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Classifiers and DP structure in Nuosu Yi: Evidence from tone

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This paper investigates classifiers and determiner phrases (DPs) in Nuosu Yi (Tibeto-Burman, China), a typologically exceptional language featuring both obligatory classifiers and an overt definite determiner. Nevertheless, the nature of the definite determiner remains debated. Gerner (2013) argues that the definite determiner consists of a classifier and the definite element *su*^{33}, whereas Jiang (2018; 2020) contends that *su*^{33} alone functions as the definite determiner. These analyses, however, overlook the critical role of tone in Nuosu Yi definiteness marking. Drawing on original fieldwork data, I argue that the definite determiner in Nuosu Yi is spelled out as Ⓗ*su*^{33}, consisting of a floating H tone and the determiner *su*^{33}. Crucially, the feature [+definite] is realized as a floating H tone. This feature triggers Clf-to-D head movement, after which the floating H tone docks onto the preceding classifier if they form a complex head (i.e., a single morphosyntactic word). This analysis challenges the assumption that Clf-to-D movement occurs only in article-less classifier languages, as observed in several Southeast and East Asian languages (Simpson 2005; Wu & Bodomo 2009). In contrast, the Nuosu Yi data show that Clf-to-D head movement can also occur in languages with an overt D, indicating that this movement is independent of whether D is overt or covert. By incorporating tonal data, this study provides new insights into the morphosyntactic nature of DPs in classifier languages and highlights the use of tone in syntactic disambiguation (head movement vs. non-movement structures).

1 Introduction

Nuosu Yi (Tibeto-Burman, China) is well-known as a counterexample to Chierchia's (1998) original hypothesis that classifier languages lack definite determiners, as it features both obligatory classifiers and an overt definite determiner.[1] This is illustrated in (1), where the classifier is obligatory.[2]

(1) *Nuosu Yi DP construction:* [N-Clf-*su*^{33}]
sse^{33}vo^{33} *(ma^{44}) su^{33}
boy *(CLF) SU
'the boy' (definite)

Given that classifier languages typically lack definite determiners, the Nuosu Yi DP construction in (1) is typologically exceptional. However, the precise role of the definite determiner in Nuosu Yi remains under debate. Gerner (2013) argues that the definite determiner comprises a classifier and the definite element *su*^{33} as they form an inseparable bundle, whereas Jiang (2018; 2020) contends that *su*^{33} alone functions as the definite determiner. This paper aims to unify these two perspectives by proposing a Clf-to-D head movement approach. In all the following examples, I will gloss *su*^{33} as 'DEF', standing for 'definite determiner'. However, as we will see in Section 4.2, the specific Vocabulary Insertion rule for the Nuosu Yi definite determiner is more complex.

Clf-to-D head movement has been proposed to account for the definite bare classifier phrases observed in several East and Southeast Asian languages (Simpson 2005; Wu & Bodomo 2009; Li & Bisang 2012). The key idea is that classifiers express definiteness by moving to the D head, which is the locus of definiteness. For instance, Wu & Bodomo (2009) argue that in Cantonese, an article-less classifier language, classifiers denote definiteness by raising to D, thus licensing the null definite D. Based on novel field data of Nuosu Yi's definite [N-Clf] construction, in which *su*^{33} is optional (see (2) below), I argue that the definite [N-Clf] in Nuosu Yi is best captured by Clf-to-D head movement, followed by definite tone docking. The tone change on the classifier, from 33 to 44, results from definite tone docking and crucially signals the syntactic raising of Clf to D. This proposal thus retains Gerner's (2013) insight that (the complex head) D consists of both a classifier and *su*^{33}, as well as Jiang's (2018; 2020) view that *su*^{33} itself functions as the definite determiner.

[1] To the best of my knowledge, Jiang (2012; 2015; 2018) was the first to explore the theoretical implications of the existence of a definite determiner in Nuosu Yi, identifying it as the only classifier language with a definite determiner. Since then, this typologically exceptional language has gained increasing attention in the literature and has been cited in numerous works on DP structures and definiteness (e.g., Little & Winarto 2019; Hall 2019; Dayal & Sağ 2020; Moroney 2021; Sağ 2025).

[2] In this paper, I follow the official Yi Pinyin romanization for consonants and vowels but use IPA tone markers for ease of presentation.

(2) [N-Clf-(*su*^{33})]: tone change on the classifier
sse^{33}vo^{33} **ma^{44}** (su^{33}) (ma^{33} → ma^{44})
boy CLF (DEF)
'the boy' (definite)

Regarding the tone change patterns in Nuosu Yi DPs, in (2), the underlying 33 tone classifier *ma*^{33} changes to 44 when it precedes the definite determiner *su*^{33}. Notably, this tone change is obligatory for a definite interpretation, regardless of whether *su*^{33} is present. In other words, the tone change persists even when *su*^{33} is omitted. By contrast, this tone change does not occur in the presence of a numeral, as shown in (3) (cf. (2)). Crucially, this contrast demonstrates that what plays a role in triggering tone change on classifiers is by no means simply the linear word order, but the underlying syntactic structure. As I will show in Section 4.2, what matters is not linear adjacency but structural adjacency, further supporting a head movement analysis.

(3) [N-Num-Clf-*su*^{33}]: no tone change on the classifier
sse^{33}vo^{33} nyi^{21} **ma^{33}** su^{33}
boy two CLF DEF
'the two boys' (definite)

The rest of the paper is organized as follows. Section 2 introduces the stringent [Clf-D] order in Nuosu Yi, focusing on the tone change patterns exhibited in Nuosu Yi DPs. Section 3 reviews previous accounts of definite classifier and indefinite numeral classifier phrase constructions and discusses another Sino-Tibetan language that marks definiteness through tone changes on classifiers. Section 4 presents the main analysis, arguing that the definite [N-Clf] phrase in Nuosu Yi arises from Clf-to-D head movement, with the classifier's tone change resulting from the docking of a definite floating H tone from D onto the preceding classifier. Section 5 argues that the tone change in Nuosu Yi DPs is not a case of tone sandhi but represents grammatical tone. Section 6 discusses the broader implications of this study, particularly the role of tone in disambiguating syntactic structures, and the availability of Clf-to-D head movement in languages with an overt D. Section 7 concludes.

2 The Clf-D order in Nuosu Yi and tone changes

2.1 A classifier language with D

Nuosu Yi, a Sino-Tibetan language spoken in the Liangshan Yi Autonomous Prefecture of Sichuan, China, is typologically unique. Unlike most classifier languages, such as Mandarin Chinese, Japanese and Korean, Nuosu Yi features an overt definite determiner, i.e., *su*^{33} (Jiang 2012;

2018; 2020). In Nuosu Yi DP constructions, *su*^{33} linearizes after the obligatory classifier, turning an indefinite DP (i.e., N-Clf, (4a)) into a definite one (i.e., N-Clf-*su*^{33}, (4b)).[3]

(4) a. Nga^{33} sse^{33}vo^{33} ma^{33} mo^{33} o^{44}.
1SG boy CLF see PFV
'I saw a boy.' (indefinite)

b. Nga^{33} sse^{33}vo^{33} *(ma^{44}) **su^{33}** mo^{33} o^{44}.
1SG boy *(CLF) DEF see PFV
'I saw the boy.' (definite)

c. Nga^{33} sse^{33}vo^{33} **cy^{44}/a^{33}zzy^{44}** *(ma^{33}) mo^{33} o^{44}.
1SG boy this/that *(CLF) see PFV
'I saw this/that boy.'

Importantly, *su*^{33} is not a demonstrative as Nuosu Yi has the proximal demonstrative *cy*^{44} and the distal demonstrative *a*^{33}*zzy*^{44}, which occupy distinct positions from *su*^{33} (4c). Specifically, the demonstrative precedes the classifier whereas the definite determiner *su*^{33} follows it. Furthermore, both *su*^{33} and the demonstratives cannot combine directly with the head noun, and the absence of a classifier leads to ungrammaticality, as indicated in (4b) and (4c).

Additionally, demonstratives and *su*^{33} cannot co-occur within the same nominal domain, see (5).[4]

(5) *sse^{33}vo^{33} **cy^{44}/a^{33}zzy^{44}** ma$^{33/44}$ **su^{33}**
boy this/that CLF DEF
intended: 'this/that boy'

Furthermore, I present two diagnostics providing evidence that *su*^{33} is a definite determiner. The first evidence is from the consistency test (Löbner 1985; Dayal 2004), which is used to distinguish demonstratives from definite determiners (though see Moroney 2019 for potential challenges to this diagnostic). As seen in (6), the definite determiner *su*^{33} leads to a contradiction (6a) while the demonstrative *cy*^{44}/*a*^{33}*zzy*^{44} does not (6b).

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[3] *ma*^{33} is the general classifier in Nuosu Yi, and it can be used with any noun except those that require more specific classifiers, e.g., *ji*^{33} for long, slim objects as in *bi*^{21} *ji*^{33} 'a pen'.

[4] This restriction may be explained by the Principle of Economy of Lexical Insertion, which states that 'making the specifier visible' and 'making the head visible' operate either disjointly or conjointly, depending on the language and on the constituent in the specifier position (Giusti 2002; Alexiadou et al. 2007; Jiang 2018). Under this analysis, Nuosu Yi is a language similar to English in which only one position—either Spec DP or the head D—can be filled. Cross-linguistically, however, languages such as Hungarian and Greek allow both the head D and Spec DP to be filled (Giusti 2015).

(6) *Consistency test* (Jiang 2020: 6)

a. #Nga^{33} si^{33}hni^{33} ma^{44} **su^{33}** hxie^{33}vur^{33}, si^{33}hni^{33} ma^{44} **su^{33}** hxie^{33}-a^{21}-vur^{33}.
1SG girl CLF DEF like girl CLF DEF like-NEG-like
Lit. 'I like the girl but don't like the girl.'

b. Nga^{33} si^{33}hni^{33} **cy^{44}/a^{33}zzy^{44}** ma^{33} hxie^{33}vur^{33}, si^{33}hni^{33} **cy^{44}/a^{33}zzy^{44}** ma^{33}
1SG girl this/that CLF like girl this/that CLF
hxie^{33}-a^{21}-vur^{33}.
like-NEG-like
'I like this/that girl but don't like this/that girl.'

Another diagnostic for definiteness comes from Milsark's (1974) *Definiteness Restriction*, which states that definite expressions are not allowed in existential sentences. Indeed, the definite DP [N-Clf-*su^{33}*] is excluded from the existential *jjo^{33}* 'have' construction in Nuosu Yi whereas the indefinite DP [N-Clf] is not, as exemplified in (7).

(7) *Definiteness restriction test*

a. *Hma^{55}yi^{33} go^{33} **sse^{33}vo^{33} ma^{44} su^{33}** jjo^{33}.
classroom inside boy CLF DEF have
Lit. 'There is the boy in the classroom.'

b. Hma^{55}yi^{33} go^{33} **sse^{33}vo^{33} ma^{33}** jjo^{33}.
classroom inside boy CLF have
'There is a boy in the classroom.'

Given these two diagnostics, I take *su^{33}* to be the definite determiner in Nuosu Yi (to be revised).

On the other hand, similar to typical classifier languages, bare nouns in Nuosu Yi are ambiguous between singular and plural. This is demonstrated in (8a), where the head noun *vo^{55}* 'pig' does not change its form regardless of whether the numeral is singular or plural.

(8) a. **vo^{55}** cy^{21}/nyi^{21}/suo^{33} ma^{33}
pig one/two/three CLF
'one/two/three pig(s)'

b. vo^{55} (*cy^{21}) ma^{44} su^{33}
pig one CLF DEF
'the pig'

c. vo^{55} nyi^{21}/suo^{33} ma^{33} su^{33}
pig two/three CLF DEF
'the two/three pigs'

In the definite DP construction, when the numeral is *cy*^{21} 'one', it must be absent from the DP construction (8b). By contrast, when the numeral is larger than one, there is no such restriction (8c).

In addition, the classifier and the definite determiner form an inseparable bundle and no element can be inserted between them, see (9a) (cf. (9b)).[5]

(9) a. *sy^{21}hni^{33} ko^{55} a^{44}yy^{33} su^{33}
apple CLF big DEF
intended: 'the big basket of apples'
b. sy^{21}hni^{33} a^{44}yy^{33} ko^{55} su^{33}
apple big CLF DEF
'the big basket of apples'

To summarize, Nuosu Yi is typologically rare in that it has both obligatory classifiers and a definite determiner, namely, *su*^{33}. Moreover, the definite determiner immediately follows a classifier and nothing can be inserted between them.

2.2 Definite [N-Clf] phrase and tone change

Nuosu Yi is a tonal language with four tones. There are three lexical tones (i.e., /55/ (H), /33/ (M), /21/ (L)), along with a sandhi tone (i.e., /44/ (MH)) (Lama 1991; Edmondson et al. 2017; Lee & Shen 2024). The minimal pairs shown in **Table 1** demonstrate the contrastive nature of these four tones.

55 TONE	33 TONE	21 TONE	44 TONE
xi^{55} 'bite'	xi^{33} 'thread'	xi^{21} 'such'	xi^{44} 'what'
lo^{55} 'hand'	lo^{33} 'boat'	lo^{21} 'surround'	lo^{44} 'after'
jju^{55} 'waist'	jju^{33} 'oats'	jju^{21} 'mark'	jju^{44} 'NMLZ'

Table 1: Tonal minimal sets in Nuosu Yi (adapted from Gerner 2013: 27).

Lama (1991) proposes that the sandhi tone 44 results from a long-term dissimilatory process involving the 33 and 21 tones in natural speech. Moreover, it has been proposed that the sandhi tone 44 is derived from the 33 tone or the 21 tone in syllable combination (Edmondson et al.

[5] In Nuosu Yi nominal phrases, the head noun can either precede or follow an adjective, followed by demonstratives, numerals, classifiers, and the definite determiner. Note that the definite determiner and the demonstrative cannot co-occur. I take APs as modifiers of NPs and assume an NP-over-AP structure.

2017). Generally, if the 44 tone appears as the first syllable of a two-syllable word or phrase, it is likely that this sandhi tone originally came from a 33 tone, as seen in ***zza*^{33}** 'food' + *zze*^{33} 'to eat' → ***zza*^{44}** *zze*^{33} 'to eat food'. Conversely, if the 44 tone appears on the second syllable of a two-syllable word or phrase, it might originate from a 21 tone, as in the example *jjy*^{33} 'RECP' + ***ndu*^{21}** 'hit' → *jjy*^{33} ***ndu*^{44}** 'beat each other'.

However, in a few cases, the sandhi tone 44 also holds the status of a contrastive tone as in *xi*^{44} 'what', *lo*^{44} 'after', and *jju*^{44} 'NMLZ' (shown in the fourth column of **Table 1**), all of which are monosyllabic functional morphemes.

Crucially, Lama (1991) claims that the 44 tone largely has grammatical use and observes that when a 33 or 21 tone classifier takes the 44 tone, it can denote definiteness on its own, as demonstrated in (10) and (11).

(10) Lama (1991: 38, gloss adapted, impossible reading added)
Co^{33} **ma^{44}** la^{44} la^{33}?
person CLF:DEF come come
'Did the person come?' (definite)
*'Did a person come?' (indefinite)

(11) Lama (1991: 38, gloss adapted, impossible reading added)
Rru^{21} **zzi^{44}** yu^{33} si^{44} la^{33}.
chopstick CLF:DEF grasp RES come
'Get the pair of chopsticks.' (definite)
*'Get a pair of chopsticks.' (indefinite)

I gloss the definite use of *ma*^{44} and *zzi*^{44} as 'CLF:DEF', representing 'definite classifier'. Specifically, the underlyingly 33 tone classifier *ma*^{33} and the underlyingly 21 tone classifier *zzi*^{21} adopt the 44 tone, leading to a definite interpretation in the absence of *su*^{33}. As can be seen in the translations above, the indefinite reading is impossible in these cases.

The tone change shown in (10) and (11) will be discussed in more detail in Section 5: there, I will provide evidence that it is not a case of tone sandhi, as (i) it occurs only in specific grammatical contexts—namely, definite contexts; and (ii) the tone change from 21 to 44, as shown in (11), is not phonologically general. Instead, I argue that this is best analyzed as an instance of grammatical tone, where the tone change on the classifier results from definite tone docking. The point in this section is simply that classifiers with 21 and 33 tones shift to 44 to mark definiteness.

When the classifier has an underlying 55 tone, however, the classifier cannot take the 44 tone and the absence of *su*^{33} only leads to an indefinite reading, as illustrated in (12).[6]

(12) a. Te^{21}yy^{33} **zzi^{55}** yu^{33} si^{44} la^{33}.
book CLF grasp RES come
'Get a book.' (indefinite)
*'Get the book.' (definite)

b. *Te^{21}yy^{33} **zzi^{44}** yu^{33} si^{44} la^{33}. (zzi^{55} → *zzi^{44})
book CLF grasp RES come
intended: 'Get the book.' (definite)

Furthermore, it is well-known that definiteness can be divided into *anaphoric* and *unique* definiteness (Schwarz 2009; 2013). The former type of definites requires previous linguistic mention (i.e., discourse anaphora) in order to refer, while the latter does not. To further investigate Nuosu Yi's definite [N-Clf] pattern, I observe that it is also attested in anaphoric and unique definite contexts, as illustrated in (13) and (14).

(13) a. Si^{33}hni^{33} ma^{33} si^{33}ni^{21} sse^{33}vo^{33} ma^{33} hma^{55}yi^{33} go^{33} vur^{33} li^{33} o^{44}.
girl CLF and boy CLF classroom inside enter go.up PFV
'A girl and a boy entered the classroom.'

b. **Si^{33}hni^{33} ma^{44}** go^{44} nyi^{33} o^{44}.
girl CLF:DEF LOC sit PFV
'The girl sat down.' [anaphoric definiteness]

(14) Nga^{33} i^{21}mi^{33} **hlo^{21}bbo^{21} ma^{44}** mo^{33} o^{44}.
1SG tonight moon CLF:DEF see PFV
'I saw the moon tonight.' [unique definiteness]

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[6] One way to show that *te^{21}yy^{33} zzi^{55}* 'book CLF' in (12a) is truly indefinite rather than underspecified for definiteness is to put it in existential *jjo^{33}/rrur^{33}* constructions. The existential verb *rrur^{33}* means 'lie about' and is used for inanimate entities that are positioned out of order, whereas *jjo^{33}* means 'have' and can be used for both animate and inanimate entities (see (7)).

According to Gerner (2013: 453), only indefinite nominal phrases are allowed in the "Locative NP + presented NP + Existential verb" construction, while definite nominal phrases are not. As shown in (ia), *te^{21}yy^{33} zzi^{55}* 'book CLF' can appear in the existential *rrur^{33}* construction, indicating its indefiniteness. In contrast, its definite counterpart *te^{21}yy^{33} zzi^{55} su^{33}* 'book CLF DEF' is ungrammatical in the same construction, see (ib).

(i) a. Te^{21}yy^{33}da^{44}dde^{33} go^{33} te^{21}yy^{33} zzi^{55} rrur^{33}.
book.shelf LOC book CLF lie.about
'There is a book on the bookshelf.'

b. *Te^{21}yy^{33}da^{44}dde^{33} go^{33} te^{21}yy^{33} zzi^{55} su^{33} rrur^{33}.
book.shelf LOC book CLF DEF lie.about
Lit. 'There is the book on the bookshelf.'

In the anaphoric definite example (13), the definite expression *si^{33}hni^{33} ma^{44}* 'girl CLF:DEF' in (13b) refers to the very girl that entered the classroom with a boy in the antecedent sentence (13a). In the unique definite example (14), *hlo^{21}bbo^{21} ma^{44}* 'moon CLF:DEF' is understood as referring to the unique entity that has the relevant property of *moon* in the world. Additionally, the definite [N-Clf] construction can occur in both subject (13) and object (14) positions.[7]

Moreover, this definite construction is also observed in donkey anaphora, producer-product bridging and part-whole bridging contexts.[8] The relevant examples are presented in (15)–(17). Note that it is impossible to replace the 44 tone of the definite classifier with its original tone in these contexts.

(15) Nyo^{21}mu^{33}co^{33} yy^{44}nyi^{33} ji^{33} jjo^{44} gge^{44} su^{33} **yy^{44}nyi^{33} ji^{44}** ndu^{21} go^{33}she^{44}.
farmer buffalo CLF have CLF DEF buffalo CLF:DEF hit always
'Every farmer that has a buffalo hits the buffalo.' [donkey anaphora]

(16) a. Mu^{33}ga^{55} te^{21}yy^{33} zzi^{55} bi^{33} lo^{33}.
Muga book CLF read PFV
'Muga read a book.'
b. **Bbur^{33}co^{33} ma^{44}** fa^{33}guo^{21}co^{44} ma^{33} nge^{33}.
author CLF:DEF French.person CLF COP
'The author is a French person.' [producer-product bridging]

(17) a. Mu^{33}ga^{55} yi^{33}mo^{33} a^{33}shy^{55} ma^{33} vy^{33} da^{33} o^{44}.
Muga house new CLF buy PRF PFV
'Muga bought a new house.'
b. **Ta^{21}vu^{44} ma^{44}** a^{44}yy^{33} jjy^{33} a^{44}yy^{33}.
living.room CLF:DEF big INT big
'The living room is very big.' [part-whole bridging]

[7] As correctly pointed out by a reviewer, it is well attested that the sentence-initial position is a default topic position in many Sino-Tibetan languages, where topics are typically definite. For instance, Jenks (2018) argues that Mandarin subjects are topics, allowing bare nouns in subject position to denote anaphoric definiteness. However, the subjects reported in this paper are not topics in the sense of Jenks (2018), as Nuosu Yi explicitly marks topics with the topic marker *li^{33}*, which seems to introduce a contrastive topic interpretation. The subjects discussed here appear without this topic marker, indicating that they function as grammatical subjects rather than topics.

[8] Schwarz (2009; 2013) identifies several contexts for definite expressions, including uniqueness (both immediate and larger situation), anaphoric/familiar uses, bridging (associative anaphora, such as producer-product and part-whole bridging), as well as donkey anaphora. Donkey anaphora involve quantificational anaphora, where a quantified nominal expression is referred to anaphorically. Typically, a discourse referent is introduced in a relative clause with a universally quantified head or in an if-clause. Then, the discourse referent is referred to again in the matrix clause. For example, in the English sentence 'Every farmer who owns a donkey hits the donkey', the DP in the matrix clause (*the donkey*) refers back to the donkey owned by each farmer.

A final note is that the definite [Clf-N] phrase is only used in informal speech, while in formal speech, *su*^{33} is obligatorily used. Example (18) is a news title from *Yizu Wang* 'Yi People's Daily Online'. Although the reference of the subject is clear to all readers—there is only one New Chengdu-Kunming Railway in China—and there is a tone change on the classifier *ji*^{44}, the presence of *su*^{33} is strongly preferred in this formal context.

(18) Che^{21}ko^{21} she^{33}ga^{33} a^{33}shy^{55} **ji^{44}** **su^{33}** i^{21}nyi^{21} si^{21} mga^{33}hxe^{44} o^{44}!
Chengkun railway new CLF:DEF DEF today INS test.run PFV
'The new Chengkun Railway is running on a trial basis today!'

2.3 Presence of numeral and lack of tone change

In Nuosu Yi, numerals occur between the head noun and the classifier. When a numeral is present, the [N-Num-Clf] phrase is exclusively interpreted as indefinite (19a). However, when this indefinite [N-Num-Clf] phrase is combined with the definite determiner *su*^{33} or a demonstrative, the whole expression clearly becomes definite, as shown in (19b) and (19c). Additionally, there is a difference in word order between the two cases: [N-Num-Clf-D] vs. [N-Dem-Num-Clf].

(19) a. Nga^{33} sse^{33}vo^{33} nyi^{21} ma^{33} mo^{33} o^{44}.
1SG boy two CLF see PFV
'I saw two boys.' (indefinite)

b. Nga^{33} sse^{33}vo^{33} nyi^{21} ma^{33} **su^{33}** mo^{33} o^{44}.
1SG boy two CLF DEF see PFV
'I saw the two boys.' (definite)

c. Nga^{33} sse^{33}vo^{33} **cy^{44}/a^{33}zzy^{44}** nyi^{21} ma^{33} mo^{33} o^{44}.
1SG boy this/that two CLF see PFV
'I saw these/those two boys.' (definite)

It is worth noting that in the presence of a numeral in the DP construction, the tone change on the classifier does not occur, as illustrated in (19b). Specifically, the classifier *ma*^{33} keeps its original 33 tone.

Moreover, the classifier cannot take the 44 tone, regardless of whether *su*^{33} is present or not, see (20).

(20) a. *Nga^{33} sse^{33}vo^{33} nyi^{21} **ma^{44}** **su^{33}** mo^{33} o^{44}.
1SG boy two CLF:DEF DEF see PFV
intended: 'I saw the two boys.' (definite)

b. *Nga^{33} sse^{33}vo^{33} nyi^{21} **ma^{44}** mo^{33} o^{44}.
1SG boy two CLF:DEF see PFV
intended: 'I saw the two boys.' (definite)

Specifically, in (20a) *su*^{33} is present while in (20b) *su*^{33} is absent. The key generalization is that when a numeral is present, the classifier cannot take the 44 tone, regardless of the existence or presence of *su*^{33} (cf. (19b)).

In summary, although definiteness can be overtly marked on classifiers via tone changes in Nuosu Yi, the presence of a numeral always blocks the definite form of the classifier. That is to say, in the definite [N-Num-Clf-D] construction, tone changes on the classifiers are never allowed. The co-occurrence of definite [N-Clf] and indefinite [N-Num-Clf] constructions is not unusual cross-linguistically. In the next section, I will present similar phenomena in other classifier languages, which can be effectively accounted for under a Clf-to-D head movement analysis.

3 Clf-to-D head movement in article-less classifier languages

This section aims to review previous accounts of Clf-to-D head movement (Simpson 2005; Wu & Bodomo 2009), with a focus on the blocking of Clf-to-D head movement in the presence of numerals. I will then move on to present another language that marks definiteness through tone changes on classifiers—Wenzhou Wu—which has been analyzed in terms of Clf-to-D raising (Li & Bisang 2012; Hall 2019). I suggest that both Wenzhou Wu and Nuosu Yi can be analyzed in a unified way.

3.1 Definite bare classifier phrase as a result of Clf-to-D head movement

The Clf-to-D head movement analysis was first proposed by Simpson (2005) to explain definite bare classifier phrases in several Southeast Asian languages and later expanded by Wu & Bodomo (2009) to account for similar phenomena in Cantonese. The central claim is that a determiner phrase (DP) projection exists not only in languages with overt definite determiners, such as English, but also in languages that lack them, like Mandarin Chinese and Cantonese. Specifically, Simpson observes that bare classifier phrases in Vietnamese, Hmong, and Nung—three article-less classifier languages—are often associated with definiteness. Examples from each language are provided in (21)–(23).

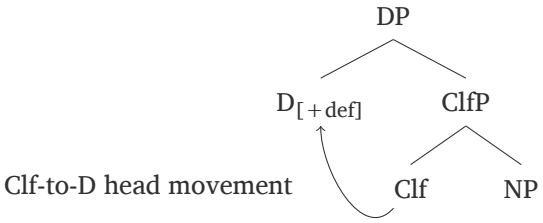
(21) *Vietnamese* (Simpson 2005: 823)
Nguoi chong rat tot.
CLF husband very good
'The husband was very good.' (definite)

(22) *Hmong* (Simpson 2005: 823)
Tus tsov tshaib tshaib plab.
CLF tiger hungry hungry stomach
'The tiger was very hungry.' (definite)

(23) *Nung* (Simpson 2005: 823)
Leo tu me da tu po va…
then CLF wife scold CLF husband say
'Then the wife scolded the husband and said …' (definite)

Following Longobardi (1994), Simpson (2005) posits that the head D is the locus of definiteness cross-linguistically. In article-less classifier languages, the definite D is null and must be overtly instantiated by some lexical element to be licensed. As a result, the [+definite] feature on D triggers Clf-to-D head movement, as illustrated in (24).

(24)



Another piece of evidence supporting the Clf-to-D head movement analysis comes from the Vietnamese "extra *cai* construction". Specifically, Vietnamese allows a second general classifier, *cai*, to occur before the regular classifier, resulting in a [*cai*-Clf-N] sequence with a clear definite interpretation, as shown in (25).

(25) *Vietnamese* (Simpson 2005: 825)
Cai con dao [anh cho toi muon], no that sac.
CLF CLF knife you give me borrow it real sharp
'The knife you gave me is really sharp.'

(25) can be naturally accounted for under the Clf-to-D head movement framework, where the general classifier *cai* occupies the head D position, leading to definiteness, while the regular classifier *con* remains *in situ*.

Building on Simpson's analysis, Wu & Bodomo (2009) extend the Clf-to-D head movement approach to account for definite [Clf-N] phrases in Cantonese, another classifier language that lacks overt definite determiners. An example of a definite bare classifier phrase in Cantonese is provided in (26).

(26) *Cantonese* (Wu & Bodomo 2009: 495)
Gaa ce zo-zyu go ceothau.
CLF car block-CONT CLF exit
'The car is blocking the exit.' (definite)

Wu & Bodomo argue that the null D triggers Clf-to-D head movement, leading the classifier to combine with D and license the null definite D. Note that the definite [Clf-N] construction can also appear in object position, see (27).

(27) *Cantonese* (Wu & Bodomo 2009: 496, indefinite reading added)
Keoi maai-zo gaa ce.
he sell-ZO CLF car
'He sold the car.' (definite)
'He sold a car.' (indefinite)

Wu & Bodomo further point out that Clf-to-D head movement is not obligatory in Cantonese, as [Clf-N] can be interpreted as either definite or indefinite depending on the context. For example, (27) can also receive an indefinite interpretation, i.e., the bare classifier phrase *gaa ce* 'CLF car' can mean 'a car', leading to the interpretation 'He sold a car' (Wu & Bodomo 2009: 497). In such cases, Clf-to-D head movement does not occur, and the classifier remains *in situ*, resulting in an indefinite reading as the head D is not licensed.

It is important to note that Clf-to-D head movement is not universally available in all classifier languages. For example, in Mandarin Chinese, bare classifier phrases never receive a definite interpretation and they are only allowed in object positions, as demonstrated in (28).

(28) *Mandarin Chinese* (adapted from Wu & Bodomo 2009: 494)
a. *Běn shū wǒmen dōu dú-guò.
CLF book we all read-EXP
intended: 'As for the book, we have all read it.'
b. Wǒ yào mǎi ben shū.
I want buy CLF book
'I want to buy a book.' (indefinite)
*'I want to buy the book.' (definite)

In summary, while Mandarin Chinese does not allow definite [Clf-N] phrases, Cantonese, Vietnamese, Hmong, and Nung do. This contrast suggests cross-linguistic variation in the availability of Clf-to-D raising.

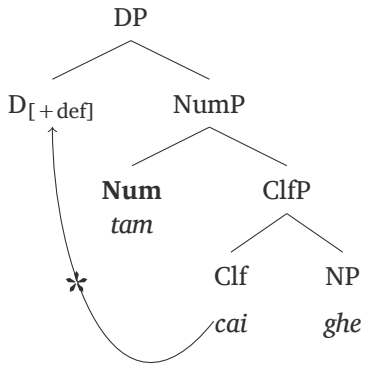
3.2 Presence of numeral and blocking of Clf-to-D head movement

It has been observed that numerals have the effect of "undoing the definiteness" in classifier languages (Cheng & Sybesma 1999). Specifically, when a numeral is present in a nominal phrase, the entire phrase yields only indefinite interpretations. For instance, Simpson (2005) observes that in Vietnamese, [Num-Clf-N] phrases are consistently interpreted as indefinite, see (29).

(29) *Vietnamese* (Simpson 2005: 824, impossible reading added)
Toi mua tam cai ghe.
I buy eight CLF chair
'I bought eight chairs.' (indefinite)
*'I bought the eight chairs.' (definite)

To account for the indefinite nature of [Num-Clf-N] constructions, Simpson proposes that a numeral phrase (NumP) is projected above the classifier phrase (ClfP), with numerals occupying the head Num. This structure prevents Clf-to-D head movement, as the classifier cannot raise to D over Num due to the Head Movement Constraint (Travis 1984). The constraint states that a head X^0 can only move to an immediately governing head Y^0. Since the head Num intervenes, its presence blocks the classifier from moving to D, as illustrated in (30).

(30)



Similar indefinite [Num-Clf-N] patterns are observed in Cantonese (Wu & Bodomo 2009; Hall 2019). One example is shown in (31) where the [Num-Clf-N] phrase is not allowed to occur in the subject position because of a ban on indefinite preverbal subjects.

(31) *Cantonese* (adapted from Hall 2019: 226)
*Loeng zek gau sik-gang juk.
two CLF dog eat-PROG meat
intended: 'The two dogs are eating meat.' (definite)

(31) shows that the [Num-Clf-N] phrase is exclusively interpreted as indefinite in Cantonese. The Head Movement Constraint provides a straightforward explanation for the unavailability of the definite reading in (31). Since the head Num intervenes between Clf and D, Clf-to-D head movement is blocked, resulting in an indefinite interpretation of the entire phrase.

3.3 Tonal marking of definiteness on classifiers

In this section, I will examine Wenzhou Wu, an article-less classifier language that marks definiteness on classifiers via tonal alternations. I will demonstrate that the Wenzhou Wu data can also be accounted for under the framework of Clf-to-D head movement and the Head Movement Constraint.

Building on Cheng & Sybesma (2005), Hall (2019) reports that Wenzhou Wu (Sino-Tibetan, China) uses tone to mark definiteness on classifiers. Wenzhou Wu has eight lexical tones, which can be divided into four groups (A, B, C, and D). Each group can be further divided into two subgroups based on register, high (hi) and low (lo). This is illustrated in **Table 2**.

	GROUP A	GROUP B	GROUP C	GROUP D
HI-REGISTER	44	45	42	23
LO-REGISTER	31	24	11	12

Table 2: Lexical tones of Wenzhou Wu (adapted from Hall 2019: 232).

In Wenzhou Wu, [Clf-N] phrases can denote both indefinite and definite meanings, with definiteness marked by a tonal change on the classifier to Group D. For indefinite [Clf-N] phrases, the classifier retains its underlying tone. However, when the tone shifts to a D-tone, the [Clf-N] phrase is interpreted as definite. Thus, classifiers with hi-A, hi-B, hi-C, and hi-D tones shift to hi-D to express definiteness, while classifiers with lo-A, lo-B, lo-C, and lo-D surface as lo-D when denoting definiteness. This tonal shift results in a minimal pair, as illustrated in (32), where the only difference lies in the tone of the classifier.

(32) *Wenzhou Wu* (adapted from Hall 2019: 232)

a. ŋ̀^{24} ɕi^{45} ma^{24} **paŋ^{45}** sɪ^{44}.
I want buy CLF$_{\text{B-TONE}}$ book
'I want to buy a book.' (indefinite)

b. ŋ̀^{24} ɕi^{45} ma^{24} **paŋ^{23}** sɪ^{44}.
I want buy CLF$_{\text{D-TONE}}$ book
'I want to buy the book.' (definite)

In addition, in Wenzhou Wu, indefinite phrases are prohibited from appearing in preverbal subject positions, similar to the ban observed in Cantonese (see (31)). As such, classifiers with an "indefinite" tone are disallowed in subject position (33a), while classifiers marked with a "definite" D-tone are permitted (33b).

(33) *Wenzhou Wu* (adapted from Hall 2019: 233)

a. *$\textbf{Dʏu}^{\textbf{31}}$ kau^{12} i^{42} tsau^{45}-ku^{42} ka^{44}løy^{11}.
CLF$_{\text{A-TONE}}$ dog want walk-cross street
intended: 'A dog wants to cross the street.'

b. $\textbf{Dʏu}^{\textbf{12}}$ kau^{12} i^{42} tsau^{45}-ku^{42} ka^{44}løy^{11}.
CLF$_{\text{D-TONE}}$ dog want walk-cross street
'The dog wants to cross the street.'

Furthermore, classifiers with an underlying D-tone are ambiguous between indefinite and definite interpretations, as demonstrated in (34).

(34) *Wenzhou Wu* (adapted from Cheng & Sybesma 2005: 6)
ŋ̀^{24} ɕi^{45} ha^{23} $\textbf{y}^{\textbf{23}}$ thuɔ^{44}.
I want drink CLF$_{\text{D-TONE}}$ soup
'I want to drink a bowl of soup.' (indefinite)
'I want to drink the soup.' (definite)

However, when a numeral is present, the classifier must retain its underlying tone, and the [Num-Clf-N] phrase is exclusively interpreted as indefinite, as shown in (35).

(35) *Wenzhou Wu* (adapted from Hall 2019: 233)
ŋ̀^{24} ɕi^{45} ma^{24} ŋ^{24} $\textbf{paŋ}^{\textbf{45}}\textbf{(*paŋ}^{\textbf{23}}\textbf{)}$ sɨ^{44} le^{31} tshɨ^{42}.
I want buy four CLF$_{\text{B-TONE(*D-TONE)}}$ book come read
'I want to buy four books to read.' (indefinite)

To summarize, in Wenzhou Wu, the marking of definiteness on classifiers is blocked by the presence of a numeral. While [Clf-N] phrases can have both definite and indefinite interpretations, [Num-Clf-N] phrases are strictly indefinite.

Moreover, building on Gerner & Bisang (2008; 2010), Hall (2019) reports another classifier language that marks definiteness on classifiers: Weining Ahmao. Weining Ahmao (Hmong-Mien, China) is typologically exceptional as its classifiers exhibit overt morphology for definiteness (definite vs. indefinite), number (singular vs. plural), and size (augmentative, medial, diminutive). Crucially, Weining Ahmao also uses tones on classifiers to mark (in)definiteness. However, as one reviewer notes, the Weining Ahmao data are more complex than what is reported in Hall (2019). Specifically, (in)definiteness is realized through various forms in Weining Ahmao, including voicing, devoicing, breathy voice, and tone changes. Moreover, tone changes occur only in some of the classifiers and do not follow a uniform pattern (e.g., shifting exclusively to a single tone). Given these complexities, I have chosen to leave Weining Ahmao out of the present analysis.

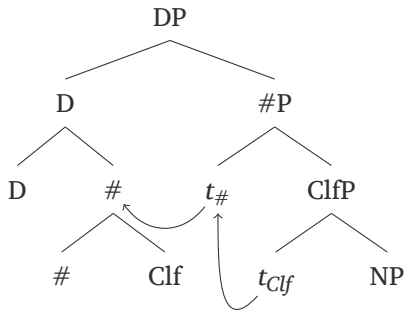
I argue that the empirical facts in Wenzhou Wu are best explained through a Clf-to-D head movement analysis combined with the Head Movement Constraint, contra Hall (2019). Specifically, I propose that [Clf-N] can be interpreted as either definite or indefinite, depending on whether the classifier undergoes Clf-to-D head movement. When there is no numeral, the classifier can raise to D, valuing the [+definite] feature from D and yielding a definite reading, as in (32b) (also see Li & Bisang 2012 for a similar proposal for Wenzhou Wu definite [Clf-N]). When there is a numeral, however, Clf-to-D head movement is blocked because raising Clf over Num to D would result in violating the Head Movement Constraint (Travis 1984). Consequently, the classifier must take a default (indefinite) spell-out, as shown in (35).

On the other hand, Hall (2019) rejects the Head Movement Constraint and instead proposes a dual-structure account, as summarized in (36).[9]

(36) a. A number phrase (#P) exists above ClfP, with the # head indicating singularity or plurality, and the numeral (NumP) occupying Spec #P.
b. Definite bare classifier phrases arise from the roll-up movement of Clf to D through #.
c. When a numeral (NumP) is present, the classifier forms a constituent with it to the exclusion of the noun, and this constituent merges in Spec #P.

For definite [Clf-N] phrases, the classifier first moves through # and then up to D through right adjunction, resulting in the realization of the complex head [D [#-Clf]], as in (37).

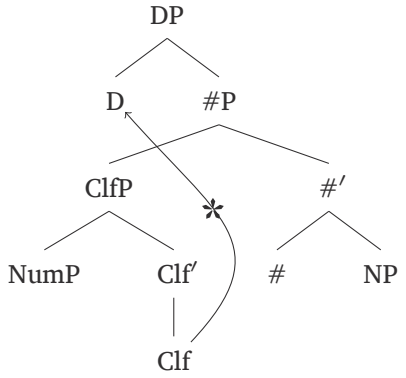
(37) Structure I: Definite [Clf-N]



For indefinite [Num-Clf-N] constructions, the numeral and the classifier form a constituent to the exclusion of NP, as illustrated in (38). As a result, Clf-to-D movement is blocked by an independently motivated ban on head movement out of a specifier (Roberts 2010).

[9] For consistency, I replace Hall's (2019) NumP with #P and his #P with NumP, without changing the core analysis.

(38) Structure II: Indefinite [Num-Clf-N]



While the dual-structure account can also capture the facts in Wenzhou Wu, it requires more complex assumptions. I argue that the Clf-to-D head movement analysis better accounts for the Wenzhou Wu data for two reasons. First, the dual-structure account presupposes that classifiers and numerals form a constituent cross-linguistically (i.e., classifiers are needed to allow numerals to count, rather than allowing nouns to be counted), which remains a controversial topic. Second, it assumes that Clf moves to the right of #, which is non-standard, as head movement typically involves left adjunction (Kayne 1991; 1994). Given these considerations, I propose that Wenzhou Wu definite [Clf-N] constructions are best analyzed under the Clf-to-D head movement approach. Further exploration of the dual-structure account is left for future research.

In the next section, I propose a grammatical tone analysis to account for these data, in which the grammatical tone of the head D docks onto the classifier if they form a single morphosyntactic word (M-Word) via head movement. Thus, D is not null, but instead consists of a grammatical tone that realizes the feature [+definite]. Crucially, the [+definite] feature triggers Clf-to-D head movement. I will show that this approach can potentially offer a unified explanation for the tonal marking of definiteness observed in classifier languages such as Wenzhou Wu and Nuosu Yi.

4 The analysis

4.1 The nominal structure and theoretical assumptions

Before presenting the main analysis, I first outline my assumptions for the syntactic structure of the Nuosu Yi nominal domain as well as the theoretical framework I adopt.

4.1.1 The structure of the Nuosu Yi nominal domain

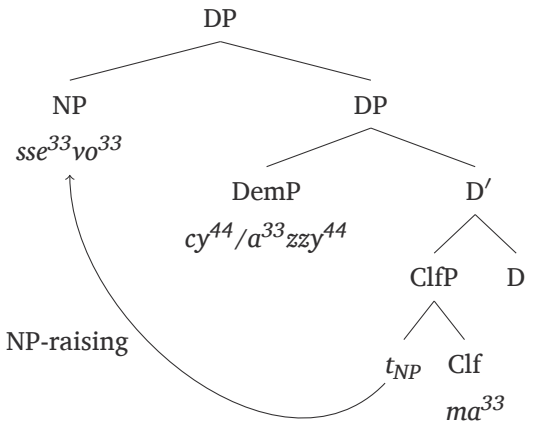
The presence of a DP level of structure has widely been assumed in languages with determiners (Abney 1987; Szabolcsi 1994). In line with this, I take DP to be the maximal projection of the nominal domain in Nuosu Yi, given that it features a definite determiner, *su*^{33} (to be revised).

I adopt the view that demonstratives occur in Spec DP whereas the definite determiner occupies the head D (Giusti 1997; 2002; Alexiadou et al. 2007). First, consider the structure when no numeral is present:

(39) sse^{33}vo^{33} cy^{44}/a^{33}zzy^{44} ma^{33}
boy this/that CLF
'this/that boy'

To account for the [N-Dem-Clf] word order observed in (39), I propose that DP projects multiple specifiers (see also Dayal 2004 for the assumption of multiple Spec DPs), with NP obligatorily moving to the highest Spec DP. The proposed structure for (39) is shown in (40).

(40)



In addition to deriving the word order facts, I suggest that NP-raising may be triggered either by D[+definite] itself or by virtue of the presence of the demonstrative that requires definiteness. Moreover, I follow Li (1999) in assuming that projections are minimal, i.e., only the projections that are interpreted are projected.

When a numeral is present, I assume that a number phrase (#P) projection exists above ClfP, with number morphology occupying the head # and the numeral phrase (NumP) in Spec #P (see also Li 1999; Borer 2005; Hall 2019).[10] Now, consider the case when a numeral is present, as in (41).

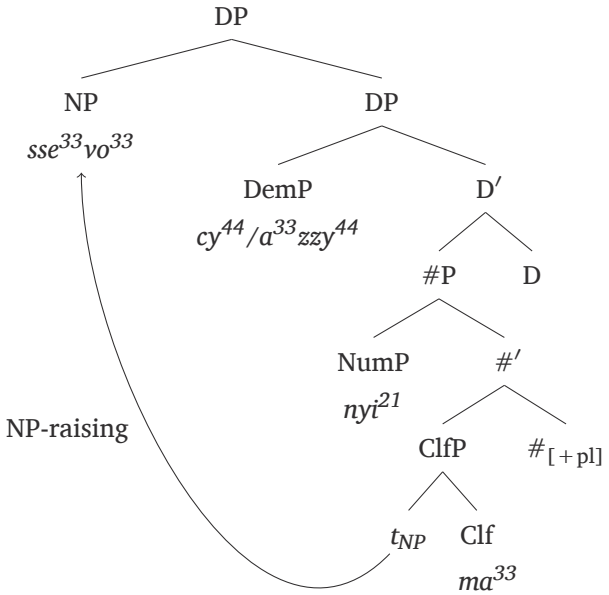
[10] This assumption is supported by the fact that numerals in Nuosu Yi can be modified, indicating their phrasal status. Therefore, they should occupy Spec positions. An example is given in (i).

(i) Mu^{33}ga^{55} te^{21}yy^{33} i^{44}nyi^{33}yi^{44}nyi^{33} suo^{33} zzi^{55} vy^{33} o^{44}.
Muga book at.least three CLF buy PFV
'Muga bought at least three books.'

(41) sse^{33}vo^{33} cy^{44}/a^{33}zzy^{44} nyi^{21} ma^{33}
boy this/that two CLF
'these/those two boys'

The proposed structure for (41) is depicted in (42).

(42)



Note that the # head is marked with the [+plural] feature due to the presence of the numeral *nyi*^{21} 'two'; further details will be discussed in Section 4.2.

4.1.2 Theoretical assumptions

The current analysis follows the framework of Distributed Morphology (DM) (Halle & Marantz 1993; Embick & Noyer 2001; Embick 2007, etc.). In DM, syntax is the starting point for all complex linguistic structures. Morphology interprets the output of the syntactic derivation (e.g., MERGE, MOVE, AGREE), i.e., terminal nodes with features.

The output of syntax is spelled out phase-cyclically at each category-defining head (*n*, *a*, *v*), working from the bottom up. Crucially, the output is subjected to an ordered set of postsyntactic PF operations, see **Figure 1**.

At PF, Vocabulary Insertion adds phonological content to syntactic terminal nodes with features. To illustrate, consider a Nuosu Yi demonstrative phrase, such as the one exemplified in (39), which has the levels of projection as outlined in the syntactic structure (40).

Specifically, at the stage of Vocabulary Insertion, the terminal node Dem has phonological content added to it, which is specified in Nuosu Yi's Vocabulary Items (43).

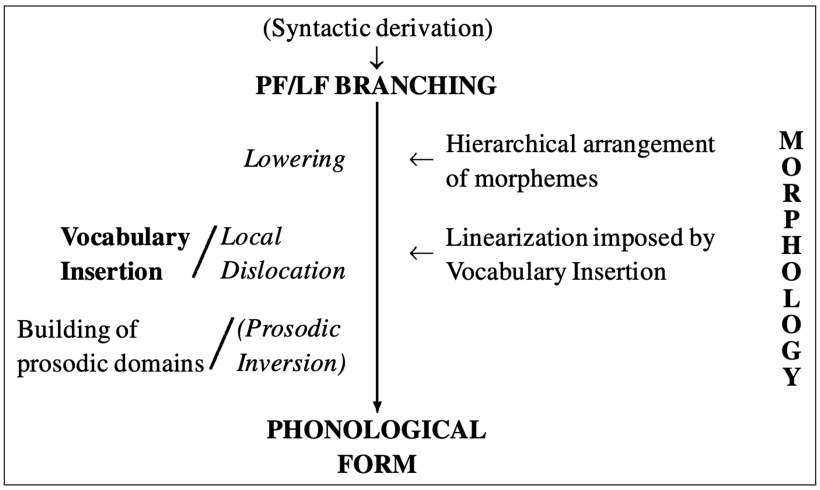


Figure 1: DM architecture (Embick & Noyer 2001).

(43) a. Dem[+ deictic, + proximal] ↔ *cy*^{44}
b. Dem[+ deictic, + distal] ↔ *a*^{33}*zzy*^{44}

Likewise, through Vocabulary Insertion, the determiner morpheme is inserted at the head D and the classifier morpheme at Clf. In the next subsection, I will demonstrate that the tone change patterns in Nuosu Yi DPs can be captured if Clf is raised to D in syntax followed by definite tone docking in the PF component.

4.2 Clf-to-D head movement followed by definite tone docking

Recall that in article-less classifier languages like Cantonese, [Clf-N] phrases can denote definiteness without the presence of a demonstrative or a definite determiner (Wu & Bodomo 2009). Wu & Bodomo argue that a null D triggers Clf-to-D movement, which allows the classifier to combine with D and receive the [+ definite] feature from D, thus the classifier behaves like a definite determiner. A similar approach has been proposed by Simpson (2005) for Southeast Asian languages such as Vietnamese, Hmong, and Nung. In a parallel way, Nuosu Yi can also express definiteness with [N-Clf] phrases without the presence of the definite determiner *su*^{33}, but only when the original 33 or 21 tone classifier takes the 44 tone. The key observations are repeated below:

(44) Lama (1991: 38, gloss adapted, impossible reading added)
Co^{33} **ma^{44}** la^{44} la^{33}?
person CLF:DEF come come
'Did the person come?' (definite)
*'Did a person come?' (indefinite)

(45) Lama (1991: 38, gloss adapted, impossible reading added)
Rru^{21} **zzi^{44}** yu^{33} si^{44} la^{33}.
chopstick CLF:DEF grasp RES come
'Get the pair of chopsticks.' (definite)
*'Get a pair of chopsticks.' (indefinite)

In (44) and (45) the classifiers *ma^{33}* and *zzi^{21}* take the 44 tone, yielding a definite reading while the indefinite reading becomes unavailable.

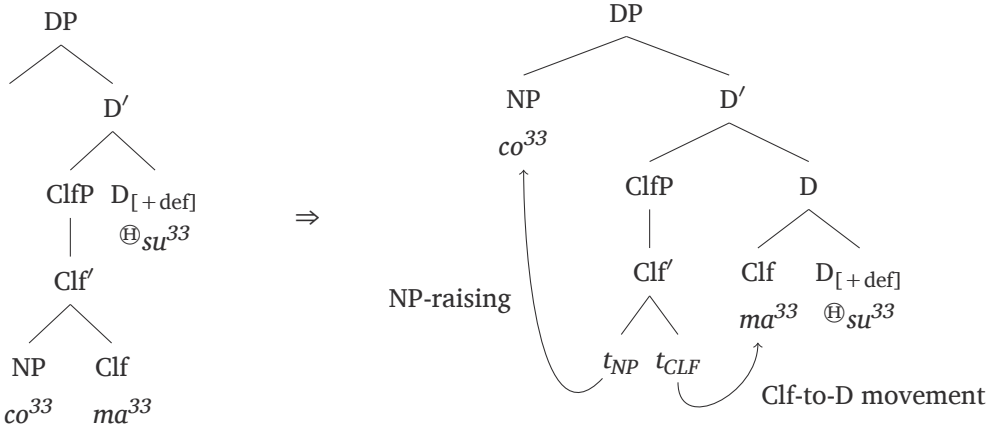
Following Wu & Bodomo (2009) and Simpson (2005), I argue that the definite [N-Clf] construction in Nuosu Yi can be best accounted for through Clf-to-D head movement, followed by definite tone docking. Specifically, I propose that the definite determiner carries a floating H tone that realizes the feature [+definite], which is essentially a grammatical tone,[11] as well as a determiner *su^{33}*.

The Vocabulary Insertion rule for the definite determiner is illustrated in (46). For clarity, I represent floating tones as circled superscript, following the convention of Rolle (2018).

(46) Vocabulary Insertion rule for Nuosu Yi definite determiner
D[+definite] ↔ Ⓗ*su^{33}*

In syntax, the classifier is triggered by the [+definite] feature on D and hence undergoes head movement to D. The derivation of the DP in (44) is shown in (47).

(47) a. b.



[11] Grammatical tone is the realization of tense, number, case or other morphosyntactic features through tone (Pak 2019). It includes nominal grammatical categories (definiteness, specificity, demonstratives, numerals, quantification, plurality, classification, case, etc.) as well as verbal ones (auxiliaries, tense, aspect, mood, agreement, etc.) (Rolle 2018).

I follow the standard view of head movement as a head-adjunction operation (e.g., Baker 1988; Kayne 1991; 1994; Matushansky 2006; Roberts 2010), where the moved head X^0 adjoins to the target head Y^0. In particular, I follow Kayne (1991; 1994) in assuming that head movement must always be left-adjunction.

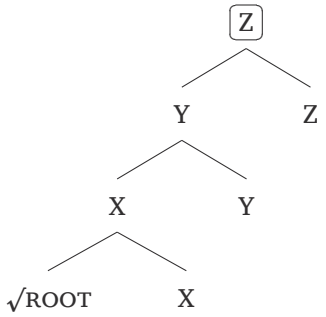
At PF, the floating tone Ⓗ docks leftward onto the preceding classifier if they form a single morphosyntactic word (M-Word) through head movement, as sketched below in (48). The docked tone is circled (e.g., Ⓗ).

(48) Clf + ⒽD → ClfⒽ D *definite tone docking*

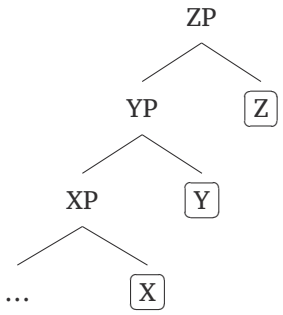
This definite tone docking explains the tonal alternation observed in Nuosu Yi when classifiers express definiteness. It is the interaction between syntax (head movement) and phonology (tone docking) that results in the surface realization of definiteness through tone changes on classifiers.

Strictly speaking, I assume that the association domain of the floating H tone is within an M-Word (Embick 2007; 2015), a (potentially complex) head not dominated by a further head projection. Based on this definition, an M-Word could be (i) a complex head formed by head movement as in (49a), or (ii) each terminal head without head movement as in (49b) (each M-Word is represented in a box).

(49) a.



b.



(49a) shows that syntactic head movement forms a complex head, which constitutes a single M-Word. What is crucial to the current analysis is that after Clf-to-D head movement, the classifier and the definite determiner are within the complex head [Clf-D], which is, in essence,

an M-Word. Therefore, definite tone docking can take place. In contrast, when no head movement occurs, Clf and D remain as two distinct M-Words (49b), thereby preventing definite tone docking. Independent evidence supporting this M-Word association domain will be discussed in Section 6.1.

Recall that Nuosu Yi has four contrastive tones: 21 (L), 33 (M), 44 (MH) and 55 (H). Regarding definite tone docking, when the classifier has an underlying 33 (M) tone, the surface tone 44 (MH) arises as a simple association of the floating H tone to the base tone of the classifier, as illustrated in **Figure 2a**. However, when the classifier has an underlying 21 (L) tone, simple docking is prohibited, triggering further tone changes. Specifically, the docking of the floating H tone to a L tone classifier would result in an LH tone contour, which is unattested in the Nuosu Yi tone inventory. Hence, the change from LH to MH can be seen as a repair that preserves the structure of Nuosu Yi's tone inventory, as illustrated in **Figure 2b** (see similar accounts for Cantonese tone changes in Chen 2000).[12]

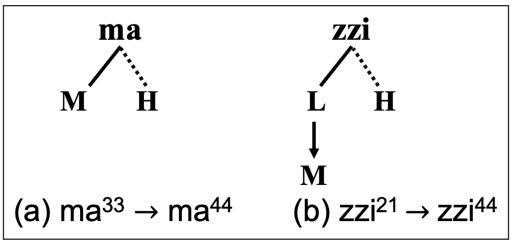


Figure 2: Autosegmental sketch of definite tone docking.

[12] As correctly pointed out by a reviewer, there is some individual variation among speakers. Specifically, some speakers do not allow 21 tone classifiers to undergo tone change to 44 before *su*^{33}. I consulted three native Nuosu Yi speakers: two accepted both forms (the original 21 tone and the changed 44 tone), while the third speaker generally disallowed this '21 to 44' tone change. However, the third speaker reported that for the 21 tone classifier *zzi*^{21} 'CLF.pair', 21 to 44 tone change is acceptable and is preferred. He confirmed example (45) and provided another example, *xy*^{44}*nie*^{33} *zzi*^{44} *su*^{33} 'shoe CLF:DEF DEF', which means 'the pair of shoes'. My speculation is that (i) for some speakers, the floating H tone cannot dock onto a L tone classifier, as LH is not allowed in the Nuosu Yi tone inventory. Consequently, these speakers only allow L tone classifiers to surface as L tone in DPs. On the other hand, for other speakers, both L and MH (as a repair that preserves the structure of Nuosu Yi's tone inventory, i.e., LH → MH) are allowed. Crucially, when *su*^{33} is omitted, the floating H tone must be overtly realized, thus the L tone classifier must change to MH as in (45).

(ii) The third speaker's acceptance of tone change in *xy*^{44}*nie*^{33} *zzi*^{44} *su*^{33} 'shoe CLF:DEF DEF' but not in other 21 tone classifiers may be attributed to frequency, which is known to influence grammatical variation and change, including tone shifts (e.g., Hopper & Bybee 2001; Bybee 2017). Specifically, *zzi*^{21} 'CLF.pair' occurs more frequently than classifiers such as *bbo*^{21} 'CLF.room', *zi*^{21} 'CLF.story', and *ge*^{21} 'CLF.handful'. As a result, N-*zzi*^{21}-*su*^{33} is more likely to undergo tone change to N-*zzi*^{44}-*su*^{33} in casual speech, leading to its acceptance, whereas the other 21 tone classifiers remain unchanged.

(iii) Moreover, the controversial status of the 21 to 44 tone change of classifiers before *su*^{33} can be due to the tone change not being indicated in orthography from a prescriptive standpoint. Specifically, while the 33 to 44 tone change of classifiers is accepted and obligatory in all registers, including formal writing, the 21 to 44 tone change of classifiers is rarely found in written language.

In both cases, the definite H tone, as the realization of the feature [+definite], is overtly realized, hence *su*^{33} can be omitted.

On the other hand, for classifiers with an underlying 55 (H) tone, the floating H tone applies vacuously because the tone of the classifier is already high. This can be seen in (50), where the classifier *zzi*^{55} cannot undergo a tone change to 44, either when preceding the definite determiner (50b) or in its absence (50c).

(50) a. te^{21}yy^{33} zzi^{55} su^{33}
book CLF DEF
'the book'

b. *te^{21}yy^{33} **zzi^{44}** su^{33}
book CLF:DEF DEF
intended: 'the book'

c. *te^{21}yy^{33} **zzi^{44}**
book CLF:DEF
intended: 'the book'

In (50a), definite tone docking is vacuous when applied to the preceding classifier *zzi*^{55}, as it already bears a H tone. Consequently, the docking of the definite floating H tone has no effect, and the classifier surfaces with its original H tone. Notably, in this case, the definite floating H tone is not overtly realized, therefore, *su*^{33} cannot be omitted. Taken together, the presence of the determiner *su*^{33} is optional for classifiers like *zzi*^{21} and *ma*^{33} when they surface with the 44 tone (as in examples (44) and (45)), but obligatory for classifiers with an underlying 55 tone (as in (50)), where the feature [+definite] has not been overtly realized through tonal changes.

Furthermore, recall that when an indefinite [N-Num-Clf] phrase is combined with the definite determiner, the entire phrase becomes definite, yet the classifier does not undergo any tone changes, as shown in (51) (cf. (52)).

(51) Nga^{33} sse^{33}vo^{33} nyi^{21} **ma^{33}** su^{33} mo^{33} o^{44}. (no tone change)
1SG boy two CLF DEF see PFV
'I saw the two boys.' (definite)

(52) Nga^{33} sse^{33}vo^{33} **ma^{44}** su^{33} mo^{33} o^{44}. (ma^{33} → ma^{44})
1SG boy CLF:DEF DEF see PFV
'I saw the boy.' (definite)

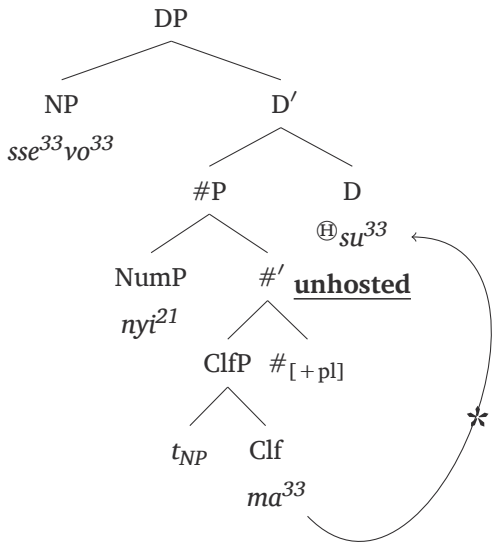
The contrast between (51) and (52) critically shows that what plays a role in triggering tone changes on classifiers is not the linear word order, but the underlying syntactic structure. If tone change were determined solely by linear [Clf-D] order, we would expect it to occur on the classifier

regardless of whether a numeral is present. However, this prediction is not borne out, as shown in (20) (repeated below as in (53)): when the numeral *nyi*^{21} 'two' is present, tone change on the classifier *ma*^{33} is not allowed (cf. (51)).

(53) *Nga^{33} sse^{33}vo^{33} nyi^{21} **ma^{44}** (**su^{33}**) mo^{33} o^{44}.
1SG boy two CLF:DEF (DEF) see PFV
intended: 'I saw the two boys.' (definite)

Hence, I propose that a #P exists above ClfP, with the # head indicating singularity or plurality, and the numeral (NumP) occupies Spec #P (Li 1999). When a numeral larger than one is present, the # head is marked as [+plural]. I further propose that it is the presence of this [+plural] feature in the intervening # head that blocks Clf-to-D movement (see (54)). Consequently, the classifier and the definite determiner cannot form a single M-Word through head movement, preventing definite tone docking from occurring.

(54)



Another piece of evidence supporting the presence of a covert # head, marked as [+plural] when a numeral greater than one is present, comes from cross-linguistic patterns relating numerals and number marking. For example, in Turkish plural expressions, numerals cannot co-occur with the plural marker *-ler*, as shown in (55).

(55) *Turkish* (Kornfilt 1996: 119)
a. *iki öğrenci-ler
two student-PL
intended: 'two students'

b. iki öğrenci
two student
'two students'

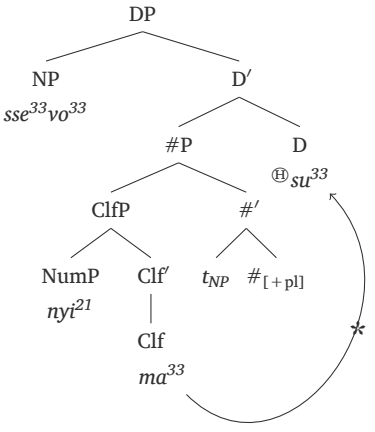
In (55a), the [+plural] feature is encoded in the # head due to the presence of the numeral *iki* 'two', and this plural meaning is interpreted semantically without the need of an overt plural marker on the noun. Likewise, I propose that in Nuosu Yi, when there is a numeral larger than one, the # head is marked with [+plural], even though no overt plural marker appears. Crucially, this covert head # with the [+plural] feature blocks Clf-to-D head movement.

That is to say, the covert # head, despite being silent, blocks Clf-to-D head movement just as overt # heads would. This is because the # head is not syntactically null. Since the numeral is in Spec #P, the # head must be marked with the feature [+plural].[13]

As a result of this structure (54), the classifier and definite determiner stay at the head Clf and the head D, respectively, thus forming two separate M-Words. Consequently, definite tone docking cannot take place. In (54), the floating H tone fails to find a host within its association domain, so it remains unhosted and does not get pronounced. This explains the absence of tone change on the classifier when a numeral is present. Nevertheless, the [+definite] D is licensed via the lexical insertion of Ⓗ*su*^{33}, leading to the definite interpretation. This further supports the idea that tone change on classifiers is structurally governed—specifically, by the presence or absence of Clf-to-D head movement.

[13] An alternative analysis is that when a numeral is present, the classifier forms a constituent with it, and this constituent merges in Spec #P. Clf-to-D head movement is blocked due to an independently motivated ban on head movement out of a specifier (Roberts 2010), as illustrated in (i).

(i)



However, this analysis posits that NumP occupies Spec ClfP, which in turn is in Spec #P. It seems unclear why ClfP would mediate between #P and NumP.

4.3 Tone change as a signal for head movement: Evidence from the Q-det *su*^{33}

In this section, I show that the morpheme *su*^{33} functions as a quantificational determiner (Q-det), when it appears without the definite floating H tone. Classical Generalized Quantifier (GQ) theory (Barwise & Cooper 1981) proposes that Q-dets occupy the head of a quantifier phrase (QP) and combine with a nominal argument (NP) to form a quantificational structure. I propose that, unlike its definite counterpart, the Q-det *su*^{33} does not trigger Clf-to-D or Clf-to-Q head movement. An example of this quantificational use of *su*^{33}, glossed as 'DET', is illustrated in (56), where it conveys a meaning equivalent to 'each' or 'every' in English.

(56) Sse^{33}vo^{33} **ma^{33}** *(**su^{33}**) rre^{33}mo^{21} cy^{21} va^{55} du^{55} o^{44}.
boy CLF *(DET) money one CLF donate PFV
'Every/Each boy donated one yuan.' (universal)

As seen in (56), when *su*^{33} functions as a Q-det, it is obligatory, and the classifier *ma*^{33} retains its underlying 33 tone.

By contrast, when preceding the definite determiner Ⓗ*su*^{33}, the classifier *ma*^{33} takes the 44 tone, as (57) illustrates. Moreover, the presence of *su*^{33} is optional.

(57) Sse^{33}vo^{33} **ma^{44}** (**su^{33}**) rre^{33}mo^{21} cy^{21} va^{55} du^{55} o^{44}.
boy CLF:DEF (DEF) money one CLF donate PFV
'The boy donated one yuan.' (definite)

Recall that in Section 4.2, I proposed that the feature [+definite] of the definite determiner triggers Clf-to-D head movement, and that the floating H tone realizes this [+definite] feature at PF. The contrast between examples (56) and (57) follows naturally under this analysis. In (57), the definite 44 tone on the classifier is an overt realization of the [+definite] feature on D—realized via definite tone docking—which has triggered Clf-to-D head movement in syntax prior to PF. By contrast, in (56), the Q-det *su*^{33} does not carry the [+definite] feature and therefore does not trigger Clf-to-Q head movement. I assume that the Q-det occupies the head of QP, with the underlying structure [$_{QP}$ [$_{ClfP}$ NP Clf] Q].

Furthermore, the universal reading of Q-det combined with a numeral is possible (58).[14]

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[14] In (58a), *cy*^{21} 'one' is optional. Nevertheless, in the absence of *cy*^{21}, the head noun undergoes a tone change (*co*^{33} → *co*^{44}), as shown in (i), which is a case of tone sandhi. This contrasts with the definite DP *co*^{33} *ma*^{44} *su*^{33} 'the person', where the classifier shifts to the 44 tone, indicating that the tone change on the classifier *ma*^{44} serves a grammatical function—specifically, marking definiteness.

(i) Co^{44} ma^{33} su^{33} rre^{33}mo^{21} cy^{21} va^{55} du^{55} o^{44}.
person CLF DET money one CLF donate PFV
'Every/Each person donated one yuan.'

(58) a. Co^{33} **cy^{21}** ma^{33} su^{33} rre^{33}mo^{21} cy^{21} va^{55} du^{55} o^{44}.
person one CLF DET money one CLF donate PFV
'Every/Each person donated one yuan.'

b. Co^{33} **nyi^{21}** ma^{33} su^{33} rre^{33}mo^{21} cy^{21} va^{55} du^{55} o^{44}.
person two CLF DET money one CLF donate PFV
'Every two people donated one yuan.'

Note that the numeral *cy^{21}* 'one' can occur in the Q-det phrase (58a) but it is not allowed in the definite DP construction (8b), repeated here as (59).[15] This shows another difference between the Q-det *su^{33}* and the definite D Ⓗ*su^{33}*.[16]

(59) vo^{55} (*cy^{21}) ma^{44} su^{33}
pig (*one) CLF:DEF DEF
'the pig'

Moreover, as shown in (56) and (58), a Q-det phrase can freely occur in subject position. Nevertheless, its occurrence in object position is not allowed, see (60). Instead, another universal quantifier construction [N-*cy^{21}*-Clf-*zzi^{44}a^{21}zzi^{33}*] must be used, see (61).

(60) *Nga^{33} **vo^{55} ma^{33} su^{33}** zza^{33} do^{21} o^{44}.
1SG pig CLF DET grain feed PFV
intended: 'I fed every pig grain.'

(61) Nga^{33} **vo^{55} cy^{21} ma^{33} zzi^{44}a^{21}zzi^{33}** zza^{33} do^{21} o^{44}.
1SG pig one CLF every grain feed PFV
'I fed every pig grain.'

Moreover, *co^{33} cy^{21} ma^{33} su^{33}* 'person one CLF DET' is often used to emphasize that the property applies to each individual without exception, particularly in contrastive or emphatic contexts. It also tends to appear in formal contexts where precision or exhaustive enumeration is required. By contrast, *co^{44} ma^{33} su^{33}* 'person CLF DET' is more commonly used in casual speech.

[15] A reviewer raised a question regarding how to express 'the one pig' or 'the only pig' in Nuosu Yi. The former is expressed simply as *vo^{55} ma^{44} su^{33}* 'pig CLF:DEF DEF', and the addition of the numeral 'one' makes the expression ungrammatical (i.e., **vo^{55} cy^{21} ma^{44} su^{33}* 'pig one CLF:DEF DEF'). To express 'the only pig', the quantifier *a^{44}di^{33}* 'only' must be inserted between the noun and the classifier, resulting in *vo^{55} a^{44}di^{33} ma^{44} su^{33}* 'pig only CLF:DEF DEF'. As noted by Gerner (2013: 115), *a^{44}di^{33}* 'only' marks the noun referent as unique for the property denoted by the noun. Crucially, it cannot co-occur with a numeral: both [N-*a^{44}di^{33}*-Num-Clf-D] and [N-Num-*a^{44}di^{33}*-Clf-D] are ungrammatical.

[16] I propose that (i) the definite [N-Clf] is an independent phrase and there is no underlying 'one' in the structure (see Cheng & Sybesma 1999 for similar accounts for Mandarin Chinese); (ii) the definite determiner has the existential (its meaning is equivalent to the indefinite determiner 'a' in English) and the uniqueness components (Bomford 2017), hence, adding the numeral *one* is uninformative. On the other hand, there is no such uniqueness component in the Q-det, thus there is an underlying 'one' in the underlying structure. The optionality of *cy^{21}* 'one' results from optional *one*-deletion in the Q-det phrase.

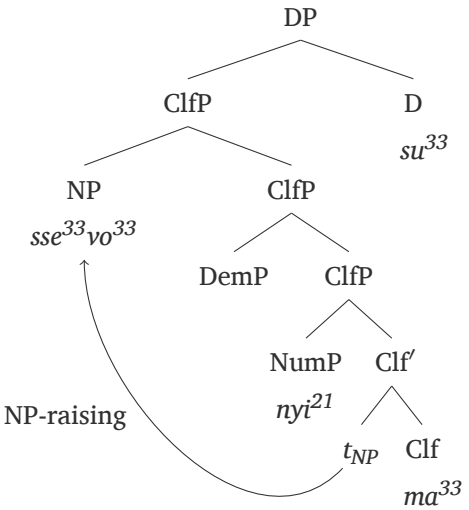
On the other hand, there is no such restriction for the definite DP construction (i.e., [N-Num-Clf-D]) as it can occur in both subject and object positions (see Section 2.2).

In summary, *su*^{33} (when not accompanied by the definite floating H tone) functions as a Q-det, and the universal [N-Num-Clf-Q] construction differs in several respects from the definite [N-Num-Clf-D] construction. The Q-det phrase is best analyzed under a non-movement structure, where the classifier and the Q-det remain *in situ*, whereas the definite determiner phrase is best explained through a Clf-to-D head movement analysis. These facts suggest that tone change is a signal of head movement, as it only occurs in the definite DP construction, where Clf-to-D movement takes place.

4.4 Comparison with non-movement analysis

As demonstrated in Section 4.2, the Clf-to-D head movement analysis and post-syntactic definite tone docking account for the tone change patterns on classifiers observed in Nuosu Yi DPs. At this point, it is worthwhile to compare the head movement analysis with other theoretical possibilities, namely, the non-movement analysis. Such an approach has in fact been discussed for Nuosu Yi in Jiang (2020: 242) who proposes that *su*^{33} alone (i.e., without the floating H tone) functions as the definite determiner, assuming that classifiers occupy the Clf head position, as illustrated in (62).

(62)



Specifically, Jiang posits that the demonstrative and the numeral appear in the higher Spec ClfP and the lower Spec ClfP, respectively. Furthermore, NP is fronted to the initial position of ClfP. After NP-fronting, the ClfP merges with D, resulting in the surface word order [N-Num-Clf-D]. This non-movement analysis offers a simple way to account for the observed [N-Num-Clf-D] linear word order without assuming that the classifier moves to D when there is no numeral, while remaining *in situ* when a numeral is present.

However, the non-movement approach does not take the tone changes on classifiers into consideration. Under the non-movement analysis, one would need to propose the following morphophonological rule (63), which changes the tone of a classifier from 33 or 21 to 44 when followed by a definite determiner.

(63) $33/21 \rightarrow 44 \; / \; \_\_ \;]_{\text{Clf}}$ D[+definite]

This rule would assume that the tone change on the classifier is determined solely by linear word order, which, as we have already seen, is not the case. In the remaining discussion, I will argue that the non-movement approach is less satisfactory than the head movement analysis for three reasons.

First, the non-movement analysis does not account for the absence of tone changes in the [N-Num-Clf-D] construction. Specifically, the morphophonological rule (63) would predict a tone change on classifiers in examples such as (51), repeated here as (64), as the 33 tone classifier *ma*^{33} immediately precedes the definite determiner.

(64) Nga^{33} sse^{33}vo^{33} nyi^{21} **ma^{33}** su^{33} mo^{33} o^{44}.
1SG boy two CLF DEF see PFV
'I saw the two boys.' (definite)

On the other hand, under the head movement analysis, I assume that the numeral occurs at Spec #P and the # head is marked with [+plural]. Clf-to-D head movement is blocked by the intervening # head due to the Head Movement Constraint (Travis 1984). Consequently, definite tone docking cannot take place as the classifier is not within the association domain of the floating H tone (i.e., within an M-Word).

Second, the non-movement analysis does not seem to shed light on the syntactic nature of the inseparability between Clf and D. Recall that in Nuosu Yi, D cannot combine with a head noun directly; rather, the mediation of a classifier is required, resulting in the [N-Clf-D] linear word order. Furthermore, nothing can intervene between Clf and D. Considering a non-movement structure such as (62), it remains unclear why Clf and D cannot be separated. On the contrary, under the Clf-to-D head movement analysis offered in (47), the restriction of the mediation of Clf follows automatically. In this framework, the inseparability of Clf and D arises from their formation as a [Clf-D] complex head through head movement, thus fully capturing the syntactic nature of Nuosu Yi's stringent [Clf-D] order.

Moreover, in other languages with definite determiners like English and German, D can readily combine directly with the head noun. This raises a natural question, that is, why the [N-D] combination is prohibited in Nuosu Yi. The head movement analysis provides a compelling explanation for such typological patterns: in Nuosu Yi, it is the complex head D, i.e., $[\text{Clf-D}]_{\text{D}}$,

that directly combines with the head noun. Hence, Nuosu Yi DPs are essentially consistent with languages such as English and German.

Lastly, the head movement analysis aligns well with cross-linguistic patterns. Clf-to-D head movement has been proposed to account for the definite bare classifier phrases in various East and Southeast Asian languages (Simpson 2005; Wu & Bodomo 2009; Li & Bisang 2012; Hall 2019). The definite [N-Clf] construction in Nuosu Yi fits into this broader typological pattern, supporting the claim that D is the locus of definiteness across languages, and that classifiers move to D to encode definiteness in classifier languages.

5 Tone change on classifiers is not tone sandhi

As briefly mentioned in Section 2.2, Nuosu Yi is a tonal language and displays a "33 → 44 / __33" sandhi pattern, where a lexical 33 tone surfaces as 44 when preceding another 33 tone (Lama 1991; Gerner 2013; Lee & Shen 2024). In this section, I will show that the tone change on Nuosu Yi classifiers is not an example of tone sandhi despite surface similarities, because this change (i) only occurs in specific grammatical contexts, and (ii) does not fully align with the "33 → 44 / __33" sandhi pattern.

Simply speaking, tone sandhi is a tonal process in which one of the lexical tones in two adjacent morphemes undergoes a tonal change. Many tonal languages spoken in East and Southeast Asia exhibit tone sandhi. A classic example is the Mandarin third tone sandhi, as illustrated in (65).

(65) *Mandarin Third Tone Sandhi* (Chen 2000: 20–21)

a. /xiao^{214} + gou^{214}/ → [**xiao^{35}** gou^{214}]
   small dog 'small dog, puppy'

b. /mai^{214} + ma^{214}/ → [**mai^{35}** ma^{214}]
   buy horse 'to buy a horse'

c. /dan^{214} + xiao^{214}/ → [**dan^{35}** xiao^{214}]
   gall small 'coward'

Mandarin has four tones: T1 (/55/), T2 (/35/), T3 (/214/), and T4 (/51/). As shown in (65), the third tone (/214/) dissimilates to T2 ([35]) when it occurs before another T3 (/214/), following the pattern "T3 → T2 /__T3".

Importantly, Mandarin third tone sandhi is conditioned by the underlying tonal values of two adjacent morphemes and is a general phonological process. It is not triggered by grammatical context or the specific construction formed by the adjacent morphemes. As seen in (65), the resulting constructions are varied: [$_{NP}$ Adj N] (65a), [$_{VP}$ V Obj] (65b), and [$_{AP}$ N Adj] (65c).

Similarly, Nuosu Yi tone sandhi applies across diverse constructions:

(66) *Nuosu Yi Tone Sandhi*

a. /co^{33} + ma^{33}/ → [**co^{44}** ma^{33}]
person CLF 'a person'

b. /zza^{33} + zze^{33}/ → [**zza^{44}** zze^{33}]
food eat 'eat food'

c. /ca^{33} + guo^{33}/ → [**ca^{44}** guo^{33}]
hot INT 'too hot'

As seen in (66), the newly-formed constructions are diverse, including [$_{\text{ClfP}}$ N Clf] (66a), [$_{\text{VP}}$ Obj V] (66b), and [$_{\text{AP}}$ Adj Adv] (66c).

On the other hand, except for tone sandhi, in tonal languages, particularly in those found in Africa, tone is consistently observed to serve grammatical functions, a phenomenon referred to as *grammatical tone*. Grammatical tone can express a wide range of grammatical meanings, including tense, agreement, number, case, definiteness, etc. An example of grammatical tone is found in Hausa (Chadic, Nigeria), as illustrated in (67).

(67) *Hausa* (Newman 1986: 257)

a. /jààkíí + -Ⓛn/ → jààkíìn [jààkîn] (í → ì)
donkey REF 'the donkey'

b. /hársúnàà + -Ⓛn/ → hársúnààn [hársúnàn] (no tone change)
language REF 'the languages'

As shown in (67), in Hausa the referential morpheme is analyzed as a suffix -Ⓛ*n*, which includes a floating L tone (i.e., Ⓛ). Specifically, this floating tone docks onto the preceding syllable if it ends in a H tone, creating a HL contour tone, as illustrated in (67a). In contrast, if the preceding syllable ends in a L tone, the floating L tone applies vacuously, as seen in (67b).

Crucially, grammatical tone is restricted to specific grammatical contexts and does not apply across the entire phonological grammar (Rolle 2018). In the Hausa example (67), the tone change is not general across the language but rather triggered by the referential context, thus meeting the requirement of grammatical tone.

Now, returning to the Nuosu Yi data, recall that in a [N-Clf] phrase, a definite interpretation is obligatory when the classifier's tone shifts to 44. In contrast, when no tone change occurs, the phrase receives an indefinite reading. For instance, if a classifier originally bears a 33 or 21 tone (e.g., *ma^{33}* and *zzi^{21}*) and shifts to 44, the [N-Clf] phrase must be interpreted as definite (see (68) and (69)). I propose that there is an underlying *su^{33}* after the classifier (as indicated in parentheses), which can be omitted if the classifier undergoes a tone change.

(68) Lama (1991: 38, gloss adapted, impossible reading added)
Co^{33} **ma^{44}** (su^{33}) la^{44} la^{33}?
person CLF:DEF (DEF) come come
'Did the person come?' (definite)
*'Did a person come?' (indefinite)

(69) Lama (1991: 38, gloss adapted, impossible reading added)
Rru^{21} **zzi^{44}** (su^{33}) yu^{33} si^{44} la^{33}.
chopstick CLF:DEF (DEF) grasp RES come
'Get the pair of chopsticks.' (definite)
*'Get a pair of chopsticks.' (indefinite)

Specifically, (69) exhibits a "21 → 44 / __33" tone change (70), which contrasts with the general Nuosu Yi tone sandhi pattern of "33 → 44 / __33" as in (71).

(70) **21** or 33 → 44/ __33 *tone change on classifier in definite [N-Clf]*

(71) 33 → 44/ __33 *Nuosu Yi tone sandhi*

More importantly, the classifier's tone change from 33 or 21 to 44, as shown in (68) and (69), signals definiteness. This supports the claim that the tone change on classifiers in Nuosu Yi DPs carries grammatical meaning, hence, is a case of grammatical tone.

A minimal pair in (72) further illustrates this contrast: when a 21 tone classifier precedes the 33 tone definite determiner *su^{33}* (which is underlyingly Ⓗ*su^{33}*), the classifier obligatorily shifts to 44 (72a). By contrast, when a 21 tone noun is followed by a 33 tone classifier, no tone sandhi occurs, as in (72b) and (72c).

(72) a. rru^{21} **zzi^{44}** su^{33} (zzi^{21} → zzi^{44})
chopstick CLF:DEF DEF
'the pair of chopsticks'
b. o^{21} ma^{33} (no tone change)
goose CLF
'a goose'
c. bi^{21} ji^{33} (no tone change)
pen CLF
'a pen'

Taken together, despite superficial similarities, the tone change on classifiers in definite [N-Clf] constructions—triggered by the definite tone docking rule, repeated in (73) below—differs from the tone sandhi pattern exhibited in Nuosu Yi. The former is grammatically conditioned, occurring

only in definite DP constructions, while the latter is phonologically conditioned and applies across various constructions. Thus, we can conclude that the tone change on classifiers in Nuosu Yi DPs is a clear case of grammatical tone, not tone sandhi.

(73) Clf + Ⓗ D → Clf Ⓗ D *definite tone docking*

6 Implications

Thus far, I have argued that Clf-to-D head movement, combined with definite tone docking, accounts for tone changes on classifiers in Nuosu Yi DPs. Some implications of the present analysis are in order. First, this analysis supports the idea that tone plays a crucial role in disambiguating syntactic structures, particularly in distinguishing head movement from non-movement structures. Second, by establishing the necessity of Clf-to-D head movement in Nuosu Yi, we see that such movement can occur not only in languages with a null D, but also in languages with an overt D. Implications of the necessity of postulating D in article-less classifier languages will also be discussed.

6.1 The role of tone in disambiguating syntactic structures

In head-final languages like Nuosu Yi, detecting head movement can be challenging because it is string-vacuous. The observation that classifiers and the definite determiner are always adjacent and uninterrupted can be explained by assuming that classifiers and the definite determiner occupy adjacent functional heads, with D selecting ClfP as its complement. This does not necessarily require postulating Clf-to-D head movement. However, I have shown that tone changes on classifiers in Nuosu Yi DPs play a crucial role in signaling syntactic structures, supporting the presence of head movement.

Recall that tonal marking of definiteness on classifiers is observed in both Wenzhou Wu and Nuosu Yi, which can be analyzed through Clf-to-D head movement. By contrast, the absence of tone changes on classifiers correlates with the presence of a numeral. **Table 3** summarizes the patterns of definiteness marking with and without numerals in these two languages:[17]

The crucial point here is that when a numeral is present, the whole phrase is interpreted as indefinite and in both languages, the definite classifier (i.e., Clf_{TONE}) cannot co-occur with a

[17] Notably, in Nuosu Yi definite [N-Clf] constructions, the classifier undergoes a tone change, and *su*^{33} becomes optional. I analyze *su*^{33} as a component of the definite determiner. Specifically, in the definite determiner (i.e., $\text{D}_{[+\text{def}]}$), D is realized as *su*^{33} while [+definite] is realized as the floating H tone. This analysis is supported by evidence in Section 4.3 that *su*^{33} alone (i.e., without the definite floating H tone) can function as a quantificational determiner. Several factors may influence the optionality of *su*^{33} in definite constructions. One possibility is discourse genre—*su*^{33} is required in formal speech but can be omitted in informal contexts, as seen in example (18). Another possibility is pragmatic emphasis—[N-Clf-*su*^{33}] may signal emphasis on the classifier (e.g., specifying shape or quantity), whereas [N-Clf] does not. I leave further investigation of *su*^{33}'s optionality to future research.

		Wenzhou Wu	Nuosu Yi
Definite	No num	Clf_{TONE}-N	N-Clf_{TONE}
			N-Clf_{TONE}-su^{33}
	Num	*Num-Clf_{TONE}-N	*N-Num-Clf_{TONE}
			N-Num-Clf-su^{33}
Indefinite	No num	Clf-N	N-Clf
	Num	Num-Clf-N	N-Num-Clf

Table 3: Summary of strategies to mark definiteness using tones on classifiers.

numeral. This restriction is not a result of linear word order at PF, as the presence of the numeral does not change the linear adjacency of the classifier and the definite determiner. Rather, it is the structural differences in syntax that lead to the restriction.

Building on previous studies on definite bare classifier constructions (Simpson 2005; Wu & Bodomo 2009; Li & Bisang 2012), I argue that tone changes on classifiers signal Clf-to-D head movement, as the tone change is led to by a grammatical tone of the head D (also see Jenks 2018 for the proposal that D has a phonological realization in article-less classifier languages). Crucially, this grammatical tone realizes the feature [+definite], which triggers Clf-to-D head movement. When a numeral is present, however, the classifier cannot move to D over Num or # because of the Head Movement Constraint (Travis 1984). Consequently, definite tone docking cannot occur in the presence of a numeral. This analysis thus provides a unified account for the marking of definiteness in these two languages through the interaction of tone docking and head movement.

Another example of tone disambiguating syntactic structures comes from [Pron-V] combinations in Nuosu Yi. Gerner (2013) observes that when a pronoun with an underlying 33 tone precedes a monosyllabic 33 tone verb, the pronoun takes a 44 tone if interpreted as the direct object, as shown in (74).

(74) *Tone changes that carry grammatical meanings* (Gerner 2013: 28)

a. Nga^{33} gu^{33}. vs. **Nga^{44}** gu^{33}.
1SG call 1SG call
'I called (someone).' vs. '(Someone) called me.'

b. Nge^{33} mgu^{33}. vs. **Nge^{44}** mgu^{33}.
2SG love 2SG love
'You love (someone).' vs. '(Someone) loves you.'

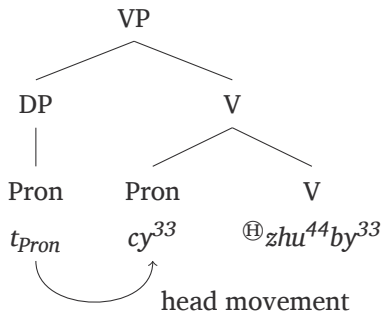
I extend this observation by noting that (i) the verb can be multi-syllabic, as in (75), and (ii) when two pronouns precede the verb, the object pronoun necessarily takes the 44 tone and it must be adjacent to the verb, as in (76).[18]

(75) Nga^{33} zhu^{44}by^{33}. vs. **Nga^{44}** zhu^{44}by^{33}.
1SG praise 1SG praise
'I praised (someone).' vs. '(Someone) praised me.'

(76) a. Nga^{33} **cy^{44}** zhu^{44}by^{33} o^{44}.
1SG 3SG praise PFV
'I praised him/her.'
b. *__Cy^{44}__ nga^{33} zhu^{44}by^{33} o^{44}.
3SG 1SG praise PFV
intended: 'I praised him/her.'

Here, the tone of the pronoun serves to disambiguate syntactic structures. Notably, no such tonal variation occurs in [(common) noun-verb] combinations. To account for this contrast, I propose that Nuosu Yi features both pronoun incorporation and anti-noun incorporation (Baker & Hale 1990). The direct object pronoun undergoes head movement to adjoin to the verb, forming a complex head [Pron-V], as sketched in (77).

(77)



I further propose that a floating grammatical tone (Ⓗ) marks object pronouns when a pronoun and a verb form a single M-Word through head movement. In contrast, when the pronoun functions as a subject and moves from Spec vP to Spec TP, it remains in a separate terminal node from the verb, resulting in two distinct M-Words. This structural separation prevents the floating H tone from docking onto the pronoun, thereby blocking the tone change when the pronoun is interpreted as the subject.

[18] (75) and (76) also show that the tone change on object pronouns is not an example of tone sandhi as (i) it is restricted to the [Pron-V] construction and carries the grammatical function of marking the direct object, and (ii) it does not fully align with the "33 → 44 / __33" sandhi pattern in Nuosu Yi.

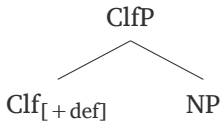
Taken together, tone changes in Nuosu Yi's [N-Clf-D] and [Pron-V] constructions can be attributed to head movement, suggesting that tone plays a crucial role in distinguishing between head movement and non-movement structures in the language.

6.2 Clf-to-D head movement in languages with overt D

Clf-to-D movement has been proposed to explain definite bare classifier phrases in several East and Southeast Asian languages (Simpson 2005; Wu & Bodomo 2009; Li & Bisang 2012), all of which are article-less classifier languages. In these cases, a null D is assumed to trigger movement of the classifier to D, allowing the classifier to acquire D-related features. The assumption behind this analysis is that a definite null D must be overtly instantiated by some lexical element to be licensed, thereby motivating Clf-to-D head movement. However, the data from Nuosu Yi show that Clf-to-D head movement can also occur in classifier languages with an overt D, suggesting that this movement is independent of whether D is overt or covert.

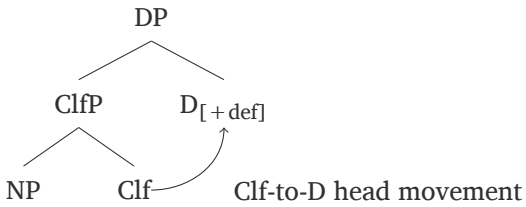
Moreover, regarding definite bare classifier phrases, the literature presents a long-standing debate on whether it is necessary to postulate a DP projection in article-less languages. For instance, Cheng & Sybesma (1999; 2005; 2012) argue against the Clf-to-D head movement analysis, proposing instead that there is no DP projection and that classifiers themselves function as the definite determiner, with Clf carrying a [+definite] value, as shown in (78).

(78)



However, the Nuosu Yi data contribute new insight to this debate by showing that classifiers act as definite determiners only when they move to D to acquire the [+definite] feature from D, as illustrated in (79). Crucially, when a numeral blocks Clf-to-D head movement in Nuosu Yi's [N-Num-Clf-D] construction, the classifier can no longer convey definiteness.

(79)



In other words, classifiers in Nuosu Yi cannot denote definiteness on their own. To encode definiteness, classifiers must move to D to get assigned the [+definite] feature. Put differently, in Nuosu Yi, definiteness is encoded in D, not in Clf. Thus, the Nuosu Yi data offer strong evidence in favor of the Clf-to-D head movement analysis, supporting the necessity of a DP projection even in languages without overt definite determiners.

7 Conclusion

Nuosu Yi DPs exhibit a tonal pattern where classifiers undergo a tone change when preceding the definite determiner. I propose to account for this with Clf-to-D head movement followed by definite tone docking, according to which the definite D is spelled out as $^{\text{H}}su^{33}$, consisting of a floating H tone and the determiner su^{33}. Crucially, the feature [+definite] is realized as a floating H tone, which docks leftward onto the preceding classifier if they form a single M-Word via head movement. In contrast, the presence of a numeral blocks Clf-to-D head movement due to a Head Movement Constraint violation (see also Simpson 2005; Wu & Bodomo 2009). This analysis captures various empirical observations including the optionality of su^{33} and the lack of tone change in the presence of a numeral. More importantly, it provides a unified explanation for both Gerner's (2013) proposal that su^{33} and the classifier together form the definite determiner and Jiang's (2018; 2020) claim that su^{33} alone functions as the definite determiner.

While this paper has mainly focused on Nuosu Yi, the findings have broader implications for other classifier languages. First, I have shown that the correlation between tone changes on classifiers and definiteness in Nuosu Yi can be explained through a grammatical tone analysis. This highlights the need for further investigation into tone change patterns to better understand how tones mark definiteness cross-linguistically. It is noted that tonal marking of definiteness on classifiers has also been observed in Wenzhou Wu and Weining Ahmao, both of which have been analyzed under the Clf-to-D head movement (via #) approach in Hall (2019). Together, these studies suggest that tone plays a crucial role in disambiguating syntactic structures, particularly in distinguishing head movement from non-movement structures.

Second, Clf-to-D head movement has been proposed to account for definite bare classifier phrases in several East and Southeast Asian languages (Simpson 2005; Wu & Bodomo 2009; Li & Bisang 2012), all of which are article-less classifier languages. In these cases, a null D is assumed to trigger movement of the classifier to D, allowing it to acquire D-related features. However, the Nuosu Yi data show that Clf-to-D head movement can also occur in classifier languages with an overt D, indicating that this movement is independent of whether D is overt or covert.

Abbreviations

1 = first person, 2 = second person, 3 = third person, CLF = classifier, CLF:DEF = definite classifier, CONT = continuous, COP = copula, CVB = coverb, DEF = definite determiner, DET = determiner, EXP = experiential, INS = instrumental, INT = intensifier, NEG = negation, NMLZ = nominalizer, PFV = perfective, PL = plural, PROG = progressive, RECP = reciprocal, REF = referential, RES = resultative, SG = singular, TOP = topic

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Competing interests

The author has no competing interests to declare.

References

Abney, Steven. 1987. *The English noun phrase in its sentential aspect*. Cambridge, MA: Massachusetts University of Technology dissertation.

Alexiadou, Artemis & Haegeman, Liliane & Stavrou, Melita. 2007. *Noun Phrase in the Generative Perspective*. Berlin, New York: De Gruyter Mouton. DOI: https://doi.org/10.1515/9783110207491

Baker, Mark. 1988. *Incorporation: A theory of grammatical function changing*. Chicago: University of Chicago Press.

Baker, Mark & Hale, Kenneth. 1990. Relativized minimality and pronoun incorporation. *Linguistic Inquiry* 21(2). 289–297.

Barwise, Jon & Cooper, Robin. 1981. Generalized quantifiers and natural language. *Linguist Philos* 4. 159–219. DOI: https://doi.org/10.1007/BF00350139

Bomford, Dylan. 2017. Split-scope definites: Relative superlatives and Haddock descriptions. *Linguist and Philos* 40. 549–593. DOI: https://doi.org/10.1007/s10988-017-9210-2

Borer, Hagit. 2005. *Structuring Sense Volume I: In Name Only*. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/acprof:oso/9780199263905.001.0001

Bybee, Joan. 2017. Mechanisms of change in grammaticization: The role of frequency. In Joseph, Brian D. & Janda, Richard D. (eds.), *The handbook of historical linguistics*, 602–623. Wiley Online Library. DOI: https://doi.org/10.1002/9780470756393.ch19

Chen, Matthew Y. 2000. *Tone sandhi: Patterns across Chinese dialects*. Cambridge: Cambridge University Press. DOI: https://doi.org/10.1017/CBO9780511486364

Cheng, Lisa Lai-Shen & Sybesma, Rint. 1999. Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30(4). 509–542. DOI: https://doi.org/10.1162/002438999554192

Cheng, Lisa Lai-Shen & Sybesma, Rint. 2005. Classifiers in four varities of Chinese. In Cinque, Guglielmo & Kayne, Richard S. (eds.), *The Oxford handbook of comparative syntax*, 259–292. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/oxfordhb/9780195136517.013.0007

Cheng, Lisa Lai-Shen & Sybesma, Rint. 2012. Classifiers and DP. *Linguistic Inquiry* 43(4). 634–650. DOI: https://doi.org/10.1162/ling_a_00109

Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6. 339–405. DOI: https://doi.org/10.1023/A:1008324218506

Dayal, Veneeta. 2004. Number marking and (in)definiteness in kind terms. *Linguistics and Philosophy* 27. 393–450. DOI: https://doi.org/10.1023/B:LING.0000024420.80324.67

Dayal, Veneeta & Sağ, Yağmur. 2020. Determiners and bare nouns. *Annual Review of Linguistics* 6(1). 173–194. DOI: https://doi.org/10.1146/annurev-linguistics-011718-011958

Edmondson, Jerold A. & Esling, John H. & Ziwo, Lama. 2017. Nuosu Yi. *Journal of the International Phonetic Association* 47(1). 87–97. DOI: https://doi.org/10.1017/S0025100315000444

Embick, David. 2007. Linearization and local dislocation: Derivational mechanics and interactions. *Linguistic Analysis* 33(3-4). 303–336.

Embick, David. 2015. *The morpheme: A theoretical introduction*. Berlin: De Gruyter Mouton. DOI: https://doi.org/10.1515/9781501502569

Embick, David & Noyer, Rolf. 2001. Movement operations after syntax. *Linguistic Inquiry* 32(4). 555–595. DOI: https://doi.org/10.1162/002438901753373005

Gerner, Matthias. 2013. *A Grammar of Nuosu*. Berlin: De Gruyter Mouton. DOI: https://doi.org/10.1515/9783110308679

Gerner, Matthias & Bisang, Walter. 2008. Inflectional speaker-role classifiers in Weining Ahmao. *Journal of Pragmatics* 40(4). 719–732. DOI: https://doi.org/10.1016/j.pragma.2007.11.004

Gerner, Matthias & Bisang, Walter. 2010. Classifier declinations in an isolating language: On a rarity in Weining Ahmao. *Language and Linguistics* 11(3). 579–623.

Giusti, Giuliana. 1997. The categorial status of determiners. In Haegeman, Liliane (ed.), *The new comparative syntax*, 95–123. London: Addison Wesley Longman Limited.

Giusti, Giuliana. 2002. The functional structure of noun phrases: A bare phrase structure approach. In Cinque, Guglielmo (ed.), *Functional structure in DP and IP: The cartography of syntactic structures*, vol. 1, 54–90. Oxford Academic. DOI: https://doi.org/10.1093/oso/9780195148794.003.0003

Giusti, Giuliana. 2015. *Nominal syntax at the interfaces: A comparative analysis of languages with articles*. Cambridge: Cambridge Scholars Publishing.

Hall, David. 2019. Licensing D in classifier languages and "numeral blocking". In Aguilar-Guevara, Ana & Pozas Loyo, Julia & Vázquez-Rojas Maldonado, Violeta (eds.), *Definiteness across languages*, Language Science Press. DOI: https://doi.org/10.5281/zenodo.3252022

Halle, Morris & Marantz, Alec. 1993. Distributed morphology and the pieces of inflection. *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*. 111–176.

Hopper, Paul & Bybee, Joan. 2001. *Frequency and the emergence of linguistic structure*. Amsterdam: John Benjamins Publishing Company. DOI: https://doi.org/10.1075/tsl.45

Jenks, Peter. 2018. Definite spans and blocking in classifier languages. *Berkeley Papers in Formal Linguistics* 1(1). DOI: https://doi.org/10.5070/BF211038555

Jiang, Li Julie. 2012. *Nominal arguments and language variation*. Cambridge, MA: Harvard University dissertation.

Jiang, Li Julie. 2015. Marking (in)definiteness in classifier languages. *Bulletin of Chinese Linguistics* 8(2). 319–343. DOI: https://doi.org/10.1163/2405478X-00802010

Jiang, Li Julie. 2018. Definiteness in Nuosu Yi and the theory of argument formation. *Linguist and Philos* 41. 1–39. DOI: https://doi.org/10.1007/s10988-017-9219-6

Jiang, Li Julie. 2020. *Nominal arguments and language variation*. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/oso/9780190084165.001.0001

Kayne, Richard S. 1991. Romance clitics, verb movement, and PRO. *Linguistic Inquiry* 22(4). 647–686. DOI: https://doi.org/10.1093/oso/9780195102352.003.0005

Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.

Kornfilt, Jaklin. 1996. Naked partitive phrases in Turkish. In Hoeksema, Jacob (ed.), *Partitives: Studies on the syntax and semantics of partitive and related constructions*, 107–142. Berlin, New York: De Gruyter Mouton. DOI: https://doi.org/10.1515/9783110908985.107

Lama, Ziwo. 1991. Shilun yiyu cigaodiao chansheng de yuanyin [A preliminary study on the origin of Yi lower-high tone]. *Minzu Yuwen [Minority Languages of China]* 5. 35–38.

Lee, Seunghun J. & Shen, Hong. 2024. Tone sandhi in Nuosu Yi at the interface: Phonological evidence for morphological structures. *Linguistics of the Tibeto-Burman Area* 47(1). 118–139. DOI: https://doi.org/10.1075/ltba.00019.lee

Li, Xuping & Bisang, Walter. 2012. Classifiers in Sinitic languages: From individuation to definiteness-marking. *Lingua* 122(4). 335–355. DOI: https://doi.org/10.1016/j.lingua.2011.12.002

Li, Yen-hui Audrey. 1999. Plurality in a classifier language. *Journal of East Asian Linguistics* 8. 75–99. DOI: https://doi.org/10.1023/A:1008306431442

Little, Carol-Rose & Winarto, Ekarina. 2019. Classifiers and the definite article in Indonesian. *Proceedings of the 49th North East Linguistics Society* 2. 209–220.

Löbner, Sebastian. 1985. Definites. *Journal of Semantics* 4. 279–326. DOI: https://doi.org/10.1093/jos/4.4.279

Longobardi, Giuseppe. 1994. Reference and proper names: A theory of N-movement in syntax and logical form. *Linguistic Inquiry* 25(4). 609–665.

Matushansky, Ora. 2006. Head movement in linguistic theory. *Linguistic Inquiry* 37(1). 69–109. DOI: https://doi.org/10.1162/002438906775321184

Milsark, Gary. 1974. *Existential sentences in English*. Cambridge, MA: Massachusetts Institute of Technology dissertation.

Moroney, Mary. 2019. Inconsistencies of the consistency test. *Proceedings of the Linguistic Society of America* 4(1). 55:1–10. DOI: https://doi.org/10.3765/plsa.v4i1.4560

Moroney, Mary. 2021. Updating the typology of definiteness: Evidence from bare nouns in Shan. *Glossa* 6(1). 1–28. DOI: https://doi.org/10.5334/gjgl.1221

Newman, Paul. 1986. Tone and affixation in Hausa. *Studies in African Linguistics* 17(3). DOI: https://doi.org/10.32473/sal.v17i3.107485

Pak, Marjorie. 2019. Logoori grammatical tone: A distributed morphology analysis. *Florida Linguistics Papers* 6(1). 51–62.

Roberts, Ian. 2010. *Agreement and head movement: Clitics, incorporation, and defective goals*. Cambridge, MA: MIT press. DOI: https://doi.org/10.7551/mitpress/9780262014304.001.0001

Rolle, Nicholas Revett. 2018. *Grammatical tone: Typology and theory*. Berkeley, CA: University of California, Berkeley dissertation. DOI: https://doi.org/10.5070/BF211040767

Sağ, Yağmur. 2025. On the (non)optionality of the Turkish classifier *tane*. *Natural Language & Linguistic Theory* 43. 907–964. DOI: https://doi.org/10.1007/s11049-024-09626-4

Schwarz, Florian. 2009. *Two types of definites in natural language*. Amherst, MA: University of Massachusetts Amherst dissertation.

Schwarz, Florian. 2013. Two kinds of definites cross-linguistically. *Language and Linguists Compass* 7(10). 534–559. DOI: https://doi.org/10.1111/lnc3.12048

Simpson, Andrew. 2005. Classifiers and DP structures in southeast Asia. In Cinque, Guglielmo & Kayne, Richard S. (eds.), *The Oxford Handbook of Comparative Syntax*, 806–838. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/oxfordhb/9780195136517.013.0018

Szabolcsi, Anna. 1994. The noun phrase. In Kiefer, Ferenc & Kiss, Katalin (eds.), *The syntactic structure of Hungarian*, 179–274. Brill. DOI: https://doi.org/10.1163/9789004373174_004

Travis, Lisa deMena. 1984. *Parameters and effects of word order variation*. Cambridge, MA: Massachusetts Institute of Technology dissertation.

Wu, Yicheng & Bodomo, Adams. 2009. Classifiers ≠ Determiners. *Linguistic Inquiry* 40(3). 487–503. DOI: https://doi.org/10.1162/ling.2009.40.3.487