

ANAPHORA INTERPRETATION IN HAUSA NARRATIVE: APPLICATION OF TOPIC-SET THEORY

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1. INTRODUCTION

The focus of this paper is participant reference in Hausa narrative. Of specific interest is the process native speakers might use to interpret anaphora in narrative discourse. Identification of the coreferential link is of primary concern. Specific questions are: What is the process native speakers use to match a pronoun (for example) to its antecedent? Is that process rule-governed? If so, what form should the rule take? Is the coreferential link related to text features or does a top-down model (e.g., schema) better explain the process? Is the search for an antecedent backward, or is the search on-line? How can one account for ambiguity? This paper will begin to address these questions vis-à-vis Hausa narrative.

This paper will show that anaphora interpretation is rule-governed. I define the rule under the rubric, Topic-set Theory. Topic-set Theory proposes that narrative discourse consists of a given number of topic-sets. Topics-sets are configurational domains larger than the sentence, marked by abstract boundaries. The theoretical claim made here is that an anaphor and its antecedent are constituents of the same topic-set. Native speakers use text-based features to recognize these abstract domains, and consequently, use these features to interpret an anaphor. The features include gender-person-number agreement and rules of participant reference. Ambiguity results when a narrator has failed (whether deliberately or not) to properly mark (via participant reference rules) the abstract onset boundary of a topic-set.

Anaphor interpretation within direct speech-acts falls outside this study. Robert Longacre (1989a) and Paul Ricoeur (1984) are careful to outline differences between speech-acts and narrative proper, this study being limited to the latter.

2. THEORETICAL FRAMEWORK

In this section I will define the theoretical framework of Topic-set Theory. The description will remain abstract at this point for two reasons. First, by formalizing the theory in abstract terms, one can more readily test the theory. Further, an abstract approach expedites wider application across languages. In Section 3 I apply Topic-set Theory to Hausa narrative, where I make language-specific claims.

2.1 BASIS OF THE THEORETICAL FRAMEWORK.

The theoretical framework of Topic-set Theory follows from of a synthesis of claims from Government and Binding (van Riemsdijk and Williams, 1986) and Discourse Grammar (Longacre, 1983a, 1989a). From Government and Binding I borrow the structural relation, **government**. From discourse grammar, I introduce **participant reference rules**. Though this synthesis is problematic, in that discourse receives little attention within Government and Binding (Newmeyer, 1983), van Riemsdijk and Williams (1986) and Williams (1977) recognize that a sentence-level grammar might have limitations. The former write, 'In principle it could turn out that it is impossible to characterize sentences in and of themselves without reference to their roles in various

conversations, situations, etc.' (1986:184) Below I discuss possible relationships between sentence-level and discourse-level rules.

2.2 GOVERNMENT.

A topic-set is a self-contained configurational domain. The basis for this proposal is the structural relation, government. Since linguists have developed this notion at the sentence level, it is best to begin at that level of language structure. Below I will extend the discussion to show how government is operative at the discourse level. For purposes of clarity, I will confine the discussion here to the noun phrase.

Van Riemsdijk and Williams (1986:231) define government as follows:

1. Government

X governs Y if Y is contained in the Maximal X-projection of X, X_{Max}, and X_{Max} is the smallest maximal projection containing Y and X c-commands Y.

While this definition is complex, it can be illustrated with reference to the following structures in (2).

2.

- (a) [V NP]vp
- (b-i) [V [P NP]pp]vp
- (b-ii) [V [NP V]s]vp
- (b-iii) [V NP1 [P NP2]pp]s

By the definition in (1), V governs the NP in (2a) but not in (2b-i) nor in (2b-ii). In (2b-i) P governs the NP. In (2b-iii) the V governs NP1 but not NP2; instead, P governs NP2.

Two features follow from this definition. The first feature is **head noun government**. As governor the head noun assigns the appropriate features to the constituents of its domain. Take, for example, the following noun phrase from Hausa (Cowan and Schuh, 1976).

3. [gida -n [uuwa -r [Muusaa]np]np]np
 house -of mother -of Musa
 HNmas/s mas/s HNFem/s fem/s
 'Musa's mother's house'

Our task is to explain the two different linkers (-n vs -r) which occur in (3). The features, masculine-singular, of the head noun, **gidaa** 'house,' spread throughout the noun phrase generating the masculine-singular linker -n. At the same time the features, feminine-singular (fem/s) of the head noun, **uuwaa** 'mother,' spread throughout the embedded noun phrase, generating the feminine singular linker, -r. In each case, the head noun may be said to govern its domain.

The second feature that follows from government is **operational independence**. This means that the head noun assigns its features only to constituents of the noun phrase which it governs. The grammatical noun phrase boundaries mark the abstract (noun phrase) domain. Note again the noun phrase in (3) above. The governor, **gidaa**, assigns the features, masculine-singular, only throughout the noun phrase it governs and not throughout the embedded noun phrase (which gets its gender and number features from the governor of the embedded noun phrase **uuwaa**). This means that the noun phrase boundary constrains the assignment of the features.

In terms of government the following rule is sufficient to generate noun phrase agreement.

4. Noun Phrase Agreement

Governor	Domain	Assignment
Head Noun	NP	∝ Features
where ∝ Features are gender, number, and person		

The rule states that the governor assigns ∝ Features (read: Alpha Features) throughout its domain.¹

Below I will return to the discussion of the notion of government and will show how government is operative at the discourse level. But first it is necessary to introduce the notion of participant reference rules. These rules are the second element that forms the basis of Topic-set Theory.

2.3 PARTICIPANT REFERENCE RULES.

Participant reference is a scheme to account for the grammatical form of a noun phrase and its distribution. Longacre (1989a) has observed that the grammatical form of a noun phrase will vary along two parameters. The first parameter is the status of the participant. A participant can be a major or a minor participant or a prop. The second parameter is the identification of the participant. Speakers of a language employ strategies to reference the participant throughout the narrative. These strategies are related to whether the narrator is introducing, integrating, tracking, or reintroducing a given participant in the narrative. The specific strategies employed in Hausa are discussed in Section 3 below.

2.4 THEORETICAL DEFINITION.

The purpose of this section is to define a topic-set. The elements of the definition follow from the theoretical discussion above.

2.4.1 Structural abstraction.

Topic-sets are structural abstractions that form abstract domains. The claim here is that narrative discourse consists of a given number of topic-sets with the potential for recursive embedding. Consequently, topic-sets are more manageable if defined as being either topic-salient (TS) or topic-embedded (TE).² Theoretically both TS and TE are topic-sets which form a relative relationship vis-à-vis the discourse. This makes it possible to define a topic-set on one level as TE (Figure 1) and at a second level to define that same topic-set as TS, since it also contains an embedded structure (Figure 2).

¹ The constituents of the noun phrase receive their grammatical form from a set of lexical rules. The dynamics of those rules, however, falls outside the scope of this paper.

² A more formalized distinction between a salient topic-set and an embedded topic-set might be the following. An embedded topic-set is characterized by a topic noun in a non-subject position (i.e. direct or indirect object) that is not promoted into topic noun status such that the topic noun does not become the grammatical subject of a matrix sentence. The promotion of a noun phrase into topic noun status is discussed in Section 3 below.

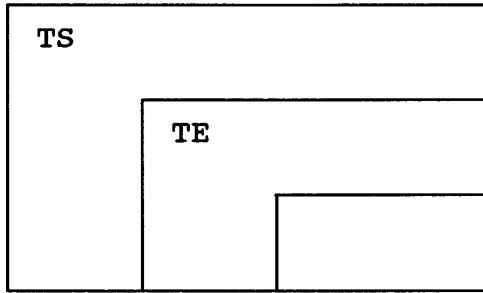


Figure 1

Topic-set Structure

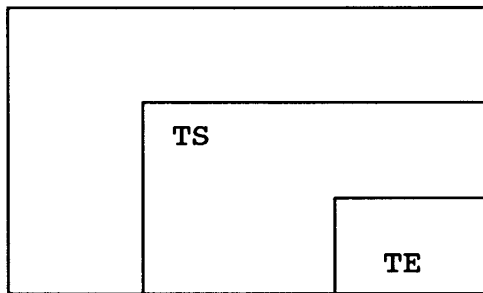


Figure 2

Embedded Topic-set Structures

This distinction will become clear in the discussion which follows.

2.4.2 Configurational domain.

A topic-set is a self-contained configurational domain. The basis for this statement is the extension of the structural relation, government, across sentence boundaries. By extension, a topic-set is a discourse-level configurational domain.

It was shown above in (3) that features of the head noun spread throughout a noun phrase, each head noun governing the constituents of its noun phrase and assigning the appropriate α Features. It was also shown that the noun phrase boundaries mark the domain of α Feature assignment, with the rule Noun Phrase Agreement formalizing this process.

By definition, topic-sets are configurational domains at the discourse level. Two structural features, topic noun government and operational independence, characterize topic-sets. **Topic noun government** refers to the fact that the governor of a topic-set is the topic noun (analogous to the head noun of the noun phrase). Its functions are to introduce and to govern its topic-set, assigning $D\alpha$ Features (read: Discourse Alpha Features) throughout that topic-set. $D\alpha$ Features are gender, number, and person.

Figure 3 illustrates this notion. The reader should interpret these as consecutive sentences in a text.

S 1 NP	V	NP
(+T-N: D α)		
S 2 NP	V	NP
(D α)		
S 3 NP	V	NP
(D α)		
S 4 NP	V	NP
(+T-N: D β)		
S 5 NP	V	NP
(D β)		
+S 6 NP	V	NP
(D β)		

Figure 3

Discourse Alpha Feature Assignment

In Figure 3 a topic noun (+T-N) introduces a topic-set in sentence 1 and in sentence 4. In terms of the first topic-set the topic noun assigns D α Features to the subject noun phrase of sentences 2 and 3. This means that for English, if the topic noun is masculine-singular, for example, the grammatical subject of sentences 2 and 3 would be the masculine-singular pronoun *he* (in Hausa the grammatical subject of sentences 2 and 3 would be realized by zero anaphora, the features being carried solely by the obligatory person-aspect markers of the verb). In terms of the second topic-set the topic noun assigns D β (read: Discourse Beta Features) to the subject noun phrase of sentences 5 and 6 (I use D α and D β Features to indicate that the topic nouns of sentences 1 and 4 are different). Sentences 1-3 and sentences 4-6, then, form two independent topic-sets.

A theoretical corollary follows. Note in Figure 3 that the first topic noun is not only the subject of the verb in sentence 1, but it is (in terms of the semantics) also the subject of the verbs in sentences 2 and 3. This corollary is more evident in Hausa where the subject noun phrase of sentences 2 and 3 would be realized by zero anaphora (i.e., absence of an overt noun phrase subject). This means that a topic noun (x) functions as the subject of (Σ) those verbs (a, b, c...) which are constituents of the topic-set (y). This can be formalized in the scheme in (5).

5.

Topic Noun as 'Subject Of'

[(x Σ) (a Σ ... b Σ ... c Σ ...)]y

The second structural feature of Topic-set Theory is **operational independence**. This means that a topic noun assigns D α Features only throughout its topic-set (or the domain which it governs). The issue here becomes the identification of the topic-set boundaries. Note Figure 3 above. The topic noun in sentence 1 introduces the first topic-set. By definition this means that the topic noun marks the onset boundary. However, the terminus boundary of the topic-set cannot be predicted. But this does not mean that the terminus boundary is less definitive. It only means that the linear space of the topic-set is open ended and falls under the control of the narrator. So in the example in Figure 3, it is only when the second topic noun is introduced in sentence 4 that one is able to identify the terminus boundary of the first topic-set. By definition, then, a narrator controls the size of a topic-set, marking the terminus boundary with the introduction of a second topic noun. Topic-sets, then, are open-ended. It follows that topic-sets can consist of a sentence, a paragraph, or a larger domain. A narrator is able to generate any

number of sentences elaborating upon a given topic or describing the action(s) of a given participant.

Demarcation of the topic-set boundaries is important. The claim made here is that a topic noun assigns $D\alpha$ Features through its domain. This follows from the fact that the boundaries mark off the domain of topic noun government. Each topic-set operates independently of the other topic-sets.

Because of the concepts of topic noun government and operational independence, it is possible to formalize $D\alpha$ Feature Assignment in a manner parallel to that of Noun Phrase Assignment (4). The rule is in (6).

6. Discourse Alpha Feature Assignment

Governor	Domain	Assignment
Topic noun	Topic-set	$D\alpha$ Feature
where $D\alpha$ Features are gender, number, and person		

The rule states that the topic noun will assign its $D\alpha$ features throughout its topic-set.

The question still remains as to the grammatical form of the topic noun and its distribution. This entails identifying the grammatical form of the topic noun at the onset boundary of a topic-set and its grammatical form internal to the topic-set. In terms of participant reference, the former relates to participant introduction and reintroduction, while the latter relates to participant integration and tracking.

It is here that Longacre's participant reference scheme becomes important; it is proposed that the assignment of the $D\alpha$ Features interact with the participant reference rules of a language. Figure 4 illustrates one way to understand this dynamic relationship.

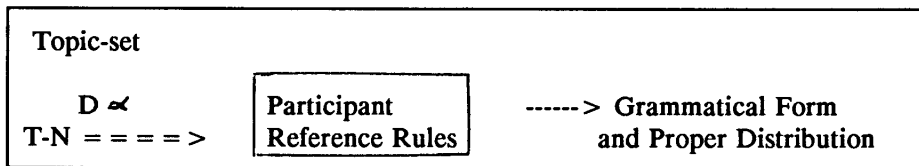


Figure 4

Discourse Alpha Feature Assignment and Participant Reference Rules

Figure 4 shows that when the topic noun assigns its $D\alpha$ features, those features pass through the participant reference rules. The output is such that the grammatical form (e.g., an indefinite NP or zero anaphora) and its distribution (e.g., onset boundary or internal to a topic-set) are consistent with the speaker's linguistic competence. It follows that the output is language-specific (e.g., speakers of Hausa use zero anaphora where speakers of English use a pronoun).

With the introduction of participant reference rules, it is necessary to revise Discourse Alpha Feature Assignment (in (6) above) as follows:

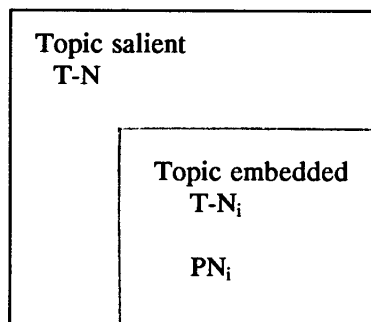
6b. Discourse Alpha Feature Assignment (revised)

Governor	Domain	Assignment	Grammatical Form and Distribution
Topic-noun	Topic-set	$D\alpha$ Features	Language-Specific
where $D\alpha$ Features are gender, number and person			

The rule now states that the governor assigns $D\alpha$ Features through its domain, generating the appropriate grammatical form of the topic noun. Its grammatical form is

language specific. (Below in Section 3 I will discuss the grammatical form of the topic noun in Hausa, both its form at the onset boundary and internal to the topic-set.)

The crucial claim that follows from this discussion is that an anaphor and its antecedent must be constituents of the same topic-set. This means that an anaphor (whether a pronoun or zero anaphora) is the grammatical manifestation of a topic noun internal to its topic-set. The antecedent that is coindexed with the anaphor is a topic noun. Interrelationships between embedded topic-sets will illustrate this claim. The reader is referred to Figures 5 and 6. Again, the term pronoun (PN) is used as an illustration.



where $T-N_i$ and PN_i are coindexed

Figure 5
PN Coindexing within
Embedded Topic-Set

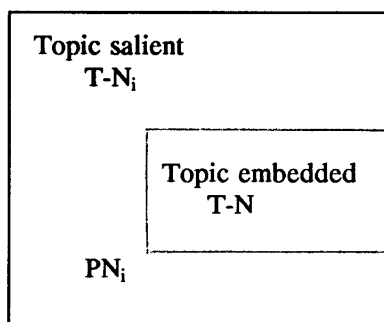


Figure 6
PN Coindexing Across
Embedded Topic Set

In Figure 5 a pronoun (PN) is coindexed with a topic noun (T-N) of the same embedded structure (TE). In Figure 6 a pronoun is coindexed with a topic noun of the same matrix structure (TS), traversing an embedded topic-set. The claim that an anaphor and its antecedent are constituents of the same topic-set follows from the fact that the topic noun governs its own topic-set and that each topic-set operates independently. I will return to this below.

2.5 DISCOURSE-LEVEL AND SENTENCE-LEVEL RULES.

Because Topic-set Theory is a discourse-level phenomenon, viewed as an extension of the structural relationship, government, across sentence boundaries, the question follows as to the relationship between sentence-level and discourse-level rules. The question is important, since discourse receives little attention within Government and Binding (Newmeyer, 1983), and since those who share discourse concerns are critical of sentence-level grammars, specifically in terms of anaphor interpretation (Givón, 1984; Hintikka and Kulas, 1985; Saarinen, 1979).

Van Riemsdijk and Williams (1986; Williams, 1977) have begun to define the possible relationship between sentence-level and discourse-level operations. They suggest that there is a distinction between rules of a sentence grammar and rules which govern higher level discourse concerns, offering a rough criterion to distinguish between such rules: discourse rules will apply across utterance boundaries, will apply globally in a discourse, and will 'violate' rules of a sentence grammar.

Take, for example, verb phrase anaphora. They show that this process can 'violate' the Complex Noun Phrase Constraint. The constraint states that no element contained in a sentence dominated by a noun phrase with a lexical head noun may be moved out of

that noun phrase by a transformation, nor may an anaphoric relation hold between such an element and any element outside the noun phrase (van Riemsdijk and Williams, 1986). Sentences in (7) and (8) illustrate their argument. In (7) the verb *left* in the main clause is in an anaphoric relationship with the empty category (shown here by --) in the embedded clause, in violation of the Complex Noun Phrase Constraint.

7.

John LEFT because he couldn't find anyone else who wanted to --

Such a pattern, however, is not possible with the transformational rule of Wh-Movement. In (8) a transformation has moved the Wh-word *what* out of the embedded clause (the empty category trace identifying the earlier position of *what* is again shown by --).

8.

*WHAT did John find a man who read --

Here the Wh-word *what* has been moved out of the embedded sentence which is dominated by a noun phrase, filled by the head noun *man*; its ungrammatical nature can be accounted for by this violation of the Complex NP Constraint. But (7) is clearly grammatical, though the relationship between the element in question and the empty category is parallel in the two sentences.

These sentences are meant to show that verb phrase anaphora is a discourse-level rule (it 'violates' the Complex NP Constraint), while Wh-Movement is a sentence-level rule (it cannot 'violate' the Complex NP Constraint). The theoretical implication that follows is important, viz. that sentence-level and discourse-level phenomena operate at two distinct levels and can, therefore, be studied independently. At the sentence level, one is interested in the dynamic that constrains noun phrase movement (via transformations). The rules that 'violate' sentence level rules such as verb phrase anaphora are interesting, but they fall outside the purview of a grammar that is interested in sentence structure alone.

Topic-set Theory provides a framework to readdress the interrelationships between sentence- and discourse-level rules. For example, though Government and Binding offers a theoretical account for the interpretation of anaphora at the sentence level, van Riemsdijk and Williams (1986) note that a sentence-level grammar cannot predict when a pronoun will occur in a sentence. Those concerned with discourse matters have been quick to note this (Longacre, 1976). It is argued that the distribution of pronouns, for example, can only be addressed at the discourse level. In addition, a sentence-level grammar can not provide a context for the application of transformational rules (Jaggar, 1978).³

In the theoretical discussion here, it is proposed that there are unique interrelationships which exist between Topic-set Theory and other rules in the grammar. It is possible that discourse-level rules and sentence-level rules operate both independently and dependently. For example, Noun Phrase Agreement in (4) states that features of the head noun spread throughout the noun phrase. As noted in (3) above, a masculine singular head noun assigns the features, masculine-singular, throughout its noun phrase, generating, for example, the masculine-singular linker, *-n* 'of.' This rule

³ The relationship between Topic-set Theory and the transformational rules of a given language falls outside the purpose of this paper. And yet it seems possible that topic-sets might provide the context in which to define the mechanism that requires the application of such sentence-level rules. The passive transformation, for example, might apply to maintain the topic-set structure of the narrative. If this can be shown, the passive structure would be obligatory and dependent upon the topic-set structure.

operates independently of Topic-set Theory in that the topic noun assigns only D features. In other words, if a topic noun is feminine, Topic-set Theory does not predict that all constituents of the topic-set domain will be assigned the feature, feminine. Agreement between a head noun and a linker, for example, is a phrase level operation whose domain is the NP node (or XMax). Operations relating to the subject of Topic-set Theory are analogous to but should not be blurred with noun phrase operations. This independence suggests that (some) discourse rules and some lower level rules operate in parallel.

The fact that a noun (phrase) can function at distinct levels, conditioned upon its level of operation is important. Two observations are necessary. First, as shown above, a noun can function as a head noun (of a noun phrase) and as a topic noun (of a topic-set). And second, though a noun (phrase) has a variety of functions at the sentence level, a topic noun functions only as the grammatical subject of those verb(s) which are elements of the topic-set. Specific examples will follow in Section 3.

However, there are also dependent relationships. Take, for example, the sentence in (9).

9. John wants him to go

By definition Topic-set Theory predicts that the noun phrase **John** and the pronoun **him** should be coreferential, since it appears that **John** and **him** are constituents of the same topic-set (at least to this point there is no mechanism to block this interpretation). Such an interpretation would be incorrect. However, the sentence in (9) is not a problem if one recognizes dependent relationships between Topic-set Theory and the sentence-level grammar: a well-known sentence-level rule blocks the interpretation that **John** and **him** are coreferential.⁴ Consequently Discourse Alpha Feature Assignment defined in (6b) will not apply.

This dependent relationship suggests that there is a converging of discourse-level and sentence-level operations. The interrelationship between D α feature assignment and the participant reference rules of a language (see Figure 4 above) provides a context that will account for the generation of pronouns. It follows that pronoun generation is subject to discourse-level concerns (participant reference scheme). And yet the sentence in (9) shows that some sentence-level rules (principles of binding) block the application of Discourse Alpha Feature Assignment.

2.6 SUMMARY.

Topic-sets are configurational domains larger than sentences, which abstract boundaries mark. Two operational features characterize topic-sets, topic noun government and operational independence. Each topic noun governs its topic-set domain and assigns D α Features. That assignment provides the coreferential link between an anaphor and its antecedent. Topic-set boundaries mark the domain and provide the mechanism for operational independence.

Based upon this theoretical discussion, we turn now to some details of Hausa narrative structure. Application of Topic-set Theory will better illustrate the theoretical discussion. I also make language-specific claims with regard to the participant reference rules of Hausa narrative.

⁴ The rule that blocks the application of Discourse Alpha Feature Assignment is taken from Government and Binding (van Riemsdijk and Williams, 1986). Specifically, the rule states that a non-reflexive pronoun must be free in its governing category and thus cannot be coindexed with the subject of the same clause.

3. TOPIC-SET THEORY AND HAUSA NARRATIVE

3.0 INTRODUCTION

The focus of this section is the application of Topic-set Theory to Hausa narrative. Specific concerns are the topic-set structures, topic noun identification, and the internal structure of the topic-set. I will show that speakers of Hausa employ two strategies to identify topic nouns: speakers will (1) generate topic nouns in subject position, and (2) promote a noun phrase into topic noun status. However, before defining these strategies, it is necessary to clarify the basic sentence grammar of Hausa (for a complete account see Cowan and Schuh (1976)).

3.0.1 Sentence-Level Constituents

Constituents of a verbal sentence are a subject noun phrase, a person-aspect marker, and a verb with following optional elements (e.g., indirect object, direct object, prepositional phrases, and adverbs in that order). The subject noun phrase and person-aspect marker agree in gender, person, and number.⁵ Nonverbal sentences consist of a subject noun phrase, a progressive aspect marker with *nàà*, and a noun phrase (e. g., *kùnkuruu ya-nàà ganii* 'Tortoise is seeing' (see below). In terms of Topic-set Theory we are concerned with the interpretation of subject noun phrases, person-aspect markers, and objects (direct and indirect).

3.0.2 Topic-set Theory Application

In terms of application, Topic-set Theory is concerned with three matters: (1) the identification of the topic noun (this is important, since topic nouns introduce the topic-set and, as governors, assign D α Features) (Sect.3.1); (2) defining the internal structure of the topic-set (Sect.3.2); (3) accounting for the distribution of noun phrases (Sect.3.3).

3.1 TOPIC NOUN IDENTIFICATION

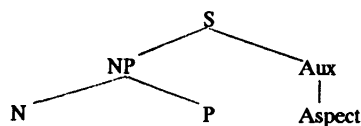
Speakers of Hausa employ two strategies to identify topic nouns in narrative texts. The first strategy is to generate a topic noun in subject position, the second to promote a noun phrase into topic noun status.

3.1.1 Generate a topic noun

The first strategy that speakers of Hausa employ to identify topic nouns is to generate a topic noun in subject position. The text *Kùnkuruu dà `Ungùluu* 'Tortoise and Vulture' in (10) illustrates this strategy.

⁵ I initially split the person-aspect marker into two morphemes in the deep structure. (i) illustrates this interpretation.

(i)



This interpretation claims that the person-aspect marker (P) is within the domain of Noun Phrase Agreement (see (4) above). Once this rule has applied, a rule comparable to English Affix Hopping will apply, generating the surface structure form of the person-aspect marker.

10.

S#	Pre-clause	NP-sub	PA	Verb	(wa)/NP	Post-clause
1	K'illum always	kùnkuruu tortoise	ya-nàà P		gani-n mak'wàbta-n-sà seeing-of neighbors-of-his tsuntsààyee, birds su-nàà taashì samà. P flying sky	
2	Rân nan sai day this	haushii jealousy	ya RC	kaamàà seize	shi. him	
3		—	Ya RC	ceè say		Direct Quote
4	Sai	—	ya RC	jee go	waje-n ùngùluu place-of vulture	
5		—	ya RC	ceè say	ma-sà to him	Indirect Quote
6	Dà farkoo with first	ùngùluu vulture	ya RC	k'i refuse		dòòmin ya ga hakànan because RC see thus bà za-ì yìwu ba. neg F possible neg
7	`Ammaa but	kùnkuruu tortoise	ya RC	làllàashee persuaded	shi him	har ùngùluu ya yàrda. until vulture RC agree
8	Shii kèè nan, sai (so it was)	ùngùluu vulture	ya RC	ḍàùki lift	kùnkuruu tortoise	
9		—	ya RC	yi do	samà dà shii sky with him	
10		—	ya RC	tàfi go		
		—	ya RC	tàfi. go		
11	Dàgà can from there	ùngùluu vulture	ya RC	sak-oo release-to	kùnkuruu, tortoise	
12		—	ya RC	cèè, say		Direct Quote
13	Kààfin kùnkuruu before tortoise yà budèè bààkii S open mouth	—	yaa C	faad-oo fall-to	kâ-n duwààtsuu, head-of stones	
14		—	yaa C	tararràtsee. shattered		

In sentence 1 the narrator has generated the topic noun, **kùnkuruu** 'tortoise,' in subject position. In sentence 2 a second topic noun, **haushii** 'jealousy,' appears in subject

position. Additional examples are in sentences 6 (*ùngùluu* 'vulture'), 7 (*kùnkuruu* 'tortoise'), 8 (*ùngùluu*), 11 (*ùngùluu*), and 13 (*kùnkuruu*).

Note that each topic noun functions as the grammatical subject of those verbs which are constituents of the topic-set governed by that topic noun. Thus *ùngùluu* of sentence 8 functions as the grammatical subject of *ya ðàùki* ('lift' sentence 8), *ya yi* ('do' of sentence 9), and *ya tàfi, ya tàfi* ('go and go' of sentence 10), because sentences 8-10 form a single topic-set.

3.1.2 Promote into Topic Noun Status

The second strategy employed in Hausa to identify topic nouns is the promotion of a noun phrase into topic noun status. (The reader should note that I have borrowed the term **promote** from Relational Grammar, though with a specialized meaning; for this study, to **promote** means to designate a non-subject sentence constituent as a topic noun.) There are two subsets of constituents which speakers of Hausa promote, direct and indirect object pronouns, and definite direct object noun phrases. An application of Longacre's (1989a) participant reference scheme will account for the distribution of these.

I first illustrate direct object pronoun promotion. The reader is referred to (11), an abstraction of (10) presented here to better facilitate the discussion.

11.

S#	Pre-clause	NP-sub	PA	Verb	(wa)/NP	Post-clause
1	K'ullum always	kùnkuruu tortoise	ya-nàà P		gani-n mak'wàbta-n-sà seeing-of neighbors-of-his tsuntsààyee, birds su-nàà taashì samà. P flying sky	
2	Rân nan sai day this	haushii jealousy	ya RC	kaamàà seize	shi. him	
3		—	Ya RC	ceè say		Direct Quote
4	Sai	—	ya RC	jee go	waje-n ùngùluu place-of vulture	
5		—	ya RC	ceè say	ma-sà to him	Indirect Quote

The reader will note that the person-aspect markers are identical in sentences 2-5. It is possible, therefore, for one to interpret this sequence of sentences as a single topic-set, with the masculine singular topic noun, *haushii* 'jealousy,' governing the person-aspect marker *ya*, of sentences 2-5. Since the subject of sentence 3 is realized as zero anaphora (shown by the absence of a subject nominal), it is possible that *haushii* is the (understood) subject of that sentence. The following translation, however, counters that interpretation.

12.

Tortoise was always watching his neighbors, the birds, flying around in the sky. One day his jealousy (**haushii**) overcame him. [He] said, 'Man, if I could fly in the sky I would really be happy.'

It seems clear that speakers of Hausa would not interpret **haushii** 'jealousy' as the subject of sentence 3; jealousy lacks the ability to speak. Instead, what is going on here is that speakers of Hausa promote the direct object pronoun, **shi** 'him,' of sentence 2 into topic noun status. The subject of sentence 3, then, is **kùnkuruu** 'tortoise,' the referent for the pronoun **shi**. Under this interpretation, there are three topic-sets here; the first consists of sentence 1, the second consists of sentence 2, and the third consists of sentences 3-5. Both 1 and 2 show the generation of a topic noun in subject position; sentence 3 shows promotion of a direction object pronoun (from 2) to topic-noun status.

A similar example is in (13). The text is entitled Muugù-n `Alk'aalii 'The Evil Judge'.

13.

S#	Pre-clause	NP-sub	PA	Verb	(wa)/NP
1	Daà earlier	àlk'aalii judge	ya-nàà P	tsàmmanii thinking	kwatanci-n-sà awaakii ukù nee. proposal-of-him goats 3 be
2		—	Ya RC	kirawoo call	shì, him
3		—	ya RC	zoo. come	
4		`Alk'aalii judge	ya RC	cèè say	ma-sà... to-him

The topic noun, **àlk'aalii** 'judge,' is the subject of sentences 1 and 2 but not of sentence 3 as shown by the following translation.

14.

Earlier the judge had been thinking that his indication meant three goats. So [he] summoned him [**shi** = the defendant] again, and [he] (= the defendant) came. The judge said to him...

Again, there is no subject nominal in sentences 2 and 3, suggesting a single topic-set. However, in fact the direct object pronoun of 2 is promoted to topic noun status in 3, so it is the man who is called who in fact comes. The presence of the nominal subject **àlk'aalii** in 4 confirms this analysis, for it would be unnecessary if there were no change in subject from 3.

A final illustration is in (15). The text is from the introduction of the novel Magana Jari ce 'Talk is Wealth' (see K. Cain in this volume for a summary of this text).

15.

S#	NP-sub	PA	Verb	(wa)/NP	Post-clause
1	Sarkii chief	ya RC	yi do	murnàà dà wannàn mafarkii. joy with this dream	
2	—	ya RC	ɗauk-oo take-to	kudii dà riigunàà, money and gowns	3.— za-ì baà maalàmi-n nân. F give teacher-def here
4	—	ya RC	cèè say	Indirect quote (S's 5 and 6)	
5	shii bàà kudii sukà kaawoo shì ba. he neg money RC bring him neg.				
6	— ya zoo nèè, — yà isad dà ùmùrnii, — yà yi salamàà, — yà tàfi. RC come be S deliver command S do farewell S go				

Sentences 5 and 6 are an indirect quote. The speaker is **maalàmi-n** 'teacher-def.' Note the object pronoun, **shì** 'him,' in sentence 5. The pronoun is promoted into topic noun status. Consequently, it is understood that the teacher is the subject of the verbs in sentence 6 (I will discuss **maalàmi-n** of sentence 3 below). Note the following translation.

16.

The chief was joyful because of the dream. [He] took money and gowns to give the teacher. [The teacher] said that they shouldn't bring money to him (=the teacher). [He] came only to deliver the command, to say good-bye, and then to leave.

(Note that this text shows that the topic-set structure of an indirect quote is identical to that of narrative proper.)

Speakers of Hausa also promote indirect object pronouns, as shown in (17). The text is from Dilaa dà Zalɓèè 'Jackal and Heron' (Kraft, 1973).

17.

S#	Pre-clause	NP-sub	PA	Verb	(wa)/NP
1	wata raanaa a day	dilaa jackal	ya-nàà P		cí-n kààzaa eating-of hen
2	sai	wani k'áshii a bone màì tsìinii sharp	ya RC	kaakàree jam	ma-sà à màk'oogwàroo. to-him at throat
3		—	ya-nàà P		neema-n màì cirèè ma-sà. seeking-of one pull-out to him
4		—	ya RC	cèè say	Indirect quote
5	sai	zalɓèè heron	ya RC	zoo, come	

In this text, the indirect object pronoun **ma-sà** 'to-him' (sentence 2) is promoted into topic noun status. Note that **k'áshii** 'bone' is the subject/topic noun of sentence 2.

Speakers of Hausa, however, will interpret the subject/topic noun of sentence 3 as *dilaa* 'jackal.' Note the following translation.

18.

One day Jackal was eating chicken and a sharp bone got caught in his (*ma-sà*) throat. [He] went looking for someone to pull it out for him. He said whoever pulled it out for him, he would give him a reward. Heron came along and said that he would do it.

The second subset of constituents which speakers of Hausa promote is definite direct object noun phrases (it is reasonable to assume that promotion of definite indirect object noun phrases exists, but no examples appear in the texts available to me.) The reader should note that the associative linker and the definite article have the same form (though at times tone differences exist).

The text in (19) illustrates definite noun phrase promotion. The text is from the novel *Magana Jari Ce* 'Talk is Wealth'. (19) is an abstraction of (15).

19.

S#	NP-sub	PA	Verb	(wa)/NP	Post-clause
1	Sarkii chief	ya RC	yi do	murnàà dà wannàn mafarkii. joy with this dream	
2	—	ya RC	ɗauk-oo take-to	kudii dà riigunàà, money and gowns	3. — za-ì baà maalàmi-n nàn. F give teacher-def here
4	—	ya RC	cèè say	Indirect quote (S's 5 and 6)	

Note that the definite noun phrase, *maalàmi-n* 'the teacher,' of sentence 3 is promoted into topic noun status and becomes the subject of the verb *cèè* 'say,' in sentence 4. Note the following translation.

20.

The chief was joyful because of the dream. [He] took money and gowns to give the teacher (*maalàmi-n*). [He] said that they shouldn't bring him any money.

It might be helpful to contrast (19) with the portion of text in (10). As noted above, speakers of Hausa promote only definite noun phrases; (10) shows that an indefinite noun phrase is not promoted. Rather, *ùngùluu* 'vulture' continues as subject of the verb *yì* 'do' of sentence 9; note also sentence 11 (*kùnkuruu* 'tortoise'), which does not get promoted to subject in (12).

3.2 INTERNAL STRUCTURE OF TOPIC-SETS

The discussion above has shown that speakers of Hausa employ two strategies to identify a topic noun. This section will consider the internal structure of a topic-set.

Internal to a topic-set, a topic noun takes one of two forms, zero anaphora or a pronoun. Zero anaphora is used in the grammatical subject position, while a pronoun is used as the grammatical object (direct or indirect). I will now illustrate each of these in turn.

Zero anaphora is used in the grammatical subject position (shown by the underline). The first example can be seen in (10) above. Note in sentence 8 that *ùngùluu* 'vulture' is the topic noun; as topic noun, *ùngùluu* is the grammatical subject of

ya *ɗàùki* 'lift.' Note also that *ùngùluu* is the understood subject of *ya yi* 'do' (sentence 9) and of *ya tàfi ya tàfi* 'go and go' (sentence 10). Sentences 8-10 form a single topic-set, with zero anaphora throughout the consecutive subject positions.

The second example can be seen also in (10) above. Note in sentence 2 that the pronoun, *shi* 'him,' has been promoted into topic noun status (shown by the pointer). As the topic noun, the referent *kùnkuruu* 'tortoise' becomes the understood subject of *ya ceè* 'say' (sentence 3), of *ya jee* (sentence 4), and *ya ceè* (sentence 5), i.e., the following sentences of the topic-set. Its grammatical form, because of the participant reference rules, is zero anaphora.

Pronouns are used as objects internal to a topic-set (e.g., sentence 2 in (10)).

3.3 HAUSA PARTICIPANT REFERENCE

This section will outline the participant reference rules for Hausa narrative. The discussion will account for the grammatical form of the noun phrase and its distribution. Underlying the discussion is the assumption that there are two subtypes of narrative, which I term here **animal** and **human**. This bifurcation is tentative, though it provides a helpful backdrop to explain features of participant reference.

I rely upon Ricoeur's (1984) extensive discussion of narrative to formulate the possibility of narrative subcategorization. Ricoeur has argued that the category narrative is a legitimate framework to include history, fiction, and novels (including stream-of-consciousness novels). The basis for his argument is that each subtype shares the feature **emplotment**.⁶ But at the same time, each subcategory shares its own distinctive feature(s). For example, non-durative aspect (e.g., aorist or historical present) characterizes history and stories, while cognitive verbs characterize stream-of-consciousness novels (cf. Longacre's (1983a) discussion of case). Ricoeur also introduces quasi participants, quasi actions, and quasi plots to characterize history, since nations and governments perform actions as opposed to individuals in narrative.

The fact that stories, history, and novels share emplotment (the salient features that holds the category narrative together) although each has its own distinctive features (that allow for variation), suggests that a subcategorization of narrative is possible. The distinctive features of Hausa narrative vis-à-vis participant reference is that in animal narrative, it is not necessary to integrate a participant into the text. By contrast, in human narrative integration is necessary. This distinction is important in that the grammatical form of a noun phrase and its distribution and the facts of noun phrase promotion are affected. I will now discuss this matter in detail.

Participant reference for animal and human discourse is distinct as shown in (22).

22. Object Pronoun Promotion

(a) Animal Discourse

N ---> Pn ---> Promotion

(b) Human Discourse

N ---> Def. NP ---> Pn ---> Promotion

⁶ Emplotment is a term used to describe the structure and development of narrative. Because a narrative has a beginning, a middle, and an end, a reader can perceive a narrative both as a whole and in its parts which constitute the whole. Consequently, a reader is able to 'follow' a narrative, identifying the climax and the interrelationships between the climax and the individual parts. I see interpretation of narrative, then, as a complex activity in which an interpreter remembers the content of a text and yet anticipates subsequent information, all of which is coordinated at the time of reading.

The distinctive feature that sets off the subcategorization is that in human narrative a narrator must integrate a participant before a pronoun can be promoted into topic noun status (a definite noun phrase will serve to integrate a participant).

First, we will consider topic noun identification. In terms of participant reference, the focus here is participant introduction and reintroduction. Note again the text in (10) above, an animal narrative. There are two participants, *kùnkuruu* 'tortoise (sentence 1) and *ùngùluu* 'vulture' (sentence 6). In both cases a simple noun phrase (proper name) introduces the participants. Once introduced, a pronoun is used to refer to each participant (e.g., *shi* 'him' refers to the tortoise in sentence 2; *shi* refers to the vulture in sentence 7). Note in sentence 2 that *shi* (= *kùnkuruu*) is promoted into topic noun status. It is at this point in the participant reference scheme that animal and human texts differ. In human texts, a pronoun is promoted only after the participant has been integrated (through reference by means of a definite NP); this is illustrated below. When in topic noun position, zero anaphora tracks both participants (e.g., *ùngùluu* in sentences 8-10; *kùnkuruu* in sentences 13-14).

(23) illustrates a human narrative. This portion of text is from the novel *Magana Jari Ce* 'Talk is Wealth'.

23.

S#	Pre-clause	NP-sub	PA	Verb	(wa)/NP
1	Ya-nàà nan ciki-n wannàn bak'i-n cikiì, sai rân nan this blackness-of inside ? day this	wani sheehù-n maalàmii a leader-of teacher	ya RC	zoo. come	
2		—	ya RC	cèè say	ma-sà to-him Direct Quote
3		Sarkii chief	ya RC	yi do	murnàà dà wannàn mafarkii. joy with this dream
4		—	ya RC	ɗauk-oo take-to	kudii dà riigunàà, — za-ì baà maalàmi-n nàn. money and gowns F give teacher-def here
5		—	ya RC	cèè say	Indirect quote (S's 6 and 7)
6	shii bàà kudii sukà kaawoo shì ba.	he neg money RC	bring	him neg	
7	— ya zoo nèè, — ya isad dà ùmùrnii, — ya yi salamàà, — ya tàfi.	RC come be	S deliver command	S do farewell	S go

Note that an indefinite noun phrase, *wani sheehùn maalàmii* 'a leader-of teacher,' introduces the participant in sentence 1 (the chief [*sarkii*] in sentence 3 has already been introduced earlier in the novel). As topic noun the teacher is the grammatical subject of *ya zoo* 'came' (sentence 1) and the understood subject of *ya cèè* 'said' (a constituent of the same topic-set). Note that in sentence 4 a definite noun phrase, *maalàmi-n nàn* 'teacher-def here,' refers to the same participant. As discussed above *maalàmi-n* is promoted into topic noun status, so that a new topic-set is established and the same participant continues as subject of sentence 5. Note also that in sentence 6 the direct

object pronoun *shi* 'him' refers to the same participant. The pronoun is promoted into topic noun status, establishing an (embedded) topic-set, and continues as subject in sentence 7. Thus the sequence for a human narrative is as follows: participant introduction (indefinite noun phrase), participant integration (definite noun phrase), and pronoun promotion. The following translation shows this interpretation.

24.

He (the chief) was still feeling sad when one day a deep scholar came. He (= *maalàmii*) said to him, 'I had a dream yesterday. I was told that if you will gather together 40 teachers, and if they pray for you for 40 days, if God wills, you will have offspring.' The chief was joyful because of the dream. He took money and gowns to give the teacher (*maalàmi-n*). He (the teacher) said--they shouldn't bring him any money. He came only to deliver the command, to say good-by, and then to leave.

The text in (25) further shows the sequence in human narrative. The text is entitled *Muugù-n`Alk'aalii* 'The Evil Judge' (Kraft, 1973).

25.

S#	Pre-clause	NP-sub	PA	Verb	(wa)/NP	Post-Clause
1		—	Akà RC indef.	kai bring	wani k'aaraa wuri-n àlk'aalii. a complaint place-of judge	
2		—	Akà RC indef.	yi do	shàrii'àà. law	
3		`Alk'aalii judge	ya RC	ga see	baà shi dà gàskiyaa, neg him with truth	
4		—	ya RC	ceè say	ma-sà to-him	Direct Quote
5		Mùtumi-n man-def	ya RC	kwatàntà gave-sign	ukù dà hannu-n-sà, 3 with hand-of-his	
6		—	ya RC	ceè say		Indirect Quote
7	Daà earlier	àlk'aalii judge	ya-nàà P	tsàmmaniì thinking	kwatanci-n-sà awaakii ukù nee. proposal-of-him goats 3 be	
8		—	Ya RC	kirawoo call	shì, him	
9		—	ya RC	zoo. come		
10		`Alk'aalii judge	ya RC	cèè say	ma-sà to-him	Direct Quote

Note in sentence 1 that an indefinite noun phrase (simply marked by the 3rd person indefinite aspect marker, *akà*) introduces the participant (the participant *mùtumi-n* 'the man' is not explicitly mentioned until sentence 5). The aspect marker is sufficient to mark the participant as the topic noun. The man is one of the grammatical subjects of *akà kai* 'bring' and of *akà yi* 'do' in sentence 2. Note in sentence 5 that a definite

noun phrase (**mùtumì-n** ‘the man’) marks the participant. As topic noun, **mùtumì-n** is the grammatical subject of **ya kwatàntà** ‘give sign’ (sentence 5) and the (understood) grammatical subject of **ya ceè** ‘say’ (sentence 6).

Of particular importance here is the use of pronouns. Note in sentence 4 that the pronoun, **ma-sà** ‘to-him,’ refers to the man. The pronoun, however, is not promoted into topic noun status. Instead the narrator has generated a definite noun phrase, **mùtumì-n**, in topic noun position (sentence 5). By contrast, in an animal narrative, the pronoun would have been promoted and there would not be a need to generate the topic noun in sentence 5. Note also sentence 8, where the pronoun **shi** ‘him’ refers to the man. Unlike **ma-sà** above **shi** is promoted into topic noun status and is the understood grammatical subject of **ya zoo** ‘come’ (sentence 9). Recall that in human texts, a participant must first be integrated, and only then is the pronoun promoted. In this text the man who brought the complaint is integrated in sentence 5; the pronoun occurs in sentence 4.

There is one additional matter that must be addressed to account for participant reference in Hausa narrative. The discussion above has shown that speakers of Hausa have a significant inventory of grammatical forms for the noun phrase. The question which follows is whether there is a general rule to account for their distribution. There seems to be. Figure 7 summarizes the rule.

Position	Noun phrase Structure
Topic noun	Zero anaphora
Introduction	(a) Animal: proper name (b) Human: indefinite noun phrase
Integration	(a) Animal: --- (b) Human: definite noun phrase
Tracking	Zero anaphora
Object promotion	(a) Animal: pronoun (b) Human: definite noun phrase pronoun if participant is integrated
Object non-promotion	(a) Animal: indefinite noun (b) Human: indefinite noun pronoun if not integrated

Figure 7

Distribution of Noun Phrases

3.4 SUMMARY

In summary, speakers of Hausa employ two strategies to identify topic nouns: speakers generate topic nouns in subject position, and speakers promote nominals (including both pronouns and definite noun phrases) into topic noun status. In animal texts a proper name introduces a participant, while in human narrative an indefinite noun phrase introduces a participant. Pronouns can be promoted in both animal and human narrative, but in human narrative the narrator must have integrated the participant (using a definite noun phrase) first. Zero anaphora tracks participants in both animal and human narrative.

4. CONCLUSIONS

Anaphora interpretation is rule governed. In this paper I have borrowed theoretical claims from Government and Binding and discourse grammar and synthesized them into a proposal termed Topic-set Theory.

Topic-set Theory claims that narrative discourse consists of topic-sets, which are discourse level configurational domains larger than the sentence. Two important features of the theory are topic noun government and operational independence. The former governs the domain of the topic-set and assigns Discourse \propto Features. The latter entails the notion that each topic-set is independent of the other(s). Each new topic noun introduces a new topic-set. In terms of application of the theory, there are two matters of concern: determining how a language identifies a topic noun, and determining the internal structure of the topic-set.

In this paper Topic-set Theory was applied to Hausa narrative. I illustrated the theoretical claims and made language-specific claims. Speakers of Hausa employ two strategies to identify topic nouns: (1) generate a topic noun in subject position, and (2) promote a noun phrase into topic noun status. The internal structure of a topic-set is shown by the use of either a pronoun or zero anaphora.

Several implications follow from this study. First, the claim that Government and Binding (and less progressive forms of Transformational Grammar) has no relationship with discourse grammar needs modification; this study has suggested that some sentence-level configurations can be extended across sentence boundaries. Second, the claim that sentence-level and discourse-level rules are different needs modification; this study has shown important overlap exists between these two levels of rules, and further study might reveal additional similarities. Third, independence of grammatical levels suggests that research on sentence-level structures can be formulated independently of discourse research, though eventually the two levels must be integrated. It follows that there is a dependent relationship between Topic-set Theory and the interpretation of anaphora at the sentence level. And fourth, linguistic modeling might profit from research in parallel distributed processing models from psychology and artificial intelligence (e.g. McClelland, 1988; McClelland and Rumelhart, 1986). This study has suggested that speakers of language apply rules in parallel (i.e., sentence- and discourse-level rules are independent of one another) and in series (i.e., sentence- and discourse-level rules are dependent upon one another). Parallel distributed processing models can accommodate both forms of processing.