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Chapter 1: Forms and functions of the base paradigm of Shilluk transitive verbs
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Forms and functions of the base paradigm of Shilluk transitive verbs

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Abstract • This chapter offers a descriptive analysis of the morphological forms that make up the base paradigm of Shilluk transitive verbs, and also of the functions that are expressed through them. With respect to morphological exponence, tone and vowel length play a central role, both in marking the functions and in distinguishing a total of seven different verb classes. As for the functions, they are syntactic voice, subject marking, and tense-aspect-modality (TAM). These functions interact with one another and with other aspects of the syntax of the clause. For example, Imperfective aspect is only available in Object voice, and certain TAM forms interact with focus marking. We pay special attention to syntactic alignment, a topic on with earlier analyses diverge. Older studies distinguish between active and passive voices (Westermann 1912, Tucker 1955). More recently, the passive has been reinterpreted as an ergative construction (Miller & Gilley 2001). We find that the construction at the center of the controversy has all the morphosyntactic properties of a passive, but not the information-structural characteristics. The scope of this chapter is restricted to the base inflectional paradigm. This means that it does not cover the many derivations which present inflectional paradigms that are largely parallel to the base paradigm. For the sake of clarity and accountability, sound examples are embedded in relation to each of the numbered illustrations.

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1 Introduction

This chapter describes the morphosyntactic structure of Shilluk clauses that are headed by transitive verbs. This topic is pivotal to the analysis of Shilluk grammar as a whole, both in relation to the syntax and in relation to the morphology. With regards to the syntax, the verb, as the head of the predicate, determines the structure of the clause as a whole. This is especially true in Shilluk, because it is a head-marking language. This means, among others, that the roles of the main arguments to the predicate are signposted morphologically on the verb, i.e., the head, rather than through case marking on the arguments, i.e., the dependents.[1]

In relation to the morphology as well, the transitive verbs are central to an accurate understanding of Shilluk grammar, because this set of lexical roots presents the richest morphological paradigms. The important role of the transitive verb system to the study of Shilluk is evident from the scientific record: the transitive verb system has been the main object of investigation in several studies (Tucker 1955; Miller & Gilley 2001, 2007; Remijsen, Miller-Naudé & Gilley 2016), more so than any other aspect of Shilluk grammar. The verb forms involve intersecting dimensions of morphological and lexical information:

- Seven verb classes, which differ in terms of vowel length and tone;
- Morphological marking for Voice (three levels), Tense-Aspect-Modality [TAM] (seven levels), and Subject marking (seven levels); marked through vowel length, tone and affixation.

To gain insight into the morphology of Shilluk transitive verbs, it is important to understand that the same morphophonological markers – vowel length and tone – express both lexical and morphological information. And this morphophonology of tone and length is not only crucial, but also highly complex: Shilluk presents three levels of vowel length and nine syllable-level tone categories, all of which appear in the paradigm of transitive verbs. To convey these phenomena effectively and accountably, sound examples are embedded in relation to the illustrations.

The chapter is structured as follows. We start out describing the system of transitive verb classes (Section 2). Then we lay out the functions that are expressed through the base paradigm. These functions are three in number, and each of these constitutes the topic of a section: Voice (Section 3), Subject

1 Case-marking on pronouns in post-verbal position is a rare instance of dependent-marking (cf. Section 4).

marking (Section 4), and Tense-Aspect-Modality [TAM] (Section 5). Certain combinations of Voice and Tense-Aspect-Modality require the presence of one of a set of constituents elsewhere in the clause. We refer to this as 'syntactic licensing'; this phenomenon is described in Section 6. Section 7 describes in detail the inflectional marking of the above-mentioned functions in relation to the seven verb classes. The base paradigm is summarized in full using exemplar verbs in Appendix A, and schematically in Appendix B.

The scope of this chapter is limited in a number of ways. First, the description is limited to the base paradigm. That is, transitive verbs additionally present several derived paradigms, such as benefactive and antipassive. These are parallel to the base paradigm, in that they present inflections marking the same three functions of Voice, Subject marking and TAM. These derived paradigms of transitive verbs are beyond the scope of this chapter. With respect to the functions, we limit ourselves to a characterisation that motivates the functional interpretation of the morphological pattern. What we will not do is describe these functions in their own right. For example, in Section 3 we describe how several levels of tense, aspect and modality are inflectionally marked on the verb. But we do not describe tense, aspect and modality in their own right, an endeavour that encompasses lexical and syntactic perspectives in addition to the morphological angle. Also beyond the scope are transitive clauses involving complex predicates, non-declarative clauses, and defective transitive verbs.

1.1 Relation to earlier work

Our understanding of the morphophonological forms that make up the transitive verb paradigm largely follows the analysis presented in Remijsen et al. (2016); in the course of this chapter we will point out discrepancies. The most important point of divergence is that, in the current study, we distinguish between the base paradigm and derived paradigms. Specifically, we argue that Applicative voice and Subject voice are part of base inflectional paradigm, on a par with Object Voice, whereas operations such as Benefactive and Antipassive are best interpreted as derivations. In contrast, Remijsen et al. (2016) treated all these morphological operations on a par. This innovation in the analysis, i.e., of distinguishing between inflection and derivation, is motivated by the recognition that morphological marking for Voice, Subject marking and TAM recurs across derivations. For example, there are subject-marked forms in the base paradigm, and also in the benefactive and the antipassive. The interpretation that the Applicative voice is inflectional is

supported by the same line of argument: it recurs across derivations. This insight is inspired by investigations in related languages, especially Andersen (1992–1994) on Dinka, and Reid et al. (2016) on Nuer.

A central topic on which earlier studies disagree is the nature of syntactic alignment in Shilluk. While Westermann (1912) and Tucker (1955) distinguish between active and passive voices, Miller & Gilley (2001) invoke an ergative analysis for the latter. In our investigations into the voice system, we find support for the former analysis on the basis of the morphosyntactic characteristics. At the same time, we agree with Miller & Gilley (2001) that the construction hypothesized to be a passive in older work is unmarked in an information-structural sense. Our analysis of TAM largely follows Miller & Gilley (2007), and in particular we adopt the hypothesis of a contrast between evidential and non-evidential past tense forms. One expansion is the No Tense form. This level of TAM has not been investigated in detail before, even though it recurs with great frequency in Shilluk speech.

1.2 Methodology

The second author is a native speaker of the Shilluk language, more specifically from Tonga, a town at the southwestern edge of Shilluk-speaking region. Decisions on which structures are grammatical and which are not are based on his native-speaker intuitions.

During the first six years of our investigations, in the course of intermittent research between 2008 and 2013, we studied the transitive verb system primarily through controlled elicitation, and only to a lesser extent on the basis of spontaneously uttered speech. In this way, we developed a detailed understanding of the morphophonological forms, while our knowledge of the functions remained rudimentary. During this period, the analysis of the morphophonology of verbs was supported through phonological and phonetic investigations with at least fifteen speakers. The results of these studies on the sound system are reported in Remijsen, Ayoker & Mills (2011), Remijsen & Ayoker (2014), and Remijsen, Ayoker & Jørgensen (to appear). By 2012, our analysis of the morphophonological forms was largely settled, and our methodology shifted to the study of spontaneous speech – especially narratives, but to a lesser extent also songs (Remijsen & Ayoker 2015). Since then, the grammatical analysis of narratives has played a central role in our investigations, bringing up phenomena we would not have thought of exploring through controlled elicitation. This process whereby the analysis develops through the study of narratives is open-ended. At the time of writing

this chapter, we have carried out detailed grammatical analysis of twelve narratives, totalling over 60 minutes, collected from eight speakers. Examples drawn from this documentary play an important role in making the descriptive analysis accountable (cf. Woodbury 2003). These and other forms of spontaneously uttered speech are signposted as such by means of a ˆ adjacent to the example number.

So far, fieldwork by the first author amounts to thirty weeks in Khartoum, Juba, and Tonga. In addition, the second author has spent three months in Edinburgh in 2009. Since 2015, however, the most important context of our investigations is not working in person, but rather through Skype, which has enabled us to intensify our collaboration considerably. From September 2015 onwards over a three-year period, we have conducted narrative analysis and controlled elicitation through a schedule of three sessions per week, on average.

1.3 The Shilluk sound system

In this section, we briefly summarize the main features of Shilluk phonology, along the lines of the analyses in Remijsen et al. (2011) and Remijsen & Ayoker (2014). This summary is relevant to the study of the transitive verbs, because stem-internal alternations, especially in terms of vowel length and tone, are central to the morphological marking.

The majority of monomorphemic native Shilluk words consist of a single closed syllable, e.g. **càm** 'eat', **kwɑ̄n** 'porridge', **lʊ̀ʊ̰t** 'stick' and **ŋʊ̌oom** 'awl'. Derivational and inflectional affixes result in more complex phonological word shapes. Consider, for example, the instrument nominalisation **góooc-ī** 'machete [hit-INSTR]' or the cardinal **á-dʌ̀k** 'three [CARD-third]'.

The consonant inventory includes ten plosives and five nasals, structured orthogonally at five places of articulation: /p,b,m; t̪,d̪,n̪; c,ɟ,ɲ, k,g,ŋ/. Voicing in plosives is distinctive in the syllable onset only; the realization of plosive codas varies allophonically in voicing and in manner (Remijsen et al. 2011); we represent them with the voiceless plosive character. The remaining consonants are the liquids /l,r/ and the semivowels /w,j/. The latter are the only consonants that can combine into complex onsets – e.g. **tjɛ́l** 'foot:P'. The vowel inventory includes two sets, which differ in specification for Advanced Tongue Root (ATR). The –ATR vowels are /ɪ,ɛ,a,ɔ,ʊ/; the +ATR vowels are /i,e,ʌ,o,u/. Stem vowels display a ternary contrast between short, long, and overlong (Remijsen et al., to appear). We represent them using one, two, and three vowel characters, respectively. Affix vowels are short or long.

The stem syllables of content words display nine distinctive tone patterns. There are three level tonemes: Low (L) /cv̀c/, Mid (M) /cv̄c/, and High (H) /cv́c/; four falling contour tones: Low Fall (LF) /cv̂c/, High Fall (HF) /cv̋c/, Late Fall (LHF) /cv́c̀/, and High Fall to Mid (HFM) /cv̋c̄/; and two rising contour tones: Low Rise (LR) /cv̌c/ and High Rise (HR) /cv̏c/. Because the inventory is so big, especially in terms of contour tones, several tone categories are represented through a combination of diacritics, and in the case of two contours – the Late Fall and the High Fall to Mid – these diacritics are distributed over two segmental characters: the first vocalic character and the coda. These are merely conventions in answer to the challenge of representing nine distinct syllable-level tone categories. That is, all transcriptions for tone make reference to the surface-phonological specification for tone of the syllable as a whole. Affixes only carry the level tones, i.e., Low, Mid, and High. To the best of our knowledge, there is only one morpheme that represents an exception to the generalization that every syllable is specified for tone.[2]

2 Transitive verb classes

Shilluk transitive verbs present a remarkable uniformity in their phonological form: the root consists of a single closed syllable. The composition of this syllable is summarized by the template /C(j/w)V(V)C/. That is, the root vowel is either short or long, and clustering of consonants is restricted to the onset, where either of the semivowels /w,j/ may follow another consonant. Among over 700 transitive verbs in our lexicographic data, there is only one that does not conform to this template: {òr} ‘send’, which lacks an onset. A total of seven classes can be distinguished, based on alternations in terms of vowel length and tone (Remijsen, Miller-Naudé & Gilley 2015, 2016). This section is dedicated to the description of these classes. As we lay out this system, we make reference to inflections for Voice (e.g. Subject voice), TAM (e.g. Past tense) and subject marking (e.g. 2nd singular). These functions determine the morphophonological specification in terms of which the verb classes diverge. Here we refer to them without motivating them; they will be discussed in depth in the following sections.

A first dimension on which the verb classes diverge is vowel length in the stem syllable. This is illustrated in Table 1. In this table, the lexical

2 The exception at issue is an allomorph of the focus marker **à**. While **à** is Low-toned in most environments, it is toneless when it follows immediately after the verb stem. There it copies the tonal target of the syllable to its left.

length of the root vowel is illustrated by the stem form in the Subject voice Past tense form, whereas morphological lengthening of the stem vowel is illustrated by the Past tense subject-marked for 2nd singular. Note that there are three patterns of alternation. First, there are verbs that have a short vowel lexically, and that do not display morphological lengthening of the stem vowel anywhere in their paradigm. The verb {ŋɔ̀l} 'cut', shown in Table 1, has a short vowel throughout its morphological paradigm. We refer to these as Fixed Short verbs. As seen from Table 1, {ŋɔ̀l} the Subject voice Past tense form and the Past tense 2nd singular form are indistinguishable from one another. Second, there are verbs that have a short root vowel, but which appear with increased vowel length in many inflections, including the past tense 2nd singular. This pattern, which we refer to as Short with Grade, is illustrated in Table 1 by {càm} 'eat'. Third, there are verbs that have a long root vowel, and which also undergo morphological lengthening. These are the 'Long (with Grade)'[3] verbs; {lèɛŋ} 'throw' is one of them.

Table 1. The three patterns of vowel length alternation in transitive verbs. The lexical length of the stem vowel is illustrated by the Subject voice (SV) Past tense form, and morphological lengthening by the Past tense 2nd singular.

Verb classes	**Fixed Short**	**Short with Grade**	**Long**
Example	{ŋɔ̀l} 'cut'	{càm} 'eat'	{lèɛŋ} 'throw'
SV PAST	**á-ŋɔ̀l**	**á-càm**	**á-lèɛŋ**
PAST 2SG	**á-ŋɔ̀l**	**á-càaam**	**á-lèɛɛŋ**

Note that morphological lengthening in Shilluk is 'overlengthening': if a verb displays morphological lengthening, then it lengthens to the third level of vowel length, i.e., overlong, irrespective of whether the root vowel is short or long, i.e., CVC, CVVC→ CVVVC. As a result, overlengthening is a neutralizing process: on the basis of a verb form with an overlong stem vowel, e.g. in the Past tense form 2nd singular, one cannot predict whether the Subject voice Past tense form has a short vowel or a long one. In this respect, Shilluk is different from Dinka, where short and long stem vowels both lengthen morphologically by one level of vowel length, i.e., CVC → CVVC and CVVC → CVVVC (Andersen 1990).

Summarizing the vowel length alternations in the base paradigm of

3 The qualification 'with Grade' is superfluous in relation to Long verbs: they all display vowel length alternation.

transitive verbs, we find a) Fixed Short verbs; b) Short with Grade verbs, that alternate between a short stem vowel and an overlong one; and c) Long verbs, alternating between long and overlong stem vowels. Vocalic overlength invariably expresses inflection in transitive verbs.[4] It is worthwhile to note that the alternation between short and long stem vowels does not occur in the base paradigm.[5]

The patterns of vowel length alternation in the stem syllable are in part predictable on the basis of vowel quality. Long verbs come with any vowel quality. But verbs with a short root vowel, i.e., the Fixed Short and Short with Grade classes, display an interaction. Fixed Short verbs have closed or half-open root vowels, but not the open vowels /a,ʌ/. In addition, the vowel is not preceded by a complex onset. Short with Grade verbs, in contrast, either have an open root vowel, i.e., /a,ʌ/, or a vowel preceded by a semivowel in the onset, e.g. {gwɔ̂ɲ} 'scratch'.[6]

The second dimension on which the transitive verbs separate into lexical classes is tone. The verbs in Table 1 all belong to Low classes, which is marked by the low-tone diacritic in the morpheme representation of these verbs: {ŋɔ̀l}, {càm}, {lɛ̀ɛŋ}. But there are also Low Fall verbs, and the difference between Low and Low Fall verb classes is crossed orthogonally with the three patterns of length alternation, yielding six classes. This is shown in Table 2, which displays the same inflections as Table 1, but now includes the Low Fall verbs. Note that the latter have a Low Fall on the stem syllable in Subject voice Past and Past 2nd singular, whereas the Low verbs have the Low tone instead.

4 This is to be expected, because overlength in Shilluk, as in other West Nilotic languages, is the diachronic outcome of suffix vowels lost through compensatory lengthening (Andersen 1990).

5 However, this alternation between short vs. long vowels is attested elsewhere in the morphology of transitive verbs. Some verbs with a long stem vowel mark the antipassive derivation through a combination of stem-internal changes which includes a shortening of the stem vowel. For example, {bûuk} 'cover with powder' has the Antipassive Past **á-bûk** (cmp. transitive Subject voice Past **á-bûuk**), and {cûʊl} 'pay for' has the Antipassive Past **á-cût** (cmp. transitive Subject voice Past **á-cûʊl**). The derivational morphology of transitive verbs is beyond the scope of this chapter.

6 The relevance of vocalic complexity to the morphological quantity alternation in Shilluk is reminiscent of a similar interaction in Anywa, a closely-related language (Reh 1996).

Table 2. Evidence for the orthogonal crossing of tone (Low vs. Low Fall) with vowel length (Fixed Short vs. Short with Grade vs. Long) in the verb class system.

Verb classes	**Fixed Short**		**Short with Grade**		**Long**	
	Low	**Low Fall**	**Low**	**Low Fall**	**Low**	**Low Fall**
Example	{ŋɔ̀l} ‘cut’	{lêŋ} ‘drum’	{càm} ‘eat’	{mâl} ‘roast’	{lɛ̀ɛŋ} ‘throw’	{mâaṭ} ‘drink’
SV PAST	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lɛ̀ɛŋ**	**á-mâaṭ**
PAST 2SG	**á-ŋɔ̀l**	**á-lêŋ**	**á-càaam**	**á-mâʌʌl**	**á-lɛ̀ɛɛŋ**	**á-mâaaṭ**

There is one additional verb class, which we label the High Fall class. It is included in Table 3, where it is illustrated by {mǻal} ‘praise’. This pattern of tonal alternation is only found on Long verbs, i.e., it does not appear on Fixed Short verbs or on Short with Grade verbs. Note that, in the Subject voice Past tense form, the tonal specification on the stem syllable for this class is the same as that of the Low Fall verbs, whereas it patterns with the Low verbs in Past 2nd singular. In certain other inflections, its specification deviates from both the Low and Low Fall verbs. One such inflection is the Object voice Imperfective, where the stem syllable carries a High Fall, after which the class is named.

Table 3. The difference in tone and vowel length between the seven classes of transitive verbs, illustrated by Subject voice Past, Past 2nd singular, and Object voice Imperfective.

Verb classes	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Low Fall**	**Low**	**Low Fall**	**Low**	**Low Fall**	**High Fall**
Example	{ŋɔ̀l} ‘cut’	{lêŋ} ‘drum’	{càm} ‘eat’	{mâl} ‘roast’	{lɛ̀ɛŋ} ‘throw’	{mâaṭ} ‘drink’	{mǻal} ‘praise’
SV PAST	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lɛ̀ɛŋ**	**á-mâaṯ**	**á-mâal**
PAST 2SG	**á-ŋɔ̀l**	**á-lêŋ**	**á-càaam**	**á-mâʌʌl**	**á-lɛ̀ɛɛŋ**	**á-mâaaṯ**	**á-màaal**
OV IMPF	**ò-ŋɔ̀l-ɔ̀**	**ò-lêŋ-ɔ̀**	**ò-càaam-ɔ̀**	**ò-mâʌʌl-ɔ̀**	**ò-lɛ̀ɛɛŋ-ɔ̀**	**ò-mâaaṭ-ɔ̀**	**ò-mǻaal-ɔ́**

Across their paradigm, Low, Low Fall and High Fall verbs each appear with a range of different specifications for tone. Before considering the phenomena, we set out an opposition between two scenarios. One possible situation is that a transitive verb has a lexical specification for tone, and that the tonal specifications it appears with in its various inflections can be interpreted as the compositional outcome of the integration of this lexical or underlying

specification with inflectional tones. We refer to this as the Compositional Tone scenario. The alternative scenario is that a verb appears with a given set of tonal specifications across its paradigm, but that these specifications cannot plausibly be related through morphophonological processes. In this second scenario, the paradigm does not offer a basis to postulate an underlying or lexical specification. We refer to this as the Set Tone scenario. Both analyses are adequate in a descriptive sense, but the Compositional Tone scenario offers an explanation of how the tonal specifications of different inflections in the paradigm are related to one another, and would be more attractive for that reason (explanatory adequacy), if the data offer support for it.

As it turns out, the situation is mixed. We will show that some inflections offer compelling evidence for Compositional Tone, whereas others do not. Starting with the former, the Low and Low Fall classes present inflections in which lexical and inflectional specifications are both expressed. Consider the data in Table 4, which presents Subject voice and Applicative voice (XV) forms, both in Past tense. The Applicative inflection involves overlengthening for verbs that are not Fixed Short. As for tone, the Low classes have a Mid tone on the stem in this inflection, and the Low Fall a High Fall to Mid. (The High Fall verbs pattern along with the Low class here.)

Table 4. Evidence for Compositional Tone, from Subject voice Past tense and Applicative voice Past tense.

Verb classes	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Low Fall**	**Low**	**Low Fall**	**Low**	**Low Fall**	**High Fall**
Example	{ŋɔ̀l} ‘cut’	{lêŋ} ‘drum’	{càm} ‘eat’	{mâl} ‘roast’	{lɛ̀ɛŋ} ‘throw’	{mâaʈ} ‘drink’	{mā́al} ‘praise’
SV PAST	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lɛ̀ɛŋ**	**á-mâaʈ**	**á-mâal**
XV PAST	**á-ŋɔ̄l**	**á-lḗŋ**	**á-cāaam**	**á-mA̋ʌʌĪ**	**á-lɛ̄ɛɛŋ**	**á-mā́aaʈ̄**	**á-māaal**

Note that the Low verbs have a lower specification for tone than the Low Fall verbs in the Subject voice Past tense: Low vs. Low Fall, respectively. This difference is retained, at a higher tonal register, in the Applicative voice, where they have Mid and High Fall to Mid, respectively. If we conceive of the Shilluk tone realization as involving three heights, numbered from 1 (low) to 3 (high), then a change from Low to Mid is a change from 1 to 2, and a change from Low Fall to High Fall to Mid can be conceived of as a change from 21 to 32. In both cases, the register is increased by 1 level. In this way, the tonal specification in the Applicative expresses both inflection and verb

class. The Compositional Hypothesis receives additional supported when the Applicative Past is inflected further for a 2nd singular subject, which is added in Table 5. This inflection adds a High target to the right of the specification of the Applicative voice Past tense. In the case of the Low verbs, which have a Mid tone in the Applicative Past, the addition of a High target yields a High Rise, i.e., ◌̄ + ◌́ → ◌̌. Or, in the numeric representation introduced above, 2 + 3 → 23.

Table 5. Further evidence for Compositional Tone, from Subject voice Past tense, Applicative voice Past tense, and Applicative voice Past tense 2nd singular.

Verb classes	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Low Fall**	**Low**	**Low Fall**	**Low**	**Low Fall**	**High Fall**
Example	{ŋɔ̀l} ‘cut’	{lêŋ} ‘drum’	{càm} ‘eat’	{mâl} ‘roast’	{lɛ̀ɛŋ} ‘throw’	{mâaʈ} ‘drink’	{mɑ̋al} ‘praise’
SV PAST	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lɛ̀ɛŋ**	**á-mâaʈ**	**á-mâal**
XV PAST	**á-ŋɔ̄l**	**á-lɛ́ɛ̄ŋ**	**á-cāaam**	**á-mʌ̋ʌʌ̄l**	**á-lɛ̄ɛɛŋ**	**á-mɑ́aaʈ̄**	**á-māaal**
XV PAST 2S	**á-ŋɔ̌l**	**á-lɛ́ŋ**	**á-cǎaam**	**á-mʌ́ʌʌl**	**á-lɛ̌ɛɛŋ**	**á-máaaʈ**	**á-mǎaal**

In the case of the Low Fall verbs, which have a High Fall to Mid in the Applicative Past, the addition of a High target yields a High level tone, i.e., ◌̂̄ + ◌́ →◌́, or numerically, 32 + 3→3. It is not surprising that a three-target configuration would be simplified in this way, i.e., for the sequence of High Fall to Mid followed by High to simplify to level High, because time pressure is very high in a three-target configuration (cf. Zhang 2001, Xu & Sun 2002). And in fact, the same simplification process (◌̂̄ + ◌́ →◌́) can be observed elsewhere in the grammar. This is shown in (1). This illustration shows possessive noun phrases. The possessed term, i.e., the head, is inflected for taking a possessor, an inflection we label pertensive following Dixon (2010). In the case of a suffixed noun, such as **dɔ́ɔɔr-ɔ́** ‘axe-S’, pertensive is marked by a suffix **-ɪ**. In (1a), where the possessor is grammatically singular, the pertensive suffix has a Mid tone. When the possessor is grammatically plural, as in (1b), this suffix is invariably High-toned. Note how, in (1b), the addition of the High-toned suffix results in a High tone on the stem. Suffixless nouns, such as **dúup** ‘mouse’, display the same tonal alternation. The High Fall to Mid of the pertensive singular turns into a level High tone in the pertensive plural.

(1) a. **dâa dɔ̃ɔ̄r-ī twɔ́ɔŋ**
EXSP.FOC axe-PRT Twong
'There is Twong's axe.'

b. **dâa dɔ́ɔr-í mʌ́ʌn**
EXSP.FOC axe-PRT:P woman.P
'There is the women's axe.'

c. **dâa dűuup̄ twɔ́ɔŋ**
EXSP.FOC mouse-PRT Twong
'There is Twong's mouse.'

d. **dâa dúuup mʌ́ʌn**
EXSP.FOC mouse:PRT:P woman.P
'There is the women's mouse.'

The alternation in (1c,d) is identical to the one in Table 5, between High Fall to Mid tone and High tone in Applicative vs. Applicative 2nd singular. This suggests that the High tone on the stem syllable of Low Fall verbs inflected for Applicative 2nd singular can be derived in a compositional manner from the Applicative voice form without subject marking, through a word-internal simplification process, whereby ˊ⁻ + ˊ→ˊ.

However, there are other inflections where the specification cannot be derived in a compositional manner. A first illustration of this appears in Table 6, which shows the Object voice Past tense form. In this inflection, all transitive verbs have the High Fall (/ ˆ /).

Table 6. Neutralisation of tone contrast in the Object voice Past tense, as evidence for Set Tone.

Verb classes	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Low Fall**	**Low**	**Low Fall**	**Low**	**Low Fall**	**High Fall**
Example	{ŋɔ̀l} 'cut'	{lêŋ} 'drum'	{càm} 'eat'	{mâl} 'roast'	{lèɛŋ} 'throw'	{mâaṭ} 'drink'	{mấal} 'praise'
SV PAST	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lèɛŋ**	**á-mâaṭ**	**á-mâal**
OV PAST	**á-ŋɔ́l**	**á-lếŋ**	**á-cấm**	**á-mấl**	**á-lếɛŋ**	**á-mấaṭ**	**á-mấal**

A second illustration of non-compositional specification can be observed in the relation between Past and No Tense forms of the Subject Voice. These are shown in Table 7. Across classes, the Past tense is marked by the prefix **á-**, whereas the No Tense form is not affixed. Note that the Low Fall verbs present the same tone on the stem on both of these TAM forms – and so do the High Fall verbs, which pattern along with the Low Fall verbs in these inflections. In contrast, the Low verbs do differ in the tonal specification of the stem between Past and No Tense: the Past tense has a Low on the stem; the No Tense has a High Fall to Mid. Clearly, the tonal specifications in Past and No Tense forms cannot be related to one another in a compositional manner across verb classes. These data also show that verb classes do not have a monopoly on tones: whereas the High Fall to Mid identifies the Low classes in Subject voice

No Tense (Table 7), the same specification for tone is found on the Low Fall classes in the Applicative (Table 4).

Table 7. Further evidence for Set Tone, from Subject voice Past vs. Subject voice No Tense.

Verb classes	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Low Fall**	**Low**	**Low Fall**	**Low**	**Low Fall**	**High Fall**
Example	{ŋɔ̀l} 'cut'	{lêŋ} 'drum'	{càm} 'eat'	{mâl} 'roast'	{lɛ̀ɛŋ} 'throw'	{mâaṭ} 'drink'	{mā́al} 'praise'
SV PAST	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lɛ̀ɛŋ**	**á-mâaṭ**	**á-mâal**
SV NT	**ŋɔ̄́l**	**lêŋ**	**cā́m̄**	**mâl**	**lɛ́ɛŋ̄**	**mâaṭ**	**mâal**

Finally, as a third illustration of non-compositional specification, we already noted, in relation to Table 3, that the High Fall class pattern along with the Low class in some inflections, with the Low Fall class in others, and go their own way elsewhere.

We conclude that the phenomena do not align fully with either the Compositional Tone scenario nor with the Set Tone scenario. Instead, we find that some inflections are related in a compositional manner, whereas others cannot. The evidence of compositionality in the Low and Low Fall classes suggests that verbs belonging to these classes actually do have an underlying specification from which several inflections can be derived in a compositional manner. In relation to the High Fall class, there is no strong evidence for compositionality.

There is no phonological basis for the tone-based division into classes. But there is a semantic tendency: verbs that typically take a human semantic object, such as {mā́ʌṭ} 'greet', {mā́an} 'hate', etc., tend to belong to the High Fall class. We underline that this is merely a tendency. In the remainder of this section, we illustrate the difference between verb classes using full-sentence examples involving minimal-pair verbs. First we contrast Low and Low Fall classes; then we contrast Low Fall and High Fall classes.

The Low verb {kɔ̀l} 'disturb' and the Low Fall verb {kɔ̂l} 'take out' are both Fixed Short. As seen from (2a,b), they are indistinguishable from one another in the Object voice Past tense. In contrast, the Past tense 2nd singular reveals the difference between the tone classes: here {kɔ̀l} 'disturb' has the Low toneme (2c), whereas {kɔ̂l} 'take out' has the Low Fall (2d). In the Applicative voice (glossed XV), {kɔ̀l} 'disturb' has the Mid toneme (2e), whereas {kɔ̂l} 'take out' has the High Fall to Mid (2f). Finally, (2g) and (2h) show how the

difference between verb class is maintained when the stem is inflected further for 2nd singular.

(2) a. **gwôk á-kɔ́l**
dog PST-disturb:OV
'Somebody disturbed the dog.'

b. **kɔ́ʊʊu̱-ɔ̄ á-kɔ́l**
thorn-S PST-take.out:OV
'Somebody took out the thorn.'

c. **gwôk á-kɔ̀l**
dog PST-disturb:2S
'You disturbed the dog.'

d. **kɔ́ʊʊu̱-ɔ̄ á-kɔ̂l**
thorn-S PST-take.out:2S
'You took out the thorn.'

e. **ɔ̀tjáaŋ á-kɔ̄l gwôk**
bell PST-disturb:XV dog
'Smb. disturbed the dog with a bell.'

f. **ŋɔ̌oom á-kɔ́l kɔ́ʊʊu̱-ɔ̄**
awl PST-take.out:XV thorn-S
'Smb. took out the thorn with an awl.'

g. **ɔ̀tjáaŋ á-kɔ̌l gwôk**
bell PST-disturb:XV:2S dog
'You disturbed the dog with a bell.'

h. **ŋɔ̌oom á-kɔ́l kɔ́ʊʊu̱-ɔ̄**
awl PST-take.out:XV:2S thorn-S
'You took out the thorn with an awl.'

Illustration (3) evidences the difference between the High Fall and Low Fall tone classes, using the minimal set of the High Fall verb {lɔ́ʊŋ} 'take turns' (3a,c) and the Long Low Fall verb {lɔ̂ʊŋ} 'pluck' (3b,d). The verb {lɔ́ʊŋ} 'take turns' could be mistaken for a Low verb based on the Past 2nd singular form (3a). However, the Object voice Imperfective (3c) reveals that it is a member of the Long / High Fall class: only members of this class have a High Fall on the verb stem in this inflection.

(3) a. **t̪āal á-lɔ̀ʊʊŋ**
cook:INFA PST-take.turns:2S
'You took turns cooking.'

b. **gjèɛɛn-ɔ̀ á-lɔ̂ʊʊŋ**
chicken-S PST-pluck:2S
'You plucked the chicken.'

c. **t̪āal ɔ̀-lɔ́ʊʊŋ-ɔ́**
cook:INFA IMPF-take.turns
'Somebody is taking turns cooking.'

d. **gjèɛɛn-ɔ̀ ɔ̀-lɔ̂ʊʊŋ-ɔ̀**
chicken-S IMPF-pluck
'Somebody is plucking the chicken.'

3 Voice

In the study of morphosyntax, the concept of voice refers to ways a verb form may mark the relation between the event that the verb expresses and the semantic roles that are expressed by its arguments (Payne 1996:169). In English, for example, if the verb form of a declarative clause is in active voice (e.g. *ate*), the language user infers that the preverbal argument represents the semantic subject; and if the verb form is in passive voice (e.g. *was eaten*), they infer that

the preverbal argument expresses the semantic object.[7] Shilluk transitive verbs present three voices that are marked through inflection in the base paradigm: Object voice (OV), Subject voice (SV), and Applicative voice (XV).

In Section 3.1, we lay out the main structural characteristics of the system. In Section 3.2, we provide a more detailed description and present evidence from narratives. Section 3.3, finally, covers the wider phenomenon of syntactic alignment, in the context of earlier work in which the Object voice has been interpreted as a passive (Westermann 1912, Tucker 1955) and as an ergative construction (Miller & Gilley 2001).

3.1 The structure of the voice system

Consider the question-answer sequences in (4). In each of these, the answer clause is headed by a form of the verb {càm} 'eat'. The preverbal argument is the same in each case: the 3rd plural pronoun **gɛ́**. However, the semantic role of this argument is different in each case. In (4a), the verb is in Object Voice, and here **gɛ́** refers to the semantic object, i.e., the vegetables. In (4b), the verb is in Subject voice, and now **gɛ́** stands for to the semantic subject, i.e., people. In fact, the use of Subject voice is determined further by information structure, in that the event referred to by the verb is part of the shared framework of reference. This is marked by the underlining; we will come back to this in Section 3.2.2. In (4c), the verb is in Applicative Voice, and here **gɛ́** refers to the semantic role of instrument (spoons). We label the voices after the constituent expressed before the verb, be it the semantic subject (Subject voice), semantic object (Object voice), or a different semantic role (Applicative voice). Subject voice is not marked in the morpheme glosses, as it displays the lexical root to the greatest extent (cf. Section 2).

(4) a. **lùm á-gwɔ́k kì dī** **gɛ́ á-cấm**
grass:P PST-make:OV PRP how PR3P PST-eat:OV
'What was done with the vegetables?' 'They were eaten.'

b. **ɟìı á-càm ŋɔ̄** **gɛ́ á-càm lùm**
people PST-eat what PR3P PST-eat grass:P
'What did the people eat?' 'They ate vegetables.'

7 Throughout this chapter, we use the term semantic subject for the more agentive of the two arguments of a transitive verb, and the term semantic object for the less agentive one. The former term leaves vague whether the semantic subject is an Agent or an Experiencer. And likewise, the latter leaves vagye whether the semantic object is a Patient, a Goal or a Destination. Also, these terms are not specific as to whether these entities are expressed as core or peripheral arguments, which is often useful in the descriptive analysis.

c. **pât á-gwɔ́ɔ̄k ŋɔ̄** **gɛ́ á-cāaam lùm**
spoon:P PST-make:XV what PR3P PST-eat:XV grass:P
'What were the spoons used for?' 'With them the vegetables were eaten.'

As seen from these examples, syntactic voice is marked on the stem syllable of the verb, rather than through affixation. The forms of {càm} 'eat' in (4) are summarized in Table 8, alongside the corresponding forms of two other verbs. Irrespective of the specification for voice, the verbs carry a prefix **á-**, which marks Past tense. Voice is marked on the stem syllable through vowel length and tone. These patterns of exponence will be described in detail in Section 7, in conjunction with the other functions that are marked on the verb. At this point, it suffices to say that, in the Past tense and without subject marking, the Object voice stem form invariably has a High Fall / ˊ̂ /. In the Subject voice form, the tonal specification is either Low / ̀ / or Low Fall / ̂ /, depending on the lexical class the verb belongs to; and the Applicative voice form has either Mid / ̄ / or High Fall to Mid / ˊ̂ ̄/, again as a function of verb class. Unless the verb belongs to a Fixed Short class, there is morphological lengthening of the stem vowel in the Applicative voice, whereas the other two voices display the lexical vowel length.

Table 8. The three voices of transitive verbs in Past tense, illustrated by three verbs: Fixed Short Low {ŋɔ̀l}, Short with Grade Low {càm} 'eat', and Low Fall {mâaṭ} 'drink'.

	{ŋɔ̀l} 'cut'	**{càm} 'eat'**	**{mâaṭ} 'drink'**
Object voice	**á-ŋɔ́l**	**á-cấm**	**á-mấaṭ**
Subject voice	**á-ŋɔ̀l**	**á-càm**	**á-mâaṭ**
Applicative voice	**á-ŋɔ̄l**	**á-cāaam**	**á-mấaaṭ̄**

The examples in (4) reveal several important characteristics of the Shilluk voice system. To begin with, note that the voice inflection of the verb reveals the semantic role of the preverbal argument: from the voice inflection on the verb, the language user can tell whether this argument expresses the semantic subject (be it Agent or Experiencer), the semantic object (be it Patient or Goal), or another semantic role, in this case Instrument. In this sense of its semantic role being signposted on the verb, the preverbal argument has a special status, i.e., it is privileged. Which semantic role is expressed in the preverbal slot is dependent on the discourse context: the preverbal argument tends to express an argument that is already part of the framework of

reference shared by speaker and hearer(s). This can be seen from the examples in (4), where each of the precursor questions sets up a different semantic role of the event as known information, which can then be referenced pronominally in the reply. Because the preverbal argument expresses shared information, it is appropriate to refer to this constituent as the topic. That is, the topic can be defined as the preverbal constituent, whose semantic role that is signposted inflectionally on the verb, and which typically expresses shared information.

Also, note that while the semantic role of the topic is evident from the verb forms in (4), it is not evident from the argument itself: the 3rd plural personal pronoun **gé** displays no case marking. And while there is one morphosyntactic context in which personal pronouns are case marked (see Section 4), it is a general characteristic of Shilluk that there is no case marking at all on nouns or on noun phrases. That is, whether a noun or noun phrase represents the semantic subject, semantic object, or any other semantic role, these functions are not morphologically marked on the noun or noun phrase, neither in the topic position, nor elsewhere in the clause. This is illustrated in (5). In (5a,b), the noun **djèl** 'goat' is the semantic object – as a topical core argument preceding the verb in (5a), and as a core argument following the verb in (5b). In (5c,d), the same noun is the semantic subject – as a topic in (5c), and in a prepositional phrase in (5d). Importantly, there is no case marking on the noun **djèl** in any these positions.

(5) a. **djèl á-cấm ɪ̄ɪ mʌ́ʌʌt̤**
goat PST-eat:OV PRP:P friend:P
'The friends ate the goat.'[8]

b. **mʌ́ʌʌt̤ á-càm djèl**
friend:P PST-eat goat
'The friends ate the goat.'

c. **djèl á-càm lùm**
goat PST-eat grass:P
'The goat chose to eat grasses.'

d. **lùm á-cấm ìɪ djèl**
grass:P PST-eat:OV PRP goat
'The goat ate grasses.'

Finally, illustration (4) shows that the voice system affects valence, the number of core arguments expressed in the clause. When the verb is in Object voice, as in (4a), the semantic object in the topic slot represents the sole core argument. In the other two voices, there are two core arguments. When the verb is in Subject voice, as in (4b), the semantic subject appears in the topic slot, and the semantic object follows the verb. In Applicative voice (4c), the core arguments that are expressed are as follows: a semantic role other

8 The choice for an active translation of this sentence into English will be explained in Section 3.2.1.

than either semantic subject or semantic object is expressed in the topic slot, and the semantic object follows immediately after the verb. Any additional argument(s) to the clause are expressed as peripheral constituents. This means a) that they can be freely omitted; and b) if they are expressed, they are expressed through a prepositional phrase. The constituent expressing the semantic subject in clauses headed by a verb in Object voice or Applicative voice is a case point. Both in (5a) and in (5d), the prepositional phrase expressing the semantic subject can be omitted.[9]

The preverbal topic can also be omitted in main clauses, i.e., there is topic drop, but this phenomenon is restricted to 3rd singular topics. This is illustrated in (6). The noun **càak** 'milk' is grammatically plural.[10] Hence it cannot be omitted in the answer, even if it is an established topic, as in (6a). Instead, it needs to be represented by a pronoun (**gɛ́**). In contrast, when the grammatically singular noun **mɔ̀k-ɔ̀** 'alcohol' is used in the same context, as in (6b), topic drop is grammatical, and in fact its expression through a pronoun is ungrammatical.[11]

(6) a. **câak á-gwɔ́k kì dī** **gɛ́/*Ø á-mɑ́aṭ**
milk.P PST-make:OV PRP how PR3P PST-drink:OV
'What was done with the milk?' 'It was drunk.'

b. **mɔ̀k-ɔ̀ á-gwɔ́k kì dī** ***ɛ́/Ø á-mɑ́aṭ**
alcohol-S PST-make:OV PRP how PR3S PST-drink:OV
'What was done with the alcohol?' 'It was drunk.'

3.2 Evidence for the voice system

In Section 3.1, the voice system is laid out using elicited examples. For the sake of accountability, we now provide evidence for the functions of the three voices using examples drawn from narratives, i.e., spontaneous speech (marked by ˆ adjacent to the example number throughout this chapter). We also develop the descriptive analysis of the functions of these three voices. Object voice is discussed in Section 3.2.1, Subject voice in Section 3.2.2, and Applicative voice in Section 3.2.3.

9 The preposition **ìɪ/īɪ** has two forms, reflecting number. If its argument is grammatically singular, it is Low-toned (ìɪ); and if its argument is grammatically plural, it takes a Mid tone (īɪ).

10 Many liquids are grammatically plural in Shilluk. This is a characteristic property of Nilo-Saharan languages (Zwarts 2007).

11 In serializations involving a 3rd person subject, the subject is referenced pronominally to the left of the second predicate head, and this pronoun cannot be dropped.

3.2.1 Object Voice

In Section 3.1, we explained that Object voice is used when the semantic object is the discourse topic. This is correct, but it is not the whole story: the Object voice form and its associated constituent order, i.e., Object-Verb, are also used when no constituent stands out in terms of information structure (cf. Miller & Gilley 2001). These two functions are described and evidenced in turn in this section.

The use of Object voice when the semantic object is topical is illustrated in (7) using an example drawn from a narrative. The referent of the noun phrase **jáā mɛ́̄j-āa** 'my mother and her friends' is introduced in the first clause, where it is dislocated and then resumed pronominally. The same referent is the topic in the second clause, where it is represented by the 3rd plural pronoun **gɛ́**. Here its referent represents the semantic object of {mʌ́ʌ̣} 'greet', which appears in Object voice.

(7)ˆ **jáā mɛ́̄j-āa gɛ́ bɛ́ɛeñ-ɔ̄ kì pôoṭ-í wɔ́n**
ass mother:PRT-1S PR3P come-NEVP PRP territory-PRT.P PR1PEX
gɛ́ á-mʌ́ʌ̣ ìɪ ján
PR3P PST-greet:OV PRP PR1S
'My mother and her friends, they had come from our place. I greeted them.'

As noted above, Object voice is also the unmarked morphosyntactic structure. That is, when the discourse context does not privilege any semantic role, then the verb is in Object Voice and the semantic object appears in the topic slot. This is evidenced in (8). The initial sentence is included to clarify the discourse context: here two friends become established as a topic. The second clause is reciprocal. Here the same referent, the two friends, represents both the semantic subject and the semantic object. As they are identical in reference, semantic subject and semantic object are equally topical, and therefore discourse structure does not dictate which should appear as the topic. Here, the unmarked constituent order can emerge: note that the verb is in Object voice, and the preverbal argument expresses the semantic object. The fact that Object voice is unmarked in terms of information structure explains why it is often more appropriate to translate Shilluk clauses with Object voice into English using active voice rather than passive voice.

(8)ˆ **cʊ̄ʊl gɛ́-kí bʊ̌ʊl á-bèeet gă̈a mʌ́ʌʌ̣ kéeer à á-pʃ́iiɪ̣̄ gên**
Chol PR3P-PRP Bol PST-stay 3P:NOMP friend:P since REL PST-grow.up:XV PR3P.N
rɪ́ɪ-gén mâar ɪī gén kí mɛ́̄ñ dwɔ́ɔŋ
REFL-PR3P love:OV PRP:P PR3P PRP IDP.S big
'Chol and Bol were friends from childhood. They love each other greatly.'

Negative evidence on this unmarked word order is presented in (9). The question 'What happened?' sets up the answer as a whole as new information. In the answer to this question, Object Voice is felicitous, but Subject Voice is not.

(9) **áa ŋɔ̄ à á-cwôop**
WHQ what FOC PST-happen
'What happened?'

lùm á-cấm ɪ̄ɪ ɟìɪ
grass:P PST-eat:OV PRP:P people
***ɟìɪ á-càm lùm**
people PST-eat grass:P
'People ate vegetables.'

3.2.2 Subject Voice

A first condition on the felicitous use of Subject voice in Shilluk is that it is only used if the semantic subject of the clause is topical, as established through the preceding discourse. Negative evidence on this was presented in (9). In that example, Subject voice cannot be used felicitously because the semantic subject is not topical. Positive evidence from spontaneous speech is presented in (10). In this narrative, Nyikango, the founder of the Shilluk nation, has just fallen out with his elder brother. At this point in the story, he is the central character and therefore topical, which is critical to the felicitous use of Subject voice in the second clause.

(10)ˆ **kɛ̂ɲ à á-kɛ̂ṯ líɲ-gɛ́ ú-tèeŋ-ɔ̀**
time:CS REL PST-go conflict-3P IMPF-become.hard
ɲíkāaaŋɔ̄ á-kwàɲ kwóp-í ḍ̪wɔ́ɔoṯ-ɔ̀
Nyikango PST-choose discussion-PRT.P depart-INF
'When their feud worsened, Nyikango opted for discussing departure [with other people in the community, to see who would be willing to move away with him].'

If the topical status of the semantic subject were the only factor determining the use of Subject Voice, we would come across it frequently in discourse. Crucially, this is not the case. Tucker (1955:432), writes that "[t]he Shilluk Transitive Verb has two Voices Active [= our Subject voice] and Passive [our Object voice], the latter being on the whole more in use than the former in every day conversation." And Westermann (1912:78) writes: "[Shilluk people] generally prefer to speak in the passive [= Object] voice". We share Westermann's assessment that the use of Object voice predominates over the use of Subject voice.

This suggests that the use of Object voice is constrained beyond the information-structural status of the semantic subject. On this issue, Miller

& Gilley (2001) write that Subject voice is pragmatically marked, and they hypothesize the following two functions. The first function they hypothesize is choice: "AVO order [our Subject voice] is used to indicate that the agent chose to accomplish an action with respect to a particular goal" (Miller & Gilley 2001:36). The second function is that Subject voice conveys "contrastive focus on the immediately following post-verbal constituent" (Miller & Gilley 2001:36). They illustrate these functions of choice and contrastive focus using the examples in (11a) and (11b), respectively. We display them using our own transcriptions and glosses, but with their translations.

(11) a. **ɲâan-dấaj̄-ɔ̄ á-ràk bjɛ́l**
young-woman-S PST-grind.coarsely grain:P
'The woman chose to grind the durra.'

b. **ɲâandấaj̄-ɔ̄ á-ràk a bjɛ́l**
young.woman-S PST-grind.coarsely FOC grain:P
'The woman ground the durra (not another grain).'

Miller & Gilley (2001) do not distinguish Subject Voice (their AVO) from Object Voice (their OVA) in terms of morphophonological form. So while they transcribe the Subject voice verb form in (11a,b) as **á-ˈrākk ˋ**, they use the same transcription for the corresponding Object voice form. In contrast, we hypothesize that the Subject Voice and Object Voice forms are different. For example, corresponding to the Subject voice in (11a,b), which we transcribe as **á-ràk**, the Object voice form is **á-rấk**. We include an example with the latter form in (12), and recommend that the reader plays and compares the sound files associated with (11a) vs. (12), paying particular attention to the verb forms.

(12) **bjɛ́l á-rấk ìɪ ɲâan-dấaj̄-ɔ̄**
grain:P PST-grind.coarsely:OV PRP young-woman-S
'The woman ground the durra.'

In the remainder of this section, we will first describe how the use of Subject voice is marked, and then point out other morphosyntactic structures that are used when the semantic subject is topical. In relation to the first issue, we can start out from the functions of 'choice' and 'contrastive focus', which were hypothesized in relation to Subject voice in Miller & Gilley (2001). To begin with, we argue that contrastive focus is central to the function of the Subject Voice. This is evident from the fact that Subject Voice can be used when the topical subject is inanimate. This is illustrated in (13). This sentence conveys contrastive focus: the pot is singled out relative to other objects that the wind

might have broken, but didn't. Note that, because the wind is inanimate, the hypothesized function of a choice is not available: lacking volition, the wind is not an Agent. Instead, the subject in the topic slot can be characterized as a Cause or Force. This suggests that, of the two functions postulated by Miller & Gilley, contrastive focus is the more widely applicable one. In fact, contrastive focus often implies choice when the semantic subject is an agent, to the effect that there is no need to hypothesize choice as a function separate from contrastive focus.

(13) **jɔ̀ɔɔm-ɔ̀ á-nʌ̀k pǔk**
wind-S PST-kill clay.pot
'The wind broke the pot.' [rather than something else]

Focus and information structure in general represents a comprehensive topic in its own right. At this point, we limit ourselves to defining Subject Voice as a marker of focus in the sense of Krifka (2008:248): the property of Subject voice is a Focus property, because Subject voice signals that alternatives to the referent of one of the internal arguments, especially the one expressing the semantic object, are relevant to the interpretation of the clause. The way these alternatives are relevant can be characterized as exclusion. For example, the use of Subject voice in (11) entails not only that the pot was broken, but also that the alternatives were not broken. That is, the use of Subject voice leads to truth-conditional differences in the interpretation of the clause, in the same way the use of *only* in conjunction with a sentence accent in English (Krifka 2008:244). Similary, the clause in (10) entails that Nyikango did not go for other courses of action.

This interpretation is evident from the fact that the clause in (13) is felicitous in response to a question that presents an alternative semantic object, as in (14). It is equally felicitous in response to **jɔ̀ɔɔm-ɔ̀ á-nʌ̀k ŋɔ̄** 'What did the wind destroy?' Crucial here is the notion of singling out relative to alternatives.

(14) **jɔ̀ɔɔm-ɔ̀ á-nʌ̀k lwɔ̂ɔl?**
wind-S PST-kill gourd
'Did the wind break the gourd?

pâṯ, á-nʌ̀k pǔk
NEG PST-kill clay.pot
No, it broke the pot.' [rather than anything else]

The information-structural interpretation of Subject voice interacts with the expression of pragmatic focus through **a/à**. Using the framework of Krifka (2008), we hypothesize that this marker is about the management of the common ground: it is concerned with the way the common ground should develop. It can be associated with a variety of arguments to the clause. In

(15), the verb is in Subject voice, and there is pragmatic focus on the semantic subject. Crucially, there is no expression of semantic focus in relation to the object here, that is, this interaction does not entail that the wind broke only the pot, rather than anything else.

(15) **áa mɛ́ñ à á-nʌ̀k pǔk** **jɔ̀ɔɔm-ɔ̀ à á-nʌ̀k pǔk**

WHQ WHO FOC PST-kill pot wind-S FOC PST-kill pot
'Who broke the pot? The wind broke the clay pot.'

Importantly, Subject voice is not used when the semantic subject is topical, while the remainder of the clause represents new information. In that information-structural scenario, transitive verbs can appear in one of several other constructions. These are illustrated in (16) and (17). In each of these interactions, the question sets up the wind as the topic. The answers illustrate three different constructions that can be used in this information-structural setting, none of which involve Subject voice. First, a semantic subject that has been introduced previously in discourse can be marked pronominally on the verb through subject marking. This is shown in (16). Note that, when the verb is marked for subject, then the preverbal argument does not need to be topical. We describe subject marking in Section 4. The fact that it is the form of the verb which signposts whether the preverbal argument is topical is in line with the overall head-marking nature of Shilluk morphosyntax.

(16) **áa ŋɔ̄ à á-gwɔ́k ìɪ jɔ̀ɔɔm-ɔ̀** **pǔk á-nʌ̀ʌʌk-é**

WHQ what FOC PST-make:OV PRP wind-S clay.pot PST-kill-3S
'What did the wind do? It broke the pot.'

Second, there are two valency-decreasing derivations, whereby the semantic subject is retained as the sole core argument: the ambitransitive and the antipassive. They are illustrated in (17a) and (17b), respectively. The answers in both of these examples display topic drop – as noted above, singular topics may be omitted in main clauses. When these derivations are used, the semantic object appears as a peripheral argument, i.e., in a prepositional phrase. These derivations are beyond the base paradigm; they will be described in a later chapter, dedicated to the derivations of transitive verbs. At this point it suffices to say that the use of these constructions affects TAM and the definiteness of the internal argument that follows the verb. With respect to TAM, the ambitransitive conveys that the event took place once, and the antipassive often conveys a durative aspect. In (17b), the use of the antipassive

is incongruous with the breaking of a single pot.[12] As for definiteness, both with the antipassive and with the ambitransitive, the expression of the semantic object as a peripheral argument conveys that it is indefinite, or only affected in part, e.g. when the referent is a mass noun (cf. Fillmore 1977, Hopper & Thompson 1980)

(17) a. **jɔ̀ɔɔm-ɔ̀ á-gwɔ̂k à ŋɔ̄?** **á-nʌ̀k-ì kí pŭk**
wind-S PST-make FOC what PST-kill-AMB PRP clay.pot
'What did the wind do? It broke a pot.' (among other pots)

b. **jɔ̀ɔɔm-ɔ̀ á-gòook kí ŋɔ̄** **á-nʌ̀ʌʌk kí pʊ̂k̄-ī**
wind-S PST-make:ATP PRP what PST-kill:ATP PRP clay.pot:P
'What was the wind doing? It was breaking pots.'

In conclusion, Subject Voice is used when the semantic subject is topical. But its use is further constrained, in that it conveys semantic focus (in the sense of Krifka 2008) on the object. If the semantic subject is topical but there is no semantic focus on the object, then other constructions are used: a subject-marked form or a derived intransitive.

3.2.3 Applicative Voice

The Applicative Voice form of the verb is used in conjunction with the topic slot being filled by an argument expressing a semantic role other than the semantic subject or the semantic object. These roles include Instrument, Reason, and Deictic setting (Location or Time). However, they do not include the Beneficiary or the Destination, as these are expressed using productive derivations for Benefactive and Spatial deixis, which are beyond the scope of this chapter. When the Applicative voice is used, the semantic object immediately follows the verb, as a core argument that is obligatorily expressed. The semantic subject can be expressed optionally, by means of an optional peripheral argument, marked by the preposition **ìɪ/īɪ**. In terms of valence, then, the verb marked for Applicative voice is accompanied by two internal arguments. Of these two, only the topic can be omitted, specifically if it is singular (topic drop).

A first example from a narrative is presented in (18). The verb **jwɔ̄ɔɔk** is inflected for Applicative voice. The preverbal argument expresses the semantic role of Instrument (the bull to be used in a commemoration ceremony). The semantic object follows the verb.

12 This particular example is also compatible with the interpretation that the Antipassive derivation has an iterative function. To the best of our knowledge, this is not the case.

(18)ˆ **wɪ̀ŋj ɲī-jɔ̄ɔm jwɔ̄ɔɔk mʌ́ʌʌt̪-īɪ**
allow BULL-cattle.with.white.forehead cry:XV friend:PRT-2S
'Let the bull with the white forehead be used to mourn your friend.'

A second example involves a serial verb construction. In (19), the topic of this clause is a woman called Apwodho. She is referenced before the first constituent verb in the serialisation (**á-wéekì**), and again, resumptively, by the pronoun **ɛ́**, immediately before the second constituent verb, **cʊ́ʊʊ̄**, which is in Applicative voice. Apwodho constitutes the semantic role of Instrument, used to compensate the hippo, the semantic object that follows the verb.

(19)ˆ **ápwŏoo̱ɔ́ ɲī ɟɪ̀rw ɲī mīi úkwér**
Apwodho daughter:PRT Jiw daughter:PRT father:PRT Okwer
á-wéekì ɲíkāaaŋɔ̄ ɛ́ cʊ́ʊʊ̄ a pʌ̀ʌʌr
PST-give:BNF:OV Nyikango PR3S pay.for:XV FOC hippo
'Apwodho, the daughter of Jiw, the sister of Okwer, was given to Nyikango in compensation for for the hippo.'

Illustration (20) shows the use of Applicative voice with the topic expressing the semantic role of a Reason. This sentence is a particular kind of question-word question, in which the Reason, marked by **dɛ̄**, appears before the verb, along with an independent pronoun referring to the queried entity, and the focus marker **à**. So the topic in this sentence is **jí dɛ̄ à** 'why, in relation to you'. The referent of the pronoun in the topical Reason is invariably resumed in the clause, in this case by the 2nd singular pronoun **jín**.

(20)ˆ **jí dɛ̄ à gɔ̄ɔɔc jín kì nɔ̀w**
PR2S WHQ FOC hit:XV PR2S PRP like.that
'Why did they beat you like that?'

Illustration (21) shows the use of Applicative Voice with the topic slot expressing a Location: **kɛ̂ŋ à ɪ̄ɪc-ɛ̄** 'a place inside which'. As in the earlier examples illustrating Applicative voice (18–20), the verb is followed by the semantic object.

(21)ˆ **kɛ̂ŋ à ɪ̄ɪc-ɛ̄ cāaam d̪ɔ̀k ɛ́ dâa pwʊ́ʊt-ɔ́ pāa dwāat-á**
place:CS REL inside-3S eat:XV cattle SUB EXSP.FOC beat-INF NEG want-1S
'A place where cows are eaten, while there is beating, I don't want it.'

Our corpus includes many instances of Applicative Voice in relative clauses. To the best of our knowledge, the constituent in the topic slot is the only argument that can function as a common argument with a superordinate clause. Illustration (22) shows the use of the Applicative Voice in a relative

clause, which is headed by **cāaam** 'eat:XV'. The common argument, **àkɛ̄ɛlɔ́** 'sorghum noodles', expresses the semantic role of Instrument in the subordinate clause, in addition to representing the semantic object of the main clause.

(22)ˆ **kâā ò-tʌ̀ʌ́t-ò kí àkɛ̄ɛlɔ́ mé cāaam mɔ̀ɔk**
CONJ IMPF-cook:ATP PRP sorghum.noodles REL.S eat:XV kind.of.fish
'Then she cooks sorghum noodles to eat the fish with.'

In summary, the Applicative voice is a morphosyntactic operation whereby a semantic role other than subject or object is expressed as a core argument in the topic slot. As we will see the Applicative Voice form is also obligatorily used in conjunction with two particular levels of TAM: Sequential Past and Conditional. These will be discussed in Section 5.6 and 5.7, respectively.

3.3 Syntactic alignment in Shilluk

3.3.1 Evaluation of earlier analyses

Subject voice and Object voice have long been interpreted as active voice and passive voice, respectively (Westermann 1912:78, Tucker 1955:432). This interpretation is compelling from the angle of the morphosyntax. First, the verb stem is morphologically unmarked in Subject voice, and marked in Object voice. This is shown in (23), which contrasts Subject voice (23a) and Object voice (23b) constructions involving the same verb. In (23a), **á-lèɛŋ** displays the underlying specification for tone of the Long Low verb {lèɛŋ} 'throw'. In the Object voice form (23b), in contrast, the verb stem is morphologically marked for voice: the High Fall on **á-lɛ̂ɛŋ** overwrites the lexical specification, to the effect that the difference in lexical specification between verb classes is neutralised in this inflection (cf. Table 6).

(23) a. **twɔ́ɔŋ á-lèɛŋ tɔ́ŋ**
Twong PST-throw spear
'Twong threw the spear.'

b. **tɔ́ŋ á-lɛ̂ɛŋ ìɪ twɔ́ɔŋ**
spear PST-throw:OV PRP Twong
'Twong threw the spear.'

Second, there is the syntactic evidence. In the Subject voice, both the semantic subject and the semantic object are expressed as core arguments. This can be seen from (23a). In the corresponding Object voice construction, (23b), the semantic subject is expressed as a peripheral argument, which can be freely omitted. In sum, the Object voice presents all morphosyntactic characteristics of a passive construction (cf. Dixon 2012:206).

In contrast, Miller & Gilley (2001) have argued that the Object voice is an ergative construction. However, their analysis that syntactic alignment in Shilluk is ergative is based on the assumption that "there is no formal marker of passive voice indicated on verbal morphology" (Miller & Gilley 2001:52). Indeed, they transcribe and gloss the Subject voice and Object voice forms identically (e.g. Miller & Gilley 2001:36). However, as seen from a comparison of the forms in (23a) vs. (23b), (11a) vs. (12), and Table 6, these two patterns of syntactic alignment are morphologically distinct from one another.

Additional evidence against the ergative analysis comes from the prepositional phrase which Miller & Gilley (2001) interpret as an ergative constituent. While the analysis of this constituent is outside the study of transitive verbs, this phenomenon is important to the interpretation of syntactic alignment, and for this reason we will present our findings here, in Section 3.3.2. Following that, in Section 3.3.3, we consider another topic that has a bearing on syntactic alignment, namely the marking of verb arguments in transitives vs. intransitives.

3.3.2 The status of the constituent headed by ɪ̀ɪ/ɪ̄ɪ

Miller & Gilley (2001) interpret the **ɪ̀ɪ/ɪ̄ɪ** constituent as ergative. If this analysis is correct, it should display characteristics of a syntactic subject. In the following subsections, we discuss four phenomena that have a bearing on this question.

3.3.2.1 Omissibility

In Subject voice and Object voice alike, the topic can be dropped in a main clause, on the condition that it is grammatically singular. This is illustrated in (24) for Subject voice. Note that the singular subject can be dropped in (24a), but not the plural one in (24b): if it is not expressed by a full noun, there needs to be a pronoun.

(24) a. **twɔ́ɔŋ/*é/Ø á-lɛ̀ɛŋ tɔ́ŋ**
Twong/PR3S PST-throw spear
'Twong / He threw the spear.'

b. **mʌ́ʌn/gé/*Ø á-lɛ̀ɛŋ tɔ́ŋ**
women.P/PR3P PST-throw spear
'The women / They threw the spear.'

The same applies to the topic expressing the semantic object in Object voice: it can be omitted if it is singular, but not if it is plural. This is shown in (25).

(25) a. **tɔ́ŋ/*é/Ø á-lɛ̂ɛ̂ŋ**
spear/PR3S PST-throw:OV
'Somebody threw the spear / it.'

b. **tɔ̂ŋ/gé/*Ø á-lɛ̂ɛ̂ŋ**
spear:P/PR3P PST-throw:OV
'Somebody threw the spears /them.'

In contrast, the prepositional phrase that expresses the semantic subject in Object voice can be freely omitted. This is illustrated in (26).

(26) a. **tɔ́ŋ á-lɛ̂ɛ̂ŋ ìɪ twɔ́ɔŋ / Ø**
spear PST-throw:OV PRP Twong
'Twong / Somebody threw the spear.'

b. **tɔ́ŋ á-lɛ̂ɛ̂ŋ īɪ mʌ́ʌn /Ø**
spear PST-throw:OV PRP:P woman.P
'Women / They threw the spear.'

In summary, the omission of the **ìɪ/īɪ** constituent differs from topic drop. The former is completely unrestricted; the latter is limited to 3rd singular topics. This difference is in line with the interpretation that the **ìɪ/īɪ** constituent is a peripheral argument, and not a core argument whose omission is restricted.

3.3.2.2 Co-occurrence with subject marking

The hypothesis that the **ìɪ/īɪ** constituent is ergative implies that it represents the syntactic subject. However, this is not necessarily the case, as seen from the examples in (27). They display subject-marked verb forms, in addition to the **ìɪ/īɪ** constituent. In (27a), which is a spontaneously uttered utterance, the verb is intransitive; in the elicited example in (27b), the verb is transitive.

(27) a.^ **à-rjɛ́ɛɛr-é ìɪ lɛ̂ɛ̱-ì tɔ́ŋ**
SEQP-shout-3S PRP pain-PRT spear
'And he shouted because of the pain from the spear.'

b. **lùm á-càm gên ìɪ kāc**
grass:P PST-eat PR3P.N PRP hunger
'They ate plants because of hunger.'

From this evidence it is clear that we need to postulate a peripheral **ìɪ/īɪ** constituent which expresses the semantic role of a Cause or Force. Given the similarity between a Cause and Force on the one hand and Agent, it is parsimonious to postulate that there are not two homophonous markers with very similar meanings but instead just a single one.

3.3.2.3 The binding of anaphora

If the **ìɪ/īɪ** constituent is ergative, its binding properties should be akin to those of core arguments. If, on the contrary, the binding properties of the **ìɪ/īɪ** constituent are akin to those of prepositional phrases, then this supports the interpretation that it is a peripheral argument.

In most contexts, the binding of anaphora in Shilluk is governed by

linearity: the interpretation of an anaphoric element is bound by a constituent that has been uttered before. This is illustrated in (28) by an example drawn from a narrative. The pronominal suffix in the noun phrase **mɛ́ɲ̄-ɛ̄** obligatorily refers to the mother of the aforementioned daughter. It cannot refer to somebody else's mother.

(28)ˆ **kâā ɲāaan-ání pwɔ̂ɔc ìɪ mɛ́ɲ̄-ɛ̄**
CONJ daughter-CS-DEF thank:OV PRP mother:PRT-3S
'Then this daughter$_{i}$ was thanked by her$_{i/*k}$ mother.'

When the same constituent **mɛ́ɲ̄-ɛ̄** appears in the topic slot, as in the elicited example in (29), then the interpretation of the pronoun cannot be bound by the **ìɪ/īɪ** constituent. That is, Abac cannot be the referent of the pronoun in **mɛ́ɲ̄-ɛ̄** 'his/her mother', it has to be somebody else's mother.[13]

(29) **mɛ́ɲ̄-ɛ̄ á-pwɔ̂ɔc ìɪ ábác**
mother PST-thank:OV PRP Abac
'Abac$_{i}$ thanked his/her$_{k/*i}$ mother.'

The same state of affairs holds with reflexives: the interpretation of an anaphoric element in the topic cannot be bound by the **ìɪ/īɪ** constituent. This is shown in (30).

(30) a. **(ábác) rɛ̄ɛ á-lîɪɲ̣-è**
Abac REFL-3S PST-see-3S
'Abac$_{i}$/She$_{i}$ looked at herself$_{i}$.'

b. ***rɛ̄ɛ á-lɪ́ɪɲ̣ ìɪ ábác**
REFL-3S PST-see:OV PRP Abac
'Abac$_{i}$ looked at herself$_{i}$.'

In itself, this does not challenge the analysis that the **ìɪ/īɪ** constituent is a core argument, as the same linearity effect can be observed with Subject voice. This is shown in (31). Here again, a pronominal referent later in the clause is bound by an earlier noun (31a), but the reverse relation does not hold (31b).

(31) a. **ábác á-pwɔ̂ɔc mɛ́ɲ̄-ɛ̄**
Abac PST-thank mother:PRT-3S
'Abac$_{i}$ thanked her$_{i}$ mother.'

b. **mɛ́ɲ̄-ɛ̄ á-pwɔ̂ɔc ábác**
mother:PRT-3S PST-thank Abac
'His/her$_{k/*i}$ mother thanked Abac$_{i}$.'

All of the evidence considered so far suggests that linearity is the key factor determining the binding of anaphora. There is one construction, however, where a pronoun is licensed by a following argument within the same clause,

13 Abac is a name given to women.

and where it matters whether this argument is core or peripheral (cf. Legate 2012). We already mentioned in Section 3.2.3 that question-word questions formed using **dɛ̄** have in the topic slot the semantic role of Reason. The referent of this Reason is indexed pronominally in the preverbal topic, and it needs to be licensed by a core argument to the right of the verb. (As the topic is neither the semantic subject nor the semantic object, the verb is in Applicative voice, with or without subject marking.) In (32a); the pronoun in the Reason is licensed by the semantic object of the verb; in (32b), it is licensed by the semantic subject, subject-marked syntactically.

(32) a. **gɛ́ dɛ̄ à mʌ̄ʌ̄ʌ̣ gɛ́n ìɪ ɟa̋aak̄-ɔ̄**
PR3P WHY FOC greet:XV PR3P PRP chief-S
'Why is the chief greeting them?'

b. **gɛ́ dɛ̄ à mʌ̄ʌ̣ gɛ̂n ɟa̋aak̄-ɔ̄**
PR3P WHY FOC greet:XV PR3P.N chief-S
'Why are they greeting the chief?'

However, the pronoun in the topic cannot be licensed by the semantic subject, if the latter is expressed in the **ìɪ/ɪ̄ɪ** constituent. This is shown in (33). Note that the only difference between (32b) and (33) is the manner in which the semantic subject is expressed.

(33) ***gɛ́ dɛ̄ à mʌ̄ʌ̄ʌ̣ ɟa̋aak̄-ɔ̄ ɪ̄ɪ gɛ́n**
PR3P WHY FOC greet:XV chief-S PRP:P PR3P
'Why are they greeting the chief?'

Additional cases of this construction provide further support that the difference between core and peripheral arguments is critical here. Beneficiaries are expressed solely as core arguments, and these can be queried in the **dɛ̄** constituent (34a), just as semantic objects can (34b).[14] Illustration (34b) additionally shows that the queried referent can be expressed as a full noun in the preverbal constituent (**kwʌ̄n**).

(34) a. **jí dɛ̄ à ṭʌ́lì jín kwʌ̄n**
PR2S WHY FOC cook:BNF:OV PR2S porridge
'Why is the porridge cooked for you?'

b. **ɛ́ dɛ̄ kwʌ̄n à ṭʌ́lì-ɪ̄ɪ jín**
PR2S WHY porridge FOC cook:BNF:OV-3S.OBL PR2S
'Why is the porridge cooked for you?'

14 The examples in (34) display the benefactive derivation, which is beyond the scope of this chapter.

Instruments, now, can be expressed either as a core argument or through a prepositional phrase. In the former case, that is, if the Instrument is expressed as a core argument, this argument can license the pronominal referent in the topic slot. This is shown in (35a), where the Instrument is expressed through a 3rd singular suffix on the verb.[15] But when the Instrument is expressed as a prepositional phrase, headed by **kí**, it cannot license the pronoun in the topic: (35b) is ungrammatical.

(35) a. **é dē pâal à cāaam-ɪ̄ɪ kwʌ̄n**
PR3S WHY spoon FOC eat:XV-3S.OBL porridge
'Why is the porridge eaten with a spoon?'

b. ***é dē pâal à cāaam kwʌ̄n kí én / gɔ̀n**
PR3S WHY spoon FOC eat:XV porridge PRP PR3S / PR3S.OBL
'Why is the porridge eaten with a spoon?'

In summary, the question construction with **dē** presents evidence that the **ìɪ/ɪ̄ɪ** constituent is not a core argument. Like the constituent headed by **kí**, and unlike core arguments, the constituent headed by **ìɪ/ɪ̄ɪ** cannot license the topic.

3.3.2.4 Evidence from -ɔ

A fourth argument regarding the prepositional status of the **ìɪ/ɪ̄ɪ** constituent can be drawn from the distribution of the suffix **-ɔ**, which is part of the inflectional marking of Imperfective and Non-Evidential Past. The presence of this suffix is sensitive to the nature of the following argument, crucially, whether it is a core argument or a peripheral one. We will illustrate this using a verb form in the Spatial / Centrifugal derivation.[16] A crucial characteristic of this derivation is that the Destination is represented morphosyntactically as an optional core argument. Note how the final **-ɔ̀** is present in (36a), where the verb is in sentence-final position, but absent in (36b) when it is followed by the destination argument.

(36) a. **kwʌ̄n ó-câaam-ɔ̀**
porridge NEVP-eat:FUG:OV
'Smb. apparently went to eat porridge.'

b. **kwʌ̄n ó-câaam kàl**
porridge NEVP-eat:FUG:OV compound
'Smb. apparently went to the compound to eat porridge.'

The verb-final **-ɔ** is not dropped before any following argument. Notice how it is present when the verb is followed by a prepositional phrase headed

15 This suffix **-ɪ̄ɪ** is not to be confused with the preposition **ìɪ/ɪ̄ɪ**.

16 The Spatial / Centrifugal derivation is not described in its own right in this chapter.

by **kì** that expresses a deictic constituent, as in (37a), and likewise when it is followed by a prepositional phrase headed by **kí**, which expresses an instrument, as in (37b).

(37) a. **kwʌ̄n ó-câaam-ɔ̀ kì léw**
porridge NEVP-eat:FUG:OV PRP dry.season
'Smb. apparently went to eat porridge in the dry season.'

b. **kwʌ̄n ó-câaam-ɔ̀ kí pâal**
porridge NEVP-eat:FUG:OV PRP spoon
'Smb. apparently went to eat porridge using a spoon.'

Interestingly, if a grammatical marker is associated with a core argument, the **-ɔ** is dropped. As noted above, inanimate destinations, such as **kàl** in (36b), are not morphosyntactically marked. But animate destinations are marked by **jìi/jǐii** 'A(NIMATE) D(ESTINATION)'. Its use is illustrated in (38), which can be compared with (36b). As the destination is a core argument, the verb does not have the suffix **-ɔ**; that is, the form with **-ɔ** is ungrammatical here.

(38) **kwʌ̄n ó-câaam / *ó-câaam-ɔ̀ jìi bɔ̀ɔɔt̪-ɔ̀**
porridge NEVP-eat:FUG:OV AD craftsman-S
'Smb. apparently went to the craftsman to eat porridge.'

From the above it is clear that the presence vs. absence of the suffix **-ɔ** depends on the status of the following argument. It is dropped if the verb is followed by a core argument, equally so if this core argument is preceded by a grammatical marker. Having established the heuristic, we can examine the state of affairs with the **ìɪ/īɪ** constituent As seen from (39), if the **ìɪ/īɪ** constituent follows immediately after the verb, the suffix is present, just as when the verb is followed by **kì** (37a) or **kí** (37b), whose status as preposition is not contentious. This state of affairs is in line with the interpretation that **ìɪ/īɪ** is a preposition marking a peripheral argument.

(39) **kwʌ̄n *ó-câaam / ó-câaam-ɔ̀ ìɪ bɔ̀ɔɔt̪ɔ̀**
porridge NEVP-eat:FUG:OV PRP compound
'The craftsman apparently went to eat porridge.'

Evidence re. this phenomenon based on a narrative is presented in (40a). This sentence displays **ôr-ɔ̀**, the patient-oriented infinitive nominalization of the Spatial / Centrifugal derivation of the verb {òr} 'send'. Like the Non-Evidential Past and the Imperfective, this infinitive form carries the **-ɔ** suffix. In (40a), which is drawn from a narrative, the verb is immediately followed by the destination, a core argument. This explains the lack of the suffix **-ɔ**.

In contrast, if the destination is left out, so that the infinitive is immediately followed by **ìɪ**, then this suffix is not dropped. This is shown in the elicited example in (40b). The realization of this sentence without **-ɔ̀** on the verb is not grammatical.

(40) a.ˆ **ò wɔ́ á-cɛ́k kí=à ôr jìi-īɪ ìɪ mɛ́j-wɔ́n**
CONJ PR1PEX PST-AUX:OV PRP=FOC send:SPT AD-2S PRP mother-1PEX
'And our mother has sent us (to come) to you.'

b. **ò wɔ́ á-cɛ́k kí=à ôr-ɔ̀ / *ôr ìɪ mɛ́j-wɔ́n**
CONJ PR1PEX PST-AUX:OV PRP=FOC send:SPT PRP mother-1PEX
'And our mother has sent us (to come).'

3.3.3 Case marking in transitives vs. intransitives

There is no case marking on the noun-phrase arguments of transitive verbs. But there is on pronominal arguments. This phenomenon is restricted a) to the expression of the semantic subject, i.e., nominative case; and b) to the position following the verb. We will describe this phenomenon in detail in Section 4. At this point, we make the comparison with intransitives. Case marking on pronominal arguments of transitive verbs is illustrated in (41), using the 3rd plural pronoun. This pronoun is unmarked when it expresses the semantic subject in the topic slot, as in (41a): this form, **gɛ́**, with High tone, is also used when the same pronoun expresses any other semantic role in the preverbal position. But when the same pronoun expresses the semantic subject following the verb, it is marked for case through tone. This is shown in (41b).

(41) a. **gɛ́ á-càm djɛ̀l**
PR3P PST-eat goat
'They ate the goat.'

b. **djɛ̀l á-càm gɛ̂n**
goat PST-eat PR3P:N
'They ate the goat.'

Importantly, the same tonal case marking is found in relation to intransitives. Illustration (42a) displays the unmarked word order of intransitives, which is Subject-Verb. The pronoun is unmarked, just as it is in (41a), where the verb is transitive. There are some constructions that displace the subject of an intransitive from the preverbal position position; time adverbials are one of them. This operation is marked on the verb. As seen from (42b), when this happens the subject of an intransitive verb is case-marked in the same way as when the semantic subject of a transitive verb is positioned after the verb (41b).

(42) a. **gɛ́ á-lâʌʌɲ**
PR3P PST-disappear
'They disappeared.'

b. **kàa á-lʌ́ʌʌɲ̄ gên**
SUB PST-disappear:VS PR3P:N
'When they disappeared, […].'

In conclusion, nominative case marking on pronouns does not single out the semantic subject of transitives; it equally applies to the semantic subject of intransitives.

3.3.4 Conclusion

Morphosyntactically, the Object voice has all the characteristics of a passive construction. It is morphologically marked on the verb, and the semantic subject is demoted. And yet, in terms of information structure, the Object voice is very much unlike a passive. Consider Dixon's assessment (2012:222) that "[a]n active construction is always functionally unmarked, and is used in neutral circumstances. Passive or antipassive will only be employed to meet some specific syntactic, semantic or pragmatic purpose." In Shilluk, it is the way around: the Object voice is used when the clause as a whole represents new information, and it is the Subject voice that is more constrained in terms of information-structural conditioning. For this reason, we agree with Miller & Gilley (2001) that the passive analysis does not offer an optimal match with the Shilluk phenomena, and this is why we have used Subject voice and Object voice instead.

One part of the puzzle that has not been taken into consideration in this discussion in earlier work is the status of the Applicative voice. Like the Object voice, Applicative voice is morphologically marked on the verb, and it is used when a semantic role other than the subject is topical. In both voices, the semantic subject is expressed as a peripheral argument, using **ìɪ/ɪ̄ɪ**. In this sense, the Shilluk voice system is akin to that of Austronesian languages, a parallel recently observed in relation to Dinka (Erlewine, Levin & van Urk 2017). In this context, it is worthwhile to note that, just as in those voice systems, the topic slot is privileged, in that extraction under relatvization is limited to this position. This helps to explain why the Applicative voice is primarily found in relative constructions: it is the only way to make a relative clause if the shared argument expresses neither the semantic subject nor the semantic object of the relative clause. An example is presented in (43).

(43)ˆ **ṭ̂ʌʌw lâw kì bɔ̂ɔl-ì kɛ̂ɲ à pwōoot ɟìɪ kí lʊ̀ʊṭ**
date:P better PRP front-PRT.S place:CS REL hit:XV people PRP stick
'Desert dates are better than a place where people get beaten with a stick.'

This characterization of syntactic alignment in Shilluk offers greater descriptive adequacy than both the active/passive analysis and the ergative analysis. However, it is certainly not a perfect correspondence, because Subject voice in Shilluk is heavily conditioned in information-structural terms.

4 Subject marking

A transitive verb can be marked for its semantic subject. This marking is illustrated in Table 9, which shows the full range of subject-marked forms for Short with Grade {càm} 'eat', in Past tense. Note that there is a) a general pattern of subject marking, which is based in form on the Subject voice form, and b) subject marking based on the Applicative voice form. With general subject marking, the preverbal constituent expresses the semantic object; with Applicative subject marking, it expresses a semantic role other than subject or object. The preverbal argument never expresses the semantic subject when there is subject marking. That is, subject marking is not an instance of agreement marking: pronominal marking of the subject is in complementary distribution with the expression of the subject as a full noun phrase (cf. Creissels 2006). This means that Subject voice and subject marking are very different from one another in a morphosyntactic sense. The paradigms for the two types of subject marking – general and Applicative – are described in Sections 4.1 and 4.2, respectively.

Table 9. Subject marking in the past tense of Short with Grade {càm} 'eat'.

	Subject marking (general pattern)	**Subject marking (general pattern), with focus**	**Subject marked Applic. voice**	**Subject marked Applic. voice, with focus**
1st sg.	**á-càaam-á**	**á-càm a jân**	**á-cāaam-á**	**á-cām a jân**
2nd sg.	**á-càaam**	**á-càm a jîn**	**á-cǎaam**	**á-cām a jîn**
3rd sg.	**á-càaam-é**	**á-càm a ên**	**á-cāaam-é**	**á-cām a ên**
1st pl. inc.	**á-càm wāa**	**á-càm a wāa**	**á-cām wāa**	**á-cām a wāa**
1st pl. exc.	**á-càm wɔ̂n**	**á-càm a wɔ̂n**	**á-cām wɔ̂n**	**á-cām a wɔ̂n**
2nd pl.	**á-càm wûn**	**á-càm a wûn**	**á-cām wûn**	**á-cām a wûn**
3rd pl.	**á-càm gên**	**á-càm a gên**	**á-cām gên**	**á-cām a gên**

In relation to the formal realization, the key thing to note about subject marking is that it is of an inflectional nature in part of the paradigm, but syntactic elsewhere. That is, in some forms, the subject marker is realized

as a bound morpheme on the verb, through affixation and/or stem-internal changes. In other forms, the marker is best conceived as an independent pronoun, case-marked through tone for its role as a semantic subject, i.e., nominative. This difference is represented in Table 9 through hyphenation. As seen from this table, we postulate that plural subject marking is invariably syntactic. Note that the plural subject markers can invariably be separated form the verb by the focus marker. In the singular, we find syntactic subject marking when there is a focus marker associated with the pronominal subject, and inflectional subject marking when there is not.

In the following subsections, we will present a descriptive analysis of this system of pronominal subject marking. There are two important questions to be addressed here. First, there is the formal status of the subject markers: is the marking inflectional or syntactic? We will motivate the distinction between inflectional vs. syntactic subject marking using the following criteria, which relate to the degree of cohesion and mutual dependence between the verb stem and the pronominal marker:

- Is the pronominal subject marker seperable from the verb stem, i.e., can another element intervene? If so, this supports the interpretation that it is an independent word. If not, this support the interpretation that it is an affix.
- Does the verb stem present a particular form when it is followed by the pronominal marker? If so, this supports the interpretation that we are dealing with inflection.
- Does the pronominal marker present a particular form when it appears in a juncture with the verb? And is this form dependent of the class of the verb?[17] Affirmative answers to these criteria support the interpretation that we are dealing with inflection.

Second, there is the question of the function, which is especially relevant to the general subject-marked forms.

4.1 Subject marking (general pattern)

Subject marking in Shilluk mixes characteristics associated with Subject voice with those associated with Object voice. The morphological form of a subject-marked verb is predictable on the basis of the corresponding Subject voice form, but the associated syntactic structure of the clause is the same

17 We thank an anonymous reviewer for pointing this criterion out to us.

as that of Object Voice. This is illustrated in (44). Illustration (44a) presents an example of a clause headed by a subject-marked verb form. Note that the stem of the verb, i.e., **càm**, is identical to the Subject voice stem, which is also **càm** (44b), and different from the corresponding Object Voice stem, which is **cấm** (44c). In spite of this formal similarity between the subject marked form (44a) and the Subject voice form (44b), the semantic object preceeds the verb in the subject-marked construction, just as it does in Object Voice (44c), and markedly different from the corresponding Subject voice construction (44b). These are the essential characteristics of the general pattern of subject marking: morphologically, it is based on the Subject Voice form, but like Object voice it displays object-verb constituent order.

(44) a. **djèl á-càm gên**
goat PST-eat PR3P:N
'They ate the goat.'

b. **djèl á-càm gén**
goat PST-eat PR3P
'The goat ate them.'

c. **djèl á-cấm ɪ̄ɪ gén**
goat PST-eat:OV PRP:P PR3P
'They ate the goat.'

The only difference distinguishing the subject-marked construction in (44a) from the corresponding Subject voice construction in (44b) is the case marking on the pronominal subject in the former: the Low Fall on **gên** signposts unambiguously that this pronoun expresses the semantic subject. This case marking, i.e., nominative, is only found on pronominal subjects: there is no nominative case marking on nouns. In any other context, the personal pronouns are High-toned – see e.g. (44b,c). It is not the case that the pronoun **gén** is case-marked for nominative whenever it expresses the semantic subject. This can be inferred from (44c), where it expressed the semantic subject in a prepositional phrase. The same point is illustrated further in (45a,b), where the same pronoun expresses the semantic subject as a core argument preceding the verb.

(45) a. **gɛ́ á-càm djèl**
PR3P PST-eat goat
'They ate the goat.'

b. **gɛ́ á-càm-ì kí djèl**
PR3P PST-eat-AMB PRP goat
'They ate some of the goat.'

While clauses with subject marking and those with Subject voice do not match up in terms of constituent order, there is a similarity in terms of information-structure. Note that, for a semantic subject to be expressed pronominally, it needs to be part of the framework of reference shared by speaker and hearer. In other words, the semantic subject is inherently topical in subject marked clauses, even though it does not appear in the preverbal slot.

As for the information-structural status of the preverbal constituent in clauses with subject marking, we find that it can represent new information.

This is illustrated by the narrative example in (46). The semantic subject of the second clause, a man called Chol, is well-established as the central character of the narrative at this point. In the first clause, he is referenced pronominally as a noun possessor (**mʌ́ʌʌn̰̄-ɛ̄** 'friend:PRT-3S'). In the second clause, he is still referenced pronominally, through subject marking on the verb (**cwɔ̀ɔɔl-ɛ̀** 'call:3S'). The semantic object (**ábác cjɛ́ɛk̄-ɛ̄** 'Abac, his wife') preceeds the verb. Crucially, however, its referent is not topical in the information-structural sense: this is the first time in the narrative that Abac has been referred to.

(46)ˆ **rùu-ì wɔ̄ɔw kɛ̂ŋ à á-bɛ́ɛeñ jwɔ́ɔk̄-ī mʌ́ʌʌn̰̄-ɛ̄,**
arrive:DVN-PRT situation time:CS REL PST-come:XV mourn:INF-PRT friend:PRT-3S
kâā ábác cjɛ́ɛk̄-ɛ̄ cwɔ̀ɔɔl-ɛ̀
CONJ Abac wife:PRT-3S call:3S
'As the time arrived to commemorate his friend, he called Abac, his wife.'

This example shows that, in subject marked clauses, the preverbal argument does not need to represent shared information. In this respect subject-marked clauses are fundamentally different from those without subject marking: in the latter the preverbal argument is an established discourse topic (cf. Section 3). As seen from (46), this is not necessarily the case when subject marking is involved.

The remainder of this section presents a descriptive analysis of the morphosyntactic nature of subject marked constructions. The key question is: how should the sequence of a verb followed by the subject marker be interpreted? One possibility is to interpret it as a suffix. In this analysis, the verb in (44a) is not **á-càm** but rather **á-càm-gɛ̂n**, i.e., inflected for 3rd plural. Such inflectional interpretations have been advanced in earlier work (Miller & Gilley 2001; Remijsen, Miller-Naudé & Gilley 2016). If we were to start out from the axiom that subject marking applies uniformely across levels of person, number and clusivity, then this inflectional analysis is inevitable, because, as will be pointed out below, subject marking is clearly inflectional in forms marked for a singular subject. Another argument in support for the inflectional analysis is the restricted distribution of the case-marked form of the personal pronouns. The case-marked forms are not used whenever the pronouns express the semantic subject, but only when they do so as an internal argument following the verb.

However, we argue against this analysis for a juncture like **á-càm + gɛ̂n**, because the verb can be separated from the subject marker, specifically by the focus marker. This is illustrated in (47a). This function morpheme can appear in a variety of syntactic positions in the clause, suggesting that it is not a

bound morpheme. For example, the focus marker can also be inserted between a OV verb and its semantic subject, expressed through a prepositional phrase (47b).

(47) a. **djèl á-càm a gên**
goat PST-eat FOC PR3P:N
'<u>They</u> ate the goat.'

b. **djèl á-cấm a ɪı gén**
goat PST-eat:OV FOC PRP:P PR3P
'<u>They</u> ate the goat.'

In fact, all seven of the levels of number, person and clusivity can be used in this way, i.e., with the focus marker positioned between the the verb stem and the subject marker: **á-càm a jân** / **jîn** / **ên** / **wāa** / **wɔ̂n** / **wûn** / **gên** (cf. Table 9). The verb is in the Subject voice form, and does not interact with the subject marking in any way. Based on these considerations, we interpret subject marking in these forms as being syntactic in nature, involving a form the personal pronoun that is case-marked for nominative.

As seen from Table 9, singular subjects are marked on the verb in a different way when there is no intervening focus marker. In the case of the verb {càm} 'eat', the forms are **á-càaam-á**, **á-càaam**, and **á-càaam-ɛ́**, respectively. The alternative construction, i.e., syntactic subject marking, is only found when the focus marker intervenes between the verb and the subject marker. This is illustrated in (48).

(48) a. **djèl á-càaam-á**
goat PST-eat-1S
'I ate the goat.'

b. **djèl á-càm a jân**
goat PST-eat FOC PR1S:N
'<u>I</u> ate the goat.'[18]

Above we noted that the morphological form of the verb that is used with syntactic subject marking is identical to the Subject voice form. Inflectional marking of singular subjects is derived from the same stem form, modified as follows: first, the stem vowel is in the long vocalic grade; second, the specification for tone on the suffix in the 1st and 3rd singular forms depends on the class the verb belongs to. These suffixes (**-a**,**-ɛ**) are High-toned when the verb belongs to one of the Low classes, and Low otherwise. For example, the Long Low verb {lèɛŋ} 'throw' has the Past tense 1st singular form **á-lèɛɛŋ-á**, whereas the Long High Fall verb {mʌ̀ʌ̰ʌ̰t̰} 'greet' has **á-mʌ̀ʌ̰ʌ̰t̰-à** in the same inflection. Finally, in the case of the 2nd singular, the pattern of marking is purely stem-internal, i.e., there is no suffix.

18 Here again, case marking through tone on the pronoun is crucial for to the interpretation of semantic argument structure. If the pronoun is not case-marked for nominative, the sentence is interpreted as Subject Voice, with a topical semantic subject: **djèl á-càm a ján** 'The goat ate <u>me</u>.'

It makes sense to treat syntactic and inflectional subject marking together, because these constructions are treated in the same way in the grammar. We will come back to this in Section 6 and in Section 6.2.

On the basis of the criteria set out in the introduction to Section 2, we interpret as inflectional the markers of singular subjects without focus marking (cf. Table 9). First, these subject markers are inseparable from the verb stem. Second, the form of the verb stem interacts with subject marking: unless the stem is Fixed Short class, the stem vowel displays morphological lengthening. Third, the 1st and 3rd subject markers are heavily reduced forms of the personal-pronoun forms, and their specification for tone interacts with the verb class system. Finally, in the case of the 2nd singular, the marking is purely stem-internal, which precludes a syntactic interpretation altogether. Fourth, the interaction between verb class and the specification for tone on the pronominal subject marker lends support to the interpretation that the latter is a suffix.

4.2 Subject marking based on Applicative Voice

Like the Applicative voice forms, the subject-marked Applicative voice forms are used when the topic expresses a semantic role other than subject or object, and in other constructions that require the use of Applicative voice (see Sections 5.6, 5.7). And also just as the Applicative voice form, a subject-marked Applicative voice form is invariably followed by a core argument expressing the semantic object. This is evidenced by the narrative example in (49). At issue here is the second clause: note how the topic slot accommodates an instrument (**ɲíŋ-ì** 'name:P-CS', the common argument of the main clause and the subordinate), and the semantic object is expressed following the verb (**píɲ** 'ground').

(49)ˆ **gé cwɔ̂l-ì gáa àkŏool bĕeen, à jíŋ ɲíŋ-í ḍwʌ̀ʌŋ mɔ́ɔɔ-gɛ́n**
PR3P call-ITER PR3P:NOMP leader:P all REL NOMP name.P-PRT status IDP.P:PRT-3P
ɲí̱n̄-ī à ɲā́k̄ gê píɲ
name-CS REL fight:XV PR3P:N ground
'They were all called leaders, which were their titles, the titles they used fighting for the land.'

In relation to the general pattern of subject marking, we have argued for an inflectional interpretation of singular subject marked forms when there is no focus marking, and for a syntactic interpretation otherwise. We postulate the same analysis in relation to subject marking in the Applicative voice. The

relevant forms are illustrated in Table 10. Critical to our interpretation is the interaction with focus marking. The singular subject marked applicative voice forms without focus marking involve a pronominal form that is either heavily reduced or stem-internal. These two units cannot be separated by the focus marker. That is, if the focus marker intervenes, a different stem form is used. These arguments (inseparability; the reduced nature of the pronominal element) support an inflectional interpretation of subject marking in relation to the singular forms without focus marking.

Table 10. The paradigm of subject-marked Applicative voice forms, illustrated by {càm} 'eat'.

Subject marked Applic. coice	**Subject marked Applic. voice, with focus**
á-cāaam-á	**á-cām a jân**
á-cǎaam	**á-cām a jîn**
á-cāaam-é	**á-cām a ên**
á-cām wāa	**á-cām a wāa**
á-cām wɔ̂n	**á-cām a wɔ̂n**
á-cām wûn	**á-cām a wûn**
á-cām gên	**á-cām a gên**

Elsewhere, i.e., when the subject is plural and/or there is a focus marker, we find a different stem form. Illustration (50a) presents elicited data showing that the focus marker can intervene between the stem and the pronominal element; (50b) shows the parallelly with general subject marking, which equally allows for the focus marker to intervene.

(50) a. **pâal á-cām (a) gên kwān**
spoon PST-eat:XV FOC PR3P:N porridge
'They / <u>They</u> used the spoon to eat porridge.'

b. **kwān á-càm (a) gên**
porridge PST-eat:OV FOC PR3P:N
'They / <u>They</u> ate the porridge.'

Just as in relation to general subject marking, we use seperability as the critical argument to determine which instances of Applicative subject marking are inflectional and which are syntactic. The evidence is more finely balanced, however, as the subject-marked stem form displays the short vocalic grade (e.g. **á-cām gên**), whereas the Applicative voice on which these subject-marked forms are based is in the long vocalic grade (e.g. **á-cāaam**). We consider the evidence from separability to be decisive. It may well be that diachronically, the forms are becoming inflectional.

5 Tense-Aspect-Modality

Seven different levels of Tense-Aspect-Modality (TAM) are expressed inflectionally in the verb paradigm. Many other dimensions of TAM are expressed in other ways, e.g. lexically, through clause-level markers, auxiliaries, and serialisation. The scope of this section is restricted to the former, i.e, to the morphological expression of TAM. These seven levels are illustrated in Table 11 for the Fixed Short Low verb {càm} 'eat'. Note that the inflections for TAM involve affixation, vowel length, and tone. Past, No Tense and Future tend to have the same stem form, and are distinguished by prefixes: **á-** for Past, **ó-** for Future, and none for the No Tense form. Note how these TAM prefixes cross orthogonally with the voice marking on the stem.

Table 11: The levels of TAM marking, illustrated by Short with Grade {càm} 'eat'.

	Subject Voice	**Object Voice**	**Applicative Voice**
Past (OV)	á-càm	á-cā́m	á-cāaam
No-tense (OV)	cā̄m	cā́m	cāaam
Future (OV)	ó-cā́m̄	ó-cā́m	ó-cāaam
Non-evidential past (OV)	ó-càaam	ó-càaam-ɔ̀	ó-càaam
Imperfective (OV)		ò-càaam-ɔ̀	
Sequential past			à-cāaam
Conditional			ò-cāaam

Imperfective and Non-Evidential Past share the same stem form, which involves the long vocalic grade, and also the same prefix, but they differ in the tonal specification of this prefix. It is **ò-** for Imperfective, and **ó-** for Non-evidential past. The Imperfective is only available for the Object voice. Sequential past and Conditional, finally, are only available with Applicative voice form. Both have a Low-toned prefix: **à-** for Sequential past, **ò-** for Conditional.

In the following subsections, we briefly describe and illustrate each of the seven inflectionally marked dimensions of TAM, focusing on their function. A detailed description of how these levels are marked in the different combinations of voice, subject marking and verb class will follow in Section 7.

5.1 Past Tense

Illustration (51) evidences the use of the past-tense form of the verb.

(51)ˆ **jɛ́ṉ mɔ́k-ání á-mâ̰aṱ ìɪ ján gɛ́ bǎa á-bḭ̂ikjɛ̀l**
tree:P IDP.P-DEF PST-drink:OV PRP PR1S PR3P NOMP CARD-six
'Those medicines I took six of them.' (lit. Those medicines I drank, they were six.)

5.2 Future Tense

Had the sentence in (51) been uttered with future tense reference, the sentence would have been as in (52) below. The only difference is the TAM prefix on the verb.

(52) **jɛ́ṉ mɔ́k-ání ʊ́-mâ̰aṱ ìɪ ján gɛ́ bǎa á-bḭ̂ikjɛ̀l**
tree:P IDP.P-DEF FUT-drink:OV PRP PR1S PR3P NOMP CARD-six
'Those medicines, I will take six of them.'

Illustration (53) shows the use of Future Tense in a narrative.

(53)ˆ **kâ̰ā kɛ̀-lɔ́k já ʊ́-jwɔ̰̂ɔk, mǔuuc kɪ́ wâaṱ**
CONJ SUB-turn PR1S FUT-cry:OV give:2S PRP bull
'And when my final funeral rite will be held, offer a bull.'

5.3 No Tense

In Object Voice, the No Tense form has the same stem shape as the corresponding Past and Future tense forms, but then without affixation. Consider the illustration in (54), which is drawn from the same narrative as as (51). Here we find the same stem form as in (51), i.e., **mâ̰aṱ**, now without a TAM prefix. Whereas (51) has specific time reference for past, there is no specific time reference in (54).

(54)ˆ **ʊ̀ gɛ́ mâ̰aṱ gɛ́ bǎa á-rjɛ̄ɛw á-rjɛ̄ɛw á-rjɛ̄ɛw**
CONJ PR3P drink:OV PR3P NCOP CARD-second CARD-second CARD-second
'And they are taken (lit. drunk) two of them three times per day (lit.: two two two.)'

Illustration (55) presents a second example of the No Tense form, now with Subject Voice.

(55)ˆ **mɛ̰̂n ɲʊ̂ʊṱ à kóookīɪ mɪ̰̂ɪ jàp-ì cám**
IDP.S show FOC reward IDP.S:PRT:S search:INF-PRT eat:INFA
kì bâ̰aaŋ̄ ŋàan mɛ̌ɛɛkɔ́
PRP behind person.CS other
'This one (story) shows the outcome of looking for food from another person.'

The use of the No Tense is felicitous only if the clause contains a licensing

constituent. In (54) this is a serialisation; in (55) it is the focus marker. This interaction between the use of the No Tense inflection of the verb and other constituents of the clause will be described in Section 6.

5.4 Non-evidential Past

The past tense is characterised more accurately as evidential past, because, alongside it, the inflectional paradigm includes another TAM form that has several functions relating to non-evidentiality, inference, and contestation. We gloss this morphological form as Non-Evidential Past; the functions are summarised briefly below. This phenomenon is described in detail in Miller & Gilley (2007). Our investigations corroborate their analysis.

A first function of the Non-Evidential Past is illustrated in (56). The verb **á-rùm** 'PST-think' conveys that the assertion in the subordinate clause is based on conjecture, rather than on eyewitness observation. Hence the use of the past tense form **á-cấm** is ungrammatical in the subordinate clause. Instead, the verb is inflected for Non-Evidential Past, which signposts that the assertion is non-evidential. Accordingly, the use of the non-evidential past is obligatory with clauses that are inherently non-evidential, such as {kwìc} 'not know'.

(56) **gɛ́ á-rùm kìnì kwān ó-càaam-ɔ̀ / *á-cấm**

PR3P PST-think QUOT porridge NEVP.OV-eat / PST-eat:OV
'They thought that the porridge was eaten.'

Similarly, Non-Evidential Past is used when describing a hypothetical situation in the past, i.e., a counterfactual or subjunctive conditional in the sense of Kaufmann (2006). This is illustrated in (57). The context here is that a man killed a hippo, the hunting of which is restricted in Shilluk culture. Against this background, the sentence in (57) expresses the hypothetical situation whereby the man had killed a kind of antelope instead, which would not have been problematic. Note that the verb in the subordinate clause is Non Evidential Past, in particular the Subject voice form, which does not carry affixes.

(57) **kɛ̀-lɔ́k ɛ́ nʌʌʌk a ŋɛ́r, pāa dí cṓʊl ìɪ ɛ́n**

SUB-turn PR3S kill:NEVP FOC white.eared.kob NEG IRR pay.for:OV PRP P3RS
'If he had killed a white-eared kob, he would not have to pay for it.'

The Non-Evidential Past has other functions that are related to non-evidentiality. One of these is that it conveys perfective and/or inference. Consider the example in (58), which is drawn from a narrative, in which a

woman describes a scary encounter she had when she was a child. She came across a strange creature in a field. In the cited utterance, she describes how this creature was covered in a black cloth, and she uses the Non-Evidential Past, here with subject marking (**kùm-ɛ̀** 'cover:NEVP-3S'). The verb is used here with perfective meaning, i.e., the covering event is presented as completed: she reports the outcome of it (the creature being covered), rather than the event in process (the covering in process), which is inferred.

(58)ˆ **gìn-ání rɪ́ɪ-gɔ̀ kùm-ɛ̀ kí ʊ́gɔ̂t̪ mɛ́-lʊ́ʊʊc̀**
thing.CS-DEF REFL-PR3S.OBL cover:NEVP-3S PRP cloth MDF-black:CTG
'That thing, it had covered itself with a dark cloth.'

This perfective-aspect function of the Non-Evidential Past is also in evidence in (59). Here a speaker described a glass bottle standing on a table, without its cap.

(59)ˆ **àd̪ʌ́ʌt̪ ʊ́-jɛ̀ɛɛp-ɔ̀**
bottle NEVP.OV-open
'Somebody opened the bottle (and left it open).'

The perfective meaning of the Non-Evidential Past is clear in comparison with the use of the Past Tense in the same environment. This can be seen from (60); these sentences differ only in the TAM marking on the verb in the subordinate clause, which is Non Evidential Past in (60a), and Past in (60b). The main clause implies eyewitness observation. In (60a), the use of the Non Evidential Past in the subordinate clause conveys that the agent witnesses e.g. emptied bowls, and infers that the porridge was eaten up, i.e., an earlier non-witnessed event. In contrast, the use of the Past Tense in the subordinate clause in (36b) is felicitous in a situation whereby the event represented by the subordinate clause (the eating) is on-going at the time when the event of the main clause takes place.

(60) a. **á-lɪ̂ɪt̪ ɪ̄ɪ gɛ́n kìnì kwʌ̄n ʊ́-càaam-ɔ̀**
PST-see:OV PRP.P PR3P COMP porridge NEVP.OV-eat
'They saw that the porridge had been eaten up.'

b. **á-lɪ̂ɪt̪ ɪ̄ɪ gɛ́n kìnì kwʌ̄n á-câm**
PST-see:OV PRP:P PR3P COMP porridge PST-eat:OV
'They saw that the porridge was being eaten.'

In other words, the use of the Non Evidential Past in (60a) conveys – through its perfective function – that the time setting of the inferred event in the subordinate clause precedes the past tense time setting of the main clause

(pluperfect). This interpretation equally applies in (58): the visit to the field is set in the past, and the inferred covering of the creature is inferred to have taken place before that.

A third function of the Non-Evidential Past is contestation. This interpretation is available in relation to events the speaker is highly likely to have an eyewitness account on, e.g. an event they participated in themselves. Illustration (61) shows corresponding sentences; in (61a) the verb in the subordinate clause is in the Non-Evidential Past; in (61b) it is in the Past tense. The use of Non-Evidential Past in (61a) conveys that the speaker disagrees with what was asserted about them.

(61) a. **gɛ́ á-kôoop kìnì kwān càaam jân**
PR3P PST-say:ATP QUOT porridge eat:NEVP PR1S:N
'They said that I ate the porridge.' (and I disagree)

b. **gɛ́ á-kôoop kìnì kwān á-cấm ìɪ ján**
PR3P PST-say:ATP QUOT porridge PST-eat:OV PRP PR1S
'They said that I ate the porridge.'

5.5 Imperfective

As the terms suggests, the imperfective inflection represents the event as an on-going process. Illustration (62) presents an example from a song. The first line presents a generic statement, and here the verb **ù-cɔ̂ɔŋ-ɔ̀**, from Low Fall {cɔ̂ɔŋ} 'dance' is in the Imperfective. This clause refers to the practice whereby an age set of young men dances with an age set of young women from a different village.[19] Note that the referent event has no specific end point.

(62)ˆ **ɲīɪŋáak mấaā̱-āa, mʌ́ʌn ɲí tấŋ kí=à ḍ̱wʌ̀ʌʌŋ bùul, pấaṯ kí jāaṯ,**
Nyijak friend:PRT-1S women HAB win.over:OV PRP=FOC dress drum NEG PRP tree[20]
'Nyijak my friend women are won over by dance attire, not by magic,'
kwâa kīɪl ó-bɔ̂w ù-cɔ̀ɔɔŋ-ɔ̀ īɪ wɔ̀ɔɔp
descendant:PRT Kil Obow IMPF-dance PRP:P young.man:P
'(We) young men dance with the descendant of Kil Obow.'

A clause whose verb is inflected for imperfective does not necessarily convey present tense setting. This is illustrated in (63), which is drawn

19 In this case, the age set of the women is referred to by their leader, i.e., the descendant of Kil Obow.

20 The meaning of **jāaṯ** 'tree, plant' extends to 'medicine, cure, magic' (e.g. **ɔ̄ɔt-jāaṯ** 'house-tree' means hospital).

from the same song. Here we find, in the first clause, the Imperfective used in a context that has past-tense time reference. This past tense reference is revealed in the subsequent clause, where the same event is referenced through the same verb, this time inflected for past tense. Evidence liks this supports the interpretation of the function of this inflection as Imperfective, i.e., as aspect rather than tense. This interpretation goes back to Miller & Gilley (2001).

(63)ˆ **gâaar-ɔ̀ ò-bàaaŋ-ɔ̀ ɪ̄ɪ mʌ́ʌn, ó-múr ɲíŋ-í gɛ́ lóʊʊè**
dead.wood-S IMPF-reject PRP:P women MASC-vagina face-PRT:P PR3P black:CTG
'The women were rejecting the dead-wood men, bastards whose faces are dirty.'
wʊ̄ʊ-mʌ́ʌn á-bàŋ-ì, pàláaŋ̣-ì à nì ɲâaŋ, gìn à bûut kì nâam
women-women PST-reject-AMB Fulani-CS REL like crocodile thing:CS REL lie PRP river
'The women rejected: "The Fulani are like a crocodile, something that lies in the river.'

The imperfective is rare in our corpus, and we do not yet fully understand why. One relevant observation is that the addition of the focus marker to a clause whose verb is in the Imperfective is ungrammatical. This restricts the functional range of the Imperfective. Another is that there are other constructions that leave tense unspecified. One such construction involves the use of the habitual marker ɲí, as in (62). Another is the No Tense form of the verb (cf. Section 5.3).

5.6 Sequential Past

The use of the Sequential Past is felicitous when the event expressed by the clause follows in close succession after another event. This is illustrated in (64). At this point in the narrative, the storyteller has just laid out how the protagonist has reported the death of his friend to the head of the village during the night. The use of the sequential past conveys that the event of the clause took place in sequence after this. It can often be translated well into English using 'and then'.

(64)ˆ **kì mwɔ̆ɔ̆ɔl à-cwɔ̄ɔɔl ɟɪ̀ɪ gɛ́-kí ɲíɪɪ-mīii bʊ̆ʊl ɪ̀ɪ ɟâaak̄-ɔ̄**
PRP morning SEQP-call:XV people PR3P-PRP offspring-mother:PRT Bol PRP chief-S
'[And he went straight to the chief of their village. He woke him up, and he told him the story of how an animal had killed his friend Bol in the forest.] After that, in the morning, the chief called all the people, and the brothers of Bol.'

The verb stem is that of the Applicative voice, and the prefix is Low-toned **à-**, whereas the past tense marker **á-** carries a High tone. Just as in other constructions involving the Applicative voice form, the semantic object follows

after the verb. In (64), this is **ɟìɪ gé-kí ɲíɪɪ-mìii bŏʊl** 'the people and Bol's brothers'. Illustration (65) presents a second example of the Sequential Past, now with the verb additionally inflected for subject marking.

(65)ˆ **kấā úgìik réŋ(-í) a jǐii gén, à-rwɔ̄ɔm gê gɔ̀n kí tɔ̂ɔɔŋ**
CONJ buffalo run-FUG:NT FOC AD:P PR3P SEQP-hit.simult:XV PR3P:N PR3S.OBL PRP spear:P
'The buffalo ran towards them, and then they hit it simultaneously with their spears.'

5.7 Conditional

A clause headed by a verb inflected for the conditional TAM form expresses a hypothetical state in the present or in the future. The verb form has the stem form of the Applicative Voice, and a Low-toned prefix **ù-**. Syntactically, the verb appears in clause-initial position, and the semantic object follows the verb. The syntactic positioning of the object following the verb is a characteristic that the conditional inflection shares with the Sequential past and with other clauses that involve the Applicative voice form. Two examples are presented in illustration (66).

(66) a. **ù-kĕeel djêk, gé ó-cṓʊl ìɪ jín**
COND-spear:XV:2S goat:P PR3P FUT-pay.for:OV PRP PR2S
'If you spear goats, you will have to pay for them.'

b. **ù-kĕeel djêk, gé cḗk kí=a cûʊʊl-ɔ̀**
COND-spear:XV goat:P PR3P AUX:OV:NT PRP=FOC pay.for-INF
'If somebody spears goats, they have to be paid for.'

The conditional, as a morphological form of the verb, is not used with past-tense reference. This is illustrated in (67). The sentence in (67a) is ungrammatical: it includes a condition that is set in the past and marked morphologically through the conditional inflection. Instead, this meaning is expressed using the subordinate clause structure of a time adverbial, as in (67b).

(67) a. ***ù-kēeel lâʌj, rîŋ-ɔ́ á-ɲwấak**
COND-spear:XV animal meat-S PST-share:OV
'If somebody speared an animal, the meat was shared.'

b. **kɛ̂ɲ à á-kēeel lâʌj, rîŋ-ɔ́ á-ɲwấak**
time:CS REL PST-spear:XV animal meat-S PST-share:OV
'When / If somebody speared an animal, the meat was shared.'

6 Syntactic licensing

Most verb forms that do not carry prefixation for TAM require the presence of another element within the clause that supplies the aspectual setting. We refer to this as 'syntactic licensing' of the verb form. Among the levels of TAM outlined in Section 5, there are two that do not (always) involve a TAM-marking prefix. One is the No Tense form, which is never marked for TAM; the other is the Non-Evidential Past, which involves a TAM prefix in some combinations of Voice and TAM, but not in others.

The phenomenon is illustrated in (68), which shows a) a Subject voice No Tense form; b) an Object voice No Tense form; c) a subject marked No Tense form; and d) a Non-Evidential Past form. If the focus marker **a/à** is not there in each of these clauses, they are all ungrammatical, in the sense that these sentences are judged to be incomplete or unfinished by native speakers. In this way, the focus marker licenses the use of these verb form that do not carry a TAM prefix. And there are several other licensers; we will go into them further on in this section.

(68) a. **dɛ̄ɛŋ cā̄m *(a) lùm**
Deng eat:NT FOC grass:P
'Deng eats the vegetables.'

b. ***lùm *(à) cā́m**
grass:P FOC eat:OV:NT
'The vegetables are being eaten.'

c. **lùm *(à) cáaaǹ-è**
grass:P FOC eat:NT-3S
'He eats the vegetables.'

d. **dɛ̄ɛŋ càaam *(a) lùm**
Deng eat:NEVP FOC grass:P
'Deng apparently eats the vegetables.'

The base-paradigm forms that require syntactic licensing are listed in Table 12. As noted above, it is the No Tense form and the Non-Evidential Past where the verb may appear without affixation. Table 12 illustrates, for each combination of Voice and subject marking, whether it is grammatical without syntactic licensing. As seen from this table, the No Tense forms require syntactic licensing in all combinations of Voice and Subject marking. In relation to the subject-marked forms, it does not matter whether the marking is inflectional or syntactic. For example, there is ***lùm cáaaǹ-è**, with the subject marked inflectionally, and the corresponding plural ***lùm cā́m gên**, where the subject is marked syntactically. Both are ungrammatical, indicating that, for the grammar, it does not make a difference whether Subject marking is inflectional or syntactic.

Table 12: Grammaticality/ungrammaticality of different combinations of voice, subject marking and TAM without syntactic licensing in declarative clauses.

	No Tense	**Non Evidential Past**
Subject Voice	***cʌ̂̄m̄ lùm** eat:NT grass:P	***càaam lùm** eat:NEVP grass:P
Subj.-marked Subject Voice	***lùm cáaam̀-ὲ** grass:P eat:NT-3S	✓ **lùm càaam ɛ̂n** grass:P eat:NEVP PR3S:N
Object Voice	***lùm cʌ̂̄m** grass:P eat:OV	Irrelevant, carries TAM prefix
Applicative Voice	***pâal cāaam lùm** spoon eat:XV grass:P	Irrelevant, carries TAM prefix
Subj.-marked Applic. Voice	***pâal cāaam-έ lùm** spoon eat:XV:NT-3S grass:P	✓ **lùm càaam ɛ̂n** grass:P eat:NEVP PR3S:N

As for the Non-Evidential Past forms, these carry a TAM prefix in the Object Voice (e.g. **ʊ́-càaam-ɔ̀**) and in the Applicative Voice form (e.g. **ʊ́-càaam**). As a result, these forms do not require syntactic licensing. In contrast, syntactic licensing is required for the Subject voice form. Surprisingly, the Non-Evidential Past subject-marked forms are grammatical in the absence of TAM inflection, i.e., they do not require syntactic licensing (cf. Table 12). This is illustrated by the narrative example in (69).[21]

(69)ˆ **gì twôooc ɛ̂n ɪ̄ɪc ʊ́gɔ̂̄t̪**
PR3P.OBL tie:SPAT:NEVP PR3S:N inside cloth
'He had tied them inside the cloth.'

How can the need for syntactic licensing be explained? The data suggest that declarative clauses – i.e., statements rather than commands or questions – need a specification for TAM, and for aspect in particular. Most often, this requirement is fulfilled through inflection. However, it can equally be fulfilled through the syntax or through the lexicon. As for the syntactic licensers, the one that occurs the most frequently is the focus marker **à/a**. Another is the infinitival adverb. These will be discussed in Sections 5.1 and 5.2, respectively. But there are others as well, and the following examples reveal that the common characteristic of syntactic licensers is that they specify aspect. Consider the sentence in (70a). The verb is in the No Tense form, and it is judged 'incomplete'.

21 In this example, the verb appears in a derivation for spatial deixis. This is orthogonal to the phenomenon at issue.

However, if the internal argument is reciprocal, as in (70b), it is grammatical. Reciprocity implies that the event extends over time, thereby specifying an aspectual scope. Concretely, in this example, there are at least two instances of annoying.

(70) a. ***kùl kɔ́l ɪ̄ gén**
Kul annoy:OV PRP:P PR3P
'They disturb Kul.'

b. **ríɪ-gén kɔ́l ɪ̄ gén**
REFL-PR3P annoy:OV PRP:P PR3P
'They are disturbing one another.'

Another syntactic licenser is serialisation.[22] This is illustrated in (71a,b). In (71a), the No Tense Object voice form is licensed by an adjectival predicate component; in (71b), the No Tense Subject voice form is licensed by an intransitive predicate. Note that, in both cases, serialisation offers an aspectual setting for the referent of No Tense verb form, by relating it to the referent of the second constituent of the serialisation.

(71) a. **kwān cám é léeeḛ̀**
porridge eat:OV PR3S hot:CTG
'The porridge is eaten while hot.'

b. **ábác cám̄ kwān é ú-cùŋɔ̀**
Abac eat:NT porridge PR3S IMPF-stand
'Abac eats porridge while standing.'

The above examples illustrate syntactic licensing. Alternatively, the specification for TAM may be satisfied lexically. Some transitive verbs regularly appear without either TAM marking or a licenser in the syntactic environment, even in declaratives. Consider the examples in (72). The verbs {mɑ́ar} 'love' in (72a) and {cɛ̀ḛ̀} 'detest' in (72b) can be used in the No Tense form, without syntactic licensing. What distinguishes them from verbs like {kɔ̀l} 'annoy' in (70a) and {twɑ́aŋ} 'betray' (72c) is that 'love' and 'detest' are dispositions that have temporal extent, inherent to the lexical meaning, which is not the case for 'annoy' and 'betray'.

(72) a. **twɔ́ɔŋ mɑ́ar**
Twong love:OV
'Twong is loved.'

b. **twɔ́ɔŋ cɛ́ḛ̀**
Twong detest:OV
'Twong is detested.'

c. ***twɔ́ɔŋ twɑ́aŋ**
Twong betray:OV
Twong is being betrayed.'

Other verbs that pattern along with {mɑ́ar} 'love' and {cɛ̀ḛ̀} 'detest' include {mɑ́an} 'hate', {wɔ́ɔr} 'respect', {bɪ́ɪw} 'despise, disrespect', {ŋʌ́ʌ̀ḛ̀} 'trust', {wɔ́ɔj} 'neglect', {bɔ́ʊr} 'hold in higher esteem', {lɔ́ʊt} 'surpass', {bwɔ́ɔn} 'consider unworthy', {tjɑ́am} 'defeat', {mʊ́ʊt} 'distrust, envy', {kʊ́ʊr} 'protect'. Aside from the last two and {cɛ̀ḛ̀}, all of these belong to

22 Serialisation can be defined by the presence of two lexical roots serving as predicates within the same clause. In such constructions, any tense marking is expressed on the first verb, and the topic is resumed by a pronoun before the second constituent head.

the Long High Fall class. As noted in Section 2, verbs that typically take a human semantic object tend to be part of this class. At the same time, this phenomenon is not determined by verb class. First, the set includes {mûʊt} 'distrust, envy', {kûʊr} 'protect', and {cɛ̀t̪} 'detest', all three of which belong to classes other than Long High Fall. Second, there are also Long High Fall verbs that typically take a human semantic object, and which nonetheless require syntactic licensing, such as {twɑ̂aŋ} 'betray'. Evidently, it is not about verb class. Instead, the shared characteristic of verbs that can appear without inflectional TAM and without syntactic licensing is that their lexical semantics express an emotion or attitude that is not punctual, but instead extends over time. This fits with the hypothesis that the crucial requirement is aspectual setting, which can be satisfied lexically, through inflection, or by syntax.

The requirement of syntactic licensing does not apply to imperatives and yes/no-questions. These non-declarative speech acts can be used systematically without tense marking.

6.1 Focus marking

The role of focus marking in syntactic licensing is evidenced by the narrative example in (72). The verb is in the Subject voice No Tense form, and the focus marker is associated with the argument that follows the verb (**kóookīı** 'reward').

(73)ˆ **mɛ́n ɲûʊt̪ a kóookīı mɪ́ɪ̄ jàp-ì cám kì bɑ̂aaŋ̄ ŋàan mɛ̌ɛɛkɔ́**
IDP.S show FOC reward IDP.S:PRT search:INF-PRT eat:INFA PRP behind person other
'This one (story) shows the outcome of looking for food from another person.'

A clause can include no more than a single instance of the focus marker. When a constituent following the verb is focused, as in (48), the focus marker is positioned before it; and when the topic is focused[23], the focus marker appears between the topic and the verb

For the No Tense form to be syntactically licensed in this way, it does not matter where in the clause the focus marker appears. This is illustrated in (74). All four of the sentences are ungrammatical if the focus marker is left out. The

23 The focus marker can be associated with the preverbal constituent, which we have analysed as the topic. This is problematic in terms of the axiom that topic and focus are mutually exclusive, i.e., that a given constituent cannot represent both (Kroeger 2004:151). It may be that we are dealing with a contrastive topic in such situations. This question calls for a detailed investigation of Shilluk information structure in its own right.

structure becomes correct if the focus marker is associated with any argument, be it core, as in (74a,b), or peripheral, as in (74c,d).

(74) a. **dɛ̄ɛŋ cā̄m a kwān**
Deng eat:NT FOC porridge
'Deng eats porridge.'

b. **kwān à cām ìɪ dɛ̄ɛŋ**
porridge FOC eat:OV:NT PRP Deng
'Deng eats the porridge.'

c. **kwān cām a ìɪ dɛ̄ɛŋ**
porridge eat:OV:NT FOC PRP Deng
'Deng eats the porridge.'

d. **kwān cām kí à pâal**
porridge eat:OV:NT PRP FOC spoon
'The porridge is eaten with a spoon.'

An aside on the form of the focus marker. It has two allomorphs. It is Low-toned, i.e., **à**, in most environments, including those in (74,b,d), but toneless **a** when it follows immediately after the verb. In the latter environment, it gets its specification for tone by copying it from the end target of the preceding syllable. This means that it is realised with Mid tone in in the juncture **cā̄m a** (74a), but with Low tone in **cām a** (74c). The fact that it is associated with the constituent to its right in terms of its function in the clause but to the constituent to its left in a phonological sense fits a widely observed cross-linguistic pattern (Himmelmann 2014).

In conclusion, focus marking interacts with the TAM system in Shilluk. Similar phenomena have been reported in Hyman & Magaji (1970), Hyman & Watters (1984) and Andersen (1988). Hyman & Magaji describe how in Gwari, tenses other than perfective are found with a focus marker or without it. Perfective tense in contrast requires the presence of the focus marker. Hyman & Watters develop the analysis of these and similar phenomena, by distinguishing between focus in its widely-used information-structural sense, as opposed to focus as a syntactic phenomenon. Andersen (1988) reports that in Päri, a language closely related to Shilluk, clauses in which the verb is marked for past tense cannot have the focus marker. Andersen concludes that the past tense marker is itself a focus marker. Here the notion of a grammatical feature of focus, as postulated in Hyman & Watters (1984), can be useful: if focus is conceived of as a grammatical feature, and a sentence can include only one instance of this feature, the ungrammaticality of the the focus marker in clauses that carry the past tense marker follows. The above description suggests that in Shilluk, it is TAM marking that is crucial, and that the presence of the focus marker satisfies this requirement, on a par with with morphological TAM marking, lexically inherent aspectual characteristics, and other syntactic licensers.

It remains to be investigated what the interaction between focus marking and the No Tense form means for information structure. In a clause with a

verb in Past tense, the focus marker is solely an information-structural device, highlighting information. In a clause with a verb in No Tense it licenses the verb, so that it can conceivably be interpreted as a TAM marker.

While the No Tense and in some cases the Non Evidential Past can be licensed by the focus marker, the Imperfective also interacts with focus marking, but in the opposite way: the cooccurrence of Imperfective inflection on the verb with the focus marker is not grammatical. This is illustrated in (75). This sentence was uttered without focus marking in a narrative. It is not grammatical for the focus marker to be included here, be it on the semantic object in the topic slot or on the semantic subject in the prepositional phrase.

(75)ˆ **kwâa kīɪl úbɔ̂w (*à) ù-cɔ̀ɔɔŋ-ɔ̀ (*a) ɪ̄ɪ wɔ̀ɔɔp**

descendant:PRT Kil Obow FOC IMPF-dance FOC PRP:P young.man:P
'(We) young men dance with the descendant of Kil Obow.'

6.2 Infinitival adverb

A verb form without TAM can be licensed by an infinitival adverb. The phenomenon is illustrated in (76a,b), in each case in the second clause, which is the main clause. In these examples, the main clause is headed by a subject-marked verb form, which is in the No Tense form (**cáaaṁ-è**, **náaaḳ̀-è**). This subject-marked verb form is followed by an infinitive of the same verb root. The morphological characteristics of the infinitive will be described in Section 7.6. This infinitive, which repeats the subject-marked verb, is the constituent that provides syntacticlicensing for the No Tense form. It is used as an adverb, expressing emphasis on the event expressed by the verb, as suggested by the fact that this constituent is repeated. That is, just as in the case of the focus marker **à/a**, we find again here a connection between focus marking and TAM (cf. Andersen 1988, Hyman & Watters 1984).

(76) a.ˆ **kɛ̀ ŋwáaal-íɪ, jí cáaaṁ-è à càaam-ɔ̀**

SUB touch:XV:NT:2S-3S.OBL PR2S eat:NT-3S FOC eat-INF
'And if you touch him, he will eat you up.'

b. **jɛ̀l-ù gén, gɔ̀ nʌʌʌḳ̀-è à nʌ̀ʌʌk-ɔ̀**

separate-2P.IMP PR3P 3S.OBL kill:NT-3S FOC kill-INF
'Separate them! He is surely about to kill him.'

The use of the infinitival adverb is only grammatical if the verb form carries subject-marking. In this context, it is worthwhile to note that it does not matter whether the subject is marked through inflection, as in (76) or

syntactically, as in (77). This equivalence shows that syntactic subject marking is equivalent to inflectional subject marking.

(77) **kwān cấm̄ gê à càaam-ɔ̀**
porridge eat PR3P.N FOC eat-INF
'They are definitely going to eat porridge (right now).'

As for the expression of TAM, the use of the infinitival adverb with the No Tense form conveys that the event is about to happen. Aside from the No Tense, this constructuion can also be used in Non-Evidential Past (78a), in Future tense (78b), and in Past tense (78c).

(78) a. **já á-lìŋ ǐı kwān càaam gê à càaam-ɔ̀**
PR1S PST-hear:ATP INDIR porridge eat:NEVP PR3P.N FOC eat-INF
'I heard that they definitely ate the porridge.'

b. **kwʌ̄n ó-cấm̄ gê à càaam-ɔ̀**
porridge FUT-eat PR3P:N FOC eat-INF
'They will definitely eat porridge.'

c. **á-kwìc-á kwìc-ɔ̀**
PST-not.know-1S not.know-INF
'I totally did not know.'

The interpretation that this construction conveys focus on the verb is supported by the fact that, while the focus marker can be included in the clause, it can only mark the infinitival adverb, which is co-referent with the verb. This is illustrated in (79). Note that the sentence is ungrammatical if the focus marker appears before the verb, where it would mark the topic, and following the verb, where it would mark the pronominally expressed semantic subject. In contrast, the focus can be added before the infinitival adverb.

(79) **kwān (*à) cấm̄ (*a) gê (à) càaam-ɔ̀**
porridge FOC eat:NT FOC PR3P.N FOC eat-INF
'They are definitely going to eat porridge (right now).'

Andersen (1988) describes a similar construction in Päri. Illustration (80) is cited from Andersen (1988:293). Note that, like the Shilluk constructions in (76–79), the Päri example has the verb repeated at the end of the clause, and Andersen labels this constituent as a verbal adverb. The main difference between the Shilluk construction and its Päri counterpart is that in Shilluk, the infinitival adverb construction is available only if the verb carries subject marking.

(80) **jòobì kêel ùbúrr-ì kèel-ò**
buffalo shoot Ubur-ERG shoot:SUF
'Ubur will shoot the buffalo.'

The two constructions also present a similarity similar in terms of focus marking. Andersen notes that Päri clauses in which the infinitival adverb appears cannot take focus marking, and he infers that the infinitival adverb is a focus marker itself. As noted above, the corresponding Shilluk construction does allow for the presence of a focus marker, but it can only be associated with the infinitival adverb. This indicates that in Shilluk as well, focus on the verb is implicated when the infinitival adverb is used, a hypothesis which is also supported by native-speaker interpretations of the meaning sentences that present this construction.

7 The base inflectional paradigm

In the preceding sections, four factors have been introduced that together determine the structure of the base inflectional paradigm. They are Verb class (Section 2), Voice (Section 3), Subject marking (Section 4), and Tense-Aspect-Modality (Section 5). The last of these factors interacts with syntactic licensing (Section 6), which is not itself a factor in the inflectional paradigm. Now we will build on this groundwork to describe the inflectional paradigm.

7.1 The Subject Voice forms

Table 13 illustrates the Subject voice forms of the inflectional paradigm, by verb class and by Tense-Aspect-Modality (TAM). The Subject voice forms are available in four levels of TAM: Past, Non-Evidential Past, No Tense, and Future. Across verb classes, Past tense is marked by the prefix **á-**, and Future tense by the prefix **ó-**. The Non-Evidential Past displays the long grade wof the stem vowel (unless the verb is Fixed Short).

Table 13: The Subject voice forms by TAM and verb class. Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mâl} 'roast', {lèɛŋ} 'throw', {mâaṭ} 'drink', and {mấal} 'praise'.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
NEvP	**ŋɔ̀l**	**lêŋ**	**càaam**	**mâʌʌl**	**lèɛɛŋ**	**mâaaṭ**	**mấaal**
NoTns	**ŋɔ́l̄**	**lêŋ**	**cấm̄**	**mâl**	**lɛ́ɛŋ̄**	**mâaṭ**	**mâal**
Future	**ó-ŋɔ́l̄**	**ó-lêŋ**	**ó-cấm̄**	**ó-mâl**	**ó-lɛ́ɛŋ̄**	**ó-mâaṭ**	**ó-mâal**

The tonal specification on the stem syllable depends on the verb class. The three Low Fall verb classes display their lexical specification (Low Fall) on the stem syllable in all four TAM forms. It follows that in the case of Low Fall verbs that are Fixed Short, there is syncretism between Non-Evidential Past and No Tense forms, because these verbs do not display a morphological vowel length alternation. For the three Low verb classes, we find their lexical specification (Low) on the stem syllable in Past and in Non-Evidential Past, but not in the No Tense and Future forms, which have a High Fall to Mid. The High Fall verbs, finally, pattern along with the Low Fall verbs in all inflections other than the Non-Evidential Past. It is only the latter inflection that reveals the specification that is specific to this verb class, i.e., High Fall. Finally, the No Tense and Non-Evidential Past forms require syntactic licensing (cf. Section 6).

Note that there is no single form in the Subject voice paradigm that displays the lexical specifications for both tone and vowel length. Instead, we find the lexical specification for tone of the verb root – Low, Low Fall or High Fall – reflected in the Non-Evidential Past, and the lexical specification for vowel length – Short or Long – in the other three levels of TAM (Past, No Tense and Future).

7.2 The Object Voice forms

The Object voice part of the base paradigm, summarized in Table 14, presents an additional level of TAM, as compared to the Subject voice and to the subject-marked forms: the Imperfective (cf. Section 5.5). The Object voice forms have one stem form in Past, No Tense, and Future, and another in Non-Evidential Past and Imperfective. In Past, No Tense, and Future, the stem vowel is in the short vocalic grade; and the tone on the stem syllable is the High Fall for all verb classes, i.e., replacing the lexical specification. In the Non-Evidential Past and Imperfective, the stem vowel is in the long vocalic grade, and here the tone reflects the lexical specification: Low for Low verbs, Low Fall for Low Fall verbs, and High Fall for High Fall verbs.

The affixes marking Past and Future are **á-** and **ǿ-**, respectively, just as in Subject Voice. Non-Evidential Past and Imperfective have **ǿ-** and **ò̰-**, respectively, and the difference in tone is the only difference between these verb forms. The latter two TAM levels also have a weakly-realised suffix **-ɔ**, Low-toned for all classes other than Long High Fall, where it is High-toned instead.

Table 14: The Object voice forms by TAM and verb class. Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mâl} 'roast', {lèɛŋ} 'throw', {mâaṭ} 'drink', and {mấal} 'praise'.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	**ŋ́ɔ́l**	**lḗŋ**	**cấm**	**mấl**	**lḗɛŋ**	**mấaṭ**	**mấal**
Past	**á-ŋ́ɔ́l**	**á-lḗŋ**	**á-cấm**	**á-mấl**	**á-lḗɛŋ**	**á-mấaṭ**	**á-mấal**
Future	**ó-ŋ́ɔ́l**	**ó-lḗŋ**	**ó-cấm**	**ó-mấl**	**ó-lḗɛŋ**	**ó-mấaṭ**	**ó-mấal**
NEvP	**ó-ŋɔ̀l-ɔ̀**	**ó-lêŋ-ɔ̀**	**ó-càaam-ɔ̀**	**ó-mâʌʌl-ɔ̀**	**ó-lèɛɛŋ-ɔ̀**	**ó-mâaaṭ-ɔ̀**	**ó-mấaal-ɔ́**
Impf	**ò-ŋɔ̀l-ɔ̀**	**ò-lêŋ-ɔ̀**	**ò-càaam-ɔ̀**	**ò-mâʌʌl-ɔ̀**	**ò-lèɛɛŋ-ɔ̀**	**ò-mâaaṭ-ɔ̀**	**ò-mấaal-ɔ́**

For the sake of backward compatibility, it is worthwhile to note that our descriptive analysis of the Object Voice Imperfective and Non-Evidential Past forms deviates from earlier work. We postulate that the High Fall class has a High Fall on the stem followed by a High tone on the suffix in the Object Voice Imperfective and Non-Evidential Past forms, e.g., **ò-mấʌʌṭ-ɔ́** 'IMPF-greet' and **ó-mấʌʌṭ-ɔ́** 'NEVP:OV-greet', respectively. In contrast, Remijsen, Miller-Naudé & Gilley (2015, 2016) postulated a High Fall to Mid followed by Mid in these forms, i.e., **ò-mấʌʌṯ̄-ɔ̄** and **ó-mấʌʌṯ̄-ɔ̄**.

Of all the levels of TAM that are available for Object voice, the No Tense forms are the only ones without a prefix, and they require syntactic licensing. This is illustrated in (81a): the addition of a focus marker renders the sentence grammatical. Without it, the sentence is ungrammatical (incomplete). In relation to the Imperfective, we find the opposite interaction: this level of TAM cannot combine with the focus marker. This is shown in (81b), which is ungrammatical with a focus marker, and fine without it.

(81) a. **kwān cấm kí *(à) pâal**
porridge eat:OV PRP FOC spoon
'The porridge is eaten with a spoon.'

b. **kwān ò-càaam-ɔ̀ kí (*a) pâal**
porridge IMPF-eat PRP FOC spoon
'The porridge is being eaten with a spoon.'

7.3 The general subject-marked forms

In Section 4 we described how there are two sets of subject-marked forms: one set that is used with the semantic object preceeding the verb (Section 4.1), and another set that is used with a semantic role other than subject and object in that position (Section 4.2). We refer to the former as the general subject-marked forms, and the latter as Applicative voice subject-marked forms. In this

subsection, we describe the former, i.e., the general subject-marked forms, and the description is limited to inflectional subject marking.

The general subject-marked forms are formally derived from the Subject voice forms, rather than from the Object voice forms. This analysis is supported by several pieces of evidence. First, there is the interaction with TAM marking: the general subject-marked forms come in Past, Non-Evidential Past, No Tense and Future, precisely those TAM levels available for Subject voice. In contrast, Object voice additionally combines with an additional level of TAM: the Imperfective.

Second, the morphological forms of the general subject-marked inflections are predictable on the basis of the corresponding Subject voice forms, but not on the basis of the Object Voice forms. With respect to syntactic subject marking, the same form is used as in Subject voice, followed by the case-marked pronominal form: **jân**, **jîn**, **ên**, **wāa**, **wɔ̂n**, **wûn**, **gên**. With respect to inflectional subject marking – i.e., in the 1st, 2nd and 3rd singular, and without focus marking (cf. Table 9 and Section 4.1) – these forms as well are derived from the Subject voice forms. This can be seen from Table 15. It shows the Subject voice form, the Object voice form, and the 1st singular subject-marked form, in each case in Past and in No Tense. Note that, in relation to the Low Fall classes, the stem syllable of the Subject voice form has the Low Fall both in Past tense and in No Tense form, whereas in Object voice, the stem syllable has the High Fall in the same TAM levels. Crucially, the 1st singular has the same specification as the Subject voice (Low Fall) in both TAM levels.

Table 15: Subject voice, Object voice and 1st singular subject-marked forms, in Past and No Tense, by verb class. Each class is represented by one verb: {ŋɔ̀l} ‘cut’, {lêŋ} ‘drum’, {càm} ‘eat’, {mɅ̂l} ‘roast’, {lèɛŋ} ‘throw’, {mâaṯ} ‘drink’, and {mɑ́al} ‘praise’.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
SV, Past	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mɅ̂l**	**á-lèɛŋ**	**á-mâaṯ**	**á-mâal**
SV, NT	**ŋɔ́l̄**	**lêŋ**	**cɑ́m̄**	**mɅ̂l**	**lɛ́ɛŋ̄**	**mâaṯ**	**mâal**
OV, Past	**á-ŋɔ́l**	**á-lɛ́ŋ**	**á-cɑ́m**	**á-mɅ́l**	**á-lɛ́ɛŋ**	**á-mɑ́aṯ**	**á-mɑ́al**
OV, NT	**ŋɔ́l**	**lɛ́ŋ**	**cɑ́m**	**mɅ́l**	**lɛ́ɛŋ**	**mɑ́aṯ**	**mɑ́al**
1st sg., Past	**á-ŋɔ̀l-á**	**á-lêŋ-à**	**á-càaam-á**	**á-mɅ̂ʌʌl-à**	**á-lèɛɛŋ-á**	**á-mâaaṯ-à**	**á-màaal-à**
1st sg., NT	**ŋɔ̀l̀-à**	**lêŋ-à**	**cáaam̀-à**	**mɅ̂ʌʌl-à**	**lɛ́ɛɛŋ̀-à**	**mâaaṯ-à**	**màaal-à**

Then consider the Low verbs. The Subject voice forms have a different specification for tone in Past vs. No Tense, but the specification for tone in the Object voice forms does not differ between these inflections. Again, the 1st singular forms pattern along with the Subject voice, presenting different inflection in Past vs. No Tense. In relation to High Fall verbs, finally, the tonal specification of the subject-marked forms is not predictable on either the Subject voice forms or the Object voice forms.

In summary, the presence vs. absence of an alternation in the specification for tone on the stem syllable in the subject-marked forms parallels the presence vs. absence of the same alternation in the Subject voice forms. In contrast, the specification for tone in Object voice has no bearing on the specification for tone in subject-marked forms. In the remainder of this subsection, we will describe inflectional subject marking systematically, by level of TAM.

Table 16 displays the inflected forms marked for subject in the Past tense. If the verb class displays morphological lengthening, the stem vowel is in the long grade. The 1st and 3rd person singular are marked by a suffix **-a** and **-ɛ**, respectively. The specification for tone on this suffix is High in the case of the Low classes, and Low otherwise.

Table 16. Inflectional SV subject marking in the Past tense, by verb class and person. The Subject voice is included for the sake of comparison. Each class is represented by one verb: {ŋɔ̀l} ‘cut’, {lêŋ} ‘drum’, {càm} ‘eat’, {mâl} ‘roast’, {lɛ̀ɛŋ} ‘throw’, {mâaṭ} ‘drink’, and {mɑ́̂al} ‘praise’.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
2nd sg.	**á-ŋɔ̀l**	**á-lêŋ**	**á-càaam**	**á-mâʌʌl**	**á-lɛ̀ɛɛŋ**	**á-mâaaṭ**	**á-màaal**
3rd sg.	**á-ŋɔ̀l-é**	**á-lêŋ-è**	**á-càaam-é**	**á-mâʌʌl-è**	**á-lɛ̀ɛɛŋ-é**	**á-mâaaṭ-è**	**á-màaal-è**
Subj. Voice	**á-ŋɔ̀l**	**á-lêŋ**	**á-càm**	**á-mâl**	**á-lɛ̀ɛŋ**	**á-mâaṭ**	**á-mâal**

Subject-marking in the Non-Evidential Past forms is purely syntactic. That is, we find the Subject Voice Non-Evidential Past form, followed by the case-marked form of the personal pronoun. However, there is an interesting difference between the Non-Evidential Past Subject Voice forms and the Non-Evidential Past forms with syntactic case marking. The former need to be syntactically licensed, but the latter does not. For example, (82a), with the verb in Subject voice, is ungrammatical in the absence of a syntactic licenser. Adding the focus marker renders the structure grammatical. In contrast, the

subject marked Non Evidential Past form in (82b) is grammatical, with or without focus marker.[24]

(82) a. **twɔ́ɔŋ lèɛɛŋ *(a) lùʊ̰t̰**
Twong throw:NEVP FOC stick
'Twong apparently threw <u>the stick</u>.'

b. **lùʊ̰t̰ lèɛɛŋ (a) ên**
stick throw:NEVP FOC PR3S.N
'S/He / <u>S/He</u> apparently threw the stick.'

Table 17 shows the forms for inflectional subject marking in the No Tense form, for each verb class. As is the case for inflectional subject-marking in the Past tense, the stem vowel is in the long grade (unless the verb is Fixed Short).

Table 17. Inflectional subject marking in the No Tense, by verb class and person. The Subject voice is included for the sake of comparison. Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mâl} 'roast', {lèɛŋ} 'throw', {mâaṭ̰} 'drink', and {mấal} 'praise'.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
2nd sg.	**ŋɔ́ɪ̀**	**lêŋ**	**cáaaa̰m**	**mâʌʌl**	**léɛɛŋ̰**	**mâaaṭ̰**	**màaal**
3rd sg.	**ŋɔ́ɪ̀-è**	**lêŋ-è**	**cáaaa̰m-è**	**mâʌʌl-è**	**léɛɛŋ̰-è**	**mâaaṭ̰-è**	**màaal-è**
Subject Voice	**ŋɔ́ɪ̄**	**lêŋ**	**cā́m̄**	**mâl**	**lɛ́ɛŋ̄**	**mâaṭ̰**	**mâal**

The Low Fall classes have the same specification for tone on the stem syllable as the corresponding Subject voice forms. In the case of the Low classes, in contrast, the corresponding Subject voice forms have a High Fall to Mid, and the subject-marked forms have a Late Fall. We can explain this alternation in terms of a regular morphophonological process, which we will first illustrate in the morphology of nouns. When a Low tone is added to the right of a High Fall to Mid, the result is a Late Fall. This is shown in (83). The construct-state form of a noun (83a,c) is used when the noun is followed by modifier that is not a possessor. In the case of a suffixless noun like **gwôk** 'dog', this inflection is stem-internal (83a); in the case of a suffixed noun like **kʊ́ʊʊ̰t̰̄-ɔ̄** 'thorn-S', it involves the suffix **-ɪ** (83c). This inflection forms the basis for inflection for proximal demonstrative. Proximal demonstrative is marked by adding a Low target to the construct-state form. This can be seen most clearly in a suffixed noun, as in the comparison between (83c) and (83d).

24 On this basis, it could be argued that nominative case marking is a syntactic licenser. However, case marking does not have this characteristic in relation to the No Tense forms. A form like ***kwān cā́m̄ wɔ̂n** 'We are eating porridge.' is incomplete and in that sense ungrammatical, in spite of the case-marked personal pronoun.

In a suffixless paradigm, the same sequence, i.e., ˊ ¯ + ˋ, yields ˊˋ. This is illustrated in (83a,b)

(83) a. **gwṓooŋ̄ têɛk**
dog:CS strong
'A strong dog'

b. **gwóooŋ̀**
dog:CS:DEM
'This dog.'

c. **kṓuṉ̄-ī bḗt̪**
thorn:CS sharp
'A sharp thorn.'

d. **kúuṉ-ì**
thorn:CS:DEM
'This thorn.'

The alternation at issue in the Low classes in Table 17, between the Subject voice form of a Low-toned verb such as **cā̋m̄** and its 2nd singular subject marked forms, can be explained in terms of the same process, whereby the addition of a Low tone to the right of a High Fall to Mid yields a Late Fall.

In the case of the High Fall class, the tonal specification of the stem syllable in the Subject voice No Tense form, which is Low-toned, differs in a non-compositional way from the Subject voice No Tense form, which carries a Low Fall. Instead it displays the same tone as the subject marked Past tense form (cf. Table 16).

The No Tense forms in Table 17 additionally form the basis corresponding inflectionally subject marked Future tense forms, which have the prefix **ó-** and are otherwise identical. The latter do not need to be licensed syntactically. In contrast, the subject-marked No Tense forms need to be licensed syntactically, irrespective of whether the subject is marked inflectionally or syntactically.

In the remainder of this subsection, we describe a stem alternation that affects the inflectionally subject marked forms of verbs belonging to Low classes. As seen from Tables 15-17, verbs belonging to the Low Fall and High Fall classes display the same stem form and suffixation in Past and No Tense, i.e., the only difference is the presence vs. absence of the Past tense marker **á-**. In the case of the Low verb classes, inflectional subject marking involves a different specification in Past on the one hand and No Tense on the other (cf. Tables 15-17). For example, for the 1st singular of {càm} we find **á-càaam-á** (past) but **cáaaṁ̀-à** (No Tense). Of these two, the stem form used in the Past tense, displays the lexical specification for tone of the verb, i.e., Low. In fact, we also find the stem form and suffix specified for tone as in the Past tense, but without this prefix, e.g. **càaam-á**. One morphosyntactic environment in which this form is found is the yes-no question, as in (84a,b). Another is an imperative form, as in (84c). The use of **kwáaaŋ̀** in (84a,c) and **kwáaaŋ̀-à** in (84b) is ungrammatical.

(84) a. **kwàaaŋ-ɛ́ t̪ɔ́ɔl** ˋ
take-3S rope YNQ
'Is he taking the rope?'

b. **kwàaaŋ-á t̪ɔ́ɔl** ˋ
take-1S rope YNQ
'Shall I take the rope?'

c. **kwàaaŋ**
take:2S
'Take (it)!'

This phenomenon is specific to the Low classes: in the Low Fall and High Fall classes, there is no difference in terms of the tonal specification of the stem syllable between subject-marked Past and No Tense.

Beyond these non-declarative speech acts, the stem form of the Past tense form but without the Past Tense prefix is also used in a number of other morphosyntactic constructions. One such construction involves the conjunction **kấā**, which marks sequential past, i.e., its function is akin to that of the Sequential Past inflection (cf. Section 5.6). If there is no subject marking, a transitive clause marked by this conjunction has the Object Voice No Tense form. This is illustrated by the narrative example in (85). Note that there is no TAM marking on the verb, i.e., **kấā** is a syntactic licenser, which does not come as a surprise, because tense (past) and aspect (consecutive) are expressed by the conjunction.

(85)ˆ **kấā làaaw-ɔ́ kwấŋ ìɪ dìwʌ̀ʌʌt**

CONJ cloth-S take:OV PRP Diwaat
'And then Diwaat took power (lit.: the cloth).'

With subject marking, one would expect to find the No Tense subject marked form, in this case **kwáaaɲ̀-è**. Instead, we find **kwàaaŋ-é**. This is illustrated in (86), which resembles the spontaneous example in (85), but is marked for a 3rd singular subject.

(86) **kấā làaaw-ɔ́ kwàaaŋ-é / *kwáaaŋ-è**

CONJ cloth-S take-3S take:NT-3S
'And then s/he took the cloth.'

The same happens when various syntactic TAM markers are involved. One of these is the irrealis marker **dí**. As seen from (87), with subject marking we find again the stem and suffix specified for tone as in the Past tense, but without the prefix.

(87) **làaaw-ɔ́ dí kwàaaŋ-é / *kwáaaŋ-è**

cloth-S IRR take-3S / take:NT-3S
'S/He would have taken the cloth.'

How can this extended use of the Past tense subject-marked stem form be explained? It is worthwhile to note here that, for six of the seven verb classes, the lexical specification for tone of a transitive verb is revealed in the Subject voice Past tense (e.g. **á-càm**). This suggests that, in the case of the Low verbs, the Subject voice No Tense form (e.g. **cấm̄**), and the inflectional subject marking that is derived from it (e.g. **cáaam̀-à**) result from a subsequent

diachronic development, which has not replaced the older subject-marked form (e.g. **càaam-á**) in a variety of syntactic contexts.

7.4 The Applicative Voice forms

The key syntactic characteristics of the Applicative voice are that the preverbal argument, the topic, is neither the semantic subject nor the semantic object, and that semantic object follows immediately after the verb (cf. Section 3.2.3). The forms are presented in Table 18. Applicative voice combines with the following levels of TAM: No Tense, Past, Future, Non-Evidential Past, Sequential Past and Conditional. All of these inflections involve the long vocalic grade of stem vowel, unless the paradigm is Fixed Short. With respect to tone, there are two stem forms: one in the Non-Evidential Past, and the other in all of the other TAM forms. The Non-Evidential Past displays the lexical specification of the verb root, i.e., Low for the Low verbs, Low Fall for the Low Fall verbs, and High Fall for the High Fall verbs. The tonal specification in the other TAM levels is predictable on the basis of this lexical specification for all classes other than High Fall. That is, if the lexical specification is Low, then the levels of TAM other than Non-Evidential Past have a Mid tone on the stem syllable in Applicative voice; and if the lexical specification is Low Fall, then the TAM levels other than Non Evidential Past have a High Fall to Mid. The High Fall verbs, finally, pattern along with the Low classes, i.e., they also have a Mid tone. So the Applicative Voice stem form is the same for No Tense, Past, Future, Sequential Past and Conditional. What distinguishes them is the TAM prefix: **á-** for Past, **à-** for Sequential Past, **ó**- for Future, and **ò**- for conditional. Finally, the Non-Evidential Past is marked by the prefix **ó-** just as in the Object Voice.

Table 18. The Applicative voice forms by TAM and verb class. Each class is represented by one verb: {ŋɔ̀l} ‘cut’, {lêŋ} ‘drum’, {càm} ‘eat’, {mâl} ‘roast’, {lèɛŋ} ‘throw’, {mâaṭ} ‘drink’, and {mǻal} ‘praise’

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
Past	**á-ŋɔ̄l**	**á-lɛ́ɛ̄ŋ**	**á-cāaam**	**á-mǻʌʌ̄**	**á-lɛ̄ɛɛŋ**	**á-mǻaa̰**	**á-māaal**
Seq. Past	**à-ŋɔ̄l**	**à-lɛ́ɛ̄ŋ**	**à-cāaam**	**à-mǻʌʌ̄**	**à-lɛ̄ɛɛŋ**	**à-mǻaa̰**	**à-māaal**
Future	**ó-ŋɔ̄l**	**ó-lɛ́ɛ̄ŋ**	**ó-cāaam**	**ó-mǻʌʌ̄**	**ó-lɛ̄ɛɛŋ**	**ó-mǻaa̰**	**ó-māaal**
Conditional	**ò-ŋɔ̄l**	**ò-lɛ́ɛ̄ŋ**	**ò-cāaam**	**ò-mǻʌʌ̄**	**ò-lɛ̄ɛɛŋ**	**ò-mǻaa̰**	**ò-māaal**
Non-Ev. Past	**ó-ŋɔ̀l**	**ó-lêŋ**	**ó-càaam**	**ó-mâʌʌl**	**ó-lèɛɛŋ**	**ó-mâaa̰**	**ó-mǻaal**

In the Non-Evidential Past, the only difference between the Applicative voice form and Object voice form is that the latter has the suffix **-ɔ**. For example, in the case of {càm} 'eat', there is **ó-càaam** in Applicative voice and **ó-càaam-ɔ̀** in Object voice. However, evidence from elsewhere in the grammar shows that the presence vs. absence of this suffix depends on whether the verb is followed by a core argument (see Section 3.3.2.4). This is invariably the case when the verb is inflected for Applicative voice, and never so when it is inflected for Object voice. Hence the two forms could be considered syncretic, the difference falling out from the interaction with the syntactic context.

7.5 The subject-marked Applicative Voice forms

Applicative voice forms can be marked for the semantic subject. In Section 4.2 we argued that subject marking Applicative voice form is inflectional in nature in the singular forms when there is no focus marker involved. Table 19 lays out the subject-marked Applicative voice forms in these singular forms, in the No Tense level of TAM. Just as in the Applicative voice without subject marking, the Past, Future, Sequential Past, and Conditional levels of TAM differ only in the addition of a prefix: **á-** in the case of Past, **ó-** in the case of Future, **à-** in the case of Sequential Past, and **ò-** in the case of Conditional.

Table 19. The subject-marked Applicative voice forms, in No Tense. Each class is represented by one verb. The Applicative voice form is included for the sake of comparison. Each class is represented by one verb: {ŋɔ̀l} 'cut', {lɛ̂ŋ} 'drum', {càm} 'eat', {mʌ̂l} 'roast', {lèɛŋ} 'throw', {mâaṭ} 'drink', and {mʌ́al} 'praise'.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
2nd sg.	**ŋɔ̌l**	**lɛ́ŋ**	**cǎaam**	**mʌ́ʌʌl**	**lɛ̌ɛɛŋ**	**máaaṭ**	**mǎaal**
3rd sg.	**ŋɔ̄l-ɛ́**	**lɛ́ŋ-ɛ́**	**cāaam-ɛ́**	**mʌ́ʌʌl-ɛ́**	**lɛ̄ɛɛŋ-ɛ́**	**máaaṭ-ɛ́**	**māaal-ɛ́**
Applic Voice w. synt. Subj marking	**ŋɔ̄l**	**lɛ́ɲ̄**	**cām**	**mʌ́Ī**	**lɛ̄ɛŋ**	**mʌ́aṭ̄**	**māal**
Applic Voice	**ŋɔ̄l**	**lɛ́ɲ̄**	**cāaam**	**mʌ́ʌʌĪ**	**lɛ̄ɛɛŋ**	**mʌ́aaṭ̄**	**māaal**

The morphological shape of the subject-marked Applicative inflections is predictable on the basis of the Applicative voice form, which is also displayed in Table 20. In terms of tone, the Low and the High Fall classes have a Mid tone in all forms other than 2nd singular. This is the same specification as in the Applicative voice. In the 2nd singular, a High target is added to the

stem syllable to the right of the lexical specification, yielding a High Rise. The Low Fall classes, which have a High Fall to Mid in the Applicative voice, display a High tone in the form inflected for a singular subject. As explained in Section 2, the addition of a High toned suffix to a stem that has a High Fall to Mid regularly changes the High Fall to Mid tone on the stem to High. In this way, the tonal specification in these inflected form can be derived in a compositional manner. As for vowel length, the forms with inflectional subject marking display the long vocalic grade. In contrast, the forms with syntactic subject marking have the short vocalic grade (cf. Table 9).

The Non-Evidential Past subject-marked Applicative forms are identical to the general subject-marked forms, described in Section 7.3. This is illustrated in (88). Note that verb is the same in (88a) vs. (88b), even though (88a) has the verb with general subject marking – the preverbal argument represents the semantic object – while (88b) displays applicative syntactic alignment, i.e., the preverbal argument represents a semantic role other than subject or object.[25]

(88) a. **kwɑ̄n càaam jân**
porridge eat:NEVP PR1S:N
'I would have eaten porridge.'
(Others assert this, I disagree.)

b. **pâal càaam jân kwɑ̄n**
spoon eat:NEVP PR1S:N porridge
'I would have used a spoon to eat porridge.'
(Others assert this, I disagree.)

While the forms are the same, there is an interaction with focus here. When the preverbal argument expresses the semantic object, then either topic or the semantic subject can be marked for focus. This is shown in (89a), which shows variants on (88a). But if the topic expresses a semantic role other than subject or object, than only this argument can be marked for focus, as in (89b), which shows the variants on (89b).

(89) a. **kwɑ̄n (à) càaam (a) jân**
porridge FOC eat:NEVP FOC PR1S:N

b. **pâal (à) càaam (*a) jân (*à) kwɑ̄n**
spoon FOC eat:NEVP FOC PR1S:N FOC porridge

7.6 The patient-oriented infinitive

The base paradigm includes an infinitive, which refers to the event denoted by the source verb. As will be demonstrated below, this form is a noun in a morphosyntactic sense. In spite of the fact that this derivation changes the word class, we treat it as part of the base inflectional paradigm, for the

25 The function of the Non-Evidential Past is explained in Section 5.4.

following reasons. First, derived verb paradigms (e.g. spatial, benefactive, etc.) also present infinitives, so that the infinitive of the base paradigm can be seen on a par with the infinitives of the derived paradigms. Second, the stem form of this infinitive is identical to a form of the base inflectional paradigm. In other words, this form relates in a predictable and productive way to the base paradigm.

Patient-oriented infinitives occur frequently: it is used in small-clause constructions and with auxiliary verbs. We first describe its use, and then its morphological form. In the narrative example in (90), the patient-oriented infinitive is **gûuur-ò**, from {gûur} 'grind'. It is used here in a small-clause construction marked by **bɛ̄ɛ**, which expresses a goal. This example reveals that this infinitive is a noun: it is inflected for being the possessed term in a possessive noun phrase (pertensive). The possessor, **àwā́ac** 'sour dough', expresses the semantic object of the verb.

(90)ˆ **cūʊṭ-ɛ̄ kā́ā kɛ́ṭ à bɛ̄ɛ gûur-ì àwā́ac**
end:PRT-3S CONJ go.away FOC PRP grind:INF-PRT sour.dough
'So, after that she went away to grind (sorghum grain to make) sour dough.'

Illustration (91) shows how a patient-oriented infinitive form is used in a clause headed by the auxiliary verb {cɛ̀k}. This auxiliary is devoid of semantic content, but it does inflect for Voice and TAM. In (91), it is in Object voice and in No Tense. The infinitive appears in a prepositional phrase, marked by **kí**.[26]

(91)ˆ **jā́ā àkwàrìcòoot-īı cɛ́̄k kí=à gûuur-ɔ̀**
those.of k.o.herb-APL AUX:OV:NT PRP=FOC grind-INF
'Herbs like *akwaricoto* [a bitter kind of herb] were ground.'

In form, the patient-oriented infinitive is identical to the Imperfective form of the transitive verb, but without the prefix. This can be seen from Table 20. Note how, for each of the seven classes of transitive verbs, the stem syllable of the base form of the patient-oriented infinitive is the same as that of the imperfective verb form, in terms of both tone and vowel length.

26 When the preposition **kí** is followed by the focus marker **à**, they coalesce into a single syllable [**kā́ā**].

Table 20. Forms illustrating the patient-oriented infinitive, by verb class, and its relation to the rest of the paradigm, in terms of stem length alternation. Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mâl} 'roast', {lèɛŋ} 'throw', {mâaṯ} 'drink', {mấal} 'praise'.

	Fixed Short		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
Verb, Impf.	**ò-ŋɔ̀l-ɔ̀**	**ò-lêŋ-ɔ̀**	**ò-càaam-ɔ̀**	**ò-mâʌʌl-ɔ̀**	**ò-lèɛɛŋ-ɔ̀**	**ò-mâaaṯ-ɔ̀**	**ò-mấaal-ɔ́**
Inf., base	**ŋɔ̀l-ɔ̀**	**lêŋ-ɔ̀**	**càaam-ɔ̀**	**mâʌʌl-ɔ̀**	**lèɛɛŋ-ɔ̀**	**mâaaṯ-ɔ̀**	**mấaal-ɔ́**
Inf., Pert. sg.	**ŋɔ̀l-ì**	**lêŋ-ì**	**càm-ì**	**mâl-ì**	**lèɛŋ-ì**	**mâaṯ-ì**	**mấal-ì**

The patient-oriented infinitive displays the inflectional paradigm of a noun. That is, as any other noun, the patient-oriented infinitive has pertensive[27], and construct state inflections, and the formation of these inflections is regular and predictable. This is shown in Table 21, which shows the inflectional paradigm of the **bɔ̀ɔɔṯ-ɔ̀** 'craftsman', which is a suffixed noun to begin with, and that of two patient-oriented infinitives. Note that the quantity alternation in the stem vowel between the noun base and the inflected forms is the same in the infinitives and the underived noun.

Table 21. Noun paradigms for **bɔ̀ɔɔṯ-ɔ̀** 'craftsman', and two patient-oriented infinitives.

	bɔ̀ɔɔṯ-ɔ̀ 'craftsman'	**mâaaṯ-ɔ̀** 'drink:INF'	**mấaal-ɔ́** 'praise:INF'
Pertensive, singular possessor	**bɔ̀ɔṯ-ì**	**mâaṯ-ì**	**mấal-ì**
Pertensive, plural possessor	**bɔ̀ɔṯ-í**	**mâaṯ-í**	**mấal-í**
Construct state	**bɔ̀ɔn̪-ì**	**mâan̪-ì**	**mấal-ì**

The quantity alternation in the stem vowel of patient-oriented infintives is predictable from the quantity alternation of the the source verb. For example, {mâaṯ} 'drink' is a member of the Long Fall class, i.e., the stem vowel alternates between long and overlong in the base paradigm of the verb. We find the same quantity alternation in the paradigm of the infinitive (cf. Table 21). Similarly, the Fixed Short root {ŋɔ̀l} 'cut', has the patient-oriented infinitive **ŋɔ̀l-ɔ̀** 'cut:INF', and retains this short vowel throughout its nominal paradigm: as seen from Table 20, the corresponding pertensive with singular possessor is **ŋɔ̀l-ì** 'cut:INF-PRT'. Finally, a Short with Grade verb like {càm}

27 The term pertensive (Dixon 2010) refers to an inflection marking the possessed (head) term of a possessive noun phrase.

'eat' has an overlong vowel in the base form of the patient-oriented infinitive: **càaam-ɔ̀** 'eat:INF'. The pertensive form of this infinitive is **càm-ì** 'eat:INF-PRT' (cf. Table 21). In each case, the stem vowel in the paradigm of the patient-oriented infinitive noun alternates between the same levels of vowel length as in the base paradigm of the source verb.

We label this infinitive 'patient-oriented', because there is another infinitive form, which is agent-oriented. The difference between the two is clear when they head a possessive noun phrase. Consider the case of {càm} 'eat'. The patient-oriented infinitive is **càaam-ɔ̀**, and the agent-oriented one is **cám**. Possessive constructions with both of these are presented in (92). In (92a), the possessive construction is headed by a patient-oriented infinitive, **càm-ì**, which is the pertensive inflection of **càaam-ɔ̀**, and the possessor term expresses the semantic object of the verb. In contrast, in a possessive construction headed by the agent-oriented infinitive, as in (92b), the possessor term expresses the semantic subject of the verb.

(92) a. **càm-ì** **gjèɛɛn-ɔ̀**
eat:INF-PRT chicken-S
'The eating of a chicken'

b. **cɑ́aam̄** **gjèɛɛn-ɔ̀**
eat:INFA:PRT chicken-S
'The eating by a chicken'

8 Conclusion

This chapter has laid out the main structural properties of Shilluk main clauses headed by a transitive verb. The base paradigm of transitive verbs is characterised by a great degree of interaction between factors. In Section 8.1, we summarize interactions at the level of the forms, and in Section 8.2 on interactions at the level of the functions.

8.1 Fusional forms

The base paradigm of Shilluk verbs presents morphological marking for Voice, TAM, and subject. It is a central characteristic of the system that these functions are marked in a fusional manner. On the one hand, various functions may be expressed on a single syllable. For example, **máaaṭ** 'drink:XV:2S' is the 2nd singular No Tense Applicative voice form of {mâaṭ} 'drink' – both Applicative voice and 2nd singular are marked on the stem syllable. Second, even when a function is marked by an affix, there often is a change in the stem syllable as well. For example, **á-càm** 'PST-eat' and **ó-cɑ́m̄** 'FUT-eat' are the

Past Tense and Future tense forms of {càm} ‘eat’, respectively, both in Subject voice. Aside from the prefix, the difference in tense is also marked through tone on the stem.

Of the three above mentioned factors, Voice is marked purely stem-internally. TAM is expressed primarily through prefixes. Subject marking varies between syntactic marking, suffixal marking, and purely stem-internal marking.

The most versatile morphophonological parameter is tone. Shilluk has an inventory totaling nine different contrasting specifications in stem syllables, and this system of contrasts is heavily exploited in the morphology. In fact, the rich inventory is undoubtedly the diachronic outcome of diachronic changes in the morphophonology (cf. Andersen 1990). It is insightful to compare the role of tone in the morphology of Shilluk verbs with the situation in Dinka, a closely-related language which also presents a rich system of morphological marking. Andersen (1992–1994) shows how in Dinka tone, vowel length, voice quality are used to mark derivation and inflection. For example, in relation to the word **wè̤ec** ‘kick:PET:2S’ “Kick it hither!”, Andersen (1992–1994:61) postulates the layers (strata) of derivation that are shown in Table 22.

Table 22. A schematic representation of the layers of derivation of **wè̤ec** ‘kick:PET:2S’, according to Andersen (1992–1994:61).

	Voice quality	**Length**	**Tone**
Root	Modal	Short	Fall
Derivation (centripetal)	Breathy	Long	Low
Inflection (2nd singular)	Breathy (unchanged)	Long (unchanged)	High

Shilluk’s richer tonal inventory allows for deeper strata to be transparent in the surface form. To illustrate this, consider again the word **máaaṯ** ‘drink:XV:2S’, the 2nd singular No Tense Applicative voice form of the Low Fall verb {mâaṯ} ‘drink’, and alongside it **lɛ̌ɛɛŋ** ‘throw:XV:2S’, the corresponding form of {lɛ̀ɛŋ} ‘throw’, shown in Table 23. Both forms are part of the base inflectional paradigm, i.e., there is no derivation involved here. Note that both the Applicative voice forms and the 2nd singular Applicative voice forms reveal the underlying specification for tone of the verb. As explained in Section 2, Applicative voice raises the tonal register from Low to Mid in the case of {lɛ̀ɛŋ} ‘throw’, and from Low Fall to High Fall to Mid in the case of {mâaṯ} ‘drink’. The 2nd singular subsequently adds a High end

target, yielding a High Rise or a High tone, depending on what this High tone attaches to. This means that tone can be 'spent' more than once in the morphology, without the top layer overwriting the layer or layers below it completely.

Table 23: A schematic representation of the layers of derivation of two Shilluk verb forms.

	{lèɛŋ} 'throw'	**{mâaṭ}** 'drink'
Root	**lèɛŋ**	**mâaṭ**
Applicative voice	**lɛ̄ɛɛŋ**	**mɑ́aaṭ̄**
2nd singular	**lɛ̌ɛɛŋ**	**máaaṭ**

8.2 Interactions between functions

Just as formal exponence is non-concatenative in Shilluk, the functions that are expressed equally interact in several ways. We will summarize these interactions out in relation to each of the three functions (Voice, TAM, Subject marking).

If the morphological operation of Voice were the sole expression of topicality, we would find Object voice used if the semantic object is topical, Subject voice used if the semantic subject is topical, and Applicative voice if a different semantic role is topical. While the first and the last of these generalisations do hold, the relation between Subject voice and information structure is more complex. As seen fromTable 24, we hypothesize that it is only when the semantic subject and the referent event of the verb are both part of the framework of reference shared by speaker and hearer that Subject voice is used. If only the Subject is topical, then a variety of other structures are used, including two valency-decreasing operations, in which the semantic object can be expressed as a peripheral argument. This shows that the expression of Voice interacts with subject marking and with the valency changing operations of antipassive and ambitransitive. We commend this topic of the relation between construction type / verb form on the one hand and information structure on the other hand for further research.

Table 24. The relation between topic and the choice of verb form, in relation to transitive verbs.

Which constituent is topical?	**Choice of verb form**
None (all new information)	Object voice
Semantic object	Object voice
Semantic role other than subject or object	Applicative
Semantic subject	Subject marking, Antipassive, Ambitransitive
Semantic subject and Semantic object	Subject marking
Semantic subject and verb	Subject voice

In relation to the controversy on the Shilluk voice system, we conclude that Object voice displays the morphosyntactic characteristics of passive voice (cf. Westermann 1912, Tucker 1955). However, unlike a passive, it is unmarked in an information-structural sense (cf. Miller & Gilley 2001). In turn, Subject voice displays the morphosyntactic characteristics of active voice, but it is marked in an informational structural sense.

TAM interacts with focus marking and with Voice. The No Tense form and most Non Evidential Past forms require a syntactic licenser, of which focus is the one that appears with the greatest frequency. In addition, some levels TAM only appear in one particular voice. Specifically, the Imperfective is only available in Object voice, but not in Subject voice and Applicative voice, and the Sequential Past and Conditional only appear in Applicative voice.

Subject marking also interacts with focus marking. Inflectional subject marking is restricted to singular subjects, and to contexts where there is no focus marker. In contrast, the focus marker appears syntactically between the verb and the case-marked subject marker, suggesting that the latter is not phonologically integrated with the verb.

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Abbreviations

The following abbreviations are used in the glosses.

AMB	Ambitransitive
APL	Associative plural
ATP	Antipassive
AUX	Auxiliary verb
BNF	Benefactive
BULL	Marker of male cattle terms
CARD	Cardinal
CONJ	Conjunction
CS	Construct state
CTG	Contingent form of adjective
DEF	Definite
DEM	Demonstrative
EXSP	Existential predicate marker
FOC	Focus
FUG	Centrifugal deixis
FUT	Future
IDP	Independent pronoun
IMP	Imperative
IMPF	Imperfective
INDIR	Indirect speech marker
INF	Infinitive
INFA	Agent-oriented infinitive
IRR	Irrealis
ITER	Iterative
MASC	Masculine nominalizer
MDF	Modification marker
N	Nominative
NEG	Negation marker
NEVP	Non-evidential past

NOMP	Copula for nominal predicates
NT	No tense
OBL	Oblique pronoun
OV	Object voice
P	Plural
PST	Past
PET	Centripetal deixis
PRP	Preposition
PRT	Pertensive
QUOT	Quotative
REFL	Reflexive
REL	Relativizer
S	Singular
SEQP	Sequential past
SUB	Subordination marker
SV	Subject voice
WHQ	wh-question marker
XV	Applicative voice
YNQ	Yes/no question marker

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Appendix A. Paradigm tables

Table A.1. The three voices (separate panels), by TAM (rows), and verb class (columns). Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mʌ̂l} 'roast', {lèɛŋ} 'throw', {mâaṭ} 'drink', and {mʌ́al} 'praise'. Subject marking is not included.

SUBJECT VOICE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	ŋɔ́ɪ̄	lêŋ	cʌ́m̄	mʌ̂l	lɛ́ɛŋ̄	mâaṭ	mâal
Past	á-ŋɔ̀l	á-lêŋ	á-càm	á-mʌ̂l	á-lèɛŋ	á-mâaṭ	á-mâal
Future	ó-ŋɔ́ɪ̄	ó-lêŋ	ó-cʌ́m̄	ó-mʌ̂l	ó-lɛ́ɛŋ̄	ó-mâaṭ	ó-mâal
Non-Ev. Past	ŋɔ̀l	lêŋ	càaam	mʌ̂ʌʌl	lèɛɛŋ	mâaaṭ	mʌ́aal
OBJECT VOICE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	ŋɔ́l	lɛ́ŋ	cʌ́m	mʌ́l	lɛ́ɛŋ	mʌ́aṭ	mʌ́al
Past	á-ŋɔ́l	á-lɛ́ŋ	á-cʌ́m	á-mʌ́l	á-lɛ́ɛŋ	á-mʌ́aṭ	á-mʌ́al
Future	ó-ŋɔ́l	ó-lɛ́ŋ	ó-cʌ́m	ó-mʌ́l	ó-lɛ́ɛŋ	ó-mʌ́aṭ	ó-mʌ́al
Non-Ev. Past	ó-ŋɔ̀l-ɔ̀	ó-lêŋ-ɔ̀	ó-càaam-ɔ̀	ó-mʌ̂ʌʌl-ɔ̀	ó-lèɛɛŋ-ɔ̀	ó-mâaaṭ-ɔ̀	ó-mʌ́aal-ɔ́
Imperfective	ò-ŋɔ̀l-ɔ̀	ò-lêŋ-ɔ̀	ò-càaam-ɔ̀	ò-mʌ̂ʌʌl-ɔ̀	ò-lèɛɛŋ-ɔ̀	ò-mâaaṭ-ɔ̀	ò-mʌ́aal-ɔ́
APPLIC. VOICE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	ŋɔ̄l	lɛ́ŋ̄	cāaam	mʌ́ʌʌl̄	lɛ̄ɛɛŋ	mʌ́aaṯ	māaal
Past	á-ŋɔ̄l	á-lɛ́ŋ̄	á-cāaam	á-mʌ́ʌʌl̄	á-lɛ̄ɛɛŋ	á-mʌ́aaṯ	á-māaal
Future	ó-ŋɔ̄l	ó-lɛ́ŋ̄	ó-cāaam	ó-mʌ́ʌʌl̄	ó-lɛ̄ɛɛŋ	ó-mʌ́aaṯ	ó-māaal
Seq. Past	à-ŋɔ̄l	à-lɛ́ŋ̄	à-cāaam	à-mʌ́ʌʌl̄	à-lɛ̄ɛɛŋ	à-mʌ́aaṯ	à-māaal
Conditional	ò-ŋɔ̄l	ò-lɛ́ŋ̄	ò-cāaam	ò-mʌ́ʌʌl̄	ò-lɛ̄ɛɛŋ	ò-mʌ́aaṯ	ò-māaal
Non-Ev.Past	ó-ŋɔ̀l	ó-lêŋ	ó-càaam	ó-mʌ̂ʌʌl	ó-lèɛɛŋ	ó-mâaaṭ	ó-mʌ́aal

Table A.2. Inflections for general subject marking by TAM (separate panels), person, and verb class (columns). Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mʌ̂l} 'roast', {lèɛŋ} 'throw', {mâaṭ} 'drink', and {mʌ́al} 'praise'.

PAST	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	á-ŋɔ̀l-á	á-lêŋ-à	á-càaam-á	á-mʌ̂ʌʌl-à	á-lèɛɛŋ-á	á-mâaaṭ-à	á-màaal-à
2nd sg.	á-ŋɔ̀l	á-lêŋ	á-càaam	á-mʌ̂ʌʌl	á-lèɛɛŋ	á-mâaaṭ	á-màaal
3rd sg.	á-ŋɔ̀l-é	á-lêŋ-è	á-càaam-é	á-mʌ̂ʌʌl-è	á-lèɛɛŋ-é	á-mâaaṭ-è	á-màaal-è
NO TENSE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	ŋɔ́l̀-à	lêŋ-à	cáaaṁ̀-à	mʌ̂ʌʌl-à	léɛɛṋ̀-à	mâaaṭ-à	màaal-à
2nd sg.	ŋɔ́l̀	lêŋ	cáaaṁ̀	mʌ̂ʌʌl	léɛɛṋ̀	mâaaṭ	màaal
3rd sg.	ŋɔ́l̀-è	lêŋ-è	cáaaṁ̀-è	mʌ̂ʌʌl-è	léɛɛṋ̀-è	mâaaṭ-è	màaal-è
FUTURE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	ó-ŋɔ́l̀-à	ó-lêŋ-à	ó-cáaaṁ̀-à	ó-mʌ̂ʌʌl-à	ó-léɛɛṋ̀-à	ó-mâaaṭ-à	ó-màaal-à
2nd sg.	ó-ŋɔ́l̀	ó-lêŋ	ó-cáaaṁ̀	ó-mʌ̂ʌʌl	ó-léɛɛṋ̀	ó-mâaaṭ	ó-màaal
3rd sg.	ó-ŋɔ́l̀-è	ó-lêŋ-è	ó-cáaaṁ̀-è	ó-mʌ̂ʌʌl-è	ó-léɛɛṋ̀-è	ó-mâaaṭ-è	ó-màaal-è

Table A.3. Inflections for applicative subject marking by person, and verb class (columns). Each class is represented by one verb: {ŋɔ̀l} 'cut', {lêŋ} 'drum', {càm} 'eat', {mʌ̂l} 'roast', {lèɛŋ} 'throw', {mâaṭ} 'drink', and {mʌ́al} 'praise'. The forms given are in the No Tense form. Past, Future, Sequential Past, and Conditional levels of TAM differ only in the addition of a prefix: á- in the case of Past, ó- in the case of Future, à- in the case of Sequential Past, and ò- in the case of Conditional.

SUBJ, APPLIC	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	ŋɔ̄l-á	léŋ-á	cāaam-á	mʌ́ʌʌl-á	lɛ̄ɛɛŋ-á	máaaṭ-á	māaal-á
2nd sg.	ŋɔ̌l	léŋ	cǎaam	mʌ́ʌʌl	lɛ̌ɛɛŋ	máaaṭ	mǎaal
3rd sg.	ŋɔ̄l-é	léŋ-é	cāaam-é	mʌ́ʌʌl-é	lɛ̄ɛɛŋ-é	máaaṭ-é	māaal-é

Appendix B. Paradigm tables, schematic

Table B.1. Schematic representation of the morphological marking of the three voices (separate panels), by TAM (rows), and verb class (columns). For each class in each inflection, the table shows affixes, stem tone and vowel lengthening (::). Subject marking is not included.

SUBJECT VOICE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	HFM	LF	HFM	LF	HFM	LF	LF
Past	á- L	á- LF	á- L	á- LF	á- L	á- LF	á- LF
Future	ó- HFM	ó- LF	ó- HFM	ó- LF	ó- HFM	ó- LF	ó- LF
Non-Ev. Past	L	LF	L ::	LF ::	L ::	LF ::	LF ::
OBJECT VOICE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	HF	HF	HF	HF	HF	HF	HF
Past	á- HF	á- HF	á- HF	á- HF	á- HF	á- HF	á- HF
Future	ó- HF	ó- HF	ó- HF	ó- HF	ó- HF	ó- HF	ó- HF
Non-Ev. Past	ó- L -ɔ̀	ó- LF-ɔ̀	ó- L :: -ɔ̀	ó- LF :: -ɔ̀	ó- L :: -ɔ̀	ó- LF :: -ɔ̀	ó- HF :: -ɔ́
Imperfective	ò-L -ɔ̀	ò- LF -ɔ̀	ò-L :: -ɔ̀	ò- LF :: -ɔ̀	ò-L :: -ɔ̀	ò- LF :: -ɔ̀	ò- HF :: -ɔ́
APPLIC. VOICE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
No Tense	M	HFM	M ::	HFM ::	M ::	HFM ::	M ::
Past	á- M	á- HFM	á- M ::	á- HFM ::	á- M ::	á- HFM ::	á- M ::
Future	ó- M	ó- HFM	ó- M ::	ó- HFM ::	ó- M ::	ó- HFM ::	ó- M ::
Seq. Past	à- M	à- HFM	à- M ::	à- HFM ::	à- M ::	à- HFM ::	à- M ::
Conditional	ò- M	ò- HFM	ò- M ::	ò- HFM ::	ò- M ::	ò- HFM ::	ò- M ::
Non-Ev.Past	ó- L	ó- LF	ó- L ::	ó- LF ::	ó- L ::	ó- LF ::	ó- L ::

Table B.2. Schematic representation of general subject marking by TAM (separate panels), person, and verb class (columns). Each class is represented by one verb: {ŋɔ̀l} 'cut', {lɛ̂ŋ} 'drum', {càm} 'eat', {mɅ̂l} 'roast', {lɛ̀ɛŋ} 'throw', {mâaṭ} 'drink', and {mɅ́al} 'praise'.

PAST	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	á- L -á	á- LF -à	á- L :: -á	á- LF :: -à	á- L :: -á	á- LF :: -à	á- L :: -à
2nd sg.	á- L	á- LF	á- L ::	á- LF ::	á- L ::	á- LF ::	á- L ::
3rd sg.	á- L -é	á- LF -è	á- L :: -é	á- LF :: -è	á- L :: -é	á- LF :: -è	á- L :: -è
NO TENSE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	LHF -à	LF -à	LHF :: -à	LF :: -à	LHF :: -à	LF :: -à	L :: -à
2nd sg.	LHF	LF	LHF ::	LF ::	LHF ::	LF ::	L ::
3rd sg.	LHF -è	LF -è	LHF :: -è	LF :: -è	LHF :: -è	LF :: -è	L :: -è
FUTURE	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	ó- LHF -à	ó- LF -à	ó- LHF :: -à	ó- LF :: -à	ó- LHF :: -à	ó- LF :: -à	ó- L :: -à
2nd sg.	ó- LHF	ó- LF	ó- LHF ::	ó- LF ::	ó- LHF ::	ó- LF ::	ó- L ::
3rd sg.	ó- LHF -è	ó- LF -è	ó- LHF :: -è	ó- LF :: -è	ó- LHF :: -è	ó- LF :: -è	ó- L :: -è

Table B.3. Schematic representation of applicative subject marking by person (rows), and verb class (columns). The forms given are in the No Tense form; Past, Future, Sequential Past, and Conditional levels of TAM differ only in the addition of a prefix: á- in the case of Past, ó- in the case of Future, à- in the case of Sequential Past, and ù- in the case of Conditional.

SUBJ, APPLIC	**Fixed Short**		**Short with Grade**		**Long**		
	Low	**Fall**	**Low**	**Fall**	**Low**	**Low Fall**	**High Fall**
1st sg.	M -á	H -á	M :: -á	H :: -á	M :: -á	H :: -á	M :: -á
2nd sg.	HR	H	HR ::	H ::	HR ::	H ::	HR ::
3rd sg.	M -é	H -é	M :: -é	H :: -é	M :: -é	H :: -é	M :: -é