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RESEARCH ARTICLE

The (post-)syntax of repeater classifiers: A case study in Thai

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Abstract

This paper analyzes the structure of Noun Phrases with repeater classifiers (i.e., numeral classifiers that are only used with the single noun they are form-identical with). I show that a previous attempt to account for repeaters in terms of syntactic head movement encounters both empirical and theoretical problems. I suggest that repeaters emerge in the post-syntactic component, via a melody copying operation, which I characterize as a type of syntactic reduplication.

1. Introduction

The focus of this paper is a special type of numeral classifier called REPEATER CLASSIFIER or repeater for short (also called echo classifier, auto-classifier, or self-classifier). Repeaters emerge when in a classifier language a subset of nouns does not combine with the established classifier lexemes, but the syntactic configuration is such that it requires the classifier slot to be filled in overtly. This tension between the properties of individual nouns (i.e., unclassifiability) and the properties of certain syntactic structures that contain them (i.e., the need for a classifier) is resolved by repeating the noun in the classifier position.[1]

As an illustration of this phenomenon, consider the following minimal pair from Thai. (1) is the baseline where the noun *rôm* 'umbrella' takes *khan*, the classifier for long, handled objects. In (2), on the other hand, *prathêet* 'country' and *laam* 'pattern' do not take an established classifier, so the classifier slot is filled by a copy of the noun.[2]

[1] See Section 3 for a refinement.
[2] Glossing abbreviations are as follows. CL: classifier, LOC: locative, PL: plural, SP: Spanish loan, TOP: topic.

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(1) rôm săam khan
umbrella three CL.handled.long
'three umbrellas' (Hundius & Kölver 1983)

(2) a. prathêet săam **prathêet**
country three CL:country
'three countries' (Hundius & Kölver 1983)
b. laaj săam **laaj**
pattern three CL:pattern
'three patterns' (Jenks 2011: 93) Thai

Crucially, 'repeaters […] classify only themselves or compounds of which they are a constituent' (Adams & Conklin 1975, cited in Placzek 1978, Gandour et al. 1984). In other words, repeaters only occur with the form-identical noun (and compounds headed by the form-identical noun). They should be distinguished from garden variety classifiers that have grammaticalized from a noun and remain form-identical to their source, but that have become generalized classifiers and thus occur with a wide range of nouns, with the form-identical source noun being only one of these.

As a specific example, the Thai classifier *khon* has grammaticalized from the homophonous noun $khon_N$ 'person' and has become a 'general classifier for nouns denoting persons, except sacred or royal ones' (Hundius & Kölver 1983: 193). Thus while *khon* does indeed classify the form-identical noun $khon_N$ 'person' (3), it also combines with other nouns such as 'child', 'student' (Pornsiri Singhapreecha, p.c., (4)), 'woman', 'teacher' (Haas 1942), or 'film star' (Hundius & Kölver 1983).

(3) khon săam khon
person three CL
'three people' (Pornsiri Singhapreecha, p.c.)

(4) dek/nákrian săam khon
child/student three CL
'three children/students' (Pornsiri Singhapreecha, p.c.) Thai

For this reason, *khon* in (3) is not a repeater but a garden variety classifier which, among other nouns, also classifies its source noun.

Repeaters can be found in certain East and Southeast Asian numeral classifier languages such as Thai, Lao, Burmese, Mal, Lisu, etc. (see Jones 1970, Aikhenvald 2000, Zhang 2012) as well as in a number of so-called multiple classifier languages of Lowland Amazonia (Aikhenvald 2000: 222).[3] Most of the data in this paper comes from Thai, because it is a very

[3] It has been observed that among East and Southeast Asian numeral classifier languages, repeaters correlate with the 'N Num Cl' order (e.g., Zhang 2012). This is sometimes explained as an avoidance of immediate repetition: in the 'Num Cl N' order repeaters would produce a suboptimal situation in which the noun and the homophonous classifier are adjacent (Kölver 1982). I note here that if this is a valid explanation, languages must differ in their tolerance for immediate repetition. In Chuukese (also called Trukese, Austronesian), the word order in NPs is 'Num Cl N', and repeaters also exist.
(i) e-yaf aaf (underlying phonological form: *ye-yafa yafa*)
one-CL:intestine intestine
'one intestine' (Benton 1968: 116, glosses adapted) Chuukese

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well-documented language and I had the opportunity to check minimal pairs with Pornsiri Singhapreecha, a linguist native speaker of the language. At the appropriate points, however, I will make comparisons with other repeater languages.

The central problem I address in this paper is how repeaters should be modeled: specifically, which grammatical module produces them and by what exact mechanism. The analysis will be couched in mainstream Chomskyan generative grammar. In this framework, syntax is the only generative component of grammar: it forms both complex words and complex phrases. The Vocabulary (aka list of vocabulary items or Exponent List) is merely a list that provides phonological content to syntactic terminals at the end of the derivation; there are no 'lexical operations'. The morphological component is post-syntactic and may perform small adjustments to the output of syntax. These adjustments are 'limited to minor operations that manipulate nodes in a sharply constrained fashion' (Embick & Noyer 2007: 293). They apply to individual vocabulary items, and only when forced by idiosyncratic morpho(phonological) requirements thereof. The general perspective of this framework and its technical toolkit make it an excellent vehicle for analyzing the facts, however, the core of the analysis could also be easily recast in other frameworks.

While explicit discussion of repeaters in generative grammar is somewhat rare, all existing analyses agree that repeaters are to be derived from the corresponding nouns by a (semi) productive rule within the generative component of grammar (broadly speaking, syntax/morphosyntax). That is, the relationship between a repeater and the corresponding noun is dynamic; in somewhat older parlance we could say that repeaters are outputs of a transformation (see Simpson 2005, Piriyawiboon 2010: 83; Jenks 2011: 94; Simpson & Ngo 2018).[4]

This view is held because in Thai, for instance, repeaters are 'very extensively applied in Standard usage' (Hundius & Kölver 1983: 190). In their seminal article on Thai classifiers, Hundius & Kölver (1983: 203) examined 'a sample of about five hundred repeater nouns', implying that the actual set of repeaters could be even larger. In Thai, there are about 40 sortal (aka unit) classifiers in daily use, and a further approximately 20 are used infrequently (Carpenter 1991, though Singhapreecha 2001 puts the total number at around 80). With this, Thai already possesses one of the most elaborate system of sortal classifiers (Carpenter 1986). If repeater classifiers were lexicalized in the same way as other, ordinary classifiers (i.e., if all repeaters were listed in the vocabulary list one by one, as classifier listemes entirely disconnected from one another as well as from their associated nouns), they would considerably inflate the functional class of sortal classifiers, making it potentially open-ended (cf. Placzek 1978: 159; Carpenter 1986, Jenks 2011: 94). This problem is even more pronounced in the royal linguistic register (*ra:cha:sàp*), in which many nouns that take regular classifiers in colloquial speech or Standard Thai take repeaters instead (Juntanamalaga 1988, Aikhenvald 2021). Assuming around 600 different classifiers, about 500 of which are extremely specific in that they apply to just a single noun, one that happens to have the same phonological shape as the classifier, would beg the question if we are missing a generalization.

Adjacency between a noun and a repeater is also tolerated in Garo (Tibeto-Burman, Northeast India). In this language, the most common word order is 'N Cl Num', but 'Cl Num N' is also possible. There is a single repeater classifier, for 'village', producing two adjacent instances of *song* in the more common word order, cf. (ii). (*Gini* means 'two'; it is unclear why Burling 2004 segments it into two morphemes.)

(ii) song song-gin-i
village CL:village-two
'two villages' (Burling 2004: 250) Garo

[4] I am not aware of explicit arguments against this view from other frameworks either.

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As formulated in Jenks (2011: 94), 'the productivity of this construction indicates that its origin is grammatical rather than lexical'.[5]

There are further productivity-related considerations, too, which make a lexicalized approach to repeaters uncompelling. New nouns are either paired with one of the established classifiers or are assigned a repeater (Singhapreecha 2001, see also Beckwith 2007: 102 on many loanwords being classified by repeaters). Of course, function words often grammaticalize from lexical classes, and established classifiers particularly often grammaticalize from nouns. However, grammaticalization requires a certain depth of time, and this is precisely what is lacking with new nouns. New nouns thus show particularly well that repeaters are linked to the corresponding nouns by a productive, immediately applicable process rather than lexicalization (i.e., being drawn from a pre-existing list of vocabulary items). That repeaters are created 'online', when the need arises, is also shown by the fact that when residents of rural areas do not know the 'correct' classifier, they often fall back on the repeater strategy (Placzek 1978: 48). Repeaters thus actively access the lexical entry of the corresponding noun and are not pre-listed as vocabulary items fully separate from these nouns. This is further supported by the fact that Carpenter (1986: 23) reports the overuse of repeaters as 'the only really frequent stylistic reclassification' strategy by speakers. Stylistic reclassification means that instead of combining a noun with one of its established, conventionalized classifiers, a speaker uses a classifier unusual for that noun, in order to achieve a stylistic effect (in this case, that of being 'cute'). This is essentially misclassification on purpose, and it again shows that repeaters are not lexicalized but created from the corresponding nouns as needed.

In this paper, I will follow earlier generative work in treating repeaters as results of a rule application. However, I will challenge the assumption that this rule applies in narrow syntax. To anticipate the main idea, I hold that repeaters emerge in the post-syntactic component of grammar via a melody copying operation, which is a type of syntactic reduplication.

The article is structured as follows. In Section 2 I review and argue against a previous attempt to account for repeaters in terms of syntactic head movement. Section 3 lays out my analysis, while Section 4 presents cross-linguistic evidence for aspects of the proposal. Section 5 discusses the relation between repeaters and unclassified nouns. Section 6 rounds out the paper with the conclusions.

2. Previous approaches to repeaters

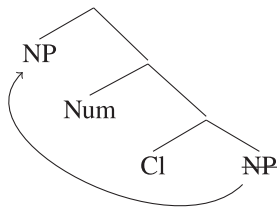
As shown in (1)–(4), the Thai NP features the word order 'N Num Cl'. Since Cinque (2005), there has been agreement in the generative literature that all noun modifiers are generated pre-nominally, and postnominal modifiers arise because the NP has moved across them to a

[5] In the multiple classifier language Tariana (Arawakan), repeaters constitute an entirely open class. 40% of underived inanimate nouns do not combine with one of the established classifiers and require a repeater in classifier environments (Aikhenvald 2003: 117). The rest of the underived inanimate nouns occur with an established classifier by default. However, even these take a repeater when the noun is in contrastive focus (Aikhenvald 2000: 223). Similarly, in Tukano (Tucanoan) all inanimate count nouns can be associated to repeaters (Ramirez 1997: 237; cited in Bowern et al. 2013+: feature 38). This means that for a lexicalist account, in addition to the regular classifiers, there should be additionally as many classifiers restricted to use with the single homophonous noun as there are inanimate nouns. This is hardly an attractive or realistic model of NP syntax and the mental lexicon of the languages in question. Since repeaters should receive a uniform account cross-linguistically, this further supports the view that in Thai and other numeral classifier languages, too, repeaters are a grammatical rather than a lexical phenomenon.

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higher structural position. This view has been widely adopted for Thai as well (see Visonyanggoon 2000, Singhapreecha 2001, Simpson 2005, Piriyawiboon 2010, Jenks 2011, Chaiphet 2023, among others), and will be subscribed to here.

(5)



That this movement affects a phrasal projection of N rather than just the nominal head itself is supported by two arguments. First, if the noun were to move by head movement, it would have to move across the Cl position, where it would amalgamate with the ordinary classifier and only the resulting complex head could move on to a position above the numeral ('no excorporation from complex heads'). Since this does not happen and the classifier is bypassed on the way, we must be looking at NP movement. Second, movement of the noun to the pre-numeral position pied-pipes adjectives such as 'Thai' or 'small' and complex modifiers like *tua-lék* 'small-bodied'[6] as well as PPs such as *nay esia* 'in Asia'. This clearly shows that the moving constituent is a whole phrase.

(6) dèk thay tua-lék săam khon
child Thai body-small three CL
'three small Thai children' (Pornsiri Singhapreecha, p.c.)

(7) prathêet lék nay esia săam prathêet
country small in Asia three CL:country
'three small countries in Asia / three small Asian countries' (Pornsiri Singhapreecha, p.c.) Thai

In the previous formal literature on classifiers, repeaters have received relatively little coverage. The main focus in Simpson (2005) is on variation among classifier languages in Southeast Asia, but Simpson also briefly considers repeaters and outlines the contours of a movement-based account. He suggests that in the case of nouns that combine with ordinary classifiers, as in (8), the Cl position is filled by selecting a classifier from the lexicon.

(8) rôm săam khan
umbrella three CL.handled.long
'three umbrellas' (Hundius & Kölver 1983) Thai

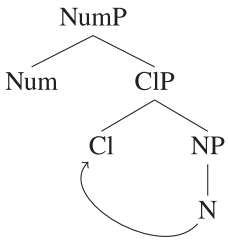
In the case of repeaters such as (9), on the other hand, N undergoes syntactic head movement to Cl. The lower copy of the head-chain is not deleted, thus at PF the same phonological material occurs twice, once in N and once in Cl. This is schematized in (10).

[6] On these types of modifiers, see Jenks (2012).

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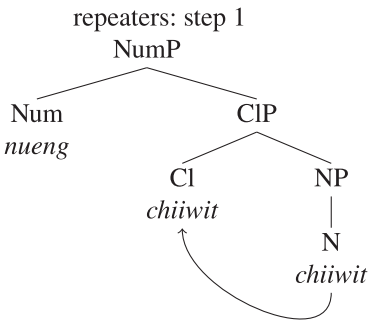
(9) chiiwit nueng chiiwit
life one CL:life
'one life' (Piriyawiboon 2010: 83) Thai

(10)

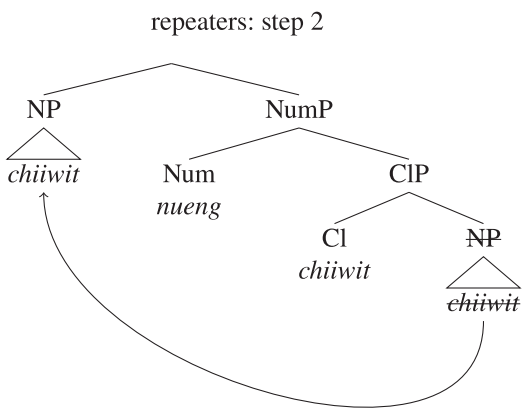


Taken together with the general NP movement in the Thai NP (also endorsed in Simpson 2005), this means that NPs with repeaters combine the head movement in (10) with the phrasal movement in (5), while in NPs with ordinary classifiers only NP movement occurs. This general idea, with slightly different syntactic labels, is also endorsed in Jenks (2011).

(11)



(12)



Even though there is some initial plausibility for the hypothesis and on some level Simpson clearly has the right intuition, there is quite a bit of evidence against the implementation of the proposal in terms of syntactic head movement. Firstly, whether a noun will take a repeater or not is an idiosyncratic property of the particular listeme; there is no morphosyntactic feature that characterizes all and only nouns that take repeaters (nor is there any semantic or phonological property unique to this class). Syntactic movement, on the

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other hand, is sensitive to morphosyntactic features and operates on morphosyntactic classes in a systematic manner. This means that movement cannot see the difference between 'cat' and 'dog' or *rôm* 'umbrella' and *prathêet* 'country'. Simpson's proposal would require head movement to operate on a listeme-by-listeme fashion, applying to a random subset of nouns in the language but not to others. This simply does not characterize syntactic movement. Consider the operation that preposes the noun (phrase) to the pre-numeral position, discussed above. This is a genuine instance of syntactic movement: it applies to all nouns, irrespective of whether that noun takes a repeater or not. That the operation that creates repeaters does not apply in this systematic fashion to all nouns but involves listeme-based idiosyncrasy points to a property of the post-syntactic component of the lexicon rather than narrow syntax.[7]

Secondly, the movement account also makes the wrong prediction when it comes to compounds. Movement that indubitably takes place in narrow syntax, such as the preposing of the noun to the pre-numeral position, cannot tear compounds into two. As shown below, it is not possible to move the head of the compound away from the non-head part. (Note that Thai compounds are left-headed.)

(13) kêɛw-nám săam bay
glass-water three CL
'three glasses' (Pornsiri Singhapreecha, p.c.)

(14) *kêɛw săam bay nám
glass three CL water
'three glasses' (Pornsiri Singhapreecha, p.c.) Thai

Consider now how compounds are classified when they are headed by an autoclassified noun. As shown in (15), only the head is repeated in the Cl position. This has been termed as the SEMI-REPEATER construction in the literature.

(15) prathêet-samŭn săam prathêet
country-satellite three CL:country
'three satellite countries' (Hundius & Kölver 1983) Thai

[7] Allan (1977: 295) makes the observation that most nouns that take a repeater 'seem to have a salient locative component, referring to topographical features, villages, states etc.'. Even if this were correct, it does not mean that there is a systematic way to predict which nouns will take repeaters. First, while in Thai nouns such as *prathêet* 'country', *myaŋ* 'town', *khàapsamùt* 'peninsula', *thăan* 'base, foundation', *khèet* 'area, zone, boundary', *pâw* 'target', or *kɔ̀* 'island' are indeed all classified by repeaters and refer to topographical features, there are also plenty of nouns that refer to topographical features but take an ordinary classifier. Hundius & Kölver (1983: 200) discuss the classifier *hèŋ*, which occurs with 'localities generally', and they characterize the nominals taking it as a 'very extensive class', including *dindɛɛn* 'area, region', *thiwtát* 'landscape', *náamtòk* 'waterfall', or *talàat* 'market'. Other classifiers for place-denoting nouns are *lăŋ* for houses and house-like structures, *thîi* for nouns such as *cùtmăaj* 'destination, goal' or *sûam* 'lavatory', *dâan* for geographical lines and boundaries, and *ráan* for commercial buildings. Second, 'referring to topographical features' is a semantic property rather than a morphosyntactic feature; hence, movement cannot be sensitive to this concept. Third, there are plenty of nouns taking repeaters that do not denote a place. Hundius & Kölver (1983) mention body part terms, taboo-concepts, objects of irregular or variable appearance (such as *laaj* 'pattern, design' or *khanɛɛn* 'mark') and abstract notions (e.g., *wíthii* 'method', *chŷy* 'name', *pɔɔramaanuu* 'atom') among nouns that take repeaters. See also Placzek (1978: Chapter 3.1) for discussion that there is no unified class meaning for repeaters.

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Under Simpson's analysis, this would involve the head of the compound moving away from the non-head part. We have just seen, however, that this is an illicit operation in Thai. Repetition of just the compound head is not unique to Thai but appears to characterize repeater languages more generally.[8]

(16) taiʔ-eiŋ tə eiŋ
brickbuilding-house one CL:house
'one masonry house' (Pe 1965) Burmese

(17) kəŋ khaak pyəi kəŋ
horn two CL:horn
'two horns' (Wajanarat 1979) Mal

I conclude from the foregoing discussion that the repetition of the noun in the Cl position does not empirically exhibit the characteristics of narrow syntactic movement.

Simpson's proposal also runs into theory-internal problems. To begin with, it falls foul of Kayne's (1994) Linear Correspondence Axiom (LCA). The LCA regulates how hierarchical structures are linearized. It rules out double exponence in movement chains because double exponence would violate irreflexivity and asymmetry, leading to conflicting (and ultimately irresolvable) linearization statements (Nunes 2004). The step in (11) creates precisely the offending configuration. One might argue that this is allowed because in a subsequent step, the NP moves out, and this repairs the problem. In (12), the N head is too deeply embedded in the landing site to c-command the instance of N that has moved to the Cl head (especially so if adjectives and PP modifiers preposed together with the noun are hosted in dedicated functional projections above NP). This reasoning raises at least two non-trivial questions, however. *i)* Why does (11) not cause the derivation to crash immediately (especially if the relative ordering of words is fixed at the end of each phase, as in Fox & Pesetsky 2005, and as argued in Simpson & Syed

[8] A reviewer notes that the head movement analysis could capture these data if it is assumed that the entire compound undergoes head movement to Cl, but at PF only the compound head is spelled out in the Cl position. This scattered deletion account is not a plausible approach to partial repeaters for several reasons. Firstly, scattered deletion is problematic in and of itself: is an entirely unconstrained operation which can be invoked in an arbitrary fashion. If scattered deletion was available for Thai head chains, one wonders why it is completely blocked in the case of Thai NP movement (14). Again, we see a discrepancy between regular syntactic movement and the head movement posited for repeaters. Secondly, scattered deletion is also called 'complementary deletion', because when it is invoked, it is generally assumed to operate in such a way that no part of the moved constituent is spelled out both in the launching site and the landing site. This is clearly not the case in partial repeaters such as (15), where *prathêet* appears both in the N and the Cl position. Thirdly, if scattered deletion was available for head chains in natural languages in general, we could expect to see apparent excorporation from complex heads with some regularity, at least in cases where it does not result in the stranding of material that cannot be pronounced in isolation. This is not the case, however: the 'no excorporation' generalization is a strong constraint on head movement, including movement of compound nouns and compound verbs (see Dékány 2018 for an overview). Thirdly, in Section 4 I will show that repeaters in Murui involve submorphemic strings. Scattered deletion, when invoked, always respects lexical integrity, and does not cut up morphemes into submorphemic parts. In Section 3 I will offer a partial reduplication account of partial repeaters. Partial reduplication is widely attested independently of repeaters as well, and as I will explain in detail, it allows partial repeaters to be viewed as an optional solution to a problem rather than as a curiosity that itself requires explanation, as on the scattered deletion account. In the analysis proposed in Section 3, only the head of the compound is present in the Cl position. The burden of proof is on the scattered deletion approach to show that the non-head ends up in Cl invisibly.

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2016, the projection that we here called NumP is a phase)? *ii)* What explains the difference in the spell out of head chains and phrasal chains? The assumption that in the case of the head chain (11) the lower copy must be spelled out, while in the case of the NP chain (12) the lower copy must be silenced remains a stipulation.[9]

It should be noted that Nunes (2004) discusses some cases of head chains where multiple, identical-looking copies are spelled out. He argues that this can happen when some mechanism makes one of the copies invisible for Chain Reduction. It is unclear what independently justifiable mechanism could be at work here to render either the head or the tail of the head movement chain invisible for reduction.[10] However, even if such a mechanism could be found, it would not solve all problems. Simpson (2005) also discusses data such as (18), where only the classifier position is filled in overtly.

(18) soong pii
two year
'two years' (Simpson 2005)

He suggests that these examples are also derived by head movement, but here chain reduction does take place (see also Simpson & Ngo 2018: 222). Thus not only is the head movement operation itself listeme-based, but the spellout of multiple copies within the chain is also listeme-based, applying idiosyncratically within the set of nouns purportedly undergoing head movement. This is unoperationalizable in any theory of syntax.

Furthermore, the step in (11) also violates one of Cinque's (2005) constraints on NP-internal movement, which are essential in deriving only the cross-linguistically attested orders of Dem, Num, A and N. The relevant constraint posits that 'Neither head movement nor movement of a phrase not containing the (overt) NP is possible' (p. 321); 'Allowing for movement of both N and NP […] would wrongly permit the derivation of most of the unattested orders' (p. 324).

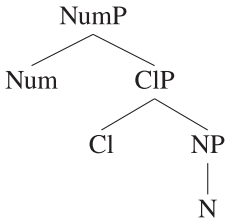
More than a decade later, Simpson & Ngo (2018) revisit Simpson's original proposal. Recognizing the fundamental problem with applying syntactic movement idiosyncratically to particular nouns but not to others, they update the account in the following way. Repeater languages are suggested to have a phonologically null classifier, which selects for all and only nouns that take repeaters. The null classifier is suffixal, and hence in need of a morphological host. This triggers nouns that occur with the null classifier to undergo N-to-Cl movement, thereby providing support to the zero affix. Nouns that occur with the morphologically free overt classifiers do not have a similar trigger for movement and hence stay in situ. (The subsequent NP movement that takes the noun to the pre-numeral position again applies to both types of nouns.)

[9] Jenks (2011: 96) has a slightly different take on the pronunciation of the two types of movement chains: he suggests that (12) should be understood as both the head movement chain and the NP chain having only their heads pronounced. As he points out, 'One prediction of this analysis is that repeater classifiers should only be found in classifier languages with NP-movement, as only in these languages will nouns participate in two distinct chains.' At least in multiple classifier languages, this prediction is not borne out. Chuukese, discussed in fn. 3, and Murui, discussed in Section 4, have repeaters in the 'Num Cl N' order. Kilivila (Austronesian) also has repeaters in the 'Cl Num N' order (Senft 1996). Neither of these orders involves NP movement.

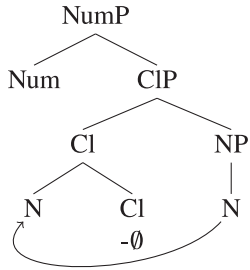
[10] Grohmann & Nevins (2004) suggest that multiple copies (within a domain) are possible as long as they are phonologically distinct (see also Nunes 2004: 48). This clearly does not hold in the case of repeaters.

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(19) structure with an ordinary classifier



(20) structure with a repeater



In this approach, the problem of which nouns will and will not move is ultimately reduced to the selectional restrictions between classifiers and nouns, a phenomenon that is independently known to have some idiosyncrasies (see esp. Haas 1942).

There are several reasons why this proposal does not represent a successful attempt at eliminating the problems of the original account. Assuming silent elements with specific meaning contributions to the functional sequence has become fairly standard, cf. declarative main clause complementizers, present tense, or singular number in many languages, or Kayne-style silent NOUNS. Null classifiers, specifically, have been posited in a wide range of publications (including those of the present author), primarily on semantic grounds. When a noun has individual/atomic reference but no classifier is present, it is often assumed that a phonologically null classifier is responsible for the individual interpretation (Sharvy 1978, Muromatsu 2003, Kobuchi-Philip 2006, Cinque 2006, Gebhardt 2009, Piriyawiboon 2010, Biswas 2013, Zhang 2013, Her et al. 2015, Dékány 2021, among others). The first problem with Simpson & Ngo's (2018) account is that its success turns on the posited affixal nature of the silent classifier, an assumption that is not falsifiable.

The second problem is that Cl is a functional head, and thus it is subject to late insertion. This means that within narrow syntax, information about the morphologically free or bound nature of the to-be-inserted classifier exponent is not yet available, and so the relevant affix-supporting movement cannot be triggered.

A third and related problem is that syntactic movement in current Minimalism is triggered by feature-checking requirements rather than the morphophonological properties of affixes. The requirements of affixes are assumed to be taken care of in the post-syntactic component, and if there is indeed a null affixal classifier present, it is not clear why its need for a host is not achieved via Lowering onto N (aka Affix Hopping) or in situ cliticization leftward onto the numeral instead. In many languages, classifiers are indeed bound morphemes that lean onto the numeral for support. Cases in point include Bangla (Bhattacharya 1999), Ch'ol (Mayan, Bale et al. 2019), Munya (Sino-Tibetan, Bai 2019), or Kokborok (Sino-Tibetan, Baskaran 2015), to mention just a few. There is no known language in which affixal

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classifiers are supported by (a copy of) the noun moving between the numeral and the classifier – in fact, one of the few absolute word order universals is that in numeral classifier languages (a copy of) the noun never intervenes between the numeral and the classifier, irrespective of whether the classifier is a free or bound morpheme. (Greenberg 1972, generalization 20A; see also Cao & Her 2025). Moreover, the classifier forms a morphological and phonological word with the noun rather than the numeral only in Kegboid languages ('Num Cl N' word order), where numeral classifiers replaced an earlier noun class system marked on nouns (Aikhenvald 2000: 110–111). Recruiting (a copy of) the noun to support an affixal classifier is thus highly unusual from a typological point of view as well.[11]

Finally, Simpson & Ngo's (2018) update of the movement analysis still suffers from three problems of the original account: it does not correctly predict the pattern of semi-repeaters and it still violates the LCA, as well as Cinque's ban on head movement in the NP. Furthermore, it is still unexplained what causes the asymmetry between the spellout of head-chains (double spell out) and phrasal chains (single spell out).

To summarize, Simpson's intuition that repeaters somehow use the lexical entry of the noun to fill the Cl position is correct on some level, but the execution in terms of syntactic head movement is not tenable. In the next section, I will outline an alternative analysis that involves access to the noun's lexical entry without movement.

3. Repeaters as reduplication

3.1. Core proposal

I suggest that repeaters emerge post-syntactically, at the time of Vocabulary Insertion. Languages with repeaters have two ways to lexicalize (i.e., spell out or expone) the Cl node. The first method is to choose from the Exponent List a vocabulary item that is specified for insertion in the abstract Cl node and is permanently associated with a specific, invariable phonological form. This produces garden-variety classifiers and is available in all classifier languages.

(21) a. rôm săam khan
umbrella three Cl.handled.long
'three umbrellas'

b. mánaaw săam lûuk
lemon three CL.fruit
'three lemons' (Hundius & Kölver 1983) Thai

(22) Cl abstract node

(23) List of Vocabulary Items that can be inserted to spell out the abstract Cl node

a. Cl ↔ *khan*/{$\sqrt{\text{RÔM}}$, etc.}__
b. Cl ↔ *lûuk*/{$\sqrt{\text{MÁNAAW}}$, etc.}__
c. …

[11] Note how this means that the problems with Simpson & Ngo's (2018) zero affix analysis would not go away by relegating the assumed head movement to the post-syntactic component either.

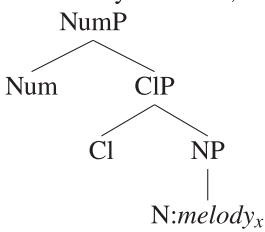
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(24) Vocabulary Insertion into Cl
  a. Cl → [Cl-*khan*]
  b. Cl → [Cl-*lûuk*]
  c. …

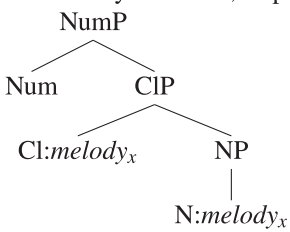
As shown in (23), the Exponent List of a typical classifier language like Thai contains several vocabulary items that can spell out Cl. As is usual for such cases, 'the winner is determined by a morpheme local to the morpheme undergoing insertion' (Embick 2015: 92). In other words, the vocabulary items for classifiers are supplied with contextual information that restricts their occurrence to the context of specific roots. Thus in the context of the root *rôm* 'umbrella', Cl is spelled out as *khan*, while in the context of the root *mánaaw* 'lemon', Cl is spelled out as *lûuk*.[12]

The second method, available only in repeater languages, is to copy the phonological matrix of the noun and use this melody to spell out the Cl functional head. This operation affects only N's phonological features/melody; its syntactico-semantic features remain unaffected. The insertion targets the Cl head directly, without a null affix being present. This is schematized below. The subscript 'x' after 'melody' is meant to indicate the identity of the two melodies.

(25) Vocabulary Insertion, step 1



(26) Vocabulary Insertion, step 2



'N' is a shorthand for the root and its categorizer *n*. Whether roots are subject to late insertion is a matter of debate (see Alexiadou et al. 2014) and it does not directly concern us here (though see the end of this section for some remarks). What is important is that

[12] The direct linking of classifiers and nouns via vocabulary entries is also adopted in Haas (1942), who states that classifiers must be treated both in the grammar and the lexicography of Thai. This view is also confirmed by Gandour et al.'s (1984: 470) acquisition study, which has found that the same classifier is acquired earlier with high-frequency nouns than with low-frequency nouns. Gandour et al. conclude that 'Thai children do not acquire classifiers by category alone. Rather, they appear to acquire them, at least in part, on an item-by-item basis from the lexicon'. Gandour et al.'s (1985) study of aphasics also confirmed that the pairing of classifiers and nouns is list-based rather than rule-based.

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Vocabulary Insertion proceeds bottom up (Bobaljik 2000), and so by the time Cl is vocabularized, N has already been associated with its own melody.

The copying of the phonological matrix of the noun is not a movement operation (whether syntactic or post-syntactic); it is a type of syntactic (i.e., non-affix creating) REDUPLICATION instead. Taking my cue from Travis (1999, 2001, 2003), I suggest to capture this via a special Vocabulary Item for Cl, one that is not permanently associated with a phonological matrix of its own but which is specified for reduplication in the list of vocabulary items (28).

(27) a. prathêet săam prathêet
country three CL:country
'three countries'
b. kɔ̀ săam kɔ̀
island three CL:island
'three islands' (Hundius & Kölver 1983) Thai

(28) Vocabulary Item, a member of the list in (23)

Cl ↔ *RED*/{$\sqrt{\text{PRATHÊET}}$, $\sqrt{\text{Kɔ̀}}$, etc.}__

(29) Vocabulary Insertion into Cl with (28)
a. Cl → [Cl-*prathêet*]
b. Cl → [Cl-*kɔ̀*]
c. …

This analysis echoes Burling's (1965: 250) view that repeaters are all 'allomorphic variants of the same morpheme', in the sense that they all go back to the same vocabulary item/listeme of the Exponent List, namely (28).[13]

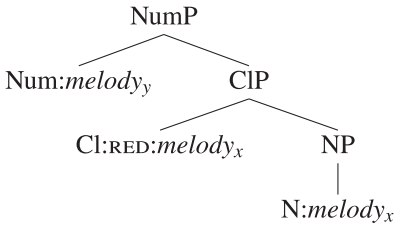
As mentioned above, on the standard approach Vocabulary Insertion operates bottom up, targeting the lower terminals before the higher ones (Bobaljik 2000). Thus after the melody of N is copied into Cl:RED, Vocabulary Insertion continues upwards. It first reaches Num, and inserts the melody of the numeral (30). Next, Vocabulary Insertion reaches and expones the instance of the NP that has been placed into the pre-numeral position (see (5)/(12)). At the same time, the exponence mechanism also registers that this instance of the NP and the instance at the bottom of the structure, in the Cl-complement position, are fully identical:

[13] The analysis pursued here has some distant parallels elsewhere in the literature. Warotamasikkhadit's (1972) grammar calls repeaters 'reduplicative classifiers' (p. 24), but does not discuss them beyond a statement that these are nouns that serve as their own classifiers. Li (2024: 287) claims that repeaters 'result from pure phonological operation', without providing arguments for this view or identifying the nature of the assumed operation. These authors share the intuition that repeaters are created from the lexical entries of the corresponding nouns via a rule that operates outside of narrow syntax. Piriyawiboon (2010: 83) comes closest to my analysis, when she writes that 'I propose that what appears in the classifier slot is the copy of the noun. After copying takes place, the noun moves to Spec of Spec[ific]P. […] This copy-to-CL is language-specific'. I take it to be significant that when it comes to the noun occurring in the pre-numeral position (referred to as 'Spec of Spec[ific]P'), Piriyawiboon talks about 'movement', while in the case of filling the Cl position, she uses the term '(language specific) copying'. Although in Minimalism movement involves a type of copying mechanism, Piriyawiboon uses the term 'copying' only in connection with repeaters, and avoids it in cases of clear syntactic movements. On my reading, Piriyawiboon's 'copying' is akin to the reduplication operation defended in this paper. However, she does not go into more detail than in the quote above, and in Jenks' (2011: 95) interpretation this 'copying' corresponds to syntactic head movement.

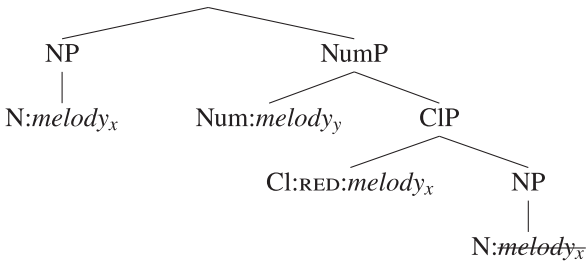
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they involve the same listeme of the Exponent List and share all of their formal (morphosyntactic) features as well. They are therefore identified as being SYNTACTIC copies, which form a movement chain. This chain then undergoes the usual chain reduction, which suppresses the surface-exponence of the tail of the chain (31). (Note that Cl:RED is not part of a movement chain, so its exponence is not affected.)

(30) Vocabulary Insertion, step 3



(31) Vocabulary Insertion, step 4



In (28) the reduplicative classifier is endowed with a contextual specification, similarly to ordinary classifiers (23). Alternatively, to capture Enfield's (2004: 120) intuition that 'the repeater strategy is the closest thing to a residue option in the numeral classifier system', we could drop the contextual information from the Vocabulary Item of Cl:RED, and make it the default or elsewhere option, suitable whenever the given root is not listed in the contextual information of other, non-reduplicative classifier listemes.

(32) Vocabulary Item, a member of the list in (23)
Cl ↔ *RED*

In order to choose between (28) and (32), we need to consider the distribution of repeaters. In Ersu (Sino-Tibetan; Sichuan Province, China), for instance, repeaters are licit if and only if the quantified noun is not compatible with any of the regular classifiers (Zhang 2014). This also appears to be the case in Lao (Goddard 2005: 98). In these languages, the lexical entry of the reduplicative classifier can be left without contextual specification; (32) can be employed as a true last resort or rescue option whenever no other classifier is appropriate. This way, the derivation can meet the requirement that every syntactic terminal must be associated with a spellout, and Vocabulary Insertion can proceed further up in the tree.[14]

[14] Vocabulary items/exponents can be phonologically null when they are specified as such in the Exponent List. Crucially, however, repeater languages have no null classifier, whether morphologically free or bound. See Section 5 for discussion of languages that do have a null classifier.

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In other repeater languages there is no full complementary distribution between repeaters and ordinary classifiers. In Thai, repeaters are generally not used when a garden variety classifier is available for the noun (33).

(33) a. dek sǎam khon/*dek
child three CL.person/CL:child
'three children'
b. pàakka sǎam dâam/*pàakka
pen three CL.long.handled/CL:pen
'three pens'
c. rôm sǎam khan/*rôm
umbrella three CL.handled.long/CL:umbrella
'three umbrellas' (Pornsiri Singhapreecha, p.c.) Thai

Conversely, nouns that take a repeater are generally not compatible with the existing garden variety classifiers. In (34), substituting *an* (the general classifier for inanimates) for repeaters produces unacceptability.

(34) a. prathêet sǎam prathêet/*an
country three CL:country/CL.general
'three countries'
b. kɔ̀ sǎam kɔ̀/*an
island three CL:island/CL.general
'three islands' (Pornsiri Singhapreecha, p.c.) Thai

For this reason, Jenks (2011: 94) suggests that 'the repeater construction seems to be a kind of last resort'.

With some nouns, however, either a repeater or a regular classifier is possible. Pornsiri Singhapreecha (p.c.) informs me that the alternants in (35) carry the same meaning.

(35) a. panhǎaa sǎam panhǎaa/rûan
problem three CL:problem/CL.story
'three problems' (Jenks 2011: 94)
b. bâan sɔ̌ɔŋ bâan/lǎŋ
house two CL:house/CL.house
'two houses' (Placzek 1978: 43) Thai

It thus seems to me that assuming a vocabulary item such as (32) as a general elsewhere-case is not fully appropriate for Thai: this would constrain repeaters to those nouns that cannot occur with ordinary classifiers, inappropriately ruling out alternations such as (35). I suggest that in a language like Thai, the nouns that take repeaters should be included in the entry of the reduplicative classifier in the form of a contextual specification, as in (23). Nouns that allow the alternation, such as those in (35), are simply listed as a contextual specification for both one of the regular classifiers and for the reduplicative classifier. Nouns in numeral classifier languages are often compatible with more than one ordinary classifier (e.g., in colloquial Thai *pàakka* 'pen' can take the general classifier *an* instead of *dâam* and *cháaŋ* 'elephant' can take *tua* 'Cl.animal' instead of the more formal *chɯ̂ɯak* 'Cl.elephant'). Thus

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including a noun in the contextual specifications of two different classifiers is necessary independently of repeaters as well.[15]

The reduplicative approach to repeaters avoids the problems raised by Simpson's (2005) and Simpson & Ngo's (2018) accounts. It captures the item-specific nature of repeaters in the Vocabulary, which is the usual repository for certain idiosyncratic, unpredictable properties of listemes, and it does not violate the LCA. While they house the same melody, N and Cl remain clearly distinct in their morphosyntactic feature specification and so they are not involved in a movement chain. Therefore the issue of chain reduction (or lack thereof) is not relevant to them: both positions are spelled out by the same melody, as is usual in cases of reduplication. No typologically unattested order is derived and no unusual morphophonological constituency between Cl and N is assumed either.

This view also affords insights into the phenomenon of semi-repeaters. Recall that for compounds headed by an autoclassified noun, only the head of the compound is repeated in the Cl position.

(36) prathêet-samŭn săam prathêet
country-satellite three CL:country
'three satellite countries' (Hundius & Kölver 1983) Thai

The reason for this, I suggest, is that the pattern in (36) is the optimal way to meet the requirement that Cl should receive an exponent. Targeting just the phonological material of the compound head keeps the melody copying mechanism minimal but at the same time allows Cl to be spelled out. In other words, this is the necessary and sufficient condition to allow Vocabulary Insertion to proceed beyond Cl. Semi-repeaters are parallel to cases of PARTIAL REDUPLICATION. These place a 'cap' on the amount of material to be repeated in such a way that the reduplicant may be smaller than the base, and the operation may affect material that would not be able to move independently.[16] No understanding of semi-repeaters is readily forthcoming from the head movement analysis, however.

[15] Burmese patterns with Thai rather than Ersu in this respect. Repeaters are often used for otherwise unclassifiable nouns (Vittrant 2002), but for certain nouns either a repeater or an ordinary classifier is possible (Pe 1965). According to Burling (1965), substituting the general classifier *khú* for repeaters is possible but less elegant. For the case of Thai and Burmese, a hybrid solution that is in between (28) and (32) is also conceivable. This would involve i) contextual specifications for Cl:RED only with those nouns that can also combine with a garden variety sortal classifier (e.g., *panhăaa* 'problem', (35-a)), and at the same time ii) designating Cl:RED as a general elsewhere-case for otherwise unclassified nouns as well. This would reduce the amount of contextual specification necessary for Cl:RED.

[16] On the ability of SYNTACTIC REDUPLICATION to target a syntactically determined SUBPART of the base (i.e., the reduplicant's sister), see Travis' (2001, 2003) analysis of iterative reduplication. The head of a compound is arguably a syntactically determined subdomain.

When it comes to compounds headed by autoclassified nouns such as (36), most descriptions of Thai and Burmese mention only the semi-repeater construction as an option (cf. Hundius & Kölver 1983 on Thai and Pe 1965, Vittrant 2002 on Burmese). For (36), a full repeater construction is ruled out.

(i) *prathêet-samŭn săam prathêet-samŭn
country-satellite three CL:country
'three satellite countries' (Pornsiri Singhapreecha, p.c.) Thai

A full repeater is possible with (ii), but with a subtle difference in meaning. With the full repeater, discussion of the

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To summarize, I suggest that repeaters involve the kind of copying found in reduplicative structures rather than the kind of copying that has been hypothesized to occur in movement structures. As discussed in Travis (2001: 461), 'the copying found in reduplication is very different from the copying mechanism used for movement (as in Copy and Delete). In syntactic reduplication, subdomains of the complement XP are being copied that would not be able to independently move. The result appears to be, then, that the copying of reduplication cannot be collapsed with the copying of movement'. Thai semi-repeaters provide one example for copying of a domain that would not be able to move on its own. A further example will be discussed in Section 4.

3.2. Repeaters as instantiations of a general classifier

As mentioned above, the proposed analysis ties in with Burling's (1965: 250) view that repeaters are all 'allomorphic variants of the same morpheme'. In the present analysis, this morpheme is Cl:RED. This single vocabulary item underlies all repeater classifiers, which are just different surface realizations of this morpheme. Theoretically, this is a more economical and streamlined model of the Thai list of vocabulary items than a potential lexicalist approach assuming 500+ different, highly specialized classifier entries, each of which is restricted to occur with the single noun that it is form-identical with. In addition to being preferable on the basis of Occam's Razor, there is also empirical support for the present proposal over the lexicalist alternative.[17]

Cl:RED can be said to be a general classifier in the sense that it is desemanticized: it does not impose shape, size, or function-based restrictions on the wide variety of nouns it co-occurs with. From this perspective, we expect Cl:RED and the 'regular' general classifier *an* to show some parallels. On the lexicalist view, on the other hand, repeaters are predicted to exhibit parallels with so-called unique classifiers. A unique classifier is a classifier whose use is restricted to a single – often culturally highly significant – noun (Grinevald 2001). The single defining criterion of unique classifiers is their highly narrow range of application; they may have an entirely different phonological shape from the noun they classify. In Thai, *chûak* (lit. 'rope') is a good example: this classifier is uniquely applied to domestic elephants (Burusphat 2007, Aikhenvald 2021) but it is not form-identical to the noun it classifies

number of very powerful countries is restricted to only 3; with the semi-repeater, among very powerful countries, three are under discussion. Naturally, economy considerations come into play and compare different derivations only if the meaning is kept the same.

(ii) prathêet-mahă-amnâat săam prathêet(-mahă-amnâat)
country-super-power three CL:country
'three superpowers' (Pornsiri Singhapreecha, p.c.) Thai

Placzek (1978: 65–67) mentions the possibility of both semi-repeaters and full repeaters for compounds, and claims that sometimes there is little or no semantic difference between them. He also points out that informants considerably disagree on examples, and raises the possibility that full repeaters correlate with diminished lexical transparency, i.e., the more lexicalized a compound is, the easier it is to apply a full repeater. The alternation between semi-repeaters and full repeaters of compounds is in need of further detailed study. What matters for us, however, is that the semi-repeater pattern is available.

[17] Repeaters can be said to be 'lexicalized' to the extent that it must be learned during language acquisition which nouns take repeaters and which do not. This is not different from how it must be learned for any noun which established classifier(s) it can and cannot occur with.

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('elephant' is *cháaŋ*).[18] Similarly, the classifier *law* lit. 'reed' is applied only to the noun *pìì* 'flute' (Hundius & Kölver 1983). On the lexicalist view, repeaters are a proper subset of unique classifiers (distinguished from the rest of the class only by their phonological identity to the classified noun), and so repeaters are expected to have similarities with unique classifiers such as *chûɪak* rather than with the general classifier *an*. This prediction is not confirmed, however: repeaters show parallels to *an* rather than to unique classifiers, both during language acquisition and in language loss.

Starting with the differences between repeaters and other unique classifiers, Carpenter's (1991) acquisition study found that the use of repeaters increased until age 5 (where they occurred in 18% of all responses), after which their use declined. By contrast, only one 9-year old child out of 204 (age range 1;8–11;3) used the unique classifier *chûɪak* with *cháaŋ* 'elephant', in spite of the fact that this classifier-noun collocation is part of the input in the formal classroom setting. That repeaters and other highly specialized classifiers are not treated in the same way by children is also confirmed by Gandour et al.'s (1984) results. Gandour et al. (1984) found that children's errors in NPs that in adult language feature *muan*, a classifier that is applied only to cigarettes and cigars, involved the substitution of a classifier used with a wider range of nouns. Thus while highly specialized classifiers are difficult for children, they overuse repeaters, which is the type of classifier that is the most specialized on the lexicalist account.[19,20]

Turning now to the similarities between repeaters and *an*, classic studies on the acquisition of classifiers such as Gandour et al. (1984) and Carpenter (1991) have shown that children overuse both the general classifier *an* and repeaters at the expense of what Grinevald (2001) calls specific classifiers, and this was the case for Gandour et al.'s (1985) conduction aphasic patient, too. Specific classifiers are classifiers which, unlike *an*, impose some shape, size, or function-based restrictions on the nouns they occur with, but which, unlike unique classifiers, are not restricted to use with a single noun (cf. *khon* for people and *lêm* for long and pointed or sharp-edged objects).

The overuse of *an* involves overgeneralization, while the overuse of repeaters amounts to overspecialization among classifiers. These are two seemingly opposite strategies, and thus their simultaneous use by the same speakers presents a puzzle. On the present account, this is not a mystery, however. Repeaters expone a general classifier whose only significant difference from *an* is that it is not associated to a piece of permanent, stable melody. The speakers in question therefore use a single strategy: both *an* and Cl:RED are classifiers with a broad range of associated nouns, which substitute for more specialized classifiers.

In their discussion of the simultaneous application of overgeneralization and overspecialization, Gandour et al. (1984, 1985) appeal to Conklin's (1981) theory of semantic load. Conklin suggests that due to their role in categorizing on the basis of inherent perceptible characteristics, specific classifiers add new information to the noun phrase, e.g., +human,

[18] Carpenter (1991) characterizes *chûɪak* as an honorific classifier applied to elephants in their ceremonial, religious function. Wild elephants are classified by *tua* (used for animals in general as well as a number of inanimate nouns), and royal elephants are classified by the repeater *cháaŋ* (Burusphat 2007, Aikhenvald 2021).

[19] Hundius & Kölver (1983) treat *muan* as a unique classifier, which combines only with *bùrìì* 'cigarette', though Gandour et al. (1984) suggest that it also classifies cigars. In either case, this is a highly specialized classifier.

[20] In her discussion of the rise and decline of repeaters in her data, Carpenter (1991: 105) points out that 'repeater use was the only response type that showed this clear U-shaped curve developmental pattern, rather than a steady improvement with age'. While I do not have a full explanation of this pattern, in my analysis repeaters are unlike other classifiers indeed in that they expone a classifier with an exceptional property, that of reduplicative phonology.

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long and thin, small and spherical, etc. This makes them semantically heavy. The general classifier, on the other hand, is semantically light, as it adds no semantic information to the NP beyond providing unit reference. For Conklin, repeaters are also semantically light: since they apply to singleton sets, they do not provide any semantic information beyond what is already present in the noun itself. To account for their data, Gandour et al. (1984, 1985) suggest that semantically light classifiers are both acquired early in childhood and retained longer in language loss. This appeal to semantic complexity thus finds parallels between *an* and repeaters without taking the latter to be different phonological variants of a general classifier. At the same time, this type of explanation does not account for why the unique classifiers that are not form-identical to their associated nouns, such as *chûɪak*, are difficult for children. Similarly to repeaters, *chûɪak*-type classifiers also apply to singleton sets. They, too, eschew noun categorization on the basis of inherent perceptible characteristics, and so they should be semantically as light as repeaters. However, Carpenter's (1991) findings do not confirm this: her results place *an* and repeaters on one pile, and unique classifiers such as *chûɪak* on another.

In overextending repeaters beyond the sphere of nouns they are usually used with, children and aphasics treat repeaters as a relatively productive category. Among Gandour et al.'s (1984) subjects, one 5-year-old used repeaters 100% of the time, while one 6-year-old used them in 76% of all responses. This was so in spite of the fact that none of the input nouns were classified by a full repeater in adult usage, and that only a few nouns allowed a partial repeater as one of several acceptable adult options. Gandour et al. (1984: 472) suggest that this overuse 'may be attributed, in part, to SYNTACTIC relationships between classifiers and classified nouns' (emphasis mine). The present proposal aligns with a non-lexical connection between repeaters and their associated nouns, and makes the repeater-producing rules alluded to in Gandour et al. (1984) fully explicit.

3.3. Consequences beyond repeater constructions

The analysis of repeaters as reduplication has consequences for the syntax of ellipsis. As shown below, the head noun can undergo ellipsis in NPs with both garden variety classifiers and repeaters.

(37) a. mii thúrian kìi lûuk?
have durian how.many CL
'How many durians do you have?'
b. cèt lûuk
seven CL
'seven' (Jenks 2011: 114) Thai, ordinary Cl

(38) săam prathêet
three CL:country
'three (countries)' (Pornsiri Singhapreecha, p.c.) Thai, repeater

Ellipsis of the nominal head in repeater constructions is preferred (Juntanamalaga 1988, Beckwith 2007: 101; Piriyawiboon 2010), presumably for reasons of economy. Recovery of the noun in repeater phrases is even more straightforward than in ordinary classifier constructions, as the former 'fully describe the head N' (Bradley 2005: 224), while the

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latter combine with a wider range of nouns. In order to derive examples such as (38), the order of operations must be 1) exponing N, 2) copying melody into Cl, 3) ellipsis of N. In other words, the melody of N must be present at an early stage of the derivation even in cases of NP ellipsis, in order to allow for melody copying from N to Cl to take place. This falls out naturally if unlike functional heads, roots are not subject to late insertion, but is also compatible with the late-insertion of roots as long as ellipsis is deletion at PF (Merchant 2001, Aelbrecht 2010). However, ellipsis as radical lack of vocabulary insertion (Kornfeld & Saab 2004) or as a null *pro* form in the ellipsis site (Lobeck 1995) is ruled out.

Repeater constructions also weigh in on an old debate about the structure of classifier expressions. Whether the classifier forms a constituent with the noun or the numeral is an ongoing lively debate in the literature, with no consensus in sight for the time being. The proposal advanced here is only compatible with the [Num [Cl N]] constituency, and thus can be viewed as an argument corroborating this structure. This is because as argued in Travis (2001: 461), a structural restriction on syntactic reduplication is that 'subdomains of the complement XP are being copied'. Differently put, the base must be in the complement of the reduplicant, which holds only on the [Num [Cl N]] structure. Repeaters therefore provide a new, so far overlooked piece of argument in the debate on NP constituency as well.[21]

4. Cross-linguistic parallels for melody copying from N

The account outlined above involves borrowing segmental information from N in order to expone a functional head already syntactically available in the extended NP. In this section, I show that this operation is attested in other languages as well. I first review Wang & Holmberg's (2021) analysis of reduplication in Xining Chinese, which is suggested to involve copying of the root's melody in order to expone the nominalizer *n*. I then turn to the facts of Murui, a multiple-classifier language of Columbia, and show that in this language melody is borrowed from the noun in order to fill the classifier slot in particular.

4.1. Reduplication into n

Wang & Holmberg (2021) observe that monosyllabic common nouns in Traditional Xining Chinese (Northwest China) are always reduplicated. Reduplication has no semantic effect, it is just a formal requirement on common nouns. (See also Wang & Holmberg 2023 on similar data involving Mandarin Chinese given names.)

(39) a. xiōng xiōng
countryside RED
'countryside'
b. mǒ mó
steamed.bun RED
'steamed bun'

[21] Note that the movement analysis also rules out [[Num Cl] N] because Cl and N are not in a head-complement relation, and because movement into a subconstituent of a left branch is generally not allowed.

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c. dō dō
knife RED
'knife' (Wang & Holmberg 2021) Traditional Xining Chinese

Nouns do not come from the lexicon in a reduplicated form: reduplication is triggered in certain environments only. Thus in (39-a), where *xiōng* is an independent noun, reduplication is obligatory, but in (40), where it is the non-head of the compound *xiōng-bóng*, reduplication is not possible.[22]

(40) a. xiǒng-bóng
countryside-person
'country bumpkin'
b. *xiōng xiōng-bóng
countryside countryside-person
Intended: 'country bumpkin' (Wang & Holmberg 2021)
Traditional Xining Chinese

Wang & Holmberg (2021) suggest that this pattern is due to a requirement in Traditional Xining Chinese that a free noun must have at least two syllables. Chinese displays a close correspondence between syllable and morpheme, but there are some polysyllabic loanwords as well. As shown below, these do not undergo reduplication because the minimum syllable count is already met.

(41) hǎdá (*hǎdá)
hada RED
'hǎdá' (piece of silk used as a greeting gift among Tibetan and Mongolian people)
(Wang & Holmberg 2021) Traditional Xining Chinese

In order to formalize their findings, Wang & Holmberg (2021) propose that Traditional Xining Chinese has a language-specific output condition (or filter) that applies after Vocabulary Insertion.

(42) *N if N is a free word and has less than two syllables.

In cases where (42) would not otherwise be met, the phonological features of the root are copied into the categorizer *n*. As the target of melody insertion is a sister null nominalizer, reduplication cannot take place when such a sister is absent. This rules out reduplication for the non-head of compounds (40-b) (which are not sisters to *n*), for pronouns (which

[22] The head of a compound can be reduplicated, but it does not have to undergo this process, as a compound is already bisyllabic (ii).

(i) mǒ mó
steamed.bun RED
'steamed bun' (Wang & Holmberg 2021)

(ii) céi mó, céi mǒ mó
vegetable steamed.bun vegetable steamed.bun RED
both: 'vegetable steamed bun' (Wang & Holmberg 2021) Traditional Xining Chinese

This pattern is somewhat reminiscent of semi-repeaters in that only the head of the compound is repeated.

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are merged higher in the DP) and for adjectives and verbs (which employ a different categorizer).

Reviewing the full details of Traditional Xining Chinese reduplication would take me too afield; the interested reader is referred to Wang & Holmberg (2021) for a full explication of the facts and the analysis. What is important for our purposes is the parallels that this reduplication displays with repeater classifiers. In both cases, the phonological matrix of the bottommost element of the extended NP is copied into a syntactically independently generated head position along the functional spine. The two phenomena are also similar in that reduplication itself has no semantic import (such as plurality, iterativity, or intensification); it only serves to satisfy a formal criterion (bisyllabicity of free nouns in Traditional Xining Chinese and overt filling of the Cl position in repeater languages). They are also similar in that the copying process mainly or exclusively targets the heads of compounds.

Where the two processes differ is the element whose requirements are met by reduplication. In Traditional Xining Chinese, the trigger of reduplication is N/the base (it cannot be a free word with less than two syllables), while in repeater languages the trigger of reduplication is Cl/the reduplicant (this position must receive a spellout). In other words, while *n* in Traditional Xining Chinese can receive a phonologically zero spellout (as long as its complement is already bisyllabic), there is no phonologically zero spellout (i.e., null classifier) in repeater languages, and thus an overt spellout of Cl is forced.

4.2. Melody copying into Cl

In this section, I turn to repeaters in Murui (Witotoan). In order to provide the relevant background for the discussion, I will first introduce the phenomenon of 'multiple classifier' languages and survey the basic facts about the Murui NP.

In certain languages, the same set of classifiers can be used in more than one morpho-syntactic environment. For instance, there are several languages in which the same set of classifiers occurs both with numerals and demonstratives (e.g., Mandarin Chinese), and sometimes classifiers occur with numerals, demonstratives as well as adjectives (Thai). In the case of Mandarin Chinese and Thai, researchers agree that one environment, namely that of numerals, is 'primary'. This is because in the context of numerals classifiers are obligatory, while with demonstratives and adjectives they are not.[23] These languages are therefore classified as numeral classifier languages, similar to Ch'ol (Mayan), which allows classifiers only with numerals and the interrogative 'how many' (Bale et al. 2019).

In other cases, however, there is no reason to think that one classifier environment is 'primary' and the others are 'secondary' (e.g., classifiers are obligatory with numerals as well as demonstratives and adjectives). In these cases we are talking about a 'multiple classifier' language (Aikhenvald 2000). An example of this type of classifier language is Murui. Classifiers in Murui are mono- or disyllabic suffixes that categorize nouns based on physical properties (shape, size, consistency, functional properties), animacy, and other characteristics (Wojtylak 2016). In the DP, they can occur on bare nouns and on nominal modifiers.

[23] Obligatoriness applies to the standard variety; classifiers are often omitted in spoken Beijing Mandarin (Her & Li 2023) as well as colloquial Thai (Juntanamalaga 1988, Beckwith 2007).

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Murui nouns come in two types: bound noun roots, which must occur with a classifier to form an independent word (43), and free nouns, which optionally occur with classifiers (44).

(43) de-fo
nose-CL.cavity
'nose' (Wojtylak 2017: 184) bound noun

(44) cheme, cheme-kɨ
brain brain-CL
'brain (general), brain (specified for form)' (Wojtylak 2017: 184) free noun

Some nouns, for instance, *ñekɨ* 'chambira palm', are compatible with more than one classifier (45). There are also free nouns for which there is no classifier, e.g., *nokae* 'canoe', *kuiada* (a fish type), or *jazikɨ* 'jungle'.

(45) a. ñekɨ-na
chambira-CL.tree
'chambira palm tree'
b. ñekɨ-ro
chambira-CL.string
'a chambira string'
c. ñekɨ-foro
chambira-CL.feather.like
'a (feather-like) chambira leaf'
d. ñekɨ-re
chambira-CL.plant.place
'place where chambira grows' (Wojtylak 2016: 400)

Adjectives, numerals, interrogative words, demonstratives and other anaphorics in Murui are bound forms; they must combine with a classifier to form independent words.[24] In adnominal position, these modifiers take the general classifier *-(j)e*, irrespective of whether the head noun is classifiable, and if so, which specific classifier(s) it takes. For the sake of brevity, I illustrate this only with numerals and demonstratives, but the other modifiers mentioned above also exhibit this pattern.

(46) da-je ñekɨ-na, da-je anane-ko
one-CL.general chambira-CL.tree one-CL.general maloca-CL.cover
'one chambira tree, one maloca (traditional roundhouse)' (Wojtylak 2016, 2017)
Num with classified Ns

(47) da-je jɨko-na, da-je jemɨ
one-CL.general dog-TOP one-CL.general woolly.monkey
'a dog, a woolly monkey' (Wojtylak 2017) Num with unclassified Ns

[24] This kind of dependency on a classifier can also be observed in the numerals of some numeral classifier languages, for instance, Ch'ol (Mayan). In this language, numerals cannot occur without classifiers so much so that a classifier must accompany each numeral even in the counting sequence ('one, two, three,…') or when the name of the number is directly referred to (e.g., 'This is three' in an educational context), see Little et al. (2022).

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(48) bai-e ñeki-na-iai, bai-e anane-ko
that-CL.general chambira-CL.tree.like-PL that-CL.general maloca-CL.cover
'those chambira trees, that maloca' (Wojtylak 2017) Dem with classified Ns

(49) bi-e jiko, bi-e nokae, bi-e semana-mo
this-CL.general dog this-CL.general canoe this-CL.general week.SP-LOC
'this dog, this canoe, this week' (Wojtylak 2017) Dem with unclassified Ns

Full NPs like those in (46)–(49) are rare, however. More frequently, the head noun is elided, and the modifier takes on the classifier that would be borne by the noun. (This aids recovering the reference of the ellipted noun; the semantic load of the general classifier is so weak that it would not be a useful anaphoric/reference-tracking device.)

(50) da-na, da-ko
one-CL.tree one-CL.cover
'one (tree), one (maloca)' (Wojtylak 2016, 2017) Num with elided Ns

(51) bi-ko, bi-foro, bi-do
this-CL.cover this-CL.feather.like this-CL.pointed
'this (house), this (feather-shaped palm leaf), this (seed)' (Wojtylak 2016)
Dem with elided Ns

Crucial to us is what happens when the elided noun is such that there is no classifier for it. Filling the classifier slot is obligatory, and Murui meets this formal requirement by employing a repeater. In the default case, repeaters are partial copies of the corresponding noun: nouns with more than two syllables give rise to disyllabic repeaters (52), while nouns with two syllables give rise to monosyllabic repeaters (see *-ko* in (53-a)).[25] (52) and (53-b) show repeaters for Spanish loanwords, while (53-a) illustrates repeaters with native words.

(52) da-mana, da-misa
one-CL:rep:semana one-CL:rep:camisa
'one week, one shirt' (Wojtylak 2017) Num with repeater

(53) a. bi-ziki, bi-kae-na, bi-ko
this-CL:rep:jaziki this-CL:rep:nokae-TOP this-CL:rep:jiko
'this jungle, this canoe, this dog' (Wojtylak 2016, 2017)
b. bi-mana, bi-dio
this-CL:rep:semana this-CL:rep:radio
'this week, this radio' (Wojtylak 2017) Dem with repeater

[25] Full repeaters can be used with loanwords if this helps to avoid ambiguity. For instance, *rero* 'watch' (a phonological adaptation of Spanish *reloj*) would give rise to the repeater form *-ro*, which would then be homophonous with the classifier for strings. In this case *rero* is not reduced: *da-rero* 'one watch (one-CL:rep:watch.SP)' (Wojtylak 2017: 217). Similarly, both *komputadora* 'computer.SP' and *grabadora* 'recorder.SP' would be repeated by *-dora.* To disambiguate in a situation where both objects are present, a full noun is used in the Cl position (Wojtylak 2017: 217). This is reminiscent of full repeaters with Thai compounds in that the default amount of melody to be copied may be extended under certain circumstances.

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Repeaters have the same phonological features and prosodic status as garden variety classifiers (Wojtylak 2017: 200).[26]

Classifiers in Murui clearly have a different distribution from the classifiers of East and Southeast Asian languages ('multiple classifier' language vs. numeral classifier languages), and I do not claim that the two systems can be collapsed. There are, however, some striking parallels between repeaters in Thai (Lao, etc.) and Murui. In both cases, there is a formal requirement to include a classifier in a certain syntactic slot. When the noun does not combine with the existing classifiers, (part of) the phonological matrix of the noun is borrowed to 'fill in the blank' (Wojtylak 2016: 27), in an almost expletive-like manner. Repeaters form a residual class in both cases (in Murui, applying only to nouns that are not classifiable, and in Thai, mostly but not exclusively applying to otherwise unclassifiable nouns), and they fill a slot that is otherwise taken up by garden-variety classifiers.

Murui clearly shows that it is possible to access the noun's lexical entry to fill a classifier position without involving syntactic movement. The partial repeaters in (52) and (53) are not eligible for movement on their own because they correspond to strings on the sub-morphemic level; they involve (partial) copying of the phonological matrix of the nominal root as a last resort. The Murui facts therefore provide strong independent evidence for a crucial ingredient of my analysis of repeaters in East and Southeast Asia.

5. Repeaters and unclassified nouns

Repeaters appear to be a way to avoid unclassified nouns when the linguistic structure mandates a classifier. The expletive-like filling of Cl contrasts with the situation in languages such as Nùng, Vietnamese, or Colloquial Khmer, where certain nouns do remain without an overt classifier in numeral phrases. Nùng (Tai, Kra–Dai) nouns fall into three groups: obligatorily classified, optionally classified, and unclassified nouns (Saul 1965, Saul & Wilson 1980).

(54) slám pị nang
three CL wife_of_older_bother
'three sisters-in-law' (Saul 1965: 288)

[26] A partially similar pattern can be observed in Zauzou (Sino-Tibetan, Southwest China) as well. As discussed in Li (2024), Zauzou classifiers are obligatory with numerals as well as other noun modifiers. Nouns not associated to one of the established classifiers take a repeater. In a large number of cases, these nouns are monosyllabic, which results in a full repeater, e.g., *kʰõ*^{31} *tə*^{31} *kʰõ*^{31} 'river one CL:river'. However, at least two nouns, *ʔɔ*^{31}*pə̃*^{13} 'sea' and *ni*^{53}*ʔɔ*^{31} 'cigarette', are bisyllabic in such a way that neither syllable carries meaning on its own, and neither syllable appears as a component in compounds. With these nouns, only the last syllable undergoes copying. Since this is again a string on the submorphemic level, it cannot possibly undergo movement.

(i) ʔɔ^{31}pə̃^{13}, ʔɔ^{31}pə̃^{13} tə^{31} pə̃^{13}
sea sea one CL:sea
'sea, one sea' (Li 2024)

(ii) ni^{53}ʔɔ^{31}, ni^{53}ʔɔ^{31} tə^{31} ʔɔ^{31}
cigarette, cigarette one CL:cigarette
'cigarette, one cigarette' (Li 2024) Zauzou

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(55) slám (pị) sláo
three CL older_sister
'three older sisters' (Saul 1965: 288)

(56) slám tị, slám vam
three place three sentence
'three places, three sentences' (Saul 1965: 290) Nùng

A similar three-way split is also observed among nouns in Vietnamese (Emeneau 1951, Nguyen 1957, Thompson 1967, Simpson & Ngo 2018). In Colloquial Khmer, nouns come in two types: optionally classified and unclassified (Jacob 1968).

(57) koːn bɤy (nèək)
child three CL.person
'three children' (Jacob 1968: 84)

(58) chkae bɤy
dog three
'three dogs' (Jacob 1968: 84) Colloquial Khmer

A detailed list of numeral classifier languages with unclassifiable nouns (in Southeast Asia and beyond) can be found in Dékány (2022, to appear).

I suggest that unclassifiable nouns and repeaters are, in a way, two sides of the same coin: repeaters provide an alternative way of dealing with otherwise unclassifiable nouns (see also Denny 1975, Goral 1979, Kölver 1982, Aikhenvald 2000: 334). Similarly to most autoclassified nouns in repeater languages, the unclassified nouns in languages like Nùng, Vietnamese, or Colloquial Khmer are not compatible with the existing overt classifiers. Autoclassified nouns and unclassified nouns also share the property of being language-particular and unpredictable.

I propose that repeater languages and languages with unclassifiable nouns differ in their Exponent List. Repeater languages have no phonologically zero classifier in their Exponent List, nor do they have portmanteaus that could spell out N and Cl with one morpheme. The result is that the Cl node is always lexicalized overtly and separately from the noun. When there is no other option, they resort to copying the noun's melody into the Cl position. Languages with unclassifiable nouns, on the other hand, have access either to a phonologically null classifier or N+Cl portmanteaus (something that needs to be investigated on a case-by-case basis), and thus can always expone the Cl position with a run-of-the-mill listeme from the Exponent List (see Dékány 2022). This means that they have no need for last-resort melody copying from N.

6. Conclusions

Taking a repeater classifier is an idiosyncratic property of a subset of Thai nouns. The place to deal with lexical idiosyncrasies is the Exponent List and the post-syntactic morphological component, not narrow syntax. This paper argued that repeater classifiers emerge post-syntactically, as a result of melody copying from N to Cl. I suggested that this melody copying is a kind of syntactic reduplication, and concurred with Travis (2001: 461) that 'the

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copying of reduplication cannot be collapsed with the copying of movement'. The analysis supports Wang & Holmberg's (2021) position that not all cases of noun doubling result from movement, and shows that *n* is not the only functional head in the extended NP that can be exponed by phonological material borrowed from N.

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