

RELATIVISATION AND THE ORDERING OF
 CROSS-REFERENCE RULES IN HAUSA

Patrick McConvell
 Australian Institute of Aboriginal Studies, Canberra

Hausa has a system of pronominal clitics attached to the auxiliary which agree with subjects. If the subject is a pronoun it is obligatorily deleted by SUBJECT PRONOUN DROP; if it is a noun, in some tenses the clitic which agrees with it may optionally be deleted by CLITIC DELETION. The way in which CLITIC DELETION can apply in the top clause of relative clauses indicates that it is RELATIVISATION and not SUBJECT PRONOUN DROP which deletes the subject in this case, that SUBJECT PRONOUN DROP is a last-cyclic rule, and that CLITIC DELETION is a cyclic rule. It is claimed that PRONOUN DROP rules may be universally post- or last-cyclic for functional reasons, and that the cyclicity of CLITIC DELETION works to functional advantage in Hausa relativisation strategy.

1. Introduction

In this paper I intend to look at three fairly simple syntactic rules of Hausa, AUXILIARY AGREEMENT, SUBJECT PRONOUN DROP, and CLITIC DELETION, which together organise the cross-reference relations of the sentence subject to the modal auxiliary. In the first section I formulate the rules and show that the latter two rules bear an extrinsic ordering relation to each other which cannot be explained away directly by any known principle. I then turn to the behaviour of these rules in relative clauses. I show that RELATIVISATION in Hausa has two forms: CHOPPING and COPYING, which are realised within the relative clause as respectively deletion and pronominalisation of the NP identical to the head. Which of these relativisation rules operates in each case depends mainly on the position and syntactic function of the NP to be relativised within the clause. In the case of sentence subjects, the fact that CLITIC DELETION may operate in the top sentence of the relative clause, but not in any lower sentences of the clause, shows that it is CHOPPING which occurs in the top sentence and COPYING in any lower sentences. As CLITIC

DELETION both precedes and follows SUBJECT PRONOUN DROP, but the latter cannot follow the former on the highest sentence cycle, CLITIC DELETION is a cyclic rule and SUBJECT PRONOUN DROP a last-cyclic rule. CLITIC DELETION is also confirmed as a cyclic rule by its behaviour in relative clauses with *ya ke*, *ta ke*, or *su ke* as their top clause.

Finally I consider CLITIC DELETION as part of a relativisation strategy, and show that the existence and ordering of the rule helps to clarify the identify of the relativised NP.

2. The Subject and Auxiliary in Simple Sentences

The simple verbal sentence in Hausa, in its neutral form,¹ is

- (1) Subject-Auxiliary-Verb-(Object(s))-(Adverbials)

The Auxiliary is normally made up of a tense-aspect marker and a marker agreeing with the subject in person, number, and gender as in (2). Personal pronoun subjects never occur in surface structure in sentences with auxiliaries,² e.g. (3); instead the agreement features on the Auxiliary indicate the nature of the absent subject, e.g. (4). In some tenses the agreement marker on the Auxiliary may be optionally omitted, (5a, b). This only happens where there is an overt subject NP present in surface structure; if there is no subject, the personal marker is always present on the auxiliary, (6a, b).

- (2) *yáaríǹyàa* *tá+a* *zóo*
 girl 3f.s. PERFECT come
 'a girl has come'
- (3) **tá* *tá+a* *zóo*
 she 3f.s. PERFECT
- (4) *tá+a* *zóo*
 3f.s. PERFECT come
 'she has come'

¹ A verbal sentence contains an auxiliary and a verb; an auxiliary sentence contains an auxiliary; copular and existential sentences contain neither. Neutral indicates that the sentence is not affected by transformations such as topicalisation, focalisation, etc. Simple means that the sentence contains only one S node.

² In copular sentences without auxiliaries third person pronoun subjects are optionally deleted.

(5) a. yáarfnyàa tá kàn zóo
girl 3f.s. HABITUAL come

b. yáarfnyàa kàn zóo
girl HABITUAL come

'a girl sometimes comes'

(6) a. *kàn zóo

b. tá+kàn zóo

'she sometimes comes'

I propose to account for the existence of the agreement marker on the Auxiliary by a transformational rule AUX AGREEMENT which adjoins a pronominal clitic to the left of AUX which matches the subject NP for the features [\pm I], [\pm II], [\pm FEMININE], and [\pm PLURAL]. Although these clitics are in some cases subsequently somewhat deformed by morphophonemic rules, their underlying form is fairly clearly (7). There is obviously a close connection with the independent pronouns (8).³

(9) TENSE	FEATURE COMPOSITION				
	INDIC	PERF	FUT	DEF	
1. SUBJUNCTIVE	-	-	-	-	Pro + [^] (low tone)
2. IMPERFECT	+	-	-	-	Pro - nàa
3. HABITUAL	+	-	-	+	Pro - kàn
4. INDEFINITE FUTURE	+	-	+	-	Pro + áà
5. DEFINITE FUTURE	+	-	+	+	záa Pro + [^]
6. PERFECT	+	+	-	-	Pro - n (w. PLUR & 2FE SING PRO) Pro - á (w. others)
7. DEFINITE PERFECT	+	+	-	+	Pro - ka (w. PLUR & 2FE SING PRO) Pro + ø (w. others)

It should be noted that the imperfect tense requires that the following verb add the feature [+N] and become a "verbal noun", e.g.

- (10) yáarínàa t́á+nàa zútwàa
 girl 3f.s. IMPERF come VN
 'a girl is coming'

Apart from the forms in (9), imperfect, indefinite future and perfect have distinct forms which occur in relative clauses, certain temporal clauses formed with *dà*, and cleft sentences.⁴ For imperfect there are two relative forms, PRO + *kèè* where AUX precedes a verb, or noun with the feature [+V], and -*kèè* otherwise, e.g. preceding a PP. The relative indefinite future which is PRO + *kàa*, is obsolescent, and the relative perfect is identical to the definite perfect.

With the exception of the definite future the PRO clitic either precedes the tense marker and is distinct from it, or precedes it and is fused with it by later rules. The definite future is made up of the morpheme *záa* which

⁴For a full discussion of the connection between these constructions see McConvell [1973]. See also Schachter [1973] for a slightly different view and for the term "out-of-focus" clause used here.

is identical to a verbal root meaning 'go' (from which is derived *zoo* 'come') and a following subjunctive tense marker with *low tone*. It is before the latter and after *záa* that the pronominal clitic is added. There are some grounds for arguing that *záa* constitutes a higher predicate, but I will instead assume that *záa* is produced by a segmentalisation rule which produces the following derivation (11) for sentence (10).

- (10) *mùtùm záa\ zoo*
 man DEF.FUT 3m.s. come
 'the man will come'

- (11) a.
$$\left[\begin{array}{c} \left[\begin{array}{cc} [\text{mùtùm}] & \\ \text{NP} & \text{NP} \end{array} \right] \\ \text{S} \end{array} \right] \left[\begin{array}{c} [-\text{PERF}] \\ +\text{FUT} \\ +\text{DEF} \\ \text{AUX} \end{array} \right] \left[\begin{array}{c} \left[\begin{array}{cc} [\text{zoo}] & \\ \text{V} & \text{V} \end{array} \right] \\ \text{VP} \end{array} \right] \left[\begin{array}{c} \left[\begin{array}{cc} & \\ & \text{V} \end{array} \right] \\ \text{VP} \end{array} \right] \text{S}$$

b. ZAA-SEGMENTALISATION

- $$\left[\begin{array}{c} \left[\begin{array}{cc} [\text{mùtùm}] & \\ \text{NP} & \text{NP} \end{array} \right] \\ \text{S} \end{array} \right] \left[\begin{array}{c} [+FUT] \\ +DEF \\ \text{AUX} \end{array} \right] [-\text{PERF}] \left[\begin{array}{c} \left[\begin{array}{cc} [\text{zoo}] & \\ \text{V} & \text{V} \end{array} \right] \\ \text{VP} \end{array} \right] \left[\begin{array}{c} \left[\begin{array}{cc} & \\ & \text{V} \end{array} \right] \\ \text{VP} \end{array} \right] \text{S}$$

c. AUX AGREEMENT

- $$\left[\begin{array}{c} \left[\begin{array}{cc} [\text{mùtùm}] & \\ \text{NP} & \text{NP} \end{array} \right] \\ \text{S} \end{array} \right] \left[\begin{array}{c} [+FUT] \\ +DEF \\ \text{AUX} \end{array} \right] \left[\begin{array}{c} [-I] \\ -II \\ -PL \end{array} \right] [-\text{PERF}] \left[\begin{array}{c} \left[\begin{array}{cc} [\text{zoo}] & \\ \text{V} & \text{V} \end{array} \right] \\ \text{VP} \end{array} \right] \left[\begin{array}{c} \left[\begin{array}{cc} & \\ & \text{V} \end{array} \right] \\ \text{VP} \end{array} \right] \text{S}$$

d. REALISATION

mùtùm záa+yá zoo

e. SUBJUNCTIVE TONE LOWERING

mùtùm záa+yà zoo

f. *aáyà → aî* (some dialects only)

[mùtùm zá\ zoo]

The element [-PERF] without further specification is realised as subjunctive tense. The justification for this is that in coordinate sentences or narrative discourse there is a sequence of tenses, such that if the first AUX is any of the [-PERF] tenses, AUX in subsequent sentences which are interpreted as the same tense as the first AUX may all be realised as subjunctive, e.g.

- (12) a. mùtùm zá+ì zóo yà rúfè kóofàa yà, kúllè mákúllí
 man DUT 3m.s. come 3m.s. SUBJ shut door 3m.s.SUBJ lock lock
 'the man will come and shut the door and lock the lock'
- b. mùtùm yá+nàa zú+waa yà rúfè kóofàa yà, kúllè mákú
 man 3m.s. IMPERF come VN 3m.s.SUBJ shut door 3m.s.SUBJ lock lock
 'the man comes and shuts the door and locks the lock'

Here the first AUX deletes identical features from subsequent AUX leaving only [-PERF], which is realised as subjunctive low-tone.

The absence of pronoun subjects is accounted for by an obligatory rule SUBJECT PRONOUN DROP, which deletes all subject NP's which are [+PRO]. If the structural description of the rule also has PRO clitic attached to AUX, this ensures that the rule will follow AUX AGREEMENT without resort to an extrinsic ordering relation between them. The rule should also precede the rules which distort the PRO-AUX combination: this is what one would expect as the latter rules have a morphophonemic character and are likely to be post-cyclic and ordered to follow syntactic rules.

CLITIC DELETION applies optionally, deleting the pronominal clitic which has been attached to AUX by AUX AGREEMENT under the following conditions:

- (a) the tense of AUX is imperfect, relative imperfect, habitual, or relative indefinite future, and
 (b) there is a subject NP present.

CLITIC DELETION operates on the output of AUX AGREEMENT and therefore follows it without any need of extrinsic ordering.

A question arises in relation to (a): how is this set of tenses to be characterised? They are all $\left[\begin{array}{c} -\text{PERF} \\ +\text{INDIC} \end{array} \right]$; but the general indefinite future is also subsumed by this feature combination, yet does not undergo CLITIC DELETION. The reason for this is probably that yáà, táà, kwáà, etc. constitute inseparable fusions of the clitic and tense marker, whereas in tá nàa, tá kèe, tá kàn and tá kàa each element retains its separate identity, as reflected in the fact that they are often written as separate words in normal Hausa orthography. One might therefore wish to characterise the applicability of CLITIC DELETION by ordering it to apply after a set of rules which fuse together PRO AUX in certain tenses, by transferring features of one on to the other and formulating it so as to apply only to the remaining distinct PRO + AUX combinations. This of course introduces additional extrinsic ordering into the rules,

and odd examples of it at that, in which a clearly syntactic rule (CLITIC DELETION) follows rules which, although formulated as syntactic rules, are very similar in effect to morphophonemic rules. Such a solution also forces one to consider DEFINITE/RELATIVE PERFECT forms such as *súkà* as fused, whereas *súkàn* is distinct.⁵ In the rules presented below I use tense features to characterise the scope of application of CLITIC DELETION, although they constitute an unnatural and unwieldy set. In mitigation it may be said that when the relative future entirely disappears from the language the rule will be much more natural.

As for condition (b), the desired result may be obtained by ordering CLITIC DELETION to follow SUBJECT PRONOUN DROP, so that clitics may not be deleted where the subject pronoun is absent. For simple sentences one might equally say that clitics may be deleted only where the subject is [-PRO], thus removing the necessity of an extrinsic ordering relation between the two rules; however, as we shall see in the next section, this statement is not true for relative clauses.

The rules relevant to the above discussion can be stated as follows:

(13) PS Rules

a. S → NP AUX VP (adv)

b. VP → $\left\{ \begin{array}{l} V \quad NP \quad PP \quad PP \\ \left\{ \begin{array}{l} NP \\ PP \\ S \end{array} \right\} \text{COP} \end{array} \right\}$

(14) Early T-Rules

a. NP AUX NP COP
1 2 3 4 => 1 ∅ 3 4

b. NP AUX $\left\{ \begin{array}{l} S \\ PP \end{array} \right\}$ COP => 1 [4] 3
1 2 3 4 2 2

c. COP → $\left[\begin{array}{l} +\text{INDIC} \\ -\text{PERF} \\ -\text{FUT} \\ -\text{DEF} \end{array} \right]$

⁵In the Western dialects, forms like *súkà* are replaced by forms like *súnkà*, which are likely to be the older forms. The removal of the *n* perfect suffix may be connected with the apparent greater fusion of *sú* and *kà* in Eastern dialects. See Newman and Schuh [1974] for a discussion of the operation of analogy in changes in the form of Aux and for the development of the Hausa clitic system in general.

Rule (14a) accounts for the form of neutral copular sentences like (16), and (14a and c) for prepositional, possessive and sentential predicates like (17a, b, c). In the first type the $\begin{bmatrix} +\text{INDIC} \\ -\text{PERF} \end{bmatrix}$ element is realized as *nɛɛ* (m.s./pl.)/*cee* (f.s.), (*nɛɛ/ʔɛɛ* in Western dialects), in the second as *nɛɛ* in the AUX. While the *nɛɛ* which occurs in verbal sentences has a relative form *kɛɛ*, the *nɛɛ* in this type has a relative form *kɛɛ* as in (18).

(15) Late T-Rules

a. AUX AGREEMENT (obligatory)

NP (zɛɛ) AUX

$$\begin{bmatrix} \alpha\text{I} \\ \beta\text{II} \\ \gamma\text{FEM} \\ \delta\text{PLUR} \end{bmatrix}$$

1 2 3 => 1 2 PRO 3

$$\begin{bmatrix} \alpha\text{I} \\ \beta\text{II} \\ \gamma\text{FEM} \\ \delta\text{PLUR} \end{bmatrix}$$

b. SUBJECT PRONOUN DROP (obligatory)

NP (zɛɛ) PRO AUX

[+PRO]

1 2 3 4 => ∅ 2 3 4

c. CLITIC DELETION (optional)

NP PRO AUX

$$\begin{bmatrix} +\text{INDIC} \\ -\text{PERF} \\ \{[-\text{FUT}]\} \\ \{[+\text{FUT}]\} \\ \{[+\text{REL}]\} \end{bmatrix}$$

1 2 3

=> 1 ∅ 3

- (16) *nfi yáarò nɛɛ*
me boy COP
'I am a boy'

- (17) a. *yáarò̀h nân (yá) nɛɛ cíkín gídáa*
boy REF that (3m.s.) IMPERF in house
'that boy is in the house'

- t. yáarò+h̃ nân (yá) nàa dà kúdfi
 boy REF that (3m.s.) IMPERF with money
 'that boy has money'
- c. n̂ nàa yáarò à lóokàcf+h̃
 1s. IMPERF boy at time REF
 'I was a boy at the time'
- (18) a. yáarò+h̃ nân (néé) (yá) kè cíkín gfdáa
 boy REF that (COP) (3m.s.) REL IMPERF in house
 'it is that boy who is in the house'
- b. yáarò+h̃ nân (néé) (yá) kè dà kúdfi
 boy REF that (COP) (3m.s.) REL IMPERF with money
 'it is that boy who has money'
- c. lóokàcf+h̃ dà ná + kè yáarò ...
 time REF REL 1s. REL IMPERF boy
 'when I was a boy ...'

These rules produce derivations of the type (19) and (20) with [-PRO] and [+PRO] subjects respectively.

- (19) [mùtúm] [nàa] [zoo]
 NP NP AUX AUX $\left[\begin{array}{c} [zoo] \\ V \quad V \\ VP \quad VP \end{array} \right]$
- a. AUX AGREEMENT mùtúm yá+nàa zóo
- b. SUBJ-PRO DROP _____
- c. CLITIC DELETION mùtúm $\left\{ \begin{array}{l} yá+ \\ \emptyset \end{array} \right\}$ nàa zóo
- d. VN FORMATION mùtúm $\left\{ \begin{array}{l} yá+ \\ \emptyset \end{array} \right\}$ nàa zú+wàa
 man $\left\{ \begin{array}{l} 3m.s. \\ \emptyset \end{array} \right\}$ IMPERF come VN
 'a man is/was coming'

- (20)
- | | | |
|--------|-------|---|
| [shíi] | [nàa] | [zoo] |
| NP | NP | AUX |
| | | AUX |
| | | $\left[\begin{array}{c} \text{VP} \\ \text{V} \end{array} \right] \left[\begin{array}{c} \text{VP} \\ \text{V} \end{array} \right]$ |
- a. shíi yá+nàa zóo
- b. ø yá+nàa zóo
- c. _____
- d. ø yá+nàa zú+wàa
- 3m.s. IMPERF come VN
- 'he is/was coming'

If CLITIC DELETION were to apply before SUBJECT PRO DROP, the following derivation would be allowed, yielding an ungrammatical output.

- (21)
- | | | |
|----------|--------|----------|
| shíi | nàa | zóo |
| a. shíi | yá+nàa | zóo |
| | | c. _____ |
| b. shíi | ø | nàa |
| | | zóo |
| d. *shíi | nàa | zú+wàa |

Simultaneous disjunctive application of the two rules would yield the same bad result, if of the two rules CLITIC DELETION were chosen to apply. If however it were stated as a general constraint on grammatical rules that where two rules apply simultaneously and disjunctively, an obligatory rule takes precedence over an optional rule, the output would be the same as that resulting from the extrinsic ordering SUBJECT PRONOUN DROP - CLITIC DELETION. Unfortunately I am not aware of any evidence to support the existence of such a constraint.⁶

It might be thought possible to restate AUX AGREEMENT as including either SUBJECT PRO DROP or CLITIC DELETION and thus eliminate a rule from the grammar. CLITIC DELETION is separated from AUX AGREEMENT by SUBJ-PRO DROP, thus cannot be combined with it. AUX AGREEMENT could combine with SUBJ-PRO DROP to produce

⁶A number of other types of constraints have been proposed to avoid having to state extrinsic ordering relations among rules. Among those proposed for phonology is PROPER INCLUSION PRECEDENCE [Koutsoudas, Sanders and Noll 1974] which does not work in this case.

Example (25) is ambiguous: it can also be interpreted as 'that specific town where they lived, I am not well acquainted with it'. This latter interpretation I take to arise from a deep structure in which the NP *gàrí* is present both as relative head and as a NP within the relative clause. The relative clause with an IQ interpretation on the other hand has no head in underlying structure. The NP *gàrí* in the clause is chopped into initial position on the basis of a feature of the [+WH] type on its determiner.

The correctness of this conception is shown by the behaviour of Pied-Piping in IQ relative clauses. In a relative clause with a relative interpretation, the arrangement is as in (26) and there is no possibility of an IQ interpretation.

- (26) *bà+h sán gàrí+h nàn dàgà fndà sú+kà zóo bá*
 Is. know town REF that from where REL 3p. REL PERF come NEG
 'I don't know that town from where they have come'

In order to receive an IQ interpretation, the sentence must be as in (27).

- (27) *bà+h sán dàgà gàrí+h dà sú+kà zóo bá*
 NEG Is. know from town REF REL 3p. REL PERF come NEG
 'I don't know which town they have come from'

Here the preposition *dàgà* precedes the first occurrence of *gàrí*; clearly therefore *gàrí* is not the relative head, but part of the PP within the clause which has been chopped to initial position. Since unlike in (26) there is no preceding identical NP, *gàrí+h* can not be reduced to the relative pronoun *fndà*, and the results of chopping are to be seen clearly in surface structure.

"Chopping" relativisation can therefore be seen as a process which extracts an NP usually marked with a referential suffix *-n/-r* or in a few cases, a PP, from within a relative clause, leaving no trace, and places it to the left of the clause preceding an inserted relative marker *dà*. Subsequent rules either delete the chopped NP or replace it with a WH pronoun, provided that there is a head NP to the left. "Copying" relativisation acts in the same way except that the NP to be relativised is copied to the left. The original is left in place and is later pronominalised by the head NP. The derivation (28) of the relative NP's in (22) illustrate these processes.

(28) [mùtùmì [ní AUX bùgáa mùtùmì]]
 NP S S NP

a. REFERENTIAL SUFFIXING

[mùtùm [ní AUX bùgáa mùtùm+ìn]]
 NP S S NP

b. RELATIVE CHOPPING

[mùtùm [mùtùm+ìn ní AUX bùgáa ø]]
 NP S S NP

c. RELATIVE TENSE CHANGE

[mùtùm [mùtùm+ìn ní AUX bùgáa ø]]
 NP S [+REL] S NP

d. dà INSERTION

[mùtùm [mùtùm+ìn dà ní AUX bùgáa ø]]
 NP S [+REL] S NP

e. RELATIVISED NP DELETION

[mùtùm [ø ìn dà ní AUX bùgáa ø]]
 NP S [+REL] S NP

Failure of (28e) to apply necessitates the application of (28f), which produces (29).

(28) f. REL-PRO FORMATION

[mùtùm [wá + ñ + dà ní AUX bùgáa ø]]
 NP S S NP

(29) mùtùm wándà ná bùgáa (yáa mútù)
 man who Is. REL PERF hit (has died)
 'the man whom I hit has died'

The derivation of (23) by COPYING is essentially the same, except that rule (28b) is replaced by (28b'), COPYING, which is followed by (28g).

(28) b'. REL COPYING

[mùtùm [mùtùm +ìn AUX yí wàasáa dà mùtùm+ìn]]
 NP S PRO S NP

g. PRONOMINALISATION

[mùtùm [[ø]+ìn dà ní yí wàasáa dà shí]]]
 NP S{PRO} S NP

For ease of presentation in what follows, I shall refer to the set of rules (28a-f) (including b) as CHOPPING, and (28a-f) (including b') as COPYING.

The question of the conditions under which each of the rules CHOPPING or COPYING applies is a complex one.⁷ Disregarding subject NP's for the moment, as a rough guide one might say that chopping applies obligatorily to direct objects in the top clause of the relative clause, optionally to indirect objects in the top clause and under certain conditions direct objects in lower clauses. In all the remaining cases (NP's within PP's, within complex NP's, indirect objects in lower sentences, etc.) COPYING is obligatory.

Exactly the same set of conditions is to be found in the "out-of-focus" clauses of Hausa cleft sentences, e.g. the strings following NP COP in (30) and (31).

- (30) yáarò (née) ná bùgáa
 boy (COP) Is. REL PERF hit
 'it was a boy that I hit'
- (31) yáarò (née) mú+kà yí wàasáa dà shíí
 boy (COP) Ip. REL PERF do play with him
 'it was a boy that I played with'

Such clauses mirror the behaviour of relative clauses in all respects except the presence of a relative pronoun or relative marker *dà*. The likely explanation for this similarity is that the derivation of cleft sentences includes an indirect question type relative clause in intermediate level.⁴

4. The Subject and Auxiliary in Relative Clauses

We arrive now at the question of which of the rules CHOPPING or COPYING applies to subject NP's in relative clauses. With NP's bearing other functions, the question is easily settled as CHOPPING leaves a gap and COPYING an anaphoric pronoun as evidence of having applied. In the case of subjects, however, the effect of CHOPPING and that of COPYING followed by PRONOMINALISATION followed (as it inevitably is) by SUBJECT PRONOUN DROP would be the same: a gap in subject position in surface structure.

In the lower sentences of relative clauses, the situation is exactly as it is with other types of subordinate or co-ordinate clauses: a subject co-referential to an NP to its left is deleted in surface structure, but its

⁷Typical "island" phenomena are involved here, elements within certain type of island being more accessible to COPYING than to CHOPPING, but in other type of island totally inaccessible to relativisation. See McConwell [1973], *Chapt* 7.

relevant features can be recovered since agreement is always marked on the auxiliary, as in 32:

- (32) yáarfnyà+r dà sù+kà cée tá+nàa zú+wàa ái bà+tà zóo bá
 girl REF REL 3p. REL say 3f.s. come well 3f.s. come NEG
 PERF IMPERF VN NEG PERF

'the girl they said was coming didn't come after all'

CLITIC DELETION cannot apply in such cases.

- (33) *yáarfnyà+r dà sù+kà cée nàa zú+wàa ái bà+tà zóo bá
 girl REF REL 3p.s. say IMPERF come well 3f.s. come NEG
 REL PERF VN NEG PERF

However, in the top sentence of the relative clause, the situation is different: the subject NP is deleted, and in addition CLITIC DELETION may optionally apply, yielding both (34a and b).

- (34) a. yáarfnyà+r dà tá + kèe zú+wàa táa yí kyáu
 girl REF REL 3f.s. REL come 3f.s. do beauty
 IMPERF VN PERF

- b. yáarfnyà+r dà kèe zú+wàa táa yí kyáu
 girl REF REL REL come 3f.s. do beauty
 IMPERF VN PERF

'the girl who is coming is beautiful'

As one would expect, the same difference in behaviour of the subject position in top and lower sentences is exhibited by the "out-of-focus" clause of cleft sentences.

- (35) a. yáarfnyàa (cée) sù+kà cêe tá+nàa zú+wàa
 girl (COP) 3p.s. say 3f.s. come VN
 REL PERF IMPERF

- b. *yáarfnyàa (cée) sù+kà cêe nàa zú+wàa
 girl (COP) 3p.s. say IMPERF come VN
 REL PERF

'it was a girl that they said was coming'

- (36) a. yáarfnyàa (cée) tá+kèe zú+wàa
 girl (COP) 3f.s. REL IMPERF come VN

- b. yáarfnyàa (cèe) kèe zú+wàa
 girl (COP) REL IMPERF come VN

'it is a girl who is coming'

In order to explain the differential behaviour of the subjects of the top and lower clauses one must return to the rules set out in section 2, as (15a, b, c) CLITIC DELETION operates only where there is an NP subject present, so

conclude that the reason that CLITIC DELETION applies before CHOPPING in this case is that it is a cyclic rule applying on the cycle before CHOPPING applies. As for SUBJECT PRONOUN DROP, it cannot apply before CLITIC DELETION on the relative clause cycle, or it would block CLITIC DELETION's application. Therefore it cannot be a cyclic or pre-cyclic rule. But SUBJECT PRONOUN DROP must apply before CLITIC DELETION on the matrix sentence cycle to account for the non-application of CLITIC DELETION where COPYING takes place. SUBJECT PRONOUN DROP cannot therefore be a post-cyclic rule, and must be a last-cyclic rule.

One problem in regarding CLITIC DELETION as a cyclic rule is that it optionally deletes pronominal clitics on lower cycles before cross-clause PRONOMINALISATION and last-cyclic SUBJECT PRONOUN DROP have a chance to operate, whereas in fact pronominal agreement is always present on AUX in surface structure where the latter rules apply. Now AUX AGREEMENT clearly must apply before all cross-clause rules which delete subjects like CHOPPING: it is therefore likely to be either cyclic or pre-cyclic. If it is cyclic, the problem of CLITIC DELETION would be solved since CLITIC DELETION by its action recreates the structural description of AUX AGREEMENT and allows it to reapply on each successive cycle. Where CHOPPING applies, this would intervene between the two rules, removing the subject NP of the relative clause so that AUX AGREEMENT could not reapply in just this case.

I state below a simplified version of RELATIVE CHOPPING as it applies to subjects only (39), together with a statement of its ordering relations (40) (e = extrinsic, i = intrinsic; where no ordering is marked, this indicates that none has so far been established).

(39) NP NP AUX
 1 2 3 => 1 (PRO) d_a ø 3
C: 1=2

(40) REL CHOPPING (?cyclic; oblig) ←
REL COPYING (?cyclic; oblig) ←
PRONOMINALISATION (cyclic; oblig) ←
AUX AGREEMENT (cyclic; oblig) ←
SUB-PRO DROP (last-cyclic; oblig) ←
CLITIC DELETION (cyclic; optional) ←

possessive and sentential clauses mentioned earlier derived by means of the T-rules (14b-c) from a copular structure, in this case containing an S as in (46). The difference is that in this particular construction it is restricted to use within RELATIVE CLAUSES.

- (46) NP AUX S COP => NP AUX S
[+INDIC]
[-PERF]

No matter how the *ya ke* construction is derived, it is clear that the subject of the sentence *ya ke* is empty, or an unmarked dummy which is obligatorily deleted. As with other impersonal verbs in Hausa, AUX AGREEMENT still operates in such cases, adding the unmarked neutral clitic *ya* [-I, -II, -F, -PL] to the AUX.

As well as the construction using the unmarked *ya ke* irrespective of the feature composition of the relative head as in (47), there is also a construction which has the same function and behaviour, except that *ya ke* may become *ta ke* or *su ke* by agreement with a feminine singular or plural relative head NP respectively, as in (48).

- (47) a. *yáarínýà+r dà yá+kè 'yá +r máhàucí cèè táa zóo*
 girl REF REL 3m.s. REL daughter REF butcher COP 3f.s. come
 IMPERF PERF
- b. *vâará+h dà yá+kè 'yá +n máhàucí nèè sún zóo*
 boys REF REL 3m.s. REL children REF butcher COP 3p. PERF come
 IMPERF
- (48) a. *yáarínýà+r dà tá+kè 'yá +r máhàucí nèè sún zóo*
 girl REF REL 3f.s. REL daughter REF butcher COP 3f.s. come
 IMPERF PERF
- 'a girl who is the butcher's daughter has come'
- b. *yáará+h dà sú+kè 'yá +n máhàucí nèè sún zóo*
 boys REF REL 3p. REL children REF butcher COP 3p. come
 IMPERF PERF
- 'boys who are butcher's children have come'

With a small number of verbs, there is the possibility of the application of a RAISING-TO-SUBJECT rule as in (49).

- (49) a. *yáa kásàncée yáarínýà+r 'yá +r máhàucí cèè*
 3m.s. PERF happen girl REF daughter REF butcher COP
 'it happened that the girl was the daughter of a butcher'

(49) cont.

- b. yáarínyà+r t́áa kásàncée 'yá +r máhàucfí cée
 girl REF 3f.s. PERF happen daughter REF butcher COP
 'the girl happened to be the daughter of a butcher'

This rule, although not common, appears to be particularly frequently used in relative clauses to place the NP to be relativised in top subject position and extends in some dialects in relative clauses to verbs which would not normally allow RAISING, e.g. the following headline from the *Gaskiya* newspaper:

- (50) ábúubúwà+n dà sù+kà kàmaatà à yí
 things REF REL 3p. REL PERF befitting one SUBJ do
 'things one ought to do'

which would normally be:

- (51) ábúubúwà+n dà yá kàmaatà à yíi sù
 things REF REL 3m.s. REL befitting one SUBJ do them
 PERF

It is likely therefore that we are dealing with a RAISING-TO-SUBJECT rule in which the element raised is determined by its identity with the relative head. This type of RELATIVE RAISING-TO-SUBJECT appears to be a copying rule as anaphoric pronouns are preferred in the position from which an object NP is raised as in (52).

- (52) yáarínyà+r dà t́á+kè sún { ?bùgáa } t́áa wárkèe
 girl REF REL 3f.s. REL 3p. PERF { ?bùgée t́à } 3f.s. get well
 IMPERF { ?hit }
 { hit her }
- 'the girl who had been hit by them recovered'

The rule can therefore be roughly formulated as follows:

- (53) RELATIVE RAISING-TO-SUBJECT (optional)

NP	[AUX	[X	NP	Y]								
	S		S		S							
1	2		3	4	5	=>	1	4	2	3	4	5
Cond 1 = 4												

RELATIVE RAISING-TO-SUBJECT creates a structure in sentences like (48) in which the top sentence subject is identical to the relative head. One might therefore expect CHOPPING and CLITIC DELETION to apply. As (54) shows, however, CLITIC DELETION does not apply in such cases.

- (54) a. *yáaròn dà kè dǎn máhàucí (nèe) yáa zóo
 b. *yáarínyàr dà kè 'yár máhàucí (cèe) táa zóo
 c. *yáaràn dà kè 'yán máhàucí (nèe) sún zóo

The same is also true of where the NP head is a personal pronoun as in (55), and in cleft sentences (56).

- (55) a. níi dà yá kè sún bùgée nì, náa wárkèe sòosáí
 b. níi dà ná kè sún bùgée nì náa wárkèe sòosáí
 me REL a) 3m.s. REL 3p. PERF hit me Is. PERF get well really
 b) Is. IMPERF
 c. *níi dà kè sún bùgée nì náa wárkèe sòosáí
 'I who had been hit by them really recovered'
- (56) a. yáarínyà+r nǎn (cée) yá kè 'yá r máhàucí cèe
 b. yáarínyà+r nǎn (cée) tá kè 'yá +r máhàucí cèe
 girl REF that (COP) a) 3m.s. REL daughter REF butcher COP
 b) 3f.s. IMPERF
 c. *yáarínyà+r nǎn (cée) kè 'yár máhàucí cèe
 'it is that girl who is a butcher's daughter'

But on further consideration, this pattern is exactly what is to be expected on the basis of the rules already formulated. Recall that the rule of CLITIC DELETION which removes clitics from the top AUX of relative clauses does so on the top cycle of the relative clause, before CHOPPING erases the subject NP. But the rule RELATIVE RAISING-TO-SUBJECT can only take place on the cycle above the relative clause since it crucially refers to the identity of the relative head NP. At the time that CLITIC DELETION could apply on the top relative clause cycle, the subject position in the RC top clause is empty, so its structural description is not met and it cannot apply. This confirms the cyclicity of the rule CLITIC DELETION.

This type of derivation does however raise questions with regard to the ordering of AUX AGREEMENT. It was shown earlier that RELATIVE CHOPPING must precede a cyclic AUX AGREEMENT rule on the matrix cycle to prevent it restoring clitics deleted by CLITIC DELETION on the previous cycle. We have also shown earlier that AUX AGREEMENT applies cyclically or pre-cyclically within simple sentences. In this case some agreement rule must re-apply after

RAISING-TO-SUBJECT to convert the neutral clitic resulting from the underlying empty subject into a fully specified clitic which agrees with the derived relative clause subject. If this rule is the same cyclic AUX AGREEMENT rule, it must therefore follow both RELATIVE RAISING-TO-SUBJECT and CHOPPING. But if CHOPPING applies to the RC top clause subject here, if it applied before AUX AGREEMENT it would remove the subject and block the reapplication of AUX AGREEMENT.

There is, however, some independent evidence to show that the original auxiliary agreement patterns determined by underlying subjects are altered to agree with derived subjects, *not* by the re-application of AUX AGREEMENT, but by a completely different rule, which I shall call AUX AGREEMENT ADJUSTMENT.

In simple sentences with associated conjoined subjects, like (57), auxiliary agreement is plural as a conjoined NP automatically receives [+PLUR] specification.

- (57) Áudù dà Músá sún zóo
 Audu with/and Musa 3p. PERF come
 'Audu and Musa have come'

If one of the conjuncts is a pronoun, the features of the pronoun are also added to the agreement marker on the AUX:

- (58) níi dà Músá mún zóo
 me with/and Musa 1p. PERF come
 'Musa and I have come'

A rule CONJUNCT MOVEMENT commonly applies to such sentences, moving the right hand part of the conjunct *dà* NP to the right of VP. Example (57) thus becomes (59), and (58), (60). In (59) where a [-PRO] NP is left in subject position, AUX must agree with this derived singular subject.

Where a pronoun like *níi* is left alone in subject position as in (60) it is obligatorily deleted by SUBJECT PRONOUN DROP. Now in this case agreement of the auxiliary may either be with the plural subject NP before CONJUNCT MOVEMENT, or with the singular pronoun left after CONJUNCT MOVEMENT.

- (59) Áudù { a) yáa } zóo dà Músá
 { b) *sún }
 Audu { a) 3m.s. } PERF come with/and Musa
 { b) *3p. }
- 'Audu has come with Musa'

- (60) { a) náa } zóo dà Músá
 { b) mún }
 { a) Is. } PERF come with/and Musa
 { b) Ip. }
 'I have come with Musa'

In order to account for *mun* in (60), AUX AGREEMENT must precede CONJUNCT MOVEMENT. Since we are dealing with a simple sentence here, we cannot say that AUX AGREEMENT reapplies on a higher cycle to produce *yaa* in (59) and *naa* in (60). I therefore propose the following rule to account for (59a) and (60b).

- (61) AUX AGREEMENT ADJUSTMENT

$$\begin{array}{ccccccc}
 \text{NP} & \text{PRO} & \text{AUX} & \Rightarrow & 1 & 2 & 3 \\
 \left[\begin{array}{c} \alpha I \\ \beta II \\ \gamma F \\ \delta PL \end{array} \right] & & & & & \left[\begin{array}{c} \alpha I \\ \beta II \\ \gamma F \\ \delta PL \end{array} \right] & \\
 1 & 2 & 3 & & & &
 \end{array}$$

This rule clearly applies after AUX AGREEMENT and CONJUNCT MOVEMENT, but must be ordered before SUBJECT PRONOUN DROP for (60a) and after it for (60b). The former order is consistent with the rule applying as soon as its structural description is met, the latter with it applying closer to surface structure.⁸

Returning to the question of agreement and deletion in *ya ke* relative clauses, we can now propose that the change from the neutral AUX *ya ke* to *ya ke/ta ke/su ke* agreeing with a raised subject NP is a result of AUX AGREEMENT ADJUSTMENT applying as soon as its structural description is met, i.e. immediately following RAISING, not a result of AUX AGREEMENT. CHOPPING would then apply, blocking the re-application of AUX AGREEMENT and CLITIC DELETION, as in the derivation (62) of the relative NP in sentence (49a).

⁸ The dialect represented by (60a) seems to be taking over from that represented by (60b). This probably results from the fact that the underlying subject in (60b) is not strictly recoverable: it could be either 'I and Musa' or 'we and Musa'. If the dialect represented by (60b) is entirely lost, the evidence for CONJUNCT MOVEMENT itself as a syntactic rule is lost, and AUX AGREEMENT ADJUSTMENT is confined to cases of raising.

First consider the relations of AUX AGREEMENT and CLITIC DELETION. Given that AUX AGREEMENT and CLITIC DELETION are cyclic rules of the same kind, in complex sentences the effect of CLITIC DELETION on a lower cycle is negated by the application of AUX AGREEMENT on the next cycle; if this is not the last cycle CLITIC DELETION re-applies reversing the situation. As I have stated the position, the two rules continue to apply in this way on successive cycles until a final state is reached on the last cycle. While such an approach adequately covers the data presented in this paper, it does not seem at all natural if syntactic rules are intended to reflect in any way the mental encoding process. The alternative would be to distinguish rules which apply once and for all on the cycle in which their structural description is met, and those which apply iteratively, which would have the additional specification [+iterative]. CLITIC DELETION would belong to the former and AUX AGREEMENT to the latter category; thus specified AUX AGREEMENT would apply twice and CLITIC DELETION once for each AUX, rather than AUX AGREEMENT n times and CLITIC DELETION n-1 times, where n is the number of S-nodes above the AUX in question.

A further alternative would be to class AUX AGREEMENT as a cyclic non-iterative rule like CLITIC DELETION and to modify AUX AGREEMENT ADJUSTMENT so that it becomes a last-cyclic rule preceding CLITIC DELETION. The new AUX AGREEMENT ADJUSTMENT rule would then be able to either change the features of a pronominal clitic or add a new clitic if the original clitic has been deleted on a previous cycle while the subject NP still remains in place.

As for SUBJECT PRONOUN DROP, its last-cyclic status seems to arise naturally from two factors.

- a. it must precede CLITIC DELETION, which is a cyclic rule (this point is considered in the following section); and
- b. it cannot apply on the cycle in which its structural description is first met, since if it were to apply on the relative clause cycle before relativisation, no pronoun subjects would be available to be relativised. This would cause the relative clause in sentences such as (38) (repeated here for convenience) and the parallel cleft sentence (63) to become ungrammatical:

(38) múu dà (mú) kèe zú+wàa nân bân mú dà kúfí
 we REL (Ip.) REL IMPERF come VN here NEG Ip. with money
 'we who are coming here have no money'

- (63) múu nèe (mú) kèe zúwàa nân
 we COP (Ip.) REL IMPERF come VN here
 'it is we who are coming here'

Clearly inability to relativise from subject NP's would considerably reduce the generality of relativisation and complicate the grammar, by introducing the necessity of a periphrastic construction to cope with the logical possibility of relativised subjects. Indeed in any language in which there is pronoun drop of any kind (arising from the existence of cross-reference phenomena within the simple sentence such as agreement and cliticisation), it is unlikely that such rules will be cyclic, and likely that they will be last or post-cyclic. If they were cyclic, they would apply before all identity rules operating across sentence boundaries (like RELATIVISATION and EQUI), thus restricting the application of the latter to non-pronouns in the positions where PRONOUN DROP can take place. It would therefore be desirable to establish a universal constraint which either completely excludes cyclic pronoun drop rules or makes them highly marked.⁹

In the absence of extensive comparative evidence it is not possible to decide here exactly what the form of such a constraint would be. One fruitful line of argument might be to distinguish PRONOUN DROP as a root transformation [Emonds 1969] (since it deletes a major constituent like a subject NP) from structure preserving rules like AUX AGREEMENT and CLITIC DELETION in Hausa and to attempt to demonstrate that all structure-preserving rules which operate within one clause are cyclic or conversely that rules which operate within one clause and do not preserve structure cannot be cyclic. This would be related to the need for rules which operate across clause boundaries to have the maximum specification of the structure of lower clauses available to them at the stage at which they apply, so that they can apply with the greatest generality. In particular, rules like RELATIVISATION, EQUI and RAISING would have precedence, both in the sense of functional importance and in actual rule ordering, over rules which merely remove redundant items from surface structure, like PRONOUN DROP.

⁹In an earlier version of this paper, given at a seminar at the Australian Institute of Aboriginal Studies, Canberra in 1974, I adduced evidence from an Australian language, Yukulta, studied by Keen [1972] to show that in this language pronoun drop rules must also be last- or post-cyclic. For a brief discussion of Yukulta EQUI and case-marking rules in a different context see McConvell [1976].

Finally, I wish to look again at the reasons why CLITIC DELETION is a cyclic rule, this time from the point of view of the functions of the two rules in what has been called relativisation strategy.

One of the main strategies in Hausa as in English for determining which NP is to be interpreted as identical to the head in a relative clause involves the contrast between a gap and a pronoun. This is particularly used where the direct object is a possible candidate as the relativised NP. In the two following sentences (64) has a gap in both subject and object position and in (65) there is an object pronoun. In both cases the AUX is 3m.s. like the head, and in (65) the object pronoun is also 3m.s., so this gives no help.

- (64) yáarò+n dà yá gánfi zaî zóo
 boy REF REL 3m.s. REL PERF see 3m.s. FUT come
 'the boy whom he was will come'

- (65) yáarò+n dà yá gán shì zaî zóo
 boy REF REL 3m.s. see 3m.s. 3m.s. FUT come
 'the boy who saw him will come'

In (64), since gánfi is a transitive verb which normally requires a direct object, a gap can be immediately located to the right of the verb in the object position. The deleted direct object is then interpreted as identical to the head yáarò and the absent subject is interpreted as having been deleted by SUBJ-PRO DROP, and therefore to have a different referent.

In (65), since in relative clause top clauses, direct objects identical to the head are deleted in nearly all cases, the pronoun in direct object position is interpreted as non-identical. Since the only remaining NP slot is the gap in subject position, this is interpreted as identical to the head.

Where CHOPPING does not apply, the gap versus pronoun strategy cannot be used. Only the agreement of AUX in the case of subject and the feature specification of the pronoun in other cases can give a clue about the identity of the relativised NP. For instance, the contrast between masculine and feminine pronouns and pronominal clitics disambiguates the sentences (66) and (67).

- (66) yáarò+n dà tá yí wàsáa dà shíí zaî zóo
 boy REF REL 3f.s. REL do play with him 3m.s. FUT come
 PERF
 'the boy she played with will come'

- (67) yáarò+n dà yá yí wàsáa dà ítá zaî zóo
 boy REF REL 3m.s. REL do play with her 3m.s. FUT come
 PERF
 'the boy who played with her will come'

however (67) where both the AUX and the oblique pronoun are masculine, is ambiguous:

- (68) yáarò+n dà yá yí wàasáa dà shíi zài zóo
 boy REF REL 3m.s. REL PERF do play with him 3m.s. FUT come
 'the boy he played with } will come'
 {the boy who played with him }

But in cases of this kind where the ambiguity is between a subject NP represented by a gap and agreement in AUX and a pronoun of the same feature composition, a third strategy comes into play. As we know, in the imperfect, habitual and indefinite future, CLITIC DELETION may optionally apply, indicating that it is CHOPPING which has applied to the subject NP, not COPYING, PRONOMINALISATION and SUBJ-PRO DROP. So, alongside (69a), which is as ambiguous as (68), there is (69b), in which the subject NP is unambiguously interpreted as identical to the relative head.

- (69) a. yáarò+n dà yá kè wàasáa dà shíi zài zóo
 boy REF REL 3m.s. REL IMPERF play with him 3m.s. FUT come
 'the boy who {he plays with } has come'
 {plays with him }
 b. yáarò+n dà kè wàasáa dà shíi zài zóo
 boy REF REL REL IMPERF play with him 3m.s. FUT come
 'the boy who plays with him has come'

Not surprisingly, because of its greater clarity (69b) is the preferred way of expressing relativisation of the subject. Examples of a similar kind include the relative clauses (70) involving a contrast between a gap and no object to the right of a verb which can be either transitive or intransitive, (71) where the pronoun is a possessive clitic and the cleft sentence (72) in which the right hand potential referent is in a subordinate clause.

- (70) a. tүүлунà+n dà sú kàn fáshèe ...
 pots REF REL 3p. HAB break
 'pots which {sometimes break } ...'
 {they sometimes break }
 b. tүүлунà+n dà kàn fáshèe ...
 pots REF REL HAB break
 'pots which sometimes break ...'
 (71) a. yáarfnyà+r dà tá kè zàuné à gídá+ntà
 girl REF REL 3f.s. REL IMPERF sitting in house 3f.s. POSS
 'the girlⁱ {whoⁱ is living in her^{i/J} house }'
 {whoseⁱ house she^j is living in }

b. yáarfnyà+r dà kè zàuné à gídá+ntà
 girl REF REL REL IMPERF sitting in house 3f.s. POSS
 'the girlⁱ whoⁱ is living in her^{i/J} house'

(72) a. Múúsá (nèè) yá kèe fásatá+n zàì zóo
 Musa (COP) 3m.s. REL IMPERF hope REF 3m.s. FUT come
 'it is Musaⁱ {that hopes he^{i/J} will come }'
 {that he hopes will come }

b. Múúsá (nèè) kèe fásatá+n zàì zóo
 Musa (COP) REL IMPERF hope REF 3m.s.FUT come
 'it is Musaⁱ that hopes he^{i/J} will come'

Numerous cases of referential ambiguity in relative clauses are thus rendered avoidable by the existence of the rule CLITIC DELETION, the application of which indicates in surface structure that the subject gap results from CHOPPING, not from COPYING, PRONOMINALISATION and SUBJECT PRONOUN DELETION. This important function of CLITIC DELETION in increasing recoverability is made possible by the fact that it is a cyclic rule, which makes available in surface structure information about earlier stages of a derivation which would otherwise result in an ambiguous surface structure. If it were a post- or last-cyclic rule and followed SUBJECT PRONOUN DROP on all occasions, clitics on the AUX of relative clauses would never be deleted, and the class of ambiguous relative clauses would be enlarged. I would not think it likely, however, that the cyclicity of CLITIC DELETION could be said to be determined by universal constraints related to communication function in the same way as I suggested that the post- or last-cyclicity of PRONOUN DROP rules could be. One point is, of course, that PRONOUN DROP is a widespread type of rule in human language, whereas CLITIC DELETION may be idiosyncratic to Hausa. Apart from that, it seems to me that this particular case of the ordering of CLITIC DELETION shows Hausa grammar using a minor rule to functional advantage.

However any increase in the generality of CLITIC DELETION either by its extension to all tenses or by a change in its extrinsic ordering relative to SUBJECT PRONOUN DROP to yield derivations like (21), would lead to a decrease in the generality of cyclic AUX-AGREEMENT in terms of surface reflections. Loss of the generality of AUX AGREEMENT would in turn tend to threaten SUBJECT PRONOUN DROP, which depends upon cross-referencing rules for its

existence. It appears that the rules here are embedded in a functional structure in which rules which ensure recoverability of reference have a relationship of contradiction with those which tend to simplify surface structure and reduce redundancy.

REFERENCES

- Emonds, Joseph. 1969. "Root and structure-preserving transformations." Doctoral dissertation, MIT.
- Keen, Sandra. 1972. "A description of Yukulta." MA thesis, Monash University.
- Keenan, Edward. 1972. "Relative clause formation in Malagasy." In Paul M. Peranteau, et al. (eds.), *The Chicago Which Hunt: Papers from the Relative Clause Festival*, pp. 169-89. Chicago: Chicago Linguistic Society.
- Koutsoudas, Andreas, Gerald Sanders and Craig Noll. 1974. "The application of phonological rules." *Language* 50:1-28.
- McConvell, Patrick. 1973. "Cleft sentences in Hausa? A syntactic study of focus." Doctoral dissertation, University of London.
- McConvell, Patrick. 1976. "Nominal hierarchies in Yukulta." In R.M.W. Dixon (ed.), *Grammatical Categories in Australian Languages*, pp. 191-200. Canberra: A.I.A.S.
- Newman, Paul and Russell G. Schuh. 1974. "The Hausa aspect system." *Afroasiatic Linguistics* 1/1:1-39.
- Ross, John R. 1967. "Constraints on variables in syntax." Doctoral dissertation, MIT.
- Schachter, Paul. 1973. "Focus and relativization." *Language* 49:19-46.

