filled by the prefix of noun class 15. In all the other tenses, it is obligatorily filled by a SI.[14]

Position –2 can be filled by the following affixes or affix sequences:

– in the dj form of the indicative present positive: *a* |a|,
– in the indicative perfect negative: *a* |a|,

[14] In contrast with the OIs, which show no variation related to the nature of the verb form in which they are inserted, the SIs vary in a way that cannot be explained in terms of phonological interaction between adjacent formatives, and four partially different sets of SIs must be recognized depending on the individual tenses. Two of these sets are used each in one particular tense only (sequential 1 and sequential 2). Each of the other two sets (arbitrarily labeled A and B) is used in a variety of tenses that cannot be characterized by any syntactic or semantic feature (or combination of features). Their distribution is synchronically arbitrary, which means that the choice between these two sets of SIs contributes to the identification of the individual tenses, but does not carry any syntactic or semantic information by itself. For a detailed description of the formal distinction between the four sets of SIs, see Annex 1.

– in the future positive: *tlaa* |tɬaa|,
– in the future negative: *tlaa se* |tɬaa-sɪ|,
– in the potential positive: *ka* |ká|,[15]
– in the potential negative: *ka se* |ká-sɪ| ~ |ka-sɪ|,[16]
– in the circumstantial present negative, circumstantial perfect negative, infinitive present negative, and infinitive perfect negative: *sa* |sa|,
– in the subjunctive negative and imperative negative: *se* |sɪ|,
– in the infinitive potential: *sa* |sá|.

Position –1 can be occupied by OIs and by the reflexive marker (or midvoice marker) |ín|.[17] The inventory of OIs is given in Annex 1. Up to three successive affixes can be found in this position, and their order is determined by the following rules:

(a) the OI of first person singular cannot be separated from the root,
(b) the reflexive marker can be separated from the root by the OI of first person singular only,
(c) the ordering of the other OIs is the mirror image of the ordering of the corresponding object NPs, which in its turn is governed by Animacy Hierarchy – Ex. (36).

(36) a. *Ke fetse bomalome dikgomo letswai.*
'I have given salt to the cows for my uncles.'
kì-f-éts-í bó-màlómé dí-qʰòmó lì-tswâːì
1SG-give-APPL.PRF-FV(CJ) CL2-uncle.1SG CL10-cow CL5-salt

b. *Ke le di ba fetse.*
'I have given it (the salt, cl. 5) to them (the cows, cl. 10) for them (my uncles, cl. 2).'
kì-lí-dí-bà-f-êːts-ì
1SG-CL5-CL10-CL2-give-APPL.PRF-FV(DJ)

Position +1 can be filled by one or more affixes encoding operations on verb valency: causative, applicative, anticausative, or reciprocal.

Position +2 can only be occupied by a perfect marker |(i)l| or |J| , used only in the perfect positive (in negative forms, 'perfect' is encoded by formatives occupying Slot –2). [18]

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[15] An optional toneless variant |ka| of this formative must be posited in the circumstantial and relative forms of the potential in order to account for the free variation observed in the tonal realization of these tenses.

[16] This formative must be analyzed as underlyingly |ká-sɪ| when it follows a toneless SI, but a variant |ka-sɪ| must be posited in order to account for its tonal properties when it follows a H-toned SI.

[17] The notation |íⁿ| means that this formative triggers modifications of the onset of the following syllable identical to those triggered by the syllabic nasal, although no nasal is present in its surface form. The reflexive marker, like Romance *se*, is not always analyzable as an incorporated reflexive pronoun, and is better analyzed as a valency operator with the expression of reflexivity as one of its possible values, but morphologically, treating it as belonging to a paradigm distinct from that of the OIs would only lead to needless complications

[18] The precise form of the perfect prefinal depends on the formatives that precede it. Most of its variants can be analyzed as representing an underlying form |il|, but sometimes it cannot be isolated as a segment, and manifests itself by a modification of the last consonant of the preceding formative

Position +3 can only be filled by the passive marker |(i)w|.

Position +4 is the only one that can be left empty in no circumstances. The affix filling this position, traditionally called 'final (vowel)', consists of a vowel with four possible values: a, ɪ, ɛ, and e ~ ɪ (with an alternation that can be explained as the result of a dissimilation process). The final is clearly inflectional, in the sense that it contributes to the identification of the individual tenses, but it does not carry any syntactic or semantic information of its own, since with the exception of e ~ ɪ (found in the perfect positive only), each of the finals is shared by a set of forms impossible to define straightforwardly as sharing a particular set of syntactic or semantic features.[19]

Position +5 can be filled by the following three formatives, designated as 'postfinals': |ŋ́| (toneless syllabic nasal followed by a floating H tone) marking the plural of the imperative, the relative marker |ńɲ|, and |ńɲ| clitic form of the interrogative pronoun *eng* [ìńɲ] 'what'.[20]

6. Underlying representations and tonal processes[21]

6.1. Introductory remarks

In Tswana, the tonal behavior of verb prefixes cannot be accounted for by means of phonological rules applying to underlying representations including no explicit indication of L tone, no 'invisible' underlying elements, and in which prefixes are uniformly separated from each other by the standard morpheme boundary (represented by a hyphen). The introduction of floating L tones in the underlying representation of some prefixes would be a possible solution, but there is strong evidence that the L tone must be analyzed as the default tone, and the introduction of L tones in underlyingly representations would lead to miss some important insights. The solution explored in Creissels & al. (1997) was the introduction of 'empty syllables' doing more or less the same job as floating L tones in other frameworks. However, the discussion I had with Irina Monich about the paper she presented at the 5th International Conference on Bantu Languages (Monich (2013)) eventually convinced me of the theoretical shortcomings of resorting to empty syllables, and I would like to explore another solution here: the introduction, at some points in the prefixal sequence, of a special boundary (represented as =) whose properties with respect to tone spreading processes depart from those of the standard morpheme boundary and are more similar (although not identical) to those of the boundary between words (represented as #).

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that can be predicted by positing an alternative underlying representation |J|, with an abstract morphophoneme J which is deleted after palatalizing the preceding consonant.

[19] A limited number of irregular verbs (such as *itse* [ítsí] 'know') invariably show the final ɪ in all tenses, except in the perfect positive. This irregularity does not affect the tonal behavior of the final vowel of these verbs, which is perfectly regular.

[20] In addition to these unproblematic postfinals, we will see in Section 7.2 that positing a postfinal consisting of a floating H tone provides a simple explanation of the tonal alternations characterizing the final syllable of some verb forms.

[21] As already mentioned in Footnote 3, the analysis developed in this paper is based on the pronunciation of a native speaker of the Ngwaketse dialect. The available documentation on other varieties as well as my own field notes on the Ngwato and Kgatla varieties suggest that the variation observed across Tswana varieties with respect to the details of the H tone spreading processes do not affect the overall organization of the system and the classification of the tenses according to the tonal behavior of verb forms in cj and dj contexts.

Many authors have observed that, in Bantu languages, the formatives traditionally analyzed as verb prefixes often show a morphophonological behavior suggesting that many verb forms synchronically analyzable as single words result from the relatively recent univerbation of analytic verb forms that originally consisted of an auxiliary followed by a dependent form of the lexical verb. This is probably the explanation of the idiosyncracies in the behavior of the verbal prefixes of Tswana that preclude a straightforward account of their tonal properties by positing underlying representations in which each prefix is simply characterized as H-toned or toneless and all formatives are uniformly separated from each other by the standard morpheme boundary.

Another difference between the treatment proposed here and that proposed in Creissels & al. (1997) or in Creissels (1999) is that some tonal alternations whose explanation as the result of phonological rules applying to underlying phonological representations required very abstract underlying representations and needlessly complex sets of phonological rules are now treated by the morphological rules that determine the input of the phonological component of the description. The system of rules proposed here is thus equivalent to that proposed in Creissels & al. (1997), but it has the following two advantages: formally, it is much simpler, and it avoids the ambiguity between synchronic description and historical reconstruction resulting from the presence of 'empty syllables' in underlying representations.

The general idea is that most of the apparent complexity of the tonal morphology of Tswana results from conditions on the action of repair rules motivated by a constraint of non-adjacency of H tone domains. Whenever two H tone domains are in contact, the violation of the non-adjacency constraint must be eliminated, but the possible repair strategies are not equally available, depending on the grammatical nature of the boundary between the two H tone domains. The analysis I propose is that 5 different repair strategies must be distinguished: (a) retraction of the second H tone domain, (b) retraction of the first H tone domain, (c) toneless vowel insertion, (d) downstep insertion, and (e) fusion. Fusion is always the last resort strategy, retraction can only affect non-monosyllabic H tone domains, a downstep can only be inserted before a non-monosyllabic H tone domain, and toneless vowel insertion can only operate if the inserted vowel takes the penultimate position in the verb form, but in other respects, the repair strategies are variously available and variously ranked, depending on the grammatical nature of the boundary:[22]

- special morpheme boundary: retraction of the second H tone domain > retraction of the first H tone domain > toneless vowel insertion > fusion
- special word boundary: retraction of the first H tone domain > downstep insertion > fusion
- standard word boundary: downstep insertion > fusion

6.2. The distribution of the special morpheme boundary =

In order to correctly predict the result of the interaction between H tones introduced by formatives included in the prefixal string and H tones underlyingly belonging to the stem by

[22] In the account proposed in this paper, H tone domains are delimited and tone spreading rules are formulated in such a way that H tone domain adjacency can only occur through boundaries other than the standard morpheme boundary.

means of the rules that will be proposed in the rest of this section, the special boundary = must be inserted in the following contexts:

- immediately after the SI in the dj form of the indicative perfect positive, in the *a*-sequential, in the subjunctive positive, and in the circumstantial present positive before lexically H-toned stems (but not in the other tenses);
- immediately after the potential marker |ká|;
- immediately after the continuative marker |sá|;
- immediately after the underlyingly toneless OIs;
- immediately before the variant |ka| of the potential marker;
- immediately before the negative marker |sa|;
- immediately before the underlyingly H-toned OIs.

The question that arises is whether it would be possible to avoid an ad hoc specification of the list of the contexts in which the special boundary = must be inserted, and to simply posit its presence at some point(s) in the morphological template of Tswana verb forms. Such a solution would be much more satisfactory, both practically and theoretically. Unfortunately, this does not seem possible, or only at the coast of a proliferation of invisible underlying elements whose only justification would be to allow for positing the special boundary in contexts in which positing it without additional specifications would lead to wrong predictions.

6.3. Lexical and post-lexical tone rules

The tone rules explicitly analyzed in this section are those accounting for the tonal structure of verbal words, but in the sentenceses illustrating the use of verb forms, the output of these rules may be further modified by the following post-lexical processes:

- if the last syllable of a word belongs to a H tone domain, and if the following word begins with at least two syllables that do not belong to a H tone domain, the first syllable of the second word is 'annexed' by the preceding H tone domain;
- if two H tone domains are in contact at a word boundary and the second one is monosyllabic, they merge into a single H tone domain;[23]
- if two H tone domains are in contact at a word boundary and the second one comprises two syllables or more, a downstep is inserted between them;
- if the right boundary of a non-monosyllabic H tone domain coincides with a pause, the last syllable in this domain is assigned a L tone, whereas the penultimate syllable is lengthened, and realized with a falling tone.[24]

[23] A consequence of these two postlexical tonal processes is that the distinction between words beginning with two toneless syllables and words beginning with a H-toned syllable followed by a toneless syllable is neutralized when such words follow another word ending with a H-toned syllable. In both cases, the first two syllables of the second word are realized with a H L contour.

[24] This is the only context in which true contour tones (i.e., contour tones that cannot be analyzed as the realization of a sequence involving two opposite register tones attached to two successive vowels with no intervening consonant) can be observed in Tswana. In all other contexts, long vowels with rising or falling tones can be perceived in fast speech, but it is always possible to analyze them as the realization of sequences involving two identical vowels belonging to two adjacent syllables with no

6.4. The H tone as the marked tone, and the notion of H tone domain

The tonal alternations affecting Tswana verb forms are at first sight fairly complex, but their description is facilitated by positing an underlying H vs. Ø rather than H vs. L contrast, and by describing tonal processes in terms of interaction between H tone domains rather than as processes affecting the tones of individual syllables. L tones are accounted for as default tones assigned to syllables that are not included in a H tone domain after the limits of H tone domains have been established by means of rules (or constraints) formulated in terms of (a) expansion of H tone domains and (b) repair strategies eliminating the violations of the non-adjacency constraint.

In the variant of autosegmental tonology adopted here, underlying H tone domains are defined as word-internal sequences of underlyingly H-toned syllables not interrupted by boundaries other than the standard morpheme boundary.

In the underlying tonal representations, the association of H tones to the syllables that constitute the stem is determined by a morphological rule (see Sections 6.5 and 6.6), and each of the formatives that constitute the prefixal string is introduced as associated to a H tone or toneless. Starting from that, the first step in the derivation leading to the surface tonal contour is the merging of sequences of H-toned syllables not interrupted by special boundaries or word boundaries into H tone domains.

For example, the underlying structures of *ke ba bona* [kì-bá-bɔ́n-á] 'I see them' and *ke ka bona* [kì-ká-bɔ̀ná] 'I can see' equally include a H tone associated to the first syllable of the stem and a H tone associated to the preceding formative. However, in the case of *ke ka bona* [kì-ká-bɔ̀ná], the presence of the special boundary = after the potential marker prevents them from merging into a single H domain, which explains why, after annexing the second syllable of the stem, the H domain generated by the H tone of the root retracts in order to satisfy the non-adjacency constraint: [25]

#kɪ=bá-bɔ́n-a#	→	#kɪ=(bá-bɔ́)n-a#	(H tone domain constitution)
	→	#kɪ=(bá-bɔ́n-á)#	(H tone domain expansion)
#kɪ-ká=bɔ́n-a#	→	#kɪ-(ká)=(bɔ́)n-a#	(H tone domain constitution)
	→	#kɪ-(bá)=(bɔ́n-á)#	(H tone domain expansion)
	→	#kɪ-(bá)=bɔ(n-á)#	(H tone domain retraction)

6.5. The lexical tone of verbs

Whatever number of syllables a Tswana verb form comprises, if in a given context the lexeme is replaced by other lexemes (either simple or derived) without modifying the number of syllables of the verb forms and without changing any other formative than the lexeme, there are never more than two possible tonal melodies. Moreover, some verb roots can be found in verb forms with an entirely L tonal melody, whereas others are only found in verb forms whose tonal melody includes at least one H tone. The obvious conclusion is that there are two

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intervening consonant, as evidenced by the fact that the successive vowels that fuse into a long vowel in fast speech tend to be separated by a glottal stop in very slow speech.

[25] The parentheses in the underlying representations make apparent the limits of H tone domains.

tonal types of verb roots (toneless and H-toned), irrespective of their syllabic structure, and that the derivative suffixes are underlyingly toneless. Since the perfect prefinal and the finals show no correlation with particular types of tonal contours, the simplest hypothesis is that they are underlyingly toneless too. [26]

6.6. Morphological rules accounting for the tonal contour of verb stems

Excluding from consideration tonal alternations analyzable as resulting from the tonal interaction between the the prefixal string and the stem, or between the stem and postfinals, four possible tonal structures must be recognized for verb stems, two for stems including a toneless root, and two for stems including a H-toned root. They are analyzed as resulting from the interaction between the inherent tonality of the root and the presence vs. absence of a grammatical H tone.

As can be seen from the morphological characterization of the individual tenses given in Appendix 2, the presence *vs.* absence of the grammatical H tone contributes to the morphological identity of individual tenses. However, like the choice of a particular final, the presence vs. absence of the grammatical H tone does not carry a specific meaning by itself; the grammatical H tone is shared by a set of tenses that cannot be characterized as including a particular formative that would be absent in other tenses, and have no syntactic or semantic feature in common either.

Consequently, any solution positing the grammatical H tone as underlyingly attached to a particular formative (as in Creissels & al. (1997)) can only result in needless complications. What I propose here is that, in the tonal representations that constitute the input for the tonal processes resulting in the surface contour of verb forms, the lexical H and the grammatical H are not represented separately, and verb stems are directly represented with an underlying tonal contour determined by a morphological rule. The following chart summarizes the output of this rule:

		–lexH	*+lexH*
–grH	1 syll.	o	ó
	2 syll.	o o	ó o
	3 syll.	o o o	ó o o
	4 or more syll.	o o o ... o	ó o o ... o
+grH	1 syll.	ó	ó
	2 syll.	o ó	ó ó
	3 syll.	o ó ó	ó ó ó
	4 or more syll.	o ó ó ... ó	ó ó ó ... ó

[26] The subjunctive positive is the only tense in which the distinction between H-toned roots and toneless roots is systematically neutralized. The tonal contours observed in this tense require positing a special set of morphological rules stipulating that, in the subjunctive positive, if no OI (or reflexive marker) is present: (a) if the stem is lexically H-toned, the lexical H tone is deleted; (b) if the stem comprises three syllables or more, a H tone is assigned to the final; (c) the SI is followed by the special boundary =.

In the simplest cases, if the grammatical H tone is not present and in the absence of an interaction with prefixes or postfinals, the tonal contour of the stem as represented in this chart is only modified by the expansion of the H domain generated by the H tone underlyingly attached to the first syllable of lexically H-toned stems. For example, in non-prepausal position, the dj form of the infinitive present positive shows the following tone pattern:

Lexically toneless verbs:

χò-tɬà	*go tla* 'to come'
χò-lìmà	*go lema* 'to cultivate'
χò-tswɛ̀lɛ̀là	*go tswelela* 'to continue'
χò-dùmèdìsà	*go dumedisa* 'to greet'
χò-dùmèdìsànà	*go dumedisana* 'to greet each other'
χò-dùmèdìsètsànà	*go dumedisetsana* 'to transmit greetings for each other'

Lexically H-toned verbs:

χò-dʒá	*go ja* 'to eat'
χò-rɛ́ká	*go reka* 'to buy'
χò-rékísá	*go rekisa* 'to sell'
χò-símólólà	*go simolola* 'to begin'
χò-tɬʰókómólòχà	*go tlhokomologa* 'to neglect'
χò-símólólɛ̀lànà	*go simololelana* 'to begin for each other'

If the grammatical H tone is present, and if the tone of the final syllable is not modified by the interaction with a postfinal or with the following word, the surface tone of the stem coincides with that indicated in the chart above, as illustrated by the cj form of the present negative:

Lexically toneless verbs

χà-kí-tɬ-í	*ga ke tle* 'I do not come'
χà-kí-bàlí	*ga ke bale* 'I do not read'
χà-kí-tswèlélí	*ga ke tswelele* 'I do not progress'
χà-kí-tɬʰàlóχájní	*ga ke tlhaloganye* 'I do not understand'
χà-rí-dùmédísání	*ga re dumedisane* 'we do not greet each other'
χà-rí-dùmédísétsání	*ga re dumedisetsane* 'we do not greet people for each other'

Lexically H-toned verbs

χà-kí-dʒí	*ga ke je* 'I do not eat'
χà-kí-rékí	*ga ke reke* 'I do not buy'
χà-kí-bérékí	*ga ke bereke* 'I do not work'
χà-kí-símólólí	*ga ke simolole* 'I do not begin'
χà-kí-sírélédíwí	*ga ke sirelediwe* 'I am not protected'
χà-rí-símólólɛ́lání	*ga re simololelane* 'we do not begin for each other'

6.7. First observations on word-internal H tone spreading

6.7.1. The maximum range of word internal H-tone spreading

H tone spreading limited to a given number of syllabes is pervasive in the Tswana variety described in this paper. As regards verb forms, word-internal tone spreading affecting three successive toneless syllables can only be observed in a particular configuration that will be presented in Section 6.9.5. In all the other configurations, the maximum range of word-internal H tone spreading is of either one or two syllables. The explanation proposed here is that H tone spreading with a maximum range of two syllables (illustrated in Section 6.6 by the spreading of the lexical H tone within verb stems devoid of grammatical H tone) occurs in syllable strings interrupted by no other boundary than the standard morpheme boundary, and H tone spreading with a maximum range of one syllable characterizes H-toned formatives that immediately precede the special boundary =.

6.7.2. H tone spreading affecting two successive toneless syllables: illustrations

In addition to the spreading of the lexical H tone within verb stems devoid of grammatical H tone, word-internal H tone spreading with a maximum range of two syllables can be observed with H tone domains generated by SIs or OIs. For example, the tonal contour of *ba a tlhaloganya* [bá-á-tɬʰálòχàŋ-à] ‘they understand (dj)’ and *ke lo tlhaloganya* [kì-ló-tɬʰálóχàŋ-à] ‘I understand you (cj)’ can be explained as resulting from the following derivations:

#bá-a-tɬʰalʊχaŋ-a#	→	#(bá)-a-tɬʰalʊχaŋ-a#	(H tone domain constitution)
	→	#(bá-á-tɬʰá)lʊχaŋ-a#	(H tone domain expansion)
#kɪ=ló-tɬʰalʊχaŋ-a#	→	#kɪ=(ló)-tɬʰalʊχaŋ-a#	(H tone domain constitution)
	→	#kɪ=(ló-tɬʰáló)χaŋ-a#	(H tone domain expansion)

6.7.3. Restrictions to the spreading of the H tones of verbal prefixes and their explanation

Toneless syllables immediately following a H-toned prefix, or separated from a H-toned prefix by a single toneless syllable, do not always undergo the spreading of this H tone. Two types of situations must be distinguished.

In some cases, the explanation is simply that, within sequences of syllables not interrupted by boundaries other than the standard morpheme boundary, the progressive spreading of a H tone to a toneless syllable is blocked by the presence of a H tone associated to the following syllable. In other words, within sequences of syllables not interrupted by boundaries other than the standard morpheme boundary, the progressive spreading of H tones is limited by the non-adjacency constraint, as illustrated by the comparison of *ba a tlhaloganya* bá-á-tɬʰálòχàŋ-à ‘they understand’ and *ba a berekelana* bá-à-bɛ́rɛ́k-ɛ́l-ànà ‘they work for each other’.

#bá-a-tɬʰalʊχaŋ-a#	→	#(bá)-a-tɬʰalʊχaŋ-a#	(H tone domain constitution)
	→	#(bá-á-tɬʰá)lʊχaŋ-a#	(H tone domain expansion)

#bá-a-bɛ́rɛk-ɛl-an-a#	→	#(bá)-a-(bɛ́)rɛk-ɛl-an-a#	(H tone domain constitution)
	→	#(bá)-a-(bɛ́rɛ́k-ɛ́l)-an-a#	(H tone domain expansion)

However, the non-adjacency constraint does not account for cases such as *ke ka tlhaloganya* [kì-ká-tɬʰálʊ̀χàŋà] 'I can understand (dj)', where there is no obvious explanation for the fact that the second syllable of the stem is not affected by the spreading of the H tone of the potential marker.

A crucial observation is that the prefixes involved in configurations showing such apparent exceptions to the rule of word-internal tone spreading have other tonal properties that have no obvious explanation. The treatment proposed in this paper relies on the observation that the tonal processes involving the prefixes in question are partially similar to those observed at word boundaries. In particular, word boundaries too allow for a spreading process limited to one syllable. This similarity justifies positing a special boundary = either to the left of to the right of the prefixes listed in Section 5.3.2, as in #kɪ-ká=tɬʰalʊχaŋ-a#, underlying representation of *ke ka tlhaloganya* [kì-ká-tɬʰálʊ̀χàŋà] 'I can understand'. The special boundary = blocks the application of the spreading rule allowing for the annexation of two successive toneless syllabes (henceforth designated as SPRa), but allows for the application of another spreading rule (SPRb) with a maximum range of one syllable.

6.8. H tone domain expansion / retraction within verb forms

Leaving aside for the moment processes whose effect is limited to the last syllable of verb stems, the interaction between H tone domains within verb forms can be analyzed as the result of the successive application of three rules or sets of rules.

6.8.1. The first spreading rule

A first spreading rule (SPRa), already illustrated in Section 6.7.2, stipulates that, within syllable strings not interrupted by the special boundary =, H domains followed by one or more toneless syllables can annex the following syllable or the following two syllables, provided this does not result in adjacency with another H tone domain. The derivation of *ba a berekelana* [bá-à-bɛ́rɛ́k-ɛ́l-ànà] 'they work for each other' presented above illustrates a configuration in which SPRa is blocked.

Note that the restriction to SPRa holds only within the limits of syllable strings not interrupted by the special boundary =. The tonal behavior of the prefixes triggering the insertion of the special boundary = can only be predicted by positing that the expansion of a H-one domain according to SPRa can reach the special boundary = irrespective of what follows it. In this respect, the special boundary = behaves exactly like the word boundary #:

... ó) o = (ó ... –SPRa→ ... ó ó) = (ó ...

... ó) o o = (ó ... –SPRa→ ... ó ó ó) = (ó ...

6.8.2. The repair rules

A second set of rules (REPAIR) deals with situations in which two H tone domains are adjacent through the special boundary = (either because the syllables on both sides of the boundary are underlyingly associated to H tones, or because a toneless syllable preceding the special boundary has been annexed by a H tone domain). In this configuration, four of the five repair strategies mentioned in Section 6.1 are available, and they are ranked as follows:

- the prefered strategy is the retraction of the second H tone domain, if it comprises two or more syllables (REPAIRa);
- if the second H tone domain is monosyllabic (and consequently cannot retract), and if the first H tone domain comprises two or more syllables, the non-adjacency constraint is satisfied by retracting the first H domain (REPAIRb);
- if the special boundary = is both immediately preceded and immediately followed by monosyllabic H domains, it may happen that the non-adjacency constraint is satisfied by the insertion of a toneless vowel, but this strategy is available only if the inserted vowel takes the penultimate position in the verb form (REPAIRc);
- if two or more successive monosyllabic H domains are only separated from each other by the special boundary =, and the toneless vowel insertion strategy is not available, they merge (REPAIRe).

6.8.3. The second spreading rule

A second spreading rule (SPRb) applies to H tone domains whose right edge coincides with a special boundary =. It stipulates that, in this configuration, a toneless syllable immediately following the special boundary can be annexed by the H tone domain, provided this does not result in adjacency with another H tone domain included in the same word. This rule must be posited as applying step by step from left to right in order to account for the spreading of H tones in the following configuration :

... ó) = o = o ... –SPRb→ ... ó = ó) = o ... –SPRb→ ... ó = ó = ó) ...

6.9. Illustrations of the tonal processes involving the special boundary =

6.9.1. The behavior of the potential marker |ká|

The underlying tonal structure of *ke ka tlhaloganya* [kì-ká-tɬʰálʊ̀χàŋ-à] ‘I can understand (dj)’ is #kɪ-(ká)=tɬʰalʊχaŋ-a#. Since the only H tone present in this representation immediately precedes the special boundary, it cannot spread according to SPRa (which accounts for spreading with a possible range of two syllables), but only according to SPRb (which accounts for spreading limited to one syllable):

#kɪ-ká=tɬʰalʊχaŋ-a#	→	#kɪ-(ká)=tɬʰalʊχaŋ-a#	(H tone domain constitution)
	→	#kɪ-(ká=tɬʰá)lʊχaŋ-a#	(SPRb)

The presence of the special boundary also accounts for the L tone surfacing on the first syllable of underlyingly H-toned roots in the configuration illustrated by *ò ka tshameka* [ò-ká-tshàmík-á] ‘you(sg) can play’. The underlying structure is #ʊ-ká=tsʰámɪk-a#, where the special boundary = prevents the two underlying H tones from merging into a single H tone domain. In such cases, if the second H tone domain comprises two or more syllables (which is the case here after the application of SPRa), it retracts in order to eliminate the violation of the non-adjacency constraint:

#ʊ-ká=tsʰámɪk-a#	→	#ʊ-(ká)=(tsʰá)mɪk-a#	(H tone domain constitution)
	→	#ʊ-(ká)=(tsʰámík-á)#	(SPRa)
	→	#ʊ-(ká)=tsʰa(mík-á)#	(REPAIRa)

In configurations in which two non-monosyllabic H domains are in contact through the special boundary =, the repair strategy is again the retraction of the second one, as illustrated by *ó ka tshameka* [ó-ká-tshàmík-á] ‘(s)he can play’:

#ó-ká=tsʰámɪk-a#	→	#(ó-ká)=(tsʰá)mɪk-a#	(H tone domain constitution)
	→	#(ó-ká)=(tsʰámík-á)#	(SPRa)
	→	#(ó-ká)=tsʰa(mík-á)#	(REPAIRa)

In configurations in which the special boundary = is immediately followed by a H-toned syllable that cannot generate a non-monosyllabic domain, but preceded by a H tone domain comprising at least two syllables, as in *ó ka ja* [ó-kà-dʒá] ‘(s)he can eat’, retraction affects the only one of the two H domains that can retract, i.e., the first one:

#ó-ká=dʒ-á#	→	#(ó-ká)=(dʒ-á)#	(H tone domain constitution)
	→	#(ó)-ka=(dʒ-á)#	(REPAIRb)

A dissyllabic variant [káà] of the potential marker (as in *ò kaa ja* [ò-káà-dʒ-á] ‘you (sg) can eat’) appears if and only if the potential marker follows a toneless SI and immediately precedes a H-toned monosyllabic stem. In this configuration, none of the two H tone domains in contact can retract, since both are monosyllabic, but the insertion of a toneless copy of the preceding vowel ensures the respect of the non-adjacency constraint:

#ʊ-ká=dʒ-á#	→	#ʊ-(ká)=(dʒ-á)#	(H tone domain constitution)
	→	#ʊ-(ká)a=(dʒ-á)#	(REPAIRc)

Note that, in this configuration, monosyllabic toneless stems also surface with a H tone, but the difference in the underlying tone of the stem conditions a different treatment of the potential marker, since the only rule that applies in this case is SPRb, as illustrated by the tonal derivation of *ò ka tla* [ò-ká-tɬ-á] ‘you (sg) can come’:

#ʊ-ká=tɬ-a#	→	#ʊ-(ká)=tɬ-a#	(H tone domain constitution)
	→	#ʊ-(ká=tɬ-á)#	(SPRb)

6.9.2. The behavior of SIs in the circumstantial form of the present positive

In the circumstantial form of the present positive, when immediately preceded by the SI (which in this tense is invariably H-toned), lexically H-toned stems comprising two syllables or more surface with a L tone on their first syllable. Moreover, an additional syllable consisting of a L-toned vowel copying the vowel of the SI appears when lexically H-toned monosyllabic stems are immediately preceded by the SI:

kí-bìn-á	*ke bina* 'while I dance'
kíì-dʒ-á	*kee ja* 'while I eat'
óò-dʒ-á	*oo ja* 'while you(sg) eat'
díì-dʒ-á	*dii ja (dikgomo)* 'while they eat (the cows)'

This can be explained by positing that, in this tense, the SI is followed by the special boundary =, and consequently cannot merge with the first syllable of H-toned stems into a single H tone domain. If the H tone underlyingly attached to the first syllable of lexically H-toned stems generates a H tone domain comprising at least two syllables, the retraction of this H tone domain eliminates the violation of the non-adjacency constraint, but a toneless copy of the vowel of the SI is inserted if the retraction of the second H tone domain is not possible:

#kí=bín-a#	→	#(kí)=(bí)n-a#	(H tone domain constitution)
	→	#(kí)=(bín-á)#	(SPRa)
	→	#(kí)=bi(n-á)#	(REPAIRa)
#kí=dʒ-á#	→	#(kí)=(dʒ-á)#	(H tone domain constitution)
	→	#(kí)ɪ=(dʒ-á)#	(REPAIRc)

6.9.3. The behavior of SIs in the dj form of the perfect positive

In the dj form of the perfect positive, when the stem is only preceded by a H-toned SI, with toneless stems, the H tone of the SI spreads to the first syllable only, though nothing seems to prevent it from spreading further, as in *ba dumedisetsanye* [bá-dúmèdìs-èts-àŋ-ì] 'they too have transmitted greetings for each other (dj)'. Moreover, H-toned stems surface with a L tone on their first syllable, the following two syllables remaining H, as if a H tone went on spreading from the first syllable, as in *ba simololelanye* [bá-sìmólól-èl-àŋ-ì] 'they have begun for each other'.

The explanation is that, in this tense, the special boundary = is present immediately after the SI, blocking the application of SPRa if the verb stem begins with two or more toneless syllable but triggering the application of a repair rule is the verb stem begins with a H-toned syllable:[27]

#bá=dumedis-ets-aŋ-ɪ#	→	#(bá)=dumedis-ets-aŋ-ɪ#	(H tone domain constitution)
	→	#(bá=dú)medis-ets-aŋ-ɪ#	(SPRb)

[27] The difference with the cases analyzed in Sections 6.9.1 and 6.9.2 is that, in the perfect positive, the empty nucleus never associates with a copy of a neighboring vowel. But the explanation is simply that, in the perfect positive, verb stems cannot be monosyllabic.

#bá=símʊlʊl-ɛl-aŋ-ɪ#	→	#(bá)=(sí)mʊlʊl-ɛl-aŋ-ɪ#	(H tone domain constitution)
	→	#(bá)=(símʊ́lʊ́)l-ɛl-aŋ-ɪ#	(SPRa)
	→	#(bá)=si(mʊ́lʊ́)l-ɛl-aŋ-ɪ#	(REPAIRa)

6.9.4. The behavior of OIs in verb forms including a single OI (1)

The insertion of a single OI into a verb form whose tonal melody is otherwise entirely L makes apparent a distinction between underlyingly toneless OIs (1st person singular, 2nd person singular, and cl. 1) and H-toned OIs (all the others).The reflexive marker behaves in all respects like H-toned OIs.

However, when inserted between a H-toned SI and a H-toned root, an underlyingly H-toned OI surfaces with a L tone, as in *ó lo thusa* [ó-lò-tʰús-á] '(s)he helps you(pl) (cj)'. When inserted between a H-toned SI and a toneless root, an underlyingly H-toned OI also surfaces with a L tone, but the tonal melody of the stem is modified by the spreading of the H tone underlyingly attached to the OI, as in *ó lo dumedisa* [ó-lò-dúmédìs-à] '(s)he greets you(pl) (dj)'.

This can be predicted in a simple way by assuming that H-toned OIs are immediately preceded by the special boundary =:

#ó=lʊ́-tʰús-a#	→	#(ó)=(lʊ́-tʰú)s-a#	(H tone domain constitution)
	→	#(ó)=(lʊ́-tʰús-á)#	(SPRa)
	→	#(ó)=lʊ-(tʰús-á)#	(REPAIRa)
#ó=lʊ́-dumedis-a#	→	#(ó)=(lʊ́)-dumedis-a#	(H tone domain constitution)
	→	#(ó)=(lʊ́-dúmé)dis-a#	(SPRa)
	→	#(ó)=lʊ-(dúmé)dis-a#	(REPAIRa)

Ga ke lo dumedise [χà-kí-lʊ́-dùmédís-í] 'I do not greet you (cj)' illustrates a configuration in which the H-toned OI cannot generate a non-monosyllabic H tone domain, and consequently two monosyllabic H tone domains are in contact through the special boundary =. The violation of the non-adjacency constraint could only be eliminated by inserting a toneless vowel or a downstep. However, vowel insertion can only occur if the inserted vowel takes the penultimate position in the verb form, and downstep insertion is not available at word-internal boundaries. Consequently, the only possibility is the last resort strategy, namely fusion (REPAIRe).

#χa-kí=lʊ́-dumédís-í#	→	#χa-(kí)=(lʊ́)-du(médís-í)#	(H tone domain constitution)
	→	#χa-(kí=lʊ́)-du(médís-í)#	(REPAIRe)

6.9.5. The behavior of OIs in verb forms including a single OI (2)

H tone spreading affecting three successive syllables inside a verb form is observed when the second underlyingly toneless syllable involved in this process represents an OI, as in *ba a go tlhaloganya le bone* [bá-á-χó-tɬʰálʊ̀χàŋ-à] 'they understand you(sg) (dj)'. This can easily be predicted without any additional ad hoc specification by inserting the special boundary =

immediately after toneless OIs. In this configuration, the expansion of the H tone domain generated by the SI reaches the special boundary = as the result of the application of SPRa, and consequently the H tone domain can annex one more syllable by virtue of SPRb:

#bá-a-χʊ=tɬʰalʊχaŋ-a#	→	#(bá)-a-χʊ=tɬʰalʊχaŋ-a#	(H tone domain constitution)
	→	#(bá-á-χʊ́)=tɬʰalʊχaŋ-a#	(SPRa)
	→	#(bá-á-χʊ́=tɬʰá)lʊχaŋ-a#	(SPRb)

Since the insertion of the special boundary immediately before H-toned OIs but immediately after toneless OIs does not seem to lead to wrong predictions in other configurations, this solution is retained here.

6.9.6. The behavior of OIs in verb forms including two or three OIs

In verb forms including two or three OIs (or one or two OIs plus the reflexive marker, which behaves exactly like H-toned OIs), the distinction between two tone classes of OIs disappears; the tone taken by each of the OIs depends exclusively on the context, not on the choice of a particular OI:

- when immediately followed by another OI, all the OIs invariably surface with a H tone;
- when preceded by another OI, an OI immediately preceding the verb stem surfaces with a H tone if the verb stem has the tonal pattern o ó ..., and with a L tone in the other cases; if the melody of the verb stem when not influenced by a H-toned formative is entirely L, the L tones of its initial syllables give way to H tones.

These observations can be predicted by assuming that, in contact with another OI or with the reflexive marker, all OIs (including those which are toneless in forms including a single OI) are underlyingly H-toned, and preceded by the special boundary =. Sequences of two or three OIs are thus represented as =ó=ó- or =ó=ó=ó- at the beginning of the tonal derivation, which means that the first OI in a sequence of two OIs and the first two OIs in a sequence of three OIs generate adjacent monosyllabic H domains, a configuration that can only be regularized by the fusion of the monosyllabic H domains. The last OI in a sequence of two or three OIs is the only one which can surface with a L tone, due to the retraction of the H domain in which it is initially included, as illustrated by the derivations of *ga ke e ba lo rokisetse* [χà-kí-í-bá-lò-rók-ís-ets-í] ‘I do not make them sew them (the dresses) for you (cj)’ and *ga ke di ba lo apeisetse* [χà-kí-dí-bá-lʊ́-àpé-ís-ets-í] ‘I do not make them cook it (the food) for you (dj)’.

#χa-kí=í=bá=lʊ́-rʊ́k-ís-éts-í#	→	#χa-(kí)=(í)=(bá)=(lʊ́-rʊ́k-ís-éts-í)#	(H tone domain constitution)
	→	#χa-(kí)=(í)=(bá)=lʊ-(rʊ́k-ís-éts-í)#	(REPAIRa)
	→	#χa-(kí=í=bá)=lʊ-(rʊ́k-ís-éts-í)#	(REPAIRe)
#χa-kí=dí=bá=lʊ́-apé-ís-éts-í#	→	#χa-(kí)=(dí)=(bá)=(lʊ́)-a(pé-ís-éts-í)#	(H tone domain constitution)
	→	#χa-(kí=dí=bá=lʊ́)-a(pé-ís-éts-í)#	(REPAIRe)

6.10. The tonal behavior of postfinals

6.10.1. The postfinal of the imperative plural

This postfinal invariably surfaces with a L tone, and does not trigger any modification of the tonal contour of the stem to which it is suffixed, as illustrated by *lema* [lìmá] 'cultivate (imper.sg) / *lemang* [lìm-á-ŋ̀] 'cultivate (imper.pl). This can be predicted by positing that this postfinal is underlyingly represented as a toneless syllabic nasal followed by a floating H tone that prevents the syllabic nasal from being annexed by a H tone domain.

6.10.2. The postfinal of relative verb forms and the interrogative clitic

These two postfinals have exactly the same segmental form and tonal properties, which can be viewed as evidence that the postfinal of relative forms results from the grammaticalization of the interrogative clitic (a grammatical path semantically similar to that by virtue of which interrogative pronouns grammaticalized as relative pronouns in Indo-European languages).

They are invariably realized as H-toned syllabic nasals, and the tonal contour of the stem to which they are suffixed differs from that predicted by the rules proposed in the previous sections by the deletion of the H tone of the last syllable of the stem if and only if it belongs to a non-monosyllabic H tone domain. This can be predicted by positing that these postfinals are underlyingly represented as H-toned syllabic nasals, and that they are separated from the stem by the special boundary =, which prevents the postfinal from merging with the last syllables of the stem into a single H domain and triggers the retraction of non-monosyllabic H tone domains including the last syllable of the stem. For example, the tonal contour of *ba tlhalogantseng* [bá-tɬʰàlóχáń-ts-è-ŋ́] '(those who) have understood' can be explained as follows:

#bá-tɬʰalóχáń-ts-é=ŋ́#	→	#(bá)-tɬʰa(lóχáń-ts-é)=(ŋ́)#	(H tone domain constitution)
	→	#(bá)-tɬʰa(lóχáń)-ts-e=(ŋ́)#	(REPAIRb)

6.11. Tonal alternations affecting finals in the absence of any overt postfinal

In some tenses, in the absence of any overt postfinal, the tone patterns resulting from the interaction of the underlying tonal structure of stems as posited in Section 6.6 with the H tones underlyingly associated to prefixes can only be modified by the postlexical rule that converts H H and H L sequences into HL L in immediate prepausal position.

However, in some tenses in which no overt postfinal is present, the verb stem shows tonal contours different from those predicted by the rule presented in Section 6.6. Crucially, in all cases, the deviation can be described as the retraction of a H tone domain including the last syllable of the stem. This is for example the case of the e-sequential illustrated by Ex. (37).

(37) *... ke bereke le bone.*
'... and I will work with them.'
kì-bérék-ì lí-bɔ̀ːné
1SG-work-FV ADD-CL2.PRO

If in the same context we replace 'work' by other verbal lexemes generating stems with a variable number of syllables we observe the following pattern:

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ó
2-syllable stem	ó ò	ò ó
3-syllable stem	ó ó ò	ò ó ò
4-syllable stem	ó ó ó ò	ò ó ó ò
5 syllables or more	ó ó ó … ó ò	ò ó ó … ó ò

the tonal contour of verb stems in the context illustrated by Ex. (...)

The crucial observation is that the L tones on the final syllables preceded by a H-toned penultimate syllable constitute the only difference with the pattern for stems including a grammatical H tone as defined in Section 6.6:

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ó
2-syllable stem	ó ó	ò ó
3-syllable stem	ó ó ó	ò ó ó
4-syllable stem	ó ó ó ó	ò ó ó ó
5 syllables or more	ó ó ó … ó ó	ò ó ó … ó ó

the basic tonal contour of verb stems including a grammatical H tone

Within the framework adopted here, at least two relatively simple types of explanation can be considered: either the structure of such forms include an underlying element not immediately apparent on the surface but responsible for the retraction of H tone domains including the last syllable of the stem (for example, a postfinal consisting of a floating H tone), or the boundary between such verb forms is not a standard word boundary, and allows for tonal interactions that do not occur at standard word boundaries.

The difficulty here is that the analysis of the retraction of H tone domains including the last syllable of verb stems in some tenses interferes with the question of the tonal marking of the cj/dj distinction. Section 7 is devoted to this question.

7. The tone of the final vowels of verb forms and the cj/dj distinction

7.1. Dj forms with stable final H tones in non-prepausal position

In some dj forms, for example the dj form of the infinitive present positive, final H tones as predicted by the tone rules posited in Section 6 are invariably maintained in non-prepausal contexts, and can only give way to L tones in prepausal position.

(38) a. *Ke batla go bereka.* / *Ke batla go bereka le nna.*

'I want to work.' 'I too want to work.'

kì-bàtɬ-à	χò-bérê:k-à	kì-bàtɬ-à	χò-bérék-á	lí-ǹ:ná
1SG-want-FV(CJ)	CL15-work-FV(DJ)	1SG-want-FV(CJ)	CL15-work-FV(DJ)	ADD-1SG

b. *Ke batla go go ya.* / *Ke batla go go ya le nna.*
'I want to go there.' 'I too want to go there.'

kì-bàtɬ-à	χò-χû:-j-à	kì-bàtɬ-à	χò-χó-j-á	lí-ǹ:ná
1SG-want-FV(CJ)	CL15-CL17-go-FV(DJ)	1SG-want-FV(CJ)	CL15-CL17-go-FV(DJ)	ADD-1SG

7.2. Dj forms that never end with two successive H-toned syllables

In other dj forms, as illustrated in (39) by the dj form of the present negative, in all contexts, the final H tones predicted by the rules posited in Section 6 are maintained if the final syllable constitutes a monosyllabic H tone domain, but give way to L tones whenever the rules posited in Section 6 delimit a H tone domain including the last two syllables of the verb form.

(39) a. *Ga ke lele.* / *Ga ke lele le nna.*
'I do not cry.' 'I do not cry either.'

χà-kí-lì:l-í		χà-kí-lìl-í	lí-ǹ:ná
NEG-1SG-cry-FV(DJ)		NEG-1SG-cry-FV(DJ)	ADD-1SG

b. *Ga ke tshabe.* / *Ga ke tshabe le nna.*
'I am not afraid.' 'I am not afraid either.'

χà-kí-tsʰâ:b-ì		χà-kí-tsʰáb-ì	lí-ǹ:ná
NEG-1SG-be_afraid-FV(DJ)		NEG-1SG-be_afraid-FV(DJ)	ADD-1SG

In contrast with the dj forms of the type presented in Section 7.1, which may have very different tonal melodies in prepausal and non-prepausal contexts, dj forms of this type always show similar melodies in prepausal and non-prepausal contexts.

If all verb forms in dj contexts behaved in this way, one could consider positing that the boundary between verb forms and phrases in afterthought function triggers a post-lexical rule similar to that operating in prepausal contexts. This is however not the case. Historically, the tone pattern of such dj form may have resulted from the morphologization of the post-lexical rule of prepausal lowering, but synchronically, we must posit something in the tonal structure distinguishing such forms from dj forms occurring in the same contexts with a tonality that cannot be explained in the same way. In contrast with the underlying representation of dj forms with stable final H tones in non-prepausal position, the underlying representation of dj forms of this type must include an element triggering the retraction of H tone domains including the last syllable of the stem. This can be done very simply by positing a postfinal consisting of a floating H tone and seperated from the stem by the special boundary =. In such a configuration, if the tonal interaction between the prefixal string and the stem results in a non-monosyllabic H tone domain including the final, the postfinal triggers the retraction of this H tone domain:

#χa-kí-lɪl-í=´#	→	#χa-(kí)-lɪ(l-í)=(´)#	(H tone domain constitution)
	→	#χa-(kí)-lɪ(l-í)#	(floating tone deletion)
#χa-kí-tsʰáb-í=´#	→	#χa-(kí-tsʰáb-í)=(´)#	(H tone domain constitution)
	→	#χa-(kí-tsʰá)b-ɪ=(´)#	(REPAIRb)
	→	#χa-(kí-tsʰá)b-ɪ#	(floating tone deletion)

7.3. Cj forms with non-alternating finals

In some cj forms, in the same way as in the dj forms presented in Section 7.1, final H tones as predicted by the rules discussed in Section 6 can only be deleted in prepausal position. In non-prepausal position, they are invariably maintained, irrespective of the grammatical nature and tone pattern of the following word.

7.4. Cj forms with alternating finals

Some other cj forms show a tonal alternation if (and only if) the rules posited in Section 6 delimit a H tone domain including at least the last two syllables of the verb form. In this configuration, the last syllable surfaces with a L tone if and only if the following word begins with an underlyingly H-toned syllable and is neither a proper name nor a substantive.

For example, *podi* [pódí] 'goat' and *ele* [élé] 'that one (cl. 9)', though having both a H-toned initial syllable, do not interact in the same way with a cj verb form like *ke reka* [kìrɛ́ká/à] 'I buy, I am buying (dj)':

(40) a. *Ke reka podi.*
'I am buying a goat.'
kì-rɛ́k-á ˈpô:dì
1SG-buy-FV(CJ) (CL9)goat

b. *Ke reka ele (podi).*
'I am buying that one (goat).'
kì-rɛ́k-à ê:lè
1SG-buy-FV(CJ) (CL9)DEM

In these two sentences, *podi* [pódí] 'goat' and *ele* [élé] 'that one (cl. 9)' equally fulfill the object function in the construction of the same verb, which shows that argument structure plays no role in the tonal alternation. Since both *podi* [pódí] 'goat' and *ele* [élé] 'that one (cl. 9)' begin with a H-toned syllable and show identical tonal behaviors in all other contexts, the only possible relevant factor in a strictly synchronic account is the difference in the grammatical nature of the word in immediate postverbal position: *podi* is a substantive, whereas *ele* is a demonstrative. Ex. (41) shows that, in the same contexts, no tonal alternation occurs with the type of cj verb forms designated here as conjunct forms with non-alternating finals (in this example, the cj form of the present negative).

(41) a. *Ga ke reke podi.*
'I don't buy a goat.'
χà-kí-rék-í ˈpô:dì
NEG-1SG-buy-FV(CJ) (CL9)goat

b. *Ga ke reke ele (podi).*
'I don't buy that one (goat).'
χà-kí-rék-í ˈê:lè
NEG-1SG-buy-FV(CJ) (CL9)DEM

The following two pairs of examples provide additional illustrations of the contrast between cj verb forms whose final shows no tonal alternation – Ex. (42a-b) & (43a-b), and cj verb forms with an alternating final – Ex. (42c-d) & (43c-d).

(42) a. *Ga ke bereke nae.*
'I don't work with him/her.'
χà-kí-bérék-í nà:-é
NEG-1SG-work-FIN(CJ) ADD-CL1

b. *Ga ke bereke nao.*
'I don't work with you(sg).'
χà-kí-bérék-í nâ:-ò
NEG-1SG-work-FIN(CJ) ADD-2SG

c. *Ke bereka nae.*
'I work with him/her.'
kì-bɛ́rɛ́k-á nà:-ɛ́
1SG-work-FIN(CJ) ADD-CL1

d. *Ke bereka nao.*
'I work with you(sg).'
kì-bɛ́rɛ́k-à nâ:-ò
1SG-work-FIN(CJ) ADD-2SG

(43) a. *Ga re di bae mmogo.*
'We don't them (cl.8) together.'
χà-rí-dì-bá-ɨ̀ m̀mɔ̂:χɔ̀
NEG-1PL-CL8-put-FV(CJ) together

b. *Ga re di bae mo ntlong.*
'We don't put them (cl.8) in the house.'
χà-rí-dì-bá-ɨ̀ mó ń-tɬɔ̀:-ŋ̀
1PL-CL8-put-FV(CJ) there CL9-house-LOC

c. *Re di baya mmogo.*
'We put them (cl.8) together.'
rì-dí-báj-á m̀mɔ̂:χɔ̀
1PL-CL8-put-FV(CJ) together

d. *Re di baya mo ntlong.*
'We put them (cl.8) in the house.'
rì-dí-báj-à mó ń-tɬɔ̀:-ŋ̀
1PL-CL8-put-FV(CJ) there CL9-house-LOC

The crucial observation is that, when followed by words other than proper names or substantives, cj forms with alternating finals show a tonal alternation that can be described as the retraction of a non-monosyllabic H tone domain including the last syllable of the verb form if and only if the following word is not a proper name or a substantive. This means that the boundary between such cj forms and a word which is not a proper name or a substantive has in common with the special morpheme boundary = and the standard word boundary # that it triggers a process motivated by the constraint of non-adjacency of H domains, but apart from the general use of fusion as the last resort strategy, the details are different:

- when two H tone domains are in contact through the special morpheme boundary =, the available strategies are, in order of preference, (a) the retraction of the second H tone domain, (b) the retraction of the first H tone domain, and (c) the insertion of a toneless vowel;
- when two H tone domains are in contact through the standard word boundary #, the only available strategy is the insertion of a downstep;
- when two H tone domains are in contact at the boundary of a cj form with an alternating final and a word which is neither a substantive nor a proper name, the available strategies are, in order of preference, (a) the retraction of the first H tone domain, and (b) the insertion of a downstep.

Therefore, a solution both relatively simple and consistent with other aspects of the account proposed here is to posit that, at the syntax-morphology interface, a special word boundary ≠ is inserted immediately after the cj verb forms that have an alternating final if and only if the following word is not a proper name or a substantive. This special word boundary differs from the standard word boundary in that, if both immediately preceded and immediately followed by H tone domains, it allows for the retraction of a the first H tone domain as a possible repair strategy.[28]

[28] Historically, it seems reasonable to assume that, originally, such cj forms were followed by a special word boundary irrespective of the nature of the following word. The crucial observation here is that, in present-day Tswana, most substantives beginning with a H-toned syllable belong to class 9,

#kɪ-rɛ́k-á#pódí#	→	#kɪ-(rɛ́k-á)#(pódí)#	(H tone domain constitution)
	→	#kɪ-(rɛ́k-á)#$^{\downarrow}$(pódí)#	(REPAIRd)
#kɪ-rɛ́k-á≠é-lé#	→	#kɪ-(rɛ́k-á)≠(é-lé)#	(H tone domain constitution)
	→	#kɪ-(rɛ́)k-a≠(pódí)#	(REPAIRb)

7.5. Possible tonal structures for verb forms in cj and dj contexts

We are now in a position to formulate a precise definition of the possible tonal structures for verb forms in cj and dj forms. Four types of tonal structures are attested for the stems of verb forms in cj contexts, and three for the stems of verb forms in dj contexts.

7.5.1. Verb forms in cj contexts with no grammatical H tone and a non-alternating final

In the absence of any tonal interaction with the prefixal sequence, the tonal contour of the stem in cj verb forms belonging to this type would show the following pattern:

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ò
2-syllable stem	ó ó	ò ò
3-syllable stem	ó ó ó	ò ò ò
4-syllable stem	ó ó ó ò	ò ò ò ò
5 syllables or more	ó ó ó ò … ò	ò ò ò ò … ò

However, in the only tense that have these characteristics in cj contexts (the present positive circumstantial), all SIs are H-toned, the special boundary = is inserted between the SI and lexically H-toned stems, and there is no configuration in which the tonal contour of lexically toneless stems would not be modified by the interaction with H tones anchored in the prefixal string. For example, if a toneless OI is inserted between the SI and the stem, the first syllable of the stem is annexed by the H tone domain generated by the SI, and the tonal contour of the stem varies as follows:

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whose original L-toned prefix has been maintained as a L-toned syllabic nasal with monosyllabic noun stems only (as for example in *ntša* [ɲtʃá] 'dog'). What probably happened is that, when the L-toned prefix of class 9 was deleted, the tonal realization did not change, but the phonological conditioning was reanalyzed as a morphological conditioning involving not only nouns that originally had a L-toned prefix (common nouns of class 9 and proper names such as *Kitso* [kítsɔ́], which comes etymologically from the class 9 noun *kitso* [kítsɔ́] 'knowledge'), but also proper names such as *Oabile* [óábìlè] < *oabile* 'he (God) has donated', or common nouns of class 1a, for which there is no evidence that a L-toned initial syllable was ever present. The result of this reanalysis was the partial re-establishment of an ordinary word boundary at the junction between this type of cj forms and the following word, depending on the grammatical nature of the following word.

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ó
2-syllable stem	ó ó	ó ò
3-syllable stem	ó ó ó	ó ò ò
4-syllable stem	ó ó ó ò	ó ò ò ò
5 syllables or more	ó ó ó ò … ò	ó ò ò ò … ò

kí-mò-dʒá *ke mo ja* ‘while eating it (the ostrich, 1sg, cj)’
kí-χò-tʰúsá *ke go thusa* ‘while helping you (1sg, cj)’
kí-χò-tsʰámíkísà *ke go tshamekisa* ‘while playing with you (1sg, cj)’
rí-χò-símólólèlà *re go simololela* ‘while beginning for you (1pl, cj)’

kí-mó-ísà *ke mo isa* ‘while taking him/her away (1sg, cj)’
kí-mó-dírèlà *ke mo direla* ‘while working for him/her (1sg, cj)’
kí-χó-dúmèdìsà *ke go dumedisa* ‘while greeting for you (1sg, cj)’

7.5.2. Verb forms in cj contexts with a grammatical H tone and a non-alternating final

Whatever prefixes are added to them, and irrespective of the nature of the following word, the stem of cj forms of this type varies in the following way:

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ó
2-syllable stem	ó ó	ò ó
3-syllable stem	ó ó ó	ò ó ó
4-syllable stem	ó ó ó ó	ò ó ó ó
5 syllables or more	ó ó ó ó … ó	ò ó ó ó … ó

This type can be illustrated by the cj form of the present negative:

χà-kí-dʒí *ga ke je* ‘I do not eat (cj)’
χà-kí-rékí *ga ke reke* ‘I do not buy (cj)’
χà-kí-bérékí *ga ke bereke* ‘I do not work (cj)’
χà-kí-símólólí *ga ke simolole* ‘I do not begin (cj)’
χà-kí-sírélédíwí *ga ke sirelediwe* ‘I am not protected (cj)’
χà-rí-símólólélání *ga re simololelane* ‘we do not begin (cj)’

χà-kí-tɬí *ga ke tle* ‘I do not come (cj)’
χà-kí-bàlí *ga ke bale* ‘I do not read (cj)’
χà-kí-tswèlélí *ga ke tswelele* ‘I do not progress (cj)’
χà-kí-tɬʰàlóχáɲí *ga ke tlhaloganye* ‘I do not understand (cj)’
χà-rí-dùmédísání *ga re dumedisane* ‘we do not greet each other (cj)’
χà-rí-dùmédísétsání *ga re dumedisetsane* ‘we do not greet people for each other (cj)’

7.5.3. Verb forms in cj contexts with no grammatical H tone and an alternating final

When no prefixed formative influences it, the tonal melody of the stem of cj forms of this type varies as indicated in the following chart. Note that, when no H-toned formative exerts its influence, the distinction with stems with no grammatical H tone invariably followed by the standard word boundary is apparent only in the case of lexically H-toned stems comprising two or three syllables:

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ò
2-syllable stem	ó ó/ò	ò ò
3-syllable stem	ó ó ó/ò	ò ò ò
4-syllable stem	ó ó ó ò	ò ò ò ò
5 syllables or more	ó ó ó ò … ò	ò ò ò ò … ò

This pattern can be illustrated by the cj form of the present positive, when a toneless SI is immediately prefixed to the stem:

kì-dʒá	*ke ja* 'I eat (cj)'
kì-rɛ́ká/à	*ke reka* 'I buy (cj)'
kì-bɛ́rɛ́ká/à	*ke bereka* 'I work (cj)'
kì-símólólà	*ke simolola* 'I begin (cj)'
kì-sírélédìwà	*ke sirelediwa* 'I am protected (cj)'
rì-símólólɛ̀lànà	*re simololelana* 'we begin for each other (cj)'
kì-tɬà	*ke tla* 'I come (cj)'
kì-bàlà	*ke bala* 'I read (cj)'
kì-tswɛ̀lɛ̀là	*ke tswelela* 'I progress (cj)'
kì-tɬʰàlòχàŋà	*ke tlhaloganya* 'I understand (cj)'
rì-dùmèdìsànà	*re dumedisana* 'we greet each other (cj)'
rì-dùmèdìsètsànà	*re dumedisetsana* 'we greet people for each other (cj)'

However, H-toned formatives may create conditions in which the alternation triggered by the special word boundary ≠ becomes apparent in a greater number of cases. For example, when the stem of the cj form of the present positive immediately follows a H-toned SI, the alternations triggered by the special word boundary occur with lexically H-toned stems comprising one, two or three syllables, and lexically toneless stems comprising one or two syllables:

ó-dʒá/à	*ó ja* '(s)he eats (cj)'
ó-rɛ́ká/à	*ó reka* '(s)he buys (cj)'
ó-bɛ́rɛ́ká/à	*ó bereka* '(s)he works (cj)'
ó-símólólà	*ó simolola* '(s)he begins (cj)'
ó-sírélédìwà	*ó sirelediwa* '(s)he is protected (cj)'
bá-símólólɛ̀lànà	*ba simololelana* 'they begin for each other (cj)'

ó-tɬá/à	*ó tla* ‘(s)he comes (cj)’
ó-bálá/à	*ó bala* ‘(s)he reads (cj)’
ó-tswɛ́lɛ́là	*ó tswelela* ‘(s)he progresses (cj)’
ó-tɬʰálóχàŋà	*ó tlhaloganya* ‘(s)he understands (cj)’
bá-dúmédìsànà	*ba dumedisana* ‘they greet each other (cj)’
bá-dúmédìsètsànà	*ba dumedisetsana* ‘they greet people for each other (cj)’

However, with lexically H-toned stems of more than three syllables and with lexically toneless stems of more than two syllables, this tonal type cannot be distinguished from that presented in Section 7.5.1.

7.5.4. Verb forms in cj contexts with a grammatical H tone and an alternating final

The tonal contour of the stem of cj forms belonging to this type shows the following pattern:

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó/ò	ó/ò
2-syllable stem	ó ó/ò	ò ó
3-syllable stem	ó ó ó/ò	ò ó ó/ò
4-syllable stem	ó ó ó ó/ò	ò ó ó ó/ò
5 syllables or more	ó ó ó ó … ó/ò	ò ó ó ó … ó/ò

This tonal type can be illustrated by the *e*-sequential:

à-dʒí	*a je* ‘and (s)he will eat (cj)’
à-bó-dʒí/ì	*a bo je (bogobe)* ‘and (s)he will eat it (the porridge) (cj)’
à-rékí/ì	*a reke* ‘and (s)he will buy (cj)’
à-bérékí/ì	*a bereke* ‘and (s)he will work (cj)’
à-símólólí/ì	*a simolole* ‘and (s)he will begin (cj)’
à-sírélédíwí/ì	*a sirelediwe* ‘and (s)he will be protected (cj)’
bà-símólólɛ́lání/ì	*ba simololelane* ‘and they will begin for each other (cj)’
à-jí	*a ye* ‘and (s)he will go (cj)
à-χó-jí/ì	*a go ye* ‘and (s)he will go there (cj)
à-bàlí	*a bale* ‘and (s)he will read (cj)
à-tswèlélí/ì	*a tswelele* ‘and (s)he will progress (cj)’
à-tɬʰàlóχáɲí/ì	*a tlhaloganye* ‘and (s)he will understand (cj)’
bà-dùmédísání/ì	*ba dumedisane* ‘and they will greet each other (cj)’
bà-dùmédísétsání/ì	*ba dumedisetsane* ‘and they will greet people for each other (cj)’

7.5.5. Verb forms in dj contexts with neither a grammatical H tone nor a postfinal H tone

In non-prepausal position, if no H tone belonging to a prefixed formative exerts an influence, the tonal melody of the stem of dj forms belonging to this type varies in the following way:[29]

[29] This chart gives the tonal melody in non-prepausal position, but the reader must bear in mind that in prepausal position, H H sequences are automatically converted into HL L.

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó	ò
2-syllable stem	ó ó	ò ò
3-syllable stem	ó ó ó	ò ò ò
4-syllable stem	ó ó ó ò	ò ò ò ò
5 syllables or more	ó ó ó ò … ò	ò ò ò ò … ò

The dj form of the present positive illustrates this tonal type:

kì-à-dʒá	*ke a ja* 'I eat (dj)'
kì-à-rɛ́ká	*ke a reka* 'I buy (dj)'
kì-à-bɛ́rɛ́ká	*ke a bereka* 'I work (dj)'
kì-à-símólólà	*ke a simolola* 'I begin (dj)'
kì-à-sírélédìwà	*ke a sirelediwa* 'I am protected (dj)'
rì-à-símólólɛ̀lànà	*re a simololelana* 'we begin for each other (dj)'
kì-à-tɬà	*ke a tla* 'I come (dj)'
kì-à-bàlà	*ke a bala* 'I read (dj)'
kì-à-tswɛ̀lɛ̀là	*ke a tswelela* 'I progress (dj)'
kì-à-tɬʰàlòχàɲà	*ke a tlhaloganya* 'I understand (dj)'
rì-à-dùmèdìsànà	*re a dumedisana* 'we greet other (dj)'
rì-à-dùmèdìsètsànà	*re a dumedisetsana* 'we greet people for each other (dj)'

7.5.6. Verb forms in dj contexts with a grammatical H tone and no postfinal H tone

In non-prepausal position, the stem of the dj forms of this type shows the following pattern:[30]

	lex. H-toned stem	lex. toneless stem
2-syllable stem	ó ó	ò ó
3-syllable stem	ó ó ó	ò ó ó
4-syllable stem	ó ó ó ó	ò ó ó ó
5 syllables or more	ó ó ó ó … ó	ò ó ó ó … ó

This pattern is only found in the dj form of the perfect negative circumstantial (and this is the reason why monosyllabic stems are not mentioned in the chart, since the perfect stem always includes two syllables at least):

kí-dʒílé	*ke jele* 'having eaten (1sg, dj)'
kí-rékílé	*ke rekile* 'having bought (1sg, dj)'
kí-bérékílé	*ke berekile* 'having worked (1sg, dj)
kí-sírélédítswí	*ke sirelediswe* 'having been protected (1sg, dj)'
rí-símólólɛ́lájní	*re simololelanye* 'having begun for each other (1pl, dj)'

[30] see Footnote 19.

kí-tsìlé	*ke tsile* ‘having come (1sg, dj)’
kí-bàdílé	*ke badile* ‘having read (1sg, dj)’
kí-tsàmáílé	*ke tsamaile* ‘having gone (1sg, dj)’
kí-tɬʰàlóχáńtsé	*ke tlhalogantse* ‘having understood (1sg, dj)’
rí-dùmédísétsáɲí	*re dumedisetsanye* ‘having greeted people for each other (1pl, dj)’

7.5.7. Verb forms in dj contexts with a grammatical H tone and a postfinal H tone

With this tonal type of dj forms (and only with this type), the only difference between prepausal and non-prepausal realizations is the falling realization of H-toned penultimate syllables in prepausal context.

	lex. H-toned stem	lex. toneless stem
monosyllabic stem	ó ~ ò	ó ~ ò
2-syllable stem	ó ò	ò ó
3-syllable stem	ó ó ò	ò ó ò
4-syllable stem	ó ó ó ò	ò ó ó ò
5 syllables or more	ó ó ó … ó ò	ò ó ó … ó ò

The indication of two possibilities with monosyllabic stems means that the L variant appears if and only if the stem is immediately preceded by a H-toned formative, as illustrated by the following example, in the dj form of the infinitive negative:

(44) a. *Go sa je go a bopamisa.*
‘Not to eat makes one thin.’
χò-sà-dʒ-í χó-à-bópám-îːs-à
CL15-NEG-eat-FV(DJ) CL15-DJ-be_thin-CAUS-FV

b. *Go sa bo je (bogobe) go a bopamisa.*
‘Not to eat it (porridge) makes one thin.’
χò-sà-bó-dʒ-ì χó-à-bópám-îːs-à
CL15-NEG-CL14-eat-FV(DJ) CL15-DJ-be_thin-CAUS-FV

This pattern can be illustrated by the dj form of the *e*-sequential:

à-dʒí	*a je* ‘and (s)he will eat (dj)’
à-bó-dʒì	*a bo je (bogobe)* ‘and (s)he will eat it (class 14) (dj)’
à-rékì	*a reke* ‘and (s)he will buy (dj)’
à-bérékì	*a bereke* ‘and (s)he will work (dj)’
à-símólólì	*a simolole* ‘and (s)he will begin (dj)’
à-sírélédíwì	*a sirelediwe* ‘and (s)he will be protected (dj)’
bà-símólólélánì	*ba simololelane* ‘and they will begin for each other (dj)’

à-jí	*a ye* ‘and (s)he will go (dj)’
à-χó-jì	*a go ye* ‘and (s)he will go there (dj)’
à-bàlí	*a bale* ‘and (s)he will read (dj)’

à-tswèlélì	*a tswelele* ‘and (s)he will progress (dj)’
à-tɬʰàlóχáɲì	*a tlhaloganye* ‘and (s)he will understand (dj)’
bà-dùmédísánì	*ba dumedisane* ‘and they will greet each other (dj)’
bà-dùmédísétsánì	*ba dumedisetsane* ‘and they will greet people for each other (dj)’

8. Correspondences between tone patterns in cj and dj contexts

Arithmetically, there are twelve possible combinations of the four tonal types of stems observed in cj contexts and the three tonal types observed in dj contexts**,** but six only are attested. Three of these combinations involve identical or similar tonal types in the contexts that make apparent a possible contrast between cj and dj forms, and therefore constitute the three possible tone patterns for the tenses in which the cj/dj distinction is not marked. The other three constitute the three possible tonal markings of the cj/dj distinction.

8.1. Tone patterns for the stem of tenses with similar contours in cj and dj contexts

The circumstantial form of the present positive is the only tense illustrating the pattern involving no grammatical H tone and the standard word boundary in all contexts.

The circumstantial form of the perfect positive is the only tense illustrating the pattern involving the grammatical H tone and the standard word boundary in all contexts.

The pattern with a grammatical H tone, the postfinal |´| in dj contexts, and the special word boundary in cj contexts if the following word is not a proper name nor a substantive, is by far the most common pattern for tenses that have similar tonal contours in cj and dj contexts. It is found in the following tenses:

indicative future negative
indicative potential negative
infinitive present negative
infinitive potential negative
circumstantial present negative
circumstantial perfect negative
circumstantial future negative
circumstantial potential negative
imperative positive
imperative negative
subjunctive positive
subjunctive negative
e-sequential

8.2. Tone patterns for the stem of tenses with different contours in cj and dj contexts

The pattern with no grammatical H tone either in dj or cj contexts, no postfinal |´| in dj contexts, and insertion of the special word boundary ≠ in cj contexts, is relatively common. It is found in the following tenses:

indicative present positive

indicative future positive
indicative potential positive
circumstantial future positive
circumstantial potential positive
infinitive present positive
infinitive future positive
infinitive potential positive
infinitive continuative
a-sequential

The pattern with the grammatical H tone both in cj and dj contexts, the postfinal |´ | in dj contexts, and the standard word boundary in all contexts, is found in two tenses: the indicative present negative and the indicative perfect negative

The pattern with no postfinal |´ | and no grammatical H tone in dj contexts contrasting with the insertion of the special word boundary and the grammatical H tone in cj contexts is found in one tense only, the indicative perfect positive.

8.3. Conclusion of Section 8

Tswana tenses can be classified into three groups of tenses with tonal structures resulting in similar contours in cj and dj contexts, and three other groups with tonal structures resulting in three possible types of contrasts between cj and dj verb forms. Unfortunately, no obvious generalization emerges from this classification, which does not seem to be correlated with any grammatical or semantic feature. The dj marker that occupies Slot –2 in the structure of the indicative present positive is the only uncontroversial morphological element to which the function of marking the cj/dj distinction can be attributed. The tonal phenomena that contribute to this distinction (presence *vs.* absence of the grammatical H tone, presence vs. absence of the postfinal |´ | in dj contexts, and possible insertion of the special word boundary ≠ in cj contexts) have a distribution that does not make it possible to analyze them as carrying a specific information by themselves.

It must however be noted that, among the possible correspondences between the contours of verb forms in cj and dj contexts, two only are attested by more than two tenses:

– the type with no distinction between a cj and a dj form, and with specific tonal processes affecting the final both in cj and dj contexts;
– the type with no specific tonal process affecting the final in the dj form, and tonal processes triggered by the presence of the special word boundary ≠ in the cj form.

Consequently, in cj contexts, the type of tonal behavior that requires positing the special word boundary ≠ between the verb form and the following word constitutes the rule, whereas the type of tonal behavior attributable to the invariable presence of the standard word boundary constitutes the exception. By contrast, in dj contexts, there is no marked imbalance between tenses with tone patterns that require positing a postfinal |´ | in the dj form and tenses for which this postfinal must not be posited.

9. Cj/dj in other Bantu languages

Before discussing in Section 10 the possibility of reconstructing the historical developments that may have resulted in the puzzling situation summarized in Section 8, it is important to examine to what extent the comparison with other Bantu languages in which a cj/dj distinction has been recognized may shed some light on the situation of Tswana.

9.1. Cj/dj in other S30 languages

The question of a possible involvement of the tonal structure of verb forms in the expression of information structure in Pedi (alias Northern Sotho)[31] is simply not addressed in Sabine Zerbian's thesis on the expression of information structure in Pedi – Zerbian (2006). In this work, Sabine Zerbian just reproduces without any comment (and without referring to the discussion in my own works on Tswana) the current (but erroneous) view according to which, in Sotho languages, the present positive is the only tense showing a cj/dj distinction.

Apart from Tswana, Southern Sotho is the only S30 variety closely related to Tswana for which precise and detailed information about the tonal structure of verb forms is available – Letšeng (1995), and for which it is therefore possible to know whether purely tonal cj/dj distinctions exist or not. Not surprisingly (since Tswana and Southern Sotho can be considered dialectal variants of a single language), the situation is in most respects identical to that described here for Tswana in Sections 3 to 7, not only functionally, but also formally:

- in one tense (the indicative present positive), the dj form is marked by a formative following the SI;
- in one tense (the indicative perfect positive), the distinction involves not only the presence *vs.* absence of a grammatical H tone affecting the tonal melody of the whole stem, but also tonal phenomena lending themselves to the same explanation as in Tswana;
- the other tenses divide into those in which the distinction is not marked and those in which it is apparent in the tone of the last syllable of the verb form, and the details are not significantly different from those observed in Tswana; crucially, in the same way as in Tswana, the tonal behavior of dj forms in non-final position cannot be predicted as a mere consequence of a virtual pause separating them from the following word.

The tonal patterns described by Letšeng (1995) for Southern Sotho can be predicted by applying a system of rules very similar to that put forward here for Tswana to underlying tonal representations very similar to those posited in this paper. The differences observed in the surface contours of the Tswana and Southern Sotho verb forms are mostly due to more restricted spreading processes in Southern Sotho: the equivalent of the SPRa rule in Southern Sotho has a maximum range of one syllable, and no other spreading rule need be posited in Southern Sotho, since no H tone spreading occurs across the special morpheme boundary ≠ or across word boundaries.

[31] The term 'Northern Sotho' is ambiguous, since it may refer either to Pedi and its standardized variety, or to the S30 varieties spoken in the zone where standardized Pedi is used as a written language. Some of these S30 varieties loosely referred to as Northern Sotho are so different from Pedi that they can be viewed as distinct languages.

There is however an interesting difference in the conditioning of the tonal alternation affecting the final vowel in the cj forms analyzed in Tswana as triggered by the special word boundary ≠. In Tswana, the alternation is sensitive both to the grammatical nature of the following word and to the tone of its first syllable (see Section 7.4), whereas in Southern Sotho, the conditioning is purely grammatical, and there is no need for positing a special word boundary: words that are not substantives, proper names, locatives or genitives invariably trigger the retraction of non-monosyllabic H tone domains including the last syllable of the verb form, irrespective of the tone of their first syllable, whereas substantives, proper names, locatives or genitives never trigger retraction. This allows for a formal treatment of this tonal type of cj verb forms much simpler than in Tswana, without resorting to a special word boundary, since this distribution can straightforwardly be predicted by positing that, in Southern Sotho, the underlying structure of such cj verb forms includes a postfinal |´| if and only if the following word in not a proper name, a substantive, a genitive, or a locative.

Among S30 varieties more distantly related to Tswana, Kgalagari is the only one for which the tonal morphology of verbs is documented, but none of the two available sources (Dickens (1986) and Crane (2009)) mentions anything that could suggest the existence of tonal contrasts between verb forms in cj and dj contexts.

9.2. Cj/dj in other Bantu languages of zone S

A cj/dj distinction functionally identical to that described here for Tswana has been recognized in other Bantu languages of zone S, in particular, in several Nguni varieties – see among others Buell (2006) for Zulu. This distinction has been identified in two tenses (the present positive and the perfect positive), which interestingly correspond to the two tenses of Tswana in which cj/dj marking is not limited to tonal alternations affecting the last syllable of verb forms. A difference between the Nguni languages and Tswana is however that, in Nguni languages, the distinction is marked segmentally, not only in the present positive (with a formative *ya* following the subject in the dj form), but also in the perfect positive, marked by two different endings in the dj form (*-ile*) and in the cj form (*-e*).

An interesting observation is however that, at least in Swati (the only Nguni language for which I have the relevant information), in addition to its segmental marking, the cj/dj distinction in the perfect positive involves tonal phenomena corresponding exactly to those described here for Tswana – Creissels (1999).

Since current descriptions of Nguni languages do not include systematic accounts of the tonal morphology, and studies devoted to Nguni tone analyze only fragments of the tonal system, one may wonder whether the lack of any mention of tenses with a purely tonal cj/dj distinction in the literature on Nguni languages reflects the reality or not. When working on my 1999 paper on Swati, I systematically checked with a Swati consultant the tone of verb forms in contexts likely to reveal a cj/dj distinction, and my conclusion was that, at least in Swati, there is nothing similar to the tonal distinctions found in a variety of tenses in Tswana as well as in Southern Sotho. Consequently, the current view according to which Nguni languages have a cj/dj distinction in two tenses only seems to be correct.

9.3. Cj/dj outside zone S

9.3.1. The geographical distribution of the cj/dj *distinction*

Outside zone S, a cj/dj distinction has been identified in zones J (Haya, Rundi, Rwanda), G (Sambaa), M (Bemba, Tonga), N (Matengo), and P (Ngindo, Ndengereko, Matuumbi, Makonde, Makwe, Makhuwa) – Güldemann (1996: 159-187), Van der Wal (2011b).

9.3.2. Variations in the function of the cj/dj *distinction*

Jenneke Van der Wal's works provide a very detailed description and thorough analysis of the cj/dj distinction of Makhuwa. As she puts it in the abstract of her 2006 paper, in Makhuwa, "1) The verb appears in its cj form when a focal element occupies the Immediate After Verb (IAV) position; 2) the verb appears in its dj form when the IAV position is empty."

Consequently, the cj/dj distinction of Tswana and Makhuwa have in common the exclusion of the cj form from prepausal contexts, and a conditioning involving exclusively information structure, but are very different in that the cj forms of Makhuwa encode the presence of a focal element in an IAV focus position, whereas in Tswana, the cj forms simply encode that the verb is followed by at least one element that must not be interpreted as topical. An obvious manifestation of this difference is that the cj form has a much wider distribution (and the dj form a much more restricted distribution) in Tswana than in Makhuwa. For example, in the inversion construction of Makhuwa, the inverted (and de-topicalized) subject can be preceded by a dj verb form, which would be absolutely agrammatical in Tswana.

As suggested by Jenneke Van der Wal in several of her works, this contrast between cj verb forms marking focality and cj verb forms marking non-topicality can probably be generalized to hold for all the languages of zones P and S that have a cj/dj distinction, since the available data does not include anything that would contradict the hypothesis of a functional similarity between Tswana and the other zone S languages, or between Makhuwa and the other zone P languages.

This difference in the function of the cj/dj distinction is probably related to the fact that, in Makhuwa at least, the cj/dj distinction is redundant with a tonal modification affecting nouns occupying the IAV focus position. By contrast, in Tswana, the interactions between cj forms and the word that follow them result in tonal alternations affecting the final syllable of the verb, but trigger no tonal modification of the following word.

9.3.3. Variations in the marking of the cj/dj *distinction*

In many languages in which a cj/dj distinction has been described, the heterogeneity of its formal manifestations is striking. However, no other language has so far been described as having a situation exactly similar to that found in Tswana and Southern Sotho, with a variety of tenses in which the ending of dj forms in non-prepausal position is characterized by a tonal behavior that cannot be straightforwardly predicted as the consequence of the possible insertion of a pause.

In the languages that have been described as having a cj/dj distinction, this distinction involves a dj marker following the SI in one tense at least. Formal similarities are observed across languages, not only between the dj markers found in this position, but also between

them and TAM markers occupying the same position in other languages, and Nurse (2006) evokes the possibilities that the TAM markers in question might well be 'recycled focus markers'.

10. A possible scenario for the emergence of the cj/dj distinction in Sotho-Tswana and other Bantu languages

10.1. The heterogeneity of cj/dj distinctions and the functional alignment hypothesis

Cross-linguistically, the cj/dj distinctions identified in the Bantu languages enumerated in Section 9.3.1 show the following three characteristics, which must be accounted for by any hypothesis about the emergence of such distinctions:

- cj/dj marking is heterogeneous in many of the languages that have this distinction;
- depending on the individual languages, cj forms may encode two clearly distinct (although related) notions: focality and non-topicality;
- in spite of this formal and functional heterogeneity, at least some of the formatives involved in cj/dj marking seem to be cognate.

The type of scenario most likely to account for this type of situation is a scenario of *functional alignment* between formal distinctions whose functions were originally distinct, but overlapped in such a way as to make it possible to reanalyze them as fulfilling exactly the same function.

Accepting this hypothesis implies rejecting the apparently simplest scenarios that can be imagined, according to which the situation of the Makhuwa type might have developed from a more ancient situation of the Tswana type, or the other way round. Rather, the original situation was of a third type, in which the formal mechanisms that subsequently underwent functional alignment had not necessarily identical functions. But at the same time, this situation must have been a plausible starting point from which divergent evolutions may have resulted in the Tswana type of cj/dj distinction on the one hand, and in the Makhuwa type on the other hand.

In some of the languages that have a cj/dj distinction, cj forms signal the presence of a focal element in an IAV focus position. Since other types of focus marking involving verb morphology are attested across Bantu languages, it seems reasonable to imagine that focus-marking devices already existing at Proto-Bantu level and involving specific types of interaction at the junction between verbs and focalized nouns in IAV position have played a role in the formation of cj/dj distinctions, even in the history of zone S languages, in which the cj/dj distinction has no direct link with focalization synchronically.

This hypothesis is supported by the fact that zone S languages (in particular Tswana – see Section 2.4.3) have constituent order patterns interpretable as vestiges of an IAV focus position in interrogative clauses. Another piece of evidence is that, in Tswana, most verb tenses show in cj contexts a special type of tonal interaction with the following word reminiscent of phenomena typically found, in the languages that have an IAV focus position, at the junction between the verb and focal elements in IAV position.

Concerning now the dj markers that are found immediately after the SI in at least one tense in all the languages in which a cj/dj distinction has been identified, it has already been

proposed that they initially marked verb focus – Nurse (2006). According to this hypothesis, former verb focus markers have been reanalyzed as encoding that no focal element occupies the IAV focus position (in systems of the Makhuwa type), or that no non-topical element follows the verb (in systems of the Tswana type). This seems quite reasonable, since these dj markers occupy a position typically occupied in Bantu languages by former auxiliaries that have grammaticalized into verb prefixes, and cross-linguistically, the use of auxiliaries such as Basque *egin* 'do' is a common way of encoding verb focus. Note that this hypothesis is consistent with the general hypothesis of an original system with an IAV focus position, since it implies that, in the original verb focus construction I propose to reconstruct, the auxiliated verb was in IAV position with respect to the focalizing auxiliary.

10.2. Reconstructing an original situation with a three-way contrast?

In order to formulate a more precise hypothesis about the kind of situation from which divergent mechanisms of functional alignment may have resulted in systems of the Tswana or Makhuwa type, it seems to me interesting to consider the possibility that this situation involved a three-way contrast of the type described by Odden (1996) in Matumbi, with two distinct and optional focalizing devices. Such a system allows for three possible types of clauses from the point of view of information packaging:

- clauses in which the verb is marked as focalized by means of a special auxiliary, or of a prefix resulting from the grammaticalization of such an auxiliary;
- clauses in which a focal element other than the verb itself occupies an IAV focus position, its discourse status of focus being possibly reinforced by a specific interaction with the verb;
- clauses in which no element is marked as focal, but in which a pause may mark the boundary between phrases that together with the verb constitute the comment, and phrases that must be interpreted as fulfilling the discourse function of afterthought.

Starting from such a situation, systems of the Tswana type may have resulted from the reanalysis of verb focalizing devices as encoding that the verb is not followed by non-topical elements, and of focalization in IAV position as encoding that the verb is followed by at least one non-topical element, whereas systems of the Makhuwa type may have resulted from the functional alignment of forms originally expressing verb focus on the forms that do not imply any focus.

10.3. Metatony and its possible role in the emergence of cj/dj distinctions

In Bantu studies, the term 'metatony' in its narrow sense refers to a tonal alternation affecting the final vowel of class 15 infinitives in some languages. In the languages in question, the final vowel of the infinitive is H if an object follows, L otherwise – Meussen (1967: 111). Several authors have pointed to the possibility that metatony might be related to the tonal processes involved in focus marking in other languages, and might have played a role in the emergence of cj/dj distinctions. Note that such a hypothesis clearly implies an additional mechanism of functional alignment, since on the one hand, infinitives as nominal forms are

not likely to be involved in focus marking, and on the other hand, metatony, in contrast to cj/dj distinctions, is sensitive to argument structure.

What makes the situation rather intricate is that, on the one hand, 'metatony' has been used in reference to various types of tonal alternations whose relationship with metatony as defined by Meeussen is far from clear, from a typological as well as historical point of view, and on the other hand, the nominal nature of the infinitive suggests that metatony might have a historical link with the marking of the relation between head nouns and their dependents, in particular, with tonal processes operating at the junction between a head noun and (some of) its dependents – see Hyman & Lionnet (2011) and Hyman (2012) for some discussion.

Tswana is precisely a language in which the final syllable of nouns immediately followed by some types of dependents (in particular, the demonstratives, the dependents introduced by the attributive linker, and the genitival dependents) undergoes a special tone rule. In Tswana, when nouns with an inherent tone pattern … H H are immediately followed by one of these dependents, they show a … H L contour that I analyze as the mark of a construct form – Creissels (2009), since it disappears whenever the same nouns occur in phonologically identical configurations, but with a different syntactic relationship with the following word. For example, in (45a), *Setswana* [sìtswáná] is the head of the noun phrase *Setswana se ba se buang* [sìtswánà sé bá-sì-búà-ŋ́] 'the Tswana they speak → the way they speak Tswana', and consequently, the contact with the attributive linker *se* [sé] introducing the relative clause triggers the use of the construct form [sìtswánà]. By contrast, in (45b), *Setswana* [sìtswáná] is in contact with the same attributive linker *se* [sé] introducing a dependent of *setilo* [sìtílɔ̀] 'chair'[32], not of *Setswana* [sìtswáná]; in this construction, *Setswana* [sìtswáná] has no dependent, and consequently the construct form would not be correct.

(45) a. *Ga ke rate Setswana se ba se buang.*
'I do not like the Tswana they speak (the way they speak Tswana)'
χà-kí-rát-í sì-tswánà s-é bá-sì-bú-à:-ŋ́
NEG-1SG-like-FV CL7-Tswana.CSTR CL7-ATB CL2- CL7-speak-FV-REL

b. *Ga ke rate setilo sa Setswana se ba se rekileng.*
'I do not like the Tswana chair they bought'
χà-kí-rát-í sì-tílɔ̀ s-á-sì-tswáná s-é bá-sì-rék-íl-è:-ŋ́
NEG-1SG-like-FV CL7-chair.CSTR CL7-GEN- CL7-Tswana CL7-ATB CL2- CL7-buy-PRF-FV-REL

Note that here, very clearly, although somewhat paradoxically (and this is reminiscent of the situation observed with the cj/dj distinction in some tenses), a tonal contour ... H L quite similar to the ... HL L contour found in prepausal position signals a particularly tight link between two adjacent words, contrasting with the default ... H H contour found whenever the noun is followed by another word with which it has no particular syntactic relationship. Following up the analysis proposed for the tonal alternations affecting the last syllable of some cj verb forms, a simple way of accounting for this construct form of Tswana nouns is to posit that the special word boundary allowing for a H tone domain retraction process to its left is inserted after nouns immediately followed by some types of dependents.

[32] The construct form [sìtílɔ̀] is triggered by the presence of the genitival dependent *sa Setswana* [s-á-sì-tswáná].

The tonal alternation marking the construct form of Tswana nouns is also found with infinitives followed by dependents typically used with nouns,[33] and as just mentioned, the similarity with one of the types of alternations involved in the marking of the cj/dj distinction is striking. Unfortunately, a historical link with metatony does not seem plausible, since metatony adds a H tone to infinitives followed by an object, whereas the tone rule that affects Tswana nouns immediately followed by some types of dependents converts ...H H sequences into ...H L.[34]

There is however evidence that, in the history of Tswana, tonal processes operating at the junction between infinitives and their complements have played a role in the emergence of the type of tonal alternation analyzed here as involving no grammatical H tone either in dj or cj contexts, no postfinal |´| in dj contexts but insertion of the special word boundary ≠ in cj contexts. A striking characteristic of this pattern is that, as already mentioned, it cannot be related to the tonal processes operating in prepausal position, since in this pattern, it is precisely the dj form that in the absence of a pause invariably shows a tonal melody of a type that cannot be found in prepausal position.

The infinitive present positive (which is in particular the form of the infinitive that includes no typically verbal formative) and the other positive forms of the infinitive are among the tenses that follow this pattern, and the other tenses that follow it (indicative present positive, indicative / circumstantial future positive, indicative / circumstantial potential positive, and *a*-sequential) show more or less strong evidence of resulting from the univerbation of a former analytic form 'auxiliary + auxiliated verb in the infinitive'. Comparison with other S30 varieties provides abundant evidence that, historically, the future marker *tlaa* |tɬaa| can be decomposed as *tla* 'come' plus *a*, and that this toneless *a* is the reflex of the L-toned prefix of the infinitive. If the hypothesis proposed above about the origin of the dj marker found in the dj form of the present positive is correct, this form too results form the univerbation of an analytic form in which an auxiliary was followed by the infinitive of the auxiliated verb. In the case of the potential positive and *a*-sequential, the historical explanation of the tonal behavior of the markers |ká| and |a| might well be the deletion of the infinitive prefix in a former analytic form 'auxiliary + auxiliated verb in the infinitive'.

If this interpretation is correct, the explanation of the apparent anomaly in the tonal contrast between the cj and dj form of these tenses might be that, historically, the tonal behavior of the cj form reflects tonal processes at the junction between nominal forms and certain types of noun dependents.

11. Conclusion

In this paper, after analyzing the function of the cj/dj distinction found in Tswana, and providing a detailed analysis of the tonal phenomena involved in this distinction, I have tried to show to what extent the available documentation on more or less similar distinctions found in other Bantu languages makes it possible to reconstruct the grammaticalization processes

[33] On the syntactic properties of Tswana infinitives, see Creissels (2004).

[34] Note however that historical changes in the tonal system may have blurred the correspondences between the tonal processes of Tswana and those found in other Bantu languages, in particular the loss of the distinction between H H and H L as contrasting tone patterns for dissyllabic stems, and the introduction of a postlexical rule converting H H ## sequences into HL L ##. As mentioned in Section 6.7.6, the loss of the noun prefix of class 9 may also have played a role in the reanalysis of some tonal processes.

responsible for their emergence. In particular, I have argued that mechanisms of functional alignment have probably played a crucial role in these processes. Of course, it would be desirable to go further with more precise proposals about the details of the evolutions that have resulted in the systems as we can observe them now in the individual languages, and in particular, in the puzzling system of tone alternations found in Tswana and Southern Sotho. Unfortunately, I am not able to be more specific on this point in the present state of the available documentation and of my understanding of the issue.

Abbreviations

ADD = additive, APPL = applicative, ATB = attributive linker, AUX = auxiliary, CAUS = causative, CJ, cj = conjoint, CL = noun class, CONT = continuative, CSTR = construct form marker, DJ, dj = disjoint, FUT = future, FV = final vowel, H = high tone, IAV = immediate-after-verb, L = low tone LOC = locative, NEG = negation, OI = object index, PL = plural, POT = potential, PRF = perfect, PSV = passive, RECIP = reciprocal, REL = relative, SEQ = sequential, SG = singular, SI = subject index

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Annex 1: Subject indexes and object indexes

Four different sets of SIs (conventionally labeled here A, B, C, and D) must be recognized in Tswana. Apart from the SI of class 1, the four sets differ from one another in tone only, since set D can be analyzed as a portmanteau resulting from the fusion of the SI itself with a formative whose underlying form is |a∞|. In contrast to the SIs, the OIs have the same underlying form in all tenses, but show complex tonal alternations conditioned by the context – see Sections 6.6.4 and 6.6.5.

The following chart presents the OIs as they appear when immediately preceded by a L-toned SI and immediately followed by the verb root:

		SI(A)	SI(B)	SI(C)	SI(D)	OI
1st person	singular	kì, ŋ̀	kí, ŋ́	kì	kà	ŋ̀
	plural	rì	rí	rì	rà, rá	rí
2nd person	singular	ò	ó	ò	wà	ò

	plural	lò	ló	lò	lwà, lwá	ló
3rd person	cl. 1[35]	ó	á, ó	à	à	mò
	cl. 2	bá	bá	bà	bà, bá	bá
	cl. 3	ó	ó	ò	wà, wá	ó
	cl. 4	í	í	ì	jà, já	í
	cl. 5	lí	lí	lì	là, lá	lí
	cl. 6	á	á	à	à, á	á
	cl. 7	sí	sí	sì	sà, sá	sí
	cl. 8/10	dí	dí	dì	tsà, tsá	dí
	cl. 9	í	í	ì	jà, já	í
	cl. 11	ló	ló	lò	lwà, lwá	ló
	cl. 14	bó	bó	bò	dʒwà, dʒwá	bó
	cl. 15/17	χó	χó	χò	χà, χá	χó

The four sets of SIs have the following distribution:

– set A occurs in the forms of the indicative, except those beginning with the negative marker *ga* [χà];
– set B occurs in the forms of the indicative beginning with the negative formative *ga* [χà], in the subjunctive, in the circumstantial forms, and in the relative forms;
– set C occurs in the *e*-sequential;
– set D occurs in the *a*-sequential; its two tonal variants may well be dialectal variants, but for some speakers at least, they are in free variation.

Annex 2: Morphological characterization of the tenses of Tswana verbs

Indicative present positive: final vowel a / SI of set A / |a| (DJ) in Slot –2 in dj contexts / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Indicative present negative: final vowel ɪ / SI of set B / |χa| (NEG) in Slot –4 / grammatical high tone / postfinal H tone in dj contexts, non-alternating final in cj contexts.

Indicative perfect positive: final vowel e~ɪ / SI of set A followed by the special boundary = in dj contexts only / |il~J| (PRF) in Slot +2 / grammatical H tone in cj contexts only / no postfinal H tone in dj contexts, alternating final in cj contexts.

Indicative perfect negative: final vowel a / SI of set B / |χa| (NEG) in Slot –4 / |a| (PRF) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, non-alternating final in cj contexts.

Indicative future positive: final vowel a / SI of set A / |tɬaa| (FUT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Indicative future negative: final vowel ɪ / SI of set A / |tɬaa-sɪ| (FUT-NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Indicative potential positive: final vowel a / SI of set A / |ká=| (POT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Indicative potential negative: final vowel ɪ / SI of set A / |ká-sɪ| (POT-NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

[35] In set B, the SI of cl. 1 shows a free variation between á and ó in the relative forms; in all the other forms using this set of SIs, the SI of cl. 1 can only be á.

Circumstantial present positive: final vowel a / SI of set B followed by the special boundary = in contact with a H-toned stem / no grammatical H tone / no postfinal H in disjoint contexts, non-alternating final in conjoint contexts.

Circumstantial present negative: final vowel ɪ, SI of set B, |=sa| (NEG) in Slot –2, grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Circumstantial perfect positive: final vowel e~ɪ / SI of set B / |il~Jl| (PRF) in Slot +2, grammatical high tone / no postfinal H in disjoint contexts, non-alternating final in conjoint contexts.

Circumstantial perfect negative: final vowel a / SI of set B / |=sa| (NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Circumstantial future positive: final vowel a / SI of set B / |tɬaa| (FUT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Circumstantial future negative: final vowel ɪ / SI of set B / |tɬaa-sɪ| (FUT-NEG) in Slot –2 | grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Circumstantial potential positive: final vowel a / SI of set B / |ká=| (POT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Circumstantial potential negative: final vowel ɪ / SI of set B / |ká-sɪ| (POT-NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Relative forms: in general, the only differences between the relative forms and the corresponding circumstantial forms are the presence of the postfinal |≠ŋ́| (REL) in Slot +5 and the free variation between SIs of set A and B. The only particular case is the present positive, in which the SI is followed by the special boundary ≠ in the circumstantial form, but nor in the relative form.

Subjunctive positive: final vowel ɛ / SI of set B / no grammatical H tone / postfinal H tone in dj contexts, alternating final in cj contexts.[36]

Subjunctive negative: final vowel ɪ / SI of set B / |sɪ| (NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Sequential 1: final vowel a / SIs of set D / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Sequential 2: final vowel ɪ / SIs of set C / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Imperative positive: final vowel a or ɛ[37] / no SI / grammatical H tone / postfinal H tone in dj contexts and alternating final in cj contexts in the singular, postfinal |ŋ´| in the plural.

Imperative negative: final vowel ɪ / no SI / |sɪ| (NEG) in Slot –2 / grammatical H tone / postfinal H tone in dj contexts and alternating final in cj contexts in the singular, postfinal |ŋ´| in the plural.

Infinitive present positive: final vowel a / |χʊ| (CL15) in Slot –3 / no grammatical H tone, strong final / no postfinal H tone in dj contexts, alternating final in cj contexts.

Infinitive present negative: final vowel ɪ / |χʊ| (CL15) in Slot –3 / |≠sa| (NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

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[36] In the subjunctive positive, if no OI or reflexive marker is inserted, stems including three syllables or more show a tonal contour contradicting the regularities observed in other tenses – see Section 6.6, Footnote 24.

[37] In the imperative positive, the choice between the two possible finals depends on the presence of object indexes.

Infinitive perfect negative: final vowel a / |χʊ| (CL15) in Slot –3 / |≠sa| (NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Infinitive future positive: final vowel a / |χʊ| (CL15) in Slot –3 / |tłaa| (FUT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Infinitive future negative: final vowel ɪ / |χʊ| (CL15) in Slot –3 / |tłaa-sɪ| (FUT-NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Infinitive potential positive: final vowel a / |χʊ| (CL15) in Slot –3 / |ká=| (POT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.

Infinitive potential negative: final vowel ɪ / |χʊ| (CL15) in Slot –3 / |ká-sɪ| (POT-NEG) in Slot –2 / grammatical high tone / postfinal H tone in dj contexts, alternating final in cj contexts.

Infinitive continuative: final vowel a / |χʊ| (CL15) in Slot –3 / |sá=| (CONT) in Slot –2 / no grammatical H tone / no postfinal H tone in dj contexts, alternating final in cj contexts.