

Multifunctionality and Contextual Realization: A Case Study in Yixing Chinese

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Abstract

This paper aims to make a contribution to the study of the nature of syntactic categories by analysing a single element in a single language, namely the marker *-lao* in Yixing Chinese. Although this marker has previously been analysed as an adjectivaliser (Hu and Perry 2018), we show that it has a much broader range of uses. We suggest that the bulk of cases can be captured in a unified way by supposing that the marker in question displays a type of possessive semantics (which we label *possession-as-attribute*), which is defined by delineating a *kind* (in the sense of e.g. Carlson 1977, Chierchia 1998), with similar semantics being expressed by adjectival elements in languages such as English. It is observed, however, that this meaning can emerge in the absence of the marker *-lao*, and that *-lao* can, in a restricted set of cases, surface in the absence of this meaning, and we suggest that these facts are attributable to the diachronic development of the marker and can be captured synchronically by making use of late-insertion mechanisms for phonological and semantic features. We propose that the case of *-lao* provides a suggestive argument for a *substance-free* approach to syntactic features, whereby syntactic features are not inherently specified for interface interpretations. Other cross-linguistic implications of our analysis are noted, in particular for the representation of adjectives.

Keywords Yixing Chinese; Minimalist Syntax; Distributed Morphology; Contextual allomorphy; Contextual allosemy; Adjectives.

1 Introduction

1.1 Outline

The universality of syntactic categories, particularly lexical classes, has been an ongoing matter of debate among linguists, whether of a more formalist or more functionalist orientation (for recent discussion, see e.g. Baker 2003, Gil 2005, Haspelmath 2007, 2010, Evans and Levinson 2009, Kaufman 2009, Chung 2012, Croft and Baker 2017, among many others). The crosslinguistic status of adjectives in particular is a matter

of continuing controversy, with adjectives often seeming to have relatively more nominal or more verbal features across languages, with many languages showing multiple classes of adjectives, and with property concepts of the sort expressed by adjectives being frequently expressed using other means (see e.g. Dixon 1977, Wetzer 1996, Beck 2002, Chafe 2012, Francez and Koontz-Garboden 2015, 2017, as well as papers in Dixon and Aikhenvald 2004). Chinese varieties, especially, are often supposed to lack an independent class of adjectives, with property-denoting predicates which would otherwise be described as adjectival being subsumed into a class of so-called ‘stative’ or ‘property verbs’ (e.g. Li and Thompson 1981, McCawley 1992 for Mandarin, Francis and Matthews 2005 for Cantonese). On the other hand, various authors have observed that property-concept denoting elements in Chinese have distinct behaviour, and argue that adjectives do indeed form a distinct class, or perhaps more than one (see e.g. Paul 2005, 2010, 2015, Tham 2013, Grano 2015).

Yixing Chinese makes an interesting contribution to this debate – Hu and Perry (2018) propose that Yixing has an overt adjectival categoriser *-lao* – we discuss some of the facts which might lead to this conclusion in section 2. Such an overt categoriser would indeed seem to be a convincing argument that (at least some) Chinese varieties have a separate class of adjectives. In this paper we investigate the properties of the marker *-lao*. In section 3, we show that it is not, in fact, a straightforward adjectival categoriser – ‘adjectives’ appear without *-lao* and *-lao* appears on unambiguously non-adjectival material. Attempting to provide a unified analysis of this element, however, turns out to yield some interesting implications in terms of the coding of property attribution crosslinguistically, as well as to the substantive nature of syntactic features.

In section 4, we show that most instances of *-lao* can be captured as a particular type of *possession*, following the approach to property-concepts taken by Francez and Koontz-Garboden (2015, 2017). More specifically, *-lao* denotes possession of an attribute which can be used to define a *kind* in the sense of Carlson (1977), Krifka et al. (1995), Chierchia (1998). We label the feature which encodes this meaning [Poss_{attr}]. In section 5 we account for the failure of *-lao* to appear in certain circumstances where it might be expected by showing that the [Poss_{attr}] feature is subject to contextual allomorphy, where the exponence of the feature is sensitive to the structure of a complex head.

All this describes the regular, productive use of *-lao* quite well, there are a number of residual cases which cannot be captured in this way. In section 6, making use of a framework broadly compatible with Distributed Morphology (Halle and Marantz 1993 et seq.), we show that these instances are best analysed as *contextual alloemes* of the same syntactic feature (cf. Wood 2015 et seq.), the presence of which, we suggest, may be accounted for as residues of the diachronic development of the morpheme in question. We illustrate this further with a discussion of the interaction between *-lao* and a negative/interrogative marker, showing that this also lends itself to an analysis involving contextual alloemy. The possibility of simultaneous allomorphy and alloemy applying to a single syntactic element suggests what we might call a ‘substance-free’ approach to syntactic features. That is to say, an approach where the relation between syntactic features and their interface interpretations is in principle arbitrary. In this sense, we come down on the non-universalist side of the debate concerning syntactic categories – the properties of syntactic features, at least in terms of their interface rela-

tion to sound and meaning, are plausibly emergent rather than universal (cf. Zeijlstra 2008, Biberauer 2019).¹ We discuss the implications of our analysis for the nature of linguistic universals and the cross-linguistic structure of lexical categories in section 7.

1.2 Yixing Chinese

As just mentioned, this paper focuses on the analysis of a single morpheme in Yixing Chinese, a Northern Wu variety spoken in Yixing County-level City in China’s Jiangsu province (pop. 1.2 million).²

The interaction between the phonological and syntactic properties of forms in Yixing will be relevant here, so we will briefly outline some of the major facts. Yixing possesses a complex system of *tone sandhi*, whereby the underlying specifications of tones on syllables typically do not surface unmodified. To be specific, Yixing has two types of tone-sandhi process which apply simultaneously, as previously described by Hu and Perry (2018). Following terminology used by Chan and Ren (1989) for the nearby Wuxi variety, these are labelled *Pattern Extension* and *Pattern Substitution*. These each apply over particular domains, which Hu and Perry identify with the phonological phrase and phonological word, respectively.

For concreteness, we will give a brief outline of the tone-sandhi system of Yixing – the details are not fully necessary to understand the argument here, but at various points we will assert that certain elements constitute phonological words or phrases, on the basis of tone-sandhi evidence. It is hoped that the summary given here will suffice to satisfy interested readers of the validity of these assertions. Some additional details can be found in Hu and Perry (2018).

Yixing has eight lexical tones, two of which are ‘checked’ tones (co-occurring with a glottal stop in isolation and limited to a restricted set of extra-short vowels). These are illustrated below using numbers as examples, and are shown together with their correspondence to Middle Chinese tonal categories.³

(1) *Yixing Tone Classes*

	平 <i>Ping</i>	上 <i>Shang</i>	去 <i>Qu</i>	入 <i>Ru</i>
陰 <i>Yin</i>	<i>sā</i> ‘three’ [sa ⁵⁵]	<i>zyòu</i> ‘nine’ [ʤø ⁵¹]	<i>sí</i> ‘four’ [sɿ ⁵¹³]	<i>bā</i> [b̥əʔ ⁵]
陽 <i>Yang</i>	<i>lín</i> ‘zero’ [liŋ ¹¹⁴]	<i>ń</i> ‘five’ [n ³⁵]	<i>nyí</i> ‘two’ [ni ²¹]	<i>l̥</i> ‘six’ [lɔʔ ¹³]

¹As a reviewer observes, these conclusions are most naturally associated with a framework that does not assume a generative lexicon, such as the Distributed Morphology approach we adopt here. However, they are not fundamentally incompatible with other approaches.

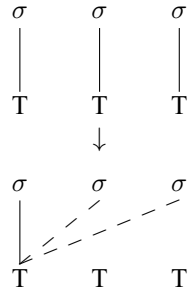
²Yixing is highly underdocumented and poorly represented in the linguistics literature, although there are a number of recent quantitative studies (Huang 2017ab, 2018, 2019) of the dialect from the point of view of linguistic geography. Huang (2016) is a monograph on the reconstruction of Yixing phonology during the Qing dynasty and historical changes in this system. To our knowledge, Hu and Perry (2018) and Hu (2023) are the only existing theoretically-oriented works on the dialect.

The first author is a native speaker of Yixing Chinese (from Taihua Town in the south of the County-level City) and all data in this paper are based on his speech and judgements.

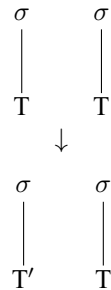
³Yixing will be transcribed here in a practical, pinyin-based orthography of our own devising. IPA transcriptions will be given where phonological detail is necessary. Where tones are transcribed broadly, we use IPA tone marks, but we use Chao tone numbers when narrow transcription is called for. The narrow transcriptions of some of these tones differ from those offered in Hu and Perry (2018), but only in minor respects.

As mentioned, Yixing has two widespread sandhi processes which occur when syllables bearing their own lexical tone are combined, namely Pattern Extension (PE) and Pattern Substitution (PS). A schematic view of what these processes involve is shown below:

(2) *PE Sandhi (schematic)*



(3) *PS Sandhi (schematic)*



In (2) we see that under PE, the initial tone of a word spreads over the whole tonal domain (taken to be the phonological *phrase*), with other pitches in the word delinked from their lexical hosts (and plausibly deleted entirely). A simple example of this occurs in the behaviour of numeral phrases – the numeral *sī* ‘four’ is realised as [sĩ̃], with a falling-rising tone. When in a larger phrase (e.g. when occurring together with a classifier and noun) this fall-rise contour spreads over the whole phrase, so that we see *sī bèn syū* ‘four books’ being realised as [sĩ̃.bən.ɕỹ]. In fact the relation of the isolation pitch contour and the contour which appears under PE sandhi is typically more complex than this (see Hu and Perry 2018 for full details), but this illustrates the general principle.

In (3) we see a similar schematic illustration of PS sandhi. Here, when two tones are adjacent within a certain domain (which we take to be the phonological word), the first tone is replaced, conditioned by the second. Because all phonological words in Yixing are (as far as we can tell) embedded in a phonological phrase, PS sandhi always occurs together with PE sandhi, feeding the latter. To illustrate, while the word *hài* ‘sea’ is realised with a falling tone [xâe] in isolation, in a compound like *hài-bā* ‘elevation above sea level’ appears with a globally rising contour [xâe.bəʔ]. We analyse this as a combination of an operation of PS (replacing the falling contour with a rise) and an

operation of PE (spreading this contour across the tonal domain).⁴

In general, the details of these sandhi processes will not be important for the arguments made here, but the domains which they identify will be.

2 Linking Elements in Yixing

We now turn to discuss the phenomenon under investigation. Most Chinese varieties possess a multifunctional linking element marking a variety of modifiers within the noun phrase (for some recent discussion see e.g. Cheng and Sybesma 2009, Li 2012, Paul 2012, Zhang 2012) This element appears on (for example) apparent adjectives (4), and possessors (5), relative clauses (6). Examples are given for Mandarin (where the element in question is 的 *de*) and Cantonese (where the element is 嘅 *ge³*).

(4) 'Adjectives' with linkers

- a. 漂亮的房子
piàoliàng de fángzi
beautiful LNK house
'a beautiful house' (Mandarin)
- b. 靚嘅屋
leng⁶ ge³ uk¹
beautiful LNK house
'a beautiful house' (Cantonese)

(5) Possessors with linkers

- a. 張三的房子
zhāngsān de fángzi
Zhangsan LNK house
'Zhangsan's house' (Mandarin)
- b. 張三嘅屋
zoeng¹ saam¹ ge³ uk¹
Cheung Sam LNK house
'Cheung Sam's house' (Cantonese)

(6) Relative clauses with linkers

- a. 張三很喜歡的房子
zhāngsān hěn xǐhuān de fángzi
Zhangsan DEG like LNK house

⁴The orthography we use here does not indicate the sandhi changes on tones, but does indicate the phonological domains within which they take place. The first element of a phonological phrase is (optionally) underlined, and elements within a phonological word are linked by hyphens.

‘The house that Zhangsan really likes.’ (Mandarin)

- b. 張三好中意嘅屋
zoeng¹ saam¹ hou² zung¹ji³ ge³ uk¹
Cheung Sam DEG like LNK house

‘The house that Cheung Sam really likes.’ (Cantonese)

In fact, Yixing possesses an exactly parallel marker, namely *gā* (which may presumably be taken to be cognate to its Cantonese analogue).

(7) *Linkers in Yixing*

- a. *‘Adjectives’*:
pyâolyan gā ffānzā
beautiful LNK house
‘a beautiful house’
- b. *Possessors*:
zānsā gā ffānzā
Zhangsan LNK house
‘Zhangsan’s house’
- c. *Relative Clauses*:
zānsā mā hwēsýì gā ffānzā
Zhangsan DEG like LNK house
‘The house that Zhangsan really likes’

What distinguishes Yixing from Mandarin and Cantonese is that we more commonly find a different element with property-concept denoting elements – this is the marker *-lao*, and it is this marker which is the main focus of this paper. This marker is also found in some neighbouring Wu varieties, such as those of Liyang and Changzhou – the latter is mentioned by Chao (1926, 1928 [2011]) and described in more detail by Shi (1982).⁵

(8) *The marker -lao*:

- pyâolyan-lao ffānzā
beautiful-LAO house
‘a beautiful house’

The phonological behaviour of *-lao* is different to that of *gā*. To be specific, *-lao* forms a phonological word with a preceding ‘adjective’, triggering PS tone sandhi if the ‘adjective’ in question is monosyllabic.⁶ The linker *gā* does not form such a phonological word, though it does belong to the same phonological *phrase* as what precedes it (and consequently undergoes PE sandhi).

⁵These Wu dialects are not, of course, the only variety that allows different elements to appear in this position. In Cantonese, for example, it is common for classifiers to appear in this position in place of a linker, though not uniquely with ‘adjectives’. (see e.g. Yip and Matthews 2011 for examples).

⁶The phonological word boundary in (9) is also indicated by downstep of a following high tone.

(9) *Phonological behaviour of -lao and gā*

- a. $(\phi(\omega \text{ hǎo láo}) (\omega \text{ ʰɛ́y}))$
hào-lao syū
good-LAO book
'a good book'
- b. $(\phi(\omega \text{ hāo}) (\omega \text{ gē}) (\omega \text{ ɛ́y}))$
hào gā syū
good LNK book
'a good book'

This leads Hu and Perry (2018) to propose that *-lao* should be analysed as an adjectival categoriser. This follows from their analysis of the distribution of phonological words in Yixing. Hu and Perry observe that, in general, when two or more elements constitute a phonological word in Yixing, the combination possesses obligatory idiomatic or conventionalized semantics. This is particularly visible in the forms that Hu and Perry call Non-Compositional Compounds (NCCs). We give an example of this phenomenon in (10).

(10) *Phonological words \Rightarrow idiomatic semantics*

- a. $(\phi(\omega \text{ ㄓㄧˋ láohú}))$
zì-láohù
paper-tiger
'paper tiger (i.e. empty threat)' (idiomatic interpretation obligatory)
- b. $(\phi(\omega \text{ ㄓㄧˋ}) (\omega \text{ láohù}))$
zì láohù
paper tiger
'paper tiger (i.e. tiger made of paper)' (non-idiomatic interpretation available)

In (10a) we see PS, replacing the citation pattern (HL L%) of *zì* 'paper' with a sandhi pattern (LH H%), with the latter being extended over the whole domain by PE. The application of PS indicates that we have a single phonological word here. As expected, this form also has obligatory idiomatic semantics. On the other hand, in (10b) we have no PS sandhi of the first element, and the *citation* pattern is consequently spread. Here, a non-idiomatic reading is available.

Hu and Perry suggest that the domain of this idiomatic semantics can be identified with a *first-categorisation domain*, made up of a combination of roots plus a (possibly null) categoriser, and that this domain also defines the phonological word.⁷ Since *-lao* forms a phonological word with preceding elements, and since it is not a root, Hu and Perry propose to analyse it as a categoriser.

In fact, this suggestion has some supporting evidence: *-lao* is not only a linking morpheme, but also typically appears on (apparent) adjectives in ordinary predicative sentences.

⁷We will slightly revise this analysis below.

(11) *-lao in predicative position:*

gā bèn syū hào-lao
this CL book good-LAO

‘this book is good’

Further evidence that *-lao* is not a linker like *gā* comes from the fact that they can co-occur straightforwardly:

(12) *Co-occurring markers:*

hào-lao gā syū
good-LAO LNK book

‘a good book’

As we will see, however, there are complications to this account.

3 *-lao* is not (just) an *a* head

Although *-lao* often appears on property-concept denoting terms with both predicative and attributive roles, it is doubly dissociated from adjectivehood. There are elements marked with *-lao* which are apparently not adjectival in character, and in the right contexts property-concept denoting elements appear readily without *-lao* attached (an example of the latter can already be seen in (7a)). Let us go through each of these cases in turn:

3.1 Non-adjectival material with *-lao*

The types of manifestly non-adjectival material which appear with *-lao* include nouns as well as verb phrases.

3.1.1 Nouns with *-lao*

It is very common to find *-lao* attached to nouns. In fact, it seems likely to us (as discussed in section 6) that this is the diachronic origin of the *-lao* marker, and the only use that clearly finds parallels in other Chinese varieties (with the exception of neighbouring Wu varieties such as Liyang and Changzhou, as mentioned above). The marker *-lao* attaches to various verb phrases as a productive agentive nominaliser, and non-productively to individual roots, with unpredictable meaning. Examples of these usages can be seen below:

(13) *Agentive nominaliser -lao:*

- a. cyǐ syānyē
eat cigarette
‘smoke [cigarettes]’

- b. [cyǐ syānyē]-lao
eat cigarette-LAO
'[cigarette] smoker'

(14) *Root nominaliser -lao*

- syào-lao
 $\sqrt{\text{small}}$ -LAO
'child'

It is important to distinguish between these two nominal uses – while the productive examples such as (13) generally express a particular habit or occupation, this is clearly not true of sporadic examples like (14).

3.1.2 Verbal and clausal material with *-lao*

In (13) we see an example where *-lao* attaches to a VP to create an agentive noun. We also see *-lao* attaching to VPs in predicative position (15).⁸

(15) *VP predicates with -lao*:

- zānsā [hwēsýì lisí]-lao
Zhangsan like Lisi-LAO
'Zhangsan likes Lisi'

In these instances, the use of *-lao* expresses that the predicate constitutes a more-or-less stable attribute of the subject.

3.2 Adjectival material without *-lao*

In the unmarked case, adjectival material in Yixing, whether predicative or attributive, appears with *-lao*. This is not true in all instances, however. In many cases, Yixing 'adjectives' (i.e. property-concept denoting terms) appear without *-lao*. We will briefly (and non-exhaustively) describe some of the conditions under which this occurs.

The marker *-lao* does not appear on 'adjectives' with preceding degree modifiers, including comparative and superlative markers. This is true whether the 'adjective' in question appears in predicative or attributing position. Elements that are incompatible with *-lao* in this way include *mā* 'very', *dìn*, *zâe* 'most', *tâ* 'too', *(ny)ân* 'so'.

The element *-lao* is also incompatible with negation, marked by *fā* (imperfective) and *mǎ* (perfective). This is illustrated below:

(16) '*Adjectives*' with degree modifiers:

⁸For consistency we continue to show *lao* as affixal in these examples, but it is not possible to see whether it forms a phonological word with any preceding material. This is because PE tone sandhi overwrites the tonal content of the object, obscuring any potential PS processes that may have taken place.

- a. mā-hào(*-lao) gā syū
very-good(*-LAO) LNK book
'very good book'
- b. gā zōn ddyenáo din-gwâi(*-lao)
this type computer most-expensive(*-LAO)
'Computers of this type are the most expensive.'

(17) *'Adjectives' with negators*

gā gā wǒsānzā fā cōnmǐn(*-lao)
this CL student NEG.IMPF clever(*-LAO)

'This student is not clever.'

As discussed further in section 6.1, we also see *-lao* optionally fail to surface with final interrogative markers (which are homophonous with, and possibly identical to, the negators mentioned above.)

(18) *'Adjectives' with interrogative markers*

gā gā wǒsānzā cōnmǐn(-lao) fā?
this CL student clever(-LAO) POL.Q.IMPF

'Is this student clever?'

We will first discuss the appearance of *-lao* with manifestly non-adjectival material, before discussing its failure to appear with apparently adjectival elements.

4 The Semantics of *-lao* and Contextual Alloosemy

As noted above, although there seems to be *prima facie* reason to analyse *-lao* as an adjectival categoriser, *-lao* not only fails to be realised on some 'adjectives', but is also found attached to elements which are manifestly not adjectives. In this section we consider these latter cases, and argue for a slightly modified analysis of *-lao*.

Over the next three sections, we will argue for the following conclusions:

- (19) a. The marker *-lao* realises a grammaticalised feature associated with semantics expressing *attributes* of individuals.
- b. Specifically *-lao* instantiates a particular type of possession, *possession-as-attribute*, which is taken to be inherent cross-linguistically in the semantics of (most) adjectives.
- c. Special cases where *-lao* seems to lack these semantics, in particular when attached to roots, may be dealt with in terms of contextual alloosemy as a consequence of late insertion of semantics.

4.1 *-lao* and Possessive semantics

When attached to a VP, the most typical use of *-lao* is in denoting a habit or a persistent psychological state, as illustrated in (20):

- (20) a. zānsā [cyǐ syānyē]-lao
Zhangsan eat cigarette-LAO
'Zhangsan smokes.'
- b. zānsā [hwēsyi lisi]-lao
Zhangsan like Lisi-LAO
'Zhangsan likes Lisi.'

Psychological states which are contingent rather than persistent tend to be infelicitous with *-lao*, so that (21) is felicitous if it reflects Zhangsan's general psychological state, but not if it represents Zhangsan's response to a particular event (e.g. if the sentence is a reply to the question 'What happens when Zhangsan looks at Lisi's picture?')⁹

- (21) zānsā [syānyē lisi]-lao
Zhangsan miss lisi-LAO
'Zhangsan misses Lisi'

Although VP-attached *-lao* generally encodes habitual situations, not all habits are generally felicitous with *-lao*. Take (22) as an example:

- (22) tō syīncyī tiē mādōnsyī(*-lao)
3SG Sunday do.shopping(*-LAO)
'S/he goes shopping on Sundays'

The key difference between (20a) and (22) is that the former is conceived of as forming a *characteristic attribute* of an individual, whereas the latter is not. We give a suggestion regarding a more precise definition of what is meant by 'characteristic attribute' below. One can obtain an informal idea of the concept, however, by considering ways that sentences such as (22) can be coerced to yield such a reading, for example if we consider a conservative Christian community where there is some norm against commercial activity on Sundays.

- (23) tō [syīncyī tiē mādōnsyī]-lao
3SG Sunday do.shopping-LAO
'S/he goes shopping on Sundays (counter to the norm)'

In this case, going shopping on Sundays is a marked characteristic of an individual, which licenses the use of *-lao*. Note that while a typical usage of *-lao* is to express states (as in e.g. (21) or with most 'adjectives'), it is perfectly compatible with eventive predicates given an appropriate context (as in 23).

⁹Clearly, this characterisation overlaps to some extent with Carlson's (1977) notion of 'stage-level' vs. 'individual-level' predicates, but is not identical with it. There is no requirement that predicates involving *-lao* be conceptualised as lasting throughout an individual's lifetime.

This ‘characteristic’ semantics here recalls the semantics of adjectives, which also typically denote particular characteristics of individuals or entities – a red book is a book which has ‘red’ as one of its characteristics. Since *-lao* also appears to act as an adjectivalising morpheme of sorts as discussed above, one obvious avenue might be to suppose that *-lao* also acts as an adjectivaliser here, and that the observed semantics are a consequence of this. We do not adopt this route, in part because *-lao* is *not* a straightforward adjectivaliser in all contexts, and also forms nouns. This is discussed further in the next section. We will adopt a more circumscribed hypothesis, that there is a feature in common between (most) adjectival forms and phrasal elements involving *-lao*.

We will draw on the account of the semantics of property concepts offered by Francez and Koontz-Garboden (2015, 2017; Henceforth F&KG). F&KG consider a number of languages in which the usual expression of property concepts is *not* through adjectives. One particular language they focus on is Ulwa (Misumalpan, Nicaragua), in which most property concepts are expressed using nouns embedded in a possessive construction.

- (24) yang as-kina minisih-ka
 1SG shirt-POSS.1SG dirtiness-POSS.3SG
 ‘My shirt is dirty’ (F&KG 2015:7 [gloss modified])

The example in (24) could be more literally translated as ‘my shirt has dirtiness’. The semantic denotation F&KG adopt for the final possessive construction here is as follows:

- (25) *minisih-ka*:
 $\lambda x.\lambda D.\exists^D z[\text{dirtiness}(z)\&\pi(x, z)]$

This could be paraphrased as ‘Given an entity x and a set of [contextually relevant] portions¹⁰ D , there is a portion z of dirtiness in D such that x has z ’. The element $\pi(x, z)$ here is represents a possessive function which can simply be read ‘ x possesses z ’. An important assumption of F&KG is that ‘possessive and canonical [i.e. adjectival] P[roperty] C[oncept] constructions have the same truth conditions’ (F&KG 2015: 557) – this would plausibly imply that adjectives in languages such as English could have a comparable denotation to the possessive construction in Ulwa:

- (26) *dirty*:
 $\lambda x.\lambda D.\exists^D z[\text{dirtiness}(z)\&\pi(x, z)]$

F&KG do not explicitly adopt this hypothesis,¹¹ but it is a reasonable extrapolation from their approach. Most importantly for present purposes, we assume that elements formed with *-lao* in Yixing have a comparable denotation. For example, the form *gāo-lao* ‘tall-LAO’ would have the following denotation.

¹⁰Where a ‘portion’ can be thought of as a generalisation of ‘degree’ beyond simple one-dimensional scales - see F&KG (2015, 2017) for a formal discussion

¹¹“We take no stance [...] on whether the denotation of adjectivally denoting PC lexemes should be identified, in at least some languages, with the denotation reached by composing substance-denoting lexemes with possessive morphology” (F&KG 2015: 554)

- (27) *gāo-lao*:
 $\lambda x.\lambda D.\exists^D z[\text{height}(z)\&\pi(x, z)]$

We propose that *-lao* simply instantiates the possessive element in these constructions. In particular, we suppose that a head with exponent *-lao* (e.g. the apparently adjectivalising head we have been discussing, but possibly other elements, including nominalisers as discussed in section 6) contains a possessive feature, which is realised with a denotation similar to that shown below:¹²

- (28) Poss:
 $\lambda x.\lambda P.\exists z[P(z)\&\pi(x, z)]$

This immediately requires some refinement – possession in general in Yixing is *not* expressed using *-lao*, with possessed elements being introduced using the existential copula *yóu*, as in (29).

- (29) ngó yóu ̄ bèn syū
 1SG EXIST one CL book
 ‘I have a book’

Although *-lao* may not be the usual element in conventional possessive constructions, there *are* self-evidently possessive constructions in which *-lao* is used. Again, these are cases where the possession in question is some characteristic attribute of an individual – cases of the ‘brown-eyed girl’ type discussed by Nevins and Myler (2014):¹³

- (30) gā gā òddöu [do ngázyīn]-lao
 this CL girl big eye-LAO
 ‘This girl has big eyes’ (and this is a characteristic of the girl)

We propose that *-lao* instantiates a more specific kind of possession – *possession-as-attribute*. Specifically, we can implement this in terms of *kinds*, as discussed by e.g. Carlson (1977), Krifka et al. (1995), Chierchia (1998).¹⁴ The marker *-lao* marks a specific type of possession – one which delineates a kind. The kind-denoting meaning is not an entailment of this type of possession sentence but a presupposition, which restricts the set of properties which can be involved in the relation.

- (31) Poss_{attr}:
 $\lambda x.\lambda P : \exists k.[\lambda w.\cup k(w) = \lambda w.Poss(P, w)].Poss(P, x)$
 Paraphrase: ‘Given a property P such that the set of individuals which possess something with property P is identical the extension of some *kind*, and an individual x, x possesses something with property P’

¹²Simpler denotations are imaginable but might require special composition rules. As a matter of readability we have omitted reference to the contextually determined set of portions D here – if necessary it could presumably be reintroduced as a restriction on z, but this does not seem to play any particular role in Yixing.

¹³See also Hirtle (1970), Hudson (1975), Beard (1976), Tsujioka (2002).

¹⁴Thanks to Theresa Biberauer for drawing our attention to the importance of kind-hood.

Here *Poss* is an abbreviation for the denotation in (28). This gives us a more precise definition of the notion of ‘characteristic attribute’ mentioned above – a *characteristic attribute* is a property which satisfies the restriction of P in (31). Different types of possessed element receiving different marking is, of course, widely attested, for example distinguishing alienable and inalienable possession (and subtypes, including kinship possession, body-part possession, etc., as well as lexical factors – see e.g. Nichols 1988, Heine 1997, Nichols and Bickel 2005, Dixon and Aikhenvald 2012, Myler 2015 for some discussion), and the restriction here can be thought of as a similar phenomenon.

The set of *kinds* available in the discourse, like other sorts of individuals, is contextually determined. Suppose that P is the property of smoking cigarettes – then given a discourse universe where cigarette-smokers (i.e. those who possess the habit of smoking cigarettes) are accepted as a specific *kind* of person, the *-lao* construction is well-defined and felicitous, and in fact this generally happens to be the case. Compare the differences between different DPs in English (for extensive discussion of kind-denoting nominal phrases in English, see Krifka et al. 1995):

- (32) a. Someone who smokes cigarettes might have a cancer risk.
 b. Someone who lives in this building might have a cancer risk.

The first of these sentences is likely to be interpreted in a generic fashion, as a general statement about the risks of smoking, but the latter is more likely to be interpreted as referring to a specific individual. We take this as indicating that (in contexts where this judgement holds), that cigarette-smokers are conceptualised as a kind whereas people who live in a particular building are not. In a context which makes people who live in a particular building a salient kind (e.g. when we are comparing the dispositions of the populations of particular buildings), the kind-referring interpretation of (32b) is readily accessible. We can compare this to the contrast in (22) and (23).

The link with property-concept denotation seems fairly straightforward: adjectives readily define kinds in e.g. English:

- (33) a. A hungry person can be quite disruptive.
 b. A person who lives in this building can be quite disruptive.

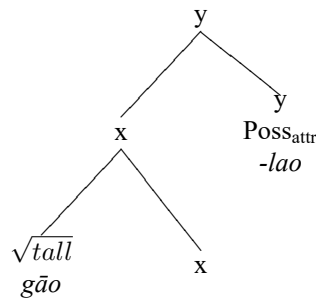
Here again the first sentence is likely to be interpreted as kind-referring and the latter as individual-referring, except with rich contextual information favouring an alternative interpretation. If we suppose that the denotation of adjectives in English is similar to that of *-lao* marked predicates in Yixing, this is expected.

The definition of ‘characteristic attributes’ in terms of kinds could be related to the notion of ‘informativeness’ discussed by Tsujioka (2002), Nevins and Myler (2014) in relation to the ‘brown-eyed girl’ examples discussed above and further below, and is also reminiscent of the semantics suggested by Paul (2015) for *de*-less adjectives in Mandarin, whereby *de*-less adjectives are only licit if the combination creates a ‘natural, plausible class’. Kinds also play a crucial role in the productivity of compounding operations – for example, Snyder (2012) proposes that compounds are only licit if they single out a subtype of a kind (a relation he calls Generalized Modification).

We assume that *-lao*, instantiating the meaning in (31), combines with a property-concept denoting element to yield a licit ‘adjectival’ form. It is worth noting that, when

attached to ‘adjectives’, this possessive semantics seems to be a consistent correlate of *-lao*. If we assume that *-lao* instantiates a simple root-attaching categoriser, this may be problematic, since Hu and Perry (2018) make a strong argument that the ‘first-categorisation domain’ of Yixing (and more widely) is obligatorily interpreted in an idiosyncratic, non-compositional way (cf. also Arad 2005). This would seem to rule out consistent, non-arbitrary semantics of the sort observed here. We propose that the head bearing the [Poss_{attr}] feature is not root-attached, but rather forms the outer layer of a head containing multiple functional items. The structure of Yixing ‘adjectives’, then, is complex, containing multiple functional layers.

(34) *Structure of gāo-lao ‘tall’*



The *x* and *y* heads in (34) are functional heads whose identity we will leave an open question in this paper. The important point here is that the ‘first-categorisation’ domain of this head is the complex x^0 . This combines with a root to yield some property, but the actual semantic contribution of the head is essentially arbitrary.¹⁵ The head bearing the [Poss_{attr}] feature lies outside this domain, allowing it to receive a consistent, non-idiomatic interpretation.

This involves a slightly different account of the distribution of the phonological word constituent to that offered by Hu and Perry (2018). Hu and Perry proposed that the domain of PS sandhi was identical to the *first-categorisation domain*. This implies that the phonological word could only be composed of a number of roots and a single categoriser, and *-lao* lies outside this domain under this proposal. We suggest instead that the phonological word simply maps onto a complex head or M-word, with the proviso that this head contain at most one root-categoriser pair.¹⁶ There is some additional

¹⁵A reviewer asks if the *x* head here is ever overt. In fact it is difficult to tell – the problem is we expect an overt *x* head behave in a way phonologically indistinguishable from a root, being placed in the same phonological word and as such triggering PS sandhi in the same way as roots. As mentioned, its contribution to the semantics is unpredictable, so this likewise cannot be used to identify a morph as an *x* head. In languages with relatively few morphological processes like Chinese, then, there is no straightforward way to say that some morph or other is an exponent of *x*, rather than a root, and we remain non-committal on whether *x* is ever overt.

¹⁶This proviso is necessary in order to explain cases of compounds (which form a complex head) where we see multiple phonological words, e.g. *wō wāe* ‘academic society (=study+society)’. This does not form a PS domain and consequently the components must be parsed as individual phonological words: $(\omega \ w\check{o})(\omega \ wae)$. This has plausibly a syntactic structure like $[_n \ [_n \ w\check{o} \ n] [_n \ wae \ n]]$, where the categorising heads are null – hence our restriction leads to the correct parsing. This restriction can perhaps be explained if we adopt the common assumption that categorising heads are phasal (following e.g. Marvin 2002, among many others).

evidence for this proposal in the behaviour of degree modifiers and negators, discussed in section 5.

In some cases, however, the head bearing [Poss_{attr}] attaches to a larger constituent. Recall (30), repeated here.

- (35) gā gā ǝddǝu [do ngázyīn]-lao
 this CL girl big eye-LAO
 ‘This girl has big eyes’ (and this is a characteristic of the girl)

Here *-lao* plausibly expones a head attached to an noun phrase constituent, containing a categorised noun (*ngázyīn*) and an ‘adjectival’ element (*do*). The contribution of the [Poss_{attr}] feature, however, is exactly the same as it is elsewhere – it creates a predicate which asserts the existence of an individual with the property within its scope (in this case, ‘big eyes’), possessed by the argument of the predicate, such that this possession relation defines a characteristic attribute.

- (36) do ngázyīn-lao:
 $\lambda x. \exists z [\text{eye}(z) \& \text{big}(z) \& \pi(x, z)]$
 Presupposition: the class of entities with big eyes forms a kind in the relevant context.

We suppose that the *verbal* forms (e.g. 20) here are simply the result of attaching a head bearing [Poss_{attr}] to part of the extended verbal projection. We posit that the interpretation of [Poss_{attr}] in these instances is precisely the same as when it is attached to ‘adjectives’, except that instead of asserting the existence of a portion of some property substance, it asserts the existence of an *event* (or set of events). One can plausibly assume that this is achieved by underspecifying the sort of individual expressed by the *z* variable in denotations like (28), so that it may refer to either concrete entities or eventualities, or indeed portions of some property substance as F&KG suppose. To illustrate, we give a (simplified) denotation of (20b) in (37):¹⁷

- (37) cyī syānyē-lao:
 $\lambda x. \exists e [\text{smoke-cigarettes}(x, e) \& \pi(x, e)]$
 Presupposition: cigarette-smoking entities constitute a kind in the relevant context.

This can be paraphrased as saying that given an individual *x*, there is a cigarette-smoking event (or set of events) in which *x* is a participant, such that *x* *has those events as a characteristic attribute*.¹⁸

If prosodification is in turn phasal, each of these will introduce a phonological word. If we further suppose that phonological words introduced at the phase level may be extended but not otherwise eliminated, then our restriction is a natural consequence – for some discussion of a model which could capture these facts, see Perry (2016, ms.)

¹⁷The idea of eventualities serving as an argument of a possession relation seems to be straightforwardly suggested by examples in English such as ‘I have a habit of repeating myself’ or ‘I had a two-hour long meeting yesterday’.

¹⁸An interesting question here is how the possessing element and the participant in the cigarette-smoking event come to be co-indexed. We can suppose this emerges as a consequence of a simple raising operation – the element which is the agent of the cigarette-smoking events raises to merge with the possessive head. This gets the right semantics, although syntactic questions regarding e.g. the theta-criterion emerge. More complex possibilities can be imagined, but we will leave the question aside here.

To sum up, analysing *-lao* as instantiating a [Poss_{attr}] feature allows us to capture all instances of predicative and attributive *-lao*. There are a number of instances, however, where *-lao* does not appear as expected, and it is to these cases we now turn.

5 Contextual Allomorphy

We suggest that the behaviour of *-lao* when attached to ‘adjectives’ can be reasonably treated as a straightforward example of contextual allomorphy. In particular, we make the following proposals:

- (38)
- a. Degree modifiers and negators cause ‘adjectives’ to undergo head-adjunction with them.
 - b. A [Poss_{attr}]-bearing head has two possible exponents, \emptyset and *-lao*.
 - c. The \emptyset exponent is inserted iff that head forms part of a complex head with a higher functional element.
 - d. *-lao* is an elsewhere morph.

That ‘adjectives’ undergo head-adjunction with degree modifiers and negators is supported by the fact that these elements form a phonological word together with the following property-concept denoting stem, as diagnosed by PS tone sandhi. If we assume (as discussed in the preceding section) that phonological words at least partially map to (complex) heads in the syntax, it follows that adjective-like elements form a complex head with degree modifiers and negators (cf. the notion M-word of Embick and Noyer (2001)).

- (39) *Degree modifiers = phonological word*
- a. *mā-zzǎo*
very-wet
‘very wet’ [mádzáo]
= *mā* [má] ‘very’ + *zzǎo* [dzǎo] ‘wet’
 - b. *mā-pân*
very-fat
‘very fat’ [máp^hâŋ]
= *mā* [má] ‘very’ + *pân* [p^hâŋ] ‘fat’

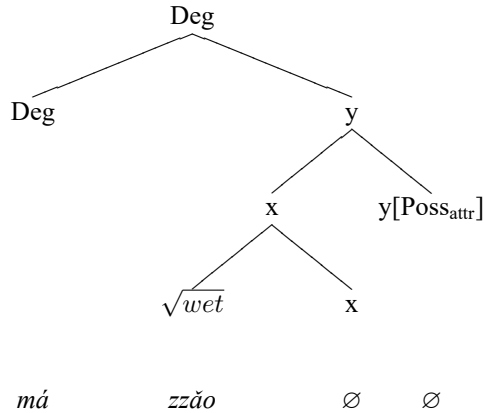
The intensifier *mā* undergoes PS sandhi conditioned by tone of the following item, changing its underlying H L% pattern into an H H% pattern before underlying I and IV tones, before being extended across the tonal domain.¹⁹

¹⁹This effect can be obviated by focusing *mā*, which then displays its underlying tone, though PE sandhi still applies across following material.

- (40) *Obviation of PS sandhi under focus*
- mā zzǎo*
very wet

A proposed structure for this sort of construction is as follows (subject to some fairly substantial modifications below):²⁰

(41) *(Provisional) structure of mā-zzǎo ‘very wet’*



Note that the parsing of a degree modifier together with the root as a phonological word provides evidence for our revision of Hu and Perry’s (2008) delineation of the phonological word, discussed above. Comparable structures can be posited for negative forms (albeit with a Neg head as opposed to a Deg head). This structure emerges as a consequence of a head-movement process, moving the ‘adjective’ (including the root and categoriser) to the Deg head. We propose that Vocabulary entries determining the exponence for the [Poss_{attr}]-bearing head are as follows:²¹

(42) *Vocabulary entries for a head*
 Poss_{attr} ↔ ∅ / [_{Z⁰} Z [_y . . . —]]
 Poss_{attr} ↔ /lao/ (elsewhere)

In other words, the zero exponent of the [Poss_{attr}]-bearing head is inserted iff embedded inside a complex head – otherwise *lao* is inserted. It may be noted that this

‘very wet’ [má dzǎo]

²⁰It will be observed that this structure is not straightforwardly compatible with antisymmetric models of the ordering of elements within complex heads along the lines of Kayne (1994), where we expect uniform adjunction to the left. If we wish to adopt a framework along these lines it must be assumed that some reordering takes place in the morphology. This may be desirable insofar as it would ensure that the allomorphy in 42 takes place under linear adjacency, but it is not necessary to assume this for our purposes.

²¹A reviewer asks how these forms are ‘expected logically’. Morphological forms, of course, are often characterised by a high degree of arbitrariness and so it may be that we cannot establish a straightforward reason for the distribution of exponents. However, we would like to suggest one possibility. In section 6 below, we argue that *-lao* is originally derived from a nominalizing suffix, which was later reanalysed as the exponent of a cross-categorial possessive feature of the sort discussed here. Given that adjectives and nouns share a substantial part of their distribution this seems plausible. However, one position where we would not expect nouns to appear is following degree markers. Forms following degree markers would consequently systematically lack *-lao* before reanalysis, and it is possible that this regularity was carried over in morphologised form into the present language, resulting in the distribution we see here.

involves the relatively more marked phonological form *lao* appearing as an elsewhere item. This sees parallels in other languages, for example in English varieties which are subject to the *Northern Subject Rule*: In these varieties, zero-marking in present tense verbs only appears in relatively restricted circumstances, prototypically requiring adjacency of a pronoun with a marked person/number combination. Otherwise, a default marker *-s* is inserted. (For discussion and literature review, see Pietsch 2005.) As with the present case, the phonologically more marked form is the elsewhere exponent.

5.1 Aside: Contrasting Adjectival Constructions in Yixing and Mandarin

Yixing provides an interesting contrast in this respect with the behaviour of Mandarin Chinese. In Yixing the unmarked predicative construction makes use of the element *-lao*. In Mandarin, on the other hand, we see no overt head along these lines, but we have the obligatory realisation of a degree modifier *hěn*. Whereas in attributive position this marker is optional, and serves as an explicit intensifier along the lines of *very*, in unmarked predicative constructions it is obligatory but semantically bleached, serving only to license the otherwise bare ‘adjective’ (see e.g. Li and Thompson 1981: 229-340).

- (43) a. 很新的汽車
 (hěn) xīn de qìchē
 (DEG) new LNK car
 ‘A (very) new car’
 (Attributive construction, *hěn* is optional, marks intensification)
- b. 這輛汽車很新
 zhè liàng qìchē *(hěn) xīn
 this CLS car *(DEG) new
 ‘This car is new’
 (Predicative construction, *hěn* is obligatory, has bleached meaning)

We suggest that in Mandarin, *hěn* serves as an elsewhere morph for a Deg head. One possible solution would follow Grano (2012) supposing that a degree head is also present in unmarked positive contexts to satisfy a syntactic requirement (the ‘T[+V] constraint’) of Mandarin,²² that the complement of T be of a syntactic category that is, or selects, part of the verbal extended projection. This element is *not* obligatorily present in attributive constructions (since there is no T head involved) and is also absent where the T[+V] constraint (or an analogous property) is satisfied by some other element.

We can propose that Yixing lacks an analogue of the T[+V] constraint of Mandarin, and that bare ‘adjectives’ can serve as the complement to T on their own. This means

²²Although Grano’s analysis makes the parametrisation between Yixing and Mandarin straightforward, it is not necessary to adopt Grano’s full analysis here, and some particular points are subject to controversy, in particular the presence of the T category in Chinese (see e.g. Sybesma 2007, J. Lin 2010, T.-H. J. Lin 2015 for some recent debate). The general point that Mandarin requires *hěn* as a licenser for an ‘adjective’ as a somehow defective predicate is straightforward enough, and it is not much of a leap to suppose that this requirement is not active in Yixing.

that the forms that we (typically) see in attributive constructions and predicative constructions in Yixing are the same – both involve the marker *-lao*, but no further degree modifiers. If a degree modifier is used, it always has its full, intensifying meaning, whether in predicative or attributive position.

- (44) a. syīn-lao cyīcuō
 new-LAO car
 ‘A new car’
 (Unmarked attributive using *lao*)
- b. mā-syīn gā cyīcuō
 DEG-new LNK car
 ‘A very new car’
 (Intensified attributive using *mā*)
- c. gā bu cyīcuō syīn-lao
 this CLS car new-LAO
 ‘This car is new’
 (Unmarked predicative using *lao*)
- d. gā bu cyīcuō mā-syīn
 this CLS car DEG-new
 ‘This car is very new’
 (Intensified predicative using *mā*)

In both Yixing and Mandarin, bare ‘adjectives’ *may* appear in predicative position, but with a marked comparative meaning. In both cases, we can attribute this to the presence of a null comparative morph. In the case of Mandarin, this can be said to satisfy the T[+V] constraint and an additional null Deg head is not required. In the case of Yixing, we suppose that the comparative morph attracts its complement to head adjoin to it in the same manner as other degree modifiers, and that this causes the insertion of a zero-exponent instead of *-lao*.²³

- (45) a. Mandarin:
 誰高?
 shěi gāo
 who tall
 ‘Who is taller?’
- b. Yixing:
 lóguō gāo
 who tall
 ‘Who is taller?’

²³Some Chinese dialects (such as Cantonese) seem to have an overt analogue of this comparative morph. In Cantonese the usual equivalent of (45) could be 邊個高啲? bin¹go³ gou¹-di¹ (who tall-COMP).

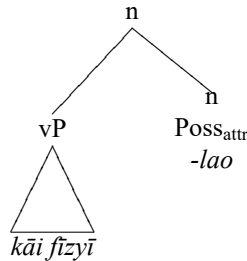
6 *-lao* as Nominalizer and Contextual Allosemy

As mentioned above, *-lao* is used to form nominals. For example, the form in (46), or (13) may be distributed exactly like any ordinary nominal.

- (46) *Agentive nominaliser -lao*:
- a. [kāi fīzyī]-lao
drive aeroplane-LAO
'aeroplane pilot'

Here it is important that we assume [Poss_{attr}] is an ordinary feature, not a category, here making the standard Minimalist assumption that heads are bundles of features, some of which may be categorial (cf. e.g. Collins and Stabler 2016). We suppose that categorial features are those that condition c-selection and consequently govern the syntactic distribution of items. Because *-lao* appears on items which are distributed as nouns as well as items distributed as adjectives, it seems that the feature it expones must be non-categorial. In other words, we can suppose that this feature appears on a variety of heads, including not just the head that forms adjectival predicates, but also the nominal categoriser *n*. We can suppose that the structure of (46) is something like that in (47):

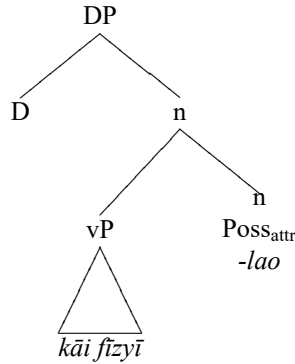
- (47) *Structure of kāi fīzyī-lao 'aeroplane pilot'*



It is important to observe that the semantic type of the form introduced by a [Poss_{attr}] head is $\langle e, t \rangle$ – that is to say, precisely what we would expect of a bare nominal in a language such as English (as well as verbs and adjectives).²⁴ The only difference between the nominal forms and the adjectival/verbal forms is that the former, but not the latter, are licensed by their syntactic category to appear in a DP environment. If the DP environment is definite (which in Yixing, like Mandarin, may or may not involve an overt determiner), this allows an individual denotation, with a head bearing [Poss_{attr}] introducing a restricting presupposition in the same way:

²⁴Chierchia (1998) suggests that Chinese bare nominals are individuals, not predicates. In particular, he suggests that bare nominals in Chinese are inherently *kind-denoting*, a property which he uses to derive a range of facts including the requirement for classifiers to individuate nominals in Chinese. The kind-denoting individual, he supposes, is type-shifted into a predicate using an operator \cup , yielding a mass-like denotation. While the meaning of [Poss_{attr}] does not yield an individual interpretation, it *is* restricted to defining kinds, and consequently has a mass-like denotation by default, in the same way as Chierchia's type-shifted nouns do. At least empirically speaking, then, [Poss_{attr}] seems to be compatible with an approach such as Chierchia's.

(48) *DP-embedded structure of kǎi fīzyī-lao ‘aeroplane pilot’*



(49) *Denotation of definite DP-embedded kǎi fīzyī-lao ‘aeroplane pilot’*

$\iota x. \exists e. [\text{fly-planes}, (x, e) \& \pi(x, e)]$

Presupposition: the set of plane-flying individuals constitutes a kind

(i.e. the unique x such that there is a set of plane-flying events with x as their agent, and x has these events as a characteristic attribute)

In many cases, an adjectival/verbal predicate or a nominal predicate can be used interchangeably. These have different syntactic properties – a verbal/adjectival predicate does not require a copula and does not license determiners and associated material (classifiers, numerals, etc.), whereas a nominal predicate *does* require a copula and licences DP material.

- (50) a. tō (*ī gā) [cyǐ syānyē]-lao
 3SG one CL eat cigarette-LAO
 ‘S/he smokes’
- b. tō *(ssi) ī gā [cyǐ syānyē]-lao
 3SG COP one CLS eat cigarette-LAO
 ‘S/he is a smoker’

The fact that these forms have identical entailments suggests that we are correct in supposing that the semantics of nominaliser *-lao* and the *-lao* that appears on verbal and adjectival predicates are identical.²⁵

However, it must be observed that the semantics of nominal forms involving *-lao* do not always straightforwardly have the property-possessive semantics discussed here. In particular, we see a number of forms with idiosyncratic or conventionalised readings which are not identical to those which would be expected from the composition of a [Poss_{attr}]-bearing head and a predicate.

²⁵As a reviewer points out, the English translations also have more or less identical entailments, but are not assumed to be identical elements. There are a few differences here – firstly, clearly the English examples lack the formal identity visible in Yixing. Secondly, English verbal morphology such as *-s* encodes additional information such as tense, not visible in the Yixing form. Finally, the English examples do not quite have identical denotations – in particular *-er* nominals appear to involve a kind presupposition comparable to the one we see in Yixing, but the verbal form does not.

- (51) a. syào-lao
small-LAO
'child'
- b. láo-lao
old-LAO
'elder'
- c. nyísyīn-lao
Yixing-LAO
'Yixinger' (i.e. someone who comes from Yixing)

In the first two examples the meaning of the form with *-lao* is narrower than would be expected from a straightforward compositional reading. *syào-lao* does not refer to small things or people in general, but specifically to children. Similarly *láo-lao* refers specifically to people with a particular status, not old people or things in general. The *-lao* affix here does not appear to involve the composition of possessive meaning with the usual property concept. Similarly, *nyísyīn-lao* does not refer to someone who has the place 'Yixing' as an attribute, but rather the property of coming from Yixing.

Explaining this requires some discussion of the diachronic development of the *-lao* morph. The use of *-lao* as a nominaliser is in fact widespread in Chinese, and is generally restricted to humans (usually male), often bearing some sort of derogatory sense.²⁶ While *-lao* in Yixing is typically restricted (with the exceptions just noted) to cases where the material to which it is attached denotes some sort of individual characteristic or disposition, its usage in other varieties is often substantially wider, simply denoting some underspecified relationship between the individual denoted by the phrase and the meaning of the material attached to *-lao*. In some varieties, such as Cantonese, the reflex of *lao* may even be used as an independent noun (which may be roughly translated as 'guy').²⁷

It seems probable that this represents the original state of affairs of *lao*. That is to say, it was originally a noun denoting a male human, which often entered into compounds with other material, resulting in complex expressions with the meaning described above, with the head noun bearing some underspecified relationship to the dependent expression. Let us call this *Stage 1*, which is still visible in Cantonese. In the next stage, *-lao* is no longer usable as an independent noun, but has become grammaticalised as a ([human], [male]) nominaliser (perhaps with derogatory overtones).²⁸ The semantic relationship between material to which the nominaliser attaches and the individual denoted by the resulting noun, however, remains underspecified. We can

²⁶Perhaps because of its relatively restricted distribution, it has not been the topic of a great deal of attention, either in Mandarin (but see Zhu 2002, You 2004) or cross-dialectally (but see Huang 2005).

²⁷Cantodict (<http://cantonese.sheik.co.uk>) gives the example 佢老婆起佢尾注攞晒啲錢跟佬走咗 *keoi⁵ lou⁵ po⁴ hei² keoi⁵ mei⁵ zyu³ laap³-sai³ di¹ cin² gan¹ lou² zau²-zo²* 'His wife took all his money and eloped with another man already'

²⁸The reader may wonder about the syntactic status of features [male], [human] in this example. In the case of the latter it is plausible to assume that it is a full-fledged syntactic feature, whose effects can be seen through e.g. categoriser selection or the availability of the 'plural' marker 們 *mén*. The status of the [male] feature is less clear, and this meaning is not reliably present when this item is used as a nominaliser. For this reason the diagram in 52 displays this feature in parentheses.

call this *Stage 2*, and represents the situation in most Chinese dialects. In *Stage 3*, we suggest, *-lao* has become specialised to representing *possessive* relationships of the sort discussed elsewhere in this paper. In *Stage 4*, the affix *-lao* is no longer restricted to human nouns, and in *Stage 5*, which is the stage we observe in Yixing, *-lao* is no longer restricted to nouns at all, accounting for its appearance on adjectival and verbal material.²⁹

These stages each involve changes in the Vocabulary item inserting the *-lao* exponent, involving the loss or gain of one or more features.

- (52) *Diachronic Stages of lao*:
- | | |
|----------|---|
| Stage 1: | $lao \leftrightarrow \sqrt{man}$ |
| | ↓ |
| Stage 2: | $lao \leftrightarrow [n, (+male), +human]$ |
| | ↓ |
| Stage 3: | $lao \leftrightarrow [n, +human, +Poss_{attr}]$ |
| | ↓ |
| Stage 4: | $lao \leftrightarrow [n, +Poss_{attr}]$ |
| | ↓ |
| Stage 5: | $lao \leftrightarrow [+Poss_{attr}]$ |

We propose that the forms in (51) constitute a residue of an earlier stage, in particular *Stage 2*, which is the stage represented by most modern Chinese varieties. In this stage *-lao* has the function of a nominaliser but its relation to attached material is otherwise underspecified. It is worth noting that the situation in Yixing is by no means unique – for example, the affix *-ly* in English is a semiproductive adverbialiser, but historically functioned as an adjectivaliser (as its German cognate *-lich* still does), and a residue of these forms remains in words like *kingly*. The question is, how is this residue realised synchronically in Yixing?

One possibility is that we simply have a split in the lexical/vocabulary items with exponent *-lao*, where the exceptional items have the vocabulary item listed in (52) for Stage 2, which realises a syntactically distinct nominaliser bearing [+human] features and restricted to some particular contexts. That is to say, we have a case of homophony, and the diachronic residue is entirely segregated from the present, productive, possessive use of *-lao*.

- | | Denotation | Syntactic Features | Exponent |
|------|---|-----------------------------|-------------------------|
| (53) | =(31) | [n, +Poss _{attr}] | <i>lao</i> ₁ |
| | $\lambda P.\lambda x.\exists R.\exists z[\text{human}(x)\&P(z)\&R(x, z)]$ | [n, +human] | <i>lao</i> ₂ |

There is another possibility, however, which is to suppose that the same vocabulary entry is involved in both the fully productive cases of *lao* and the exceptional cases. If we adopt this approach, we must suppose that the syntactic terminal which *-lao* realises bears a [Poss_{attr}] feature. But the examples in (51) do not show possessive semantics

²⁹This account is necessarily speculative to some extent, in view of the paucity of historical Yixing sources (though see Huang 2016 for a notable exception) – we do not intend to offer a definitive history of *-lao* here, only a hypothesis about how it reached its current state in Yixing. However we do believe the cross-dialectal variability we see in the status of *-lao* is evidence that some process akin to this has taken place.

of the sort we expect. This is not a problem, however, if we allow *contextual allosemy rules* to apply in the derivation to LF. Assuming late insertion of semantic features parallel to late insertion of phonological features, it is reasonable to suppose that the semantics of an item can be contextually conditioned in the same way that suppletive phonological forms can be. Wood (2015, forthc.) illustrates various applications of this notion with respect to Icelandic argument structure, and Myler (2015) discusses allosemy with respect to possessive constructions. To give a concrete example, Wood and Marantz (2017) discuss the allosemy of argument-introducing heads crosslinguistically, arguing that heads which introduce external arguments are not syntactically distinct across extended projections (e.g. verbal vs. prepositional extended projections). The fact that they introduce arguments with distinct semantic roles is supposed to be a result of contextual allosemy, implemented with insertion rules parallel to the Vocabulary Insertion rules which insert phonological features and implement (some kinds of) contextual *allomorphy*. The rules they use to introduce different external arguments are given below, where i^* is their label for an argument introducing head:

(54) *Contextual allomorphy of i^** (Wood and Marantz 2017:259)

- a. $\llbracket i^* \rrbracket \leftrightarrow \lambda x.\lambda s.FIGURE(x, s) / \text{---(locative PP)}$
- b. $\llbracket i^* \rrbracket \leftrightarrow \lambda x.\lambda s.AGENT(x, s) / \text{---(agentive vP)}$

If contextual allosemy is a possibility, a head bearing the *syntactic* feature [Poss_{attr}] need not necessarily always have the denotation given in (31), but rather can vary between this denotation and one where the possessive semantics are not present, according to the surrounding structural context.

	Denotation	Syntactic Features	Exponent
(55)	=(31) $\lambda P.\lambda x.\exists R.\exists z[\text{human}(x)\&P(z)\&R(x, z)]$	[n, +Poss _{attr}]	<i>lao</i>

One advantage of this approach is that it gives us a natural place to put the restriction to particular syntactic /semantic contexts – a [Poss_{attr}]-bearing head may only be expletive after certain elements such as place names. This can be straightforwardly expressed as a restriction on the rule of semantic insertion in these contexts. If we assume distinct vocabulary entries and lexical items, the selectional relation is not so readily expressed – there does not seem any reason that a head bearing [n, +human] should not be permitted in wider contexts.

(56) *Possible semantic insertion rule*

- $\llbracket +n, +\text{Poss}_{\text{attr}} \rrbracket \leftrightarrow \lambda P.\lambda x.\exists R.\exists z[\text{human}(x)\&P(z)\&R(x, z)] / \text{---Place names (etc.)}$

It will be observed that both of these approaches involve some complication of the grammar – in the case of the first approach, we must enlarge both our syntactic lexicon and our vocabulary list, and tolerate homophony between two distinct exponents which appear in similar syntactic contexts. In the second approach, the mapping between

meanings and exponents is less straightforward – two meanings map onto a single exponent. Which of these approaches to adopt may depend partly on whether we prioritise transparency of mapping from meaning or parsimony in terms of lexical and vocabulary items.

However, we believe there are some empirical reasons to prefer the latter approach. In particular functional items in Chinese generally, as well as other East Asian languages with a similar morphological profile, frequently display widespread apparent homophony which is rooted in historical developments similar to those discussed here (see e.g. Duffield 2017 for discussion of the case of Vietnamese). Contextual allosemy gives us a way to capture these sorts of facts in a straightforward way, meaning that *lao*, as analysed in (55, 56) is just a special case of a more general pattern.³⁰ In the next subsection, we will discuss another point where we believe that contextual allosemy can play an important analytical role.

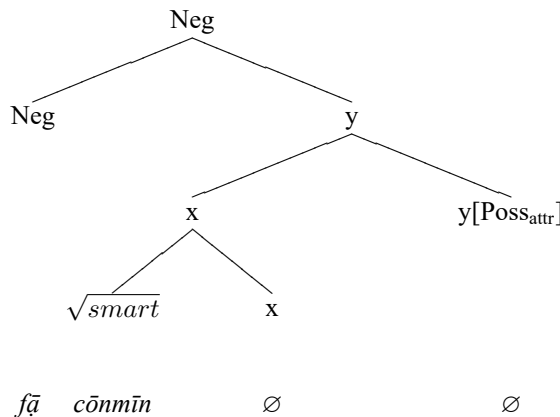
6.1 *-lao*, Negation and Interrogatives

We showed above that *-lao* is incompatible with negation in general. We believe that this can be accounted for in much the same way as intensifiers discussed previously – a *-lao*-bearing element is incorporated through head-movement into the negator, resulting in its being spelt out with a null allomorph, as a result of the allomorphy condition in (42), repeated in (57).

- (57) $\text{Poss}_{\text{attr}} \leftrightarrow \emptyset / [_Z^0 Z [_y \dots _]]]$
 $\text{Poss}_{\text{attr}} \leftrightarrow /lao/ \text{ (elsewhere)}$

In a form like *fā-cōnmīn* ‘[is] not clever’, we have the following structure after head movement:

- (58) *Structure of fā-cōnmīn* ‘[is] not clever’



It has been widely noted (see e.g. Huang 1988, Ernst 1995) that negators in Chinese (such as Mandarin 不 *bu*) cliticise to following phonological material. In a Yixing context, this means that they form a single phonological word and a PS sandhi domain. PS

³⁰We thank Theresa Biberauer (pc.) for drawing our attention to this point

sandhi applies as expected.³¹ Interestingly, we see the same incompatibility between negators and *-lao* even when the latter is a full vP. In this case we do not have evidence that the negator forms a phonological word with what follows – this is perhaps unsurprising as the vP is phrasal and not a licit object for head-movement. We suggest that in this case the Poss-bearing head undergoes movement on its own to the Neg head. It is subject to the same allomorphy conditions as it would be if it moved with other material, and consequently does not surface.³²

- (59) zānsā fā hwēs̄yì lisì(*-lao)
 Zhangsan NEG like Lisi(*-LAO)
 ‘Zhangsan does not like Lisi’

One might wonder if an alternative hypothesis is possible – for example, perhaps *lao* is semantically incompatible with negation. In fact, this is not the case. Chinese languages typically have two negation strategies for adjectival predicates, one of which involves a bare negator, as in (58), and one of which involves the combination of a negator with a copula. The second strategy *is* compatible with *-lao*.

- (60) tō fā-ssì cōnmīn-lao
 3SG NEG-COP clever-LAO
 ‘S/he is not clever’

The same goes for cases where a full vP is involved:

- (61) zānsā fā-ssì [hwēs̄yì lisì]-lao
 Zhangsan NEG-COP like Lisi-LAO
 ‘Zhangsan does not like Lisi’

In these examples, the negator is plausibly in a higher polarity-linked position, and does not serve as a valid target for head-movement (whether due to the HMC or other considerations). The facts consequently support our allomorphy-based account of the distribution of *-lao*, but are not straightforwardly compatible with a semantic account.

The cases we have dealt with so far are rigid conditions for the occurrence of *-lao*. Where *-lao* is not found, it is forbidden, and where it is found, it is obligatory with the relevant interpretation. A more complex and interesting case is provided by the behaviour of *-lao* in polar questions. Here the presence of *-lao* is *optional*.

- (62) tō cōnmīn(-lao) fā
 3SG clever(-LAO) Q
 ‘Is s/he clever?’

The same goes for cases where a full vP is involved:

³¹In this particular example, PS sandhi can be detected through the *absence* of any tonal changes. In the absence of PS sandhi, we would expect PE sandhi to result in a falling pitch contour across the phrase.

³²A question regarding linearisation arises here – why are elements like *fā* realised as head-initial and elements like *-lao* head-final? Dealing with this question in detail is beyond the scope of this paper but it can be noted that Chinese in general shows an unusual mixture of head-initial and head-final properties.

- (63) zānsā hwēsyi lisi(-lao) fā
 Zhangsan like Lisi(-LAO) Q
 ‘Does Zhangsan like Lisi?’

Before delving into the full account of these cases, we note that these facts underline that the incompatibility of *-lao* with polarity markers is not semantic. Here we have two near-identical sentences with apparently identical semantics, and the only difference is that *-lao* is present in one, but not the other. But why is this optionality possible here but not in other cases? We argue that the two polarity positions discussed above with respect to negation are also at play in the derivation of yes/no questions.

We will first need to sketch some details of the syntax of yes/no questions in Yixing. One might at first sight suspect that *fā* in examples like (62) is a simple question particle along the lines of Mandarin 嗎 *ma*, perhaps the exponent of an interrogative C head. In fact, this does not appear to be the correct analysis in Yixing. One difference is that Yixing question particles are sensitive to aspect, so that *fā* only appears with imperfective aspects. In fact this is exactly parallel to the case of negators, where *fā* is restricted to appearing with imperfective aspects.³³ A second point of difference is that Yixing question particles may be separated into two elements *fā* + *ā*,³⁴ where the former is identical to the sentential negator. This suggests a close relationship between question particles and negators.³⁵

- (64) tō cōnmīn(-lao) fā ā
 3SG clever(-LAO) NEG Q
 ‘Is s/he clever?’

We provide a rough sketch of our analysis of yes/no questions in Yixing, drawing in part on Holmberg (2015). The optionality of *-lao* in yes-no questions falls out of this analysis in a relatively straightforward way.

Holmberg (2015) proposes that there are two crucial elements in deriving a yes/no question. First, we have a polarity head specified for an open value, taken to be a variable which is the focus of the question and which is consequently moved to the specifier of the focus phrase. Second, we have an illocutionary force feature on a Q head which encodes a request to the addressee to provide a value for the polarity variable. As observed above, Yixing displays at least two positions for negators, indicating that there are at least two possible positions available for polarity variables.³⁶

- (65) [QP [_{FocP} [_{TopP} (Topic) [_{ΣP} Σ_{high} [_{IP} Subj I [_{ΣP} Σ_{low} vP]]]]] Foc] Q]

We propose that markers like *fā* do not only indicate negation – in the right context (i.e. when raised to the focus domain), they can also indicate an open polarity value

³³In perfective aspects, we see an element *mā* as a negator and a question particle *mā*.

³⁴*fā* and *ā* are distinguished by vowel quantity, quality, and, in some contexts, the presence of a final glottal stop in the former.

³⁵The Mandarin question particle is also generally considered to descend from a negator, but this is no longer true synchronically – in Yixing, on the other hand, the relation is fully transparent.

³⁶The crosslinguistic availability of multiple polarity heads is well attested – see e.g. McCloskey (2017) in Irish.

of the sort discussed by Holmberg. This could be an instance of *contextual allosemy*, of the sort discussed by Wood (2015), Wood and Marantz (2013, 2017). The syntactic head would be specified with an abstract Pol feature, but not otherwise specified. When raised to a focus position, this would be provided with open value semantics. When left in situ, however, the element will be realised with negative semantics as the elsewhere case. This underspecified Pol feature contrasts with a specified [Pol:+] feature which is provided with positive semantics (an a null allomorph).

- (66) [[Pol:+]] ↔ (Positive polarity)
 [[Pol]] ↔ (Negative polarity)
 [[Pol]] ↔ (Open polarity) / [Foc —]

The exponent of the Pol feature, $f\bar{a}$, is inserted whenever we have imperfective aspect. It may or may not undergo phonological fusion with the following particle \bar{a} to be realised as $f\bar{a}$.

What we have not specified is which of the two Σ positions this raising is supposed to have taken place from. Our proposal is that the optionality of *-lao* in questions is a consequence of this. If the polarity variable is taken to originate in the lower Σ , then *-lao* is forbidden. Otherwise, it should be obligatory. This tracks the facts of negation observed above. Note that when we have a *copula*, high negation appears to be obligatory. If our approach is correct, then, we would expect that *-lao* would be obligatory in questions where a copula appears. This is in fact the case.³⁷

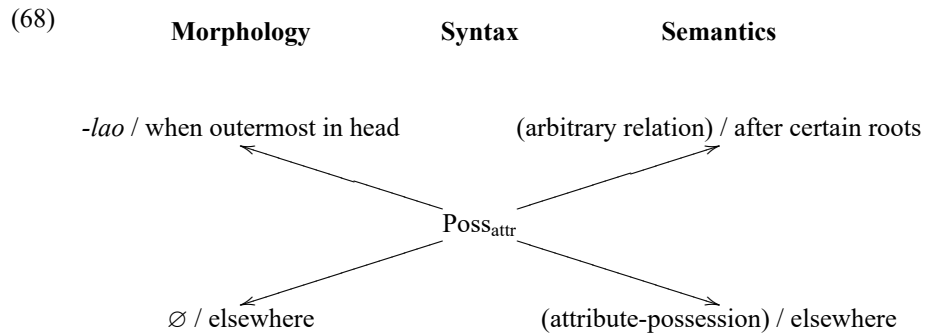
- (67) tō ssí cōnmīn*(-lao) fā
 3SG COP clever*(-LAO) POL.Q
 ‘Is s/he clever?’

7 Implications

7.1 Substance-free Syntactic Features

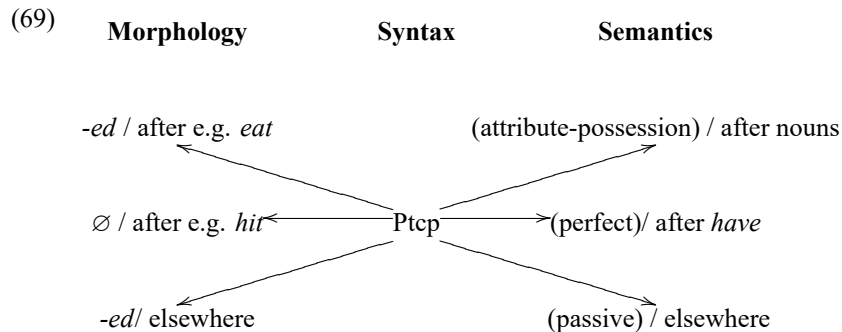
The approach taken in this paper has been to seek a unified semantics for *-lao* (and other elements) where possible. This led us to posit *possession-as-attribute* as the common meaning among most uses of *-lao*. This still, however, leaves a residue, and it is this residue that led to our proposal of contextual allosemy with respect to *-lao*, a phenomenon we also observe in the behaviour of interrogative/negative elements in the language. We also observed that *-lao* is subject to contextual realisation as a zero-morph in the presence of degree modifiers and negators. These two sorts of contextual sensitivity are unrelated to one another.

³⁷A puzzle remains here, which is why the *copula* is optional in *questions* with high polarity markers but not in statements. We suppose that this is linked to the movement of the polarity element.



In essence, then, the [Poss_{attr}] syntactic feature which we associate with *-lao* is a sort of diacritic – it has no inherent relation either to interpretation or to morphophonological realisation. The existence of this sort of feature is a natural consequence of any approach in which late insertion of both semantic and phonological features is supposed. One possibility is that only a subset of features behave in this fashion, another is that in fact cases like that of *-lao* represent the general case. In other words, syntactic features are generally *substance-free*, to borrow a term coined for phonological features by Hale and Reiss (2001). Insofar it does not involve the arbitrary supposition of two feature classes, this would seem to be the more parsimonious option, all things being equal.

These sorts of phenomena are far from unique to Chinese varieties or East Asian languages. Consider, for example, the case of English past-participial morphology. This sort of morphology is highly contextually sensitive in terms of its available meanings. In terms of morphology this is quite obvious – consider the contrast between participles like *stol-en*, *brough-t*, *drunk*, *eat-en* and *sight-ed* – each of these participial forms is realised differently according to the stem it is attached to. Similarly, we can see contextual interpretation in terms of semantics. For example, in reduced relatives like *the exhibit viewed yesterday* or following the auxiliary *be*, the participial element has a passive reading. Following the auxiliary *have*, it has an active perfect reading. When attached to nominals, we see some sort of possessive meaning emerge (as in the ‘brown-eyed girl’ examples discussed above). The morphological variation and semantic variation are cross-cutting, in a way that seems quite comparable to case of [Poss_{attr}] discussed above.³⁸



³⁸Cf. Wood (forthc.) for similar examples.

There are of course ways one could approach these sorts of examples other than pure contextual allomorphy/allosemy, for example by attributing differences in meaning to other parts of the syntactic structure. Even if this is done, however, the result is the evacuation of meaning from the syntactic feature in question, and we essentially still arrive at something like a substance-free analysis.

If we adopt something like a generally substance-free approach to syntax, numerous questions are immediately raised. First of all, if syntactic features are, in general, substance free, why do they so often appear to be *substantive*, relating sound and meaning in a fairly direct fashion? A straightforward answer to this question is that substantive mappings are *simple*. They involve a single, contextually unconditioned mapping between syntactic features and semantics, and a similar mapping between syntactic and phonological properties. One might presume, then, that they are easy to acquire and that learners prefer these mappings. Mappings that are not simply one-to-one, such as we see with *-lao*, may emerge as residues when input is too complicated to capture with simpler mappings, perhaps due to ongoing diachronic changes of the sort discussed above. We can compare this line of thinking to the emergent approach to parameters adopted by Roberts (2019) – see also Biberauer (2019) for some discussion of feature emergence in this context. Another question concerns universals – how do apparent universals like the contrast between nominal and verbal categories emerge? While a substance-free approach to syntactic features may appear anti-universalist at some level, all it really implies is that the locus of universals is not to be found in the inventory of syntactic features. One plausible proposal is that universals may appear due to a combination of interface-driven constraints and syntactic properties other than the feature inventory itself. Answering these questions and fully justifying the argument for substance-free syntactic features is well beyond the scope of this paper, but it is hoped that we have at least provided a suggestive argument that pursuing these issues may be productive.

7.2 Additional Implications

Beyond the implications relating to the content of syntactic features, the analysis of the *-lao* affix presented here has numerous other implications within Yixing, within Chinese more widely, and in a broader cross-linguistic context. We will discuss a couple of these here.

First, our approach crucially relies on a bipartite functional structure involved in the derivation of apparent *adjectives*. There may be reason to suspect that this bipartite structure, as well as the kind-delineating meanings of adjectival elements, extends beyond Yixing. Indeed, Panagiotidis and Mitrović (2020) have also recently argued, on rather different grounds, that adjectives are composite in nature, containing both *n* and *v* heads. This also finds echos in Chomsky's (1970) proposal that adjectives should be treated as bearing both [+N] and [+V] features.³⁹ A detailed account of lexical categories is far beyond the scope of this paper, but the conclusion reached here provides a new perspective which is nonetheless compatible with a variety of recent studies in this area.

³⁹More recently Zeijlstra (2020) has proposed, on more formal grounds, that adjuncts in general are categorially complex.

Secondly, our approach feeds into the typology of the syntactic encoding of possession. In particular, our research contributes to an understanding of how different forms of possession might be syntactically differentiated in a language. As discussed in section 4.1, in a language like Ulwa, as analysed by Francez and Koontz-Garboden (2015, 2017), all possessive relations are indicated in a uniform way, including the attributive possession discussed here. Ulwa shows no distinction between ordinary possession of physical or abstract objects (of the sort expressed by English *have*) and kind-defining characteristic attribute possession (of the sort expressed by Yixing *-lao*). In English, the former type is essentially expressed analytically (e.g. with *have*), while the latter type, where distinguished, is basically lexicalised as adjectivehood rather than being expressed morphosyntactically. There is yet another possibility, however, which is that both types of possession are expressed morphosyntactically, but using different strategies. This is what we see in Yixing. In Yixing, possession of objects is expressed using the possessive/existential verb *yóu*. Possession of characteristic attributes, on the other hand, is expressed by *-lao* (modulo contextual allomorphy). Where an object can be conceptualised as instantiating a characteristic attribute or simply as an ordinary individual, both constructions are possible. The possibility of such a system is expected given F&KG’s approach to property concepts, and our findings consequently provide some empirical support to this approach. An interesting comparison can be made to English here: English actually does seem to have a marker which specifically encodes attribute-possession, namely the participial ending *-ed* as attached to nominal material, as discussed above, and by Nevins and Myler (2014). We believe that our approach to *-lao* may provide a fruitful way of approaching these forms, though considerations of space prevent us from spelling out such an analysis in full. Participles in general bear many properties in common with Yixing *-lao*, including not just semantic similarity but also categorial flexibility – consider for example that the marker *-ing* in English, like *lao* in Yixing, may appear on nominal forms ‘the building of the house’, as an attributive adjective of sorts in reduced relative constructions (‘the running person’), or indeed as bona fide verbal forms (‘the person is running’). The sort of contextual allosemy observed in Yixing nominal *-lao* forms may also be observed in *-ing* forms in English – we see a distinction between the root-derived nominal *building* and its deverbal counterpart, where only the latter possesses progressive aspectual semantics. Again, further comparison of these cases may be fruitful.

8 Conclusion

In this paper, we have focused on various seemingly puzzling behaviours of the element *-lao* in Yixing, which can attach variously to adjectival roots or VPs, appearing to serve as an adjectivaliser, nominaliser, or some sort of aspectual marker. We show that these behaviours can essentially be captured as consequences of the interface properties of a particular syntactic feature, labelled by us as [Poss_{attr}]. This feature is associated with a denotation indicating a possession relation between its specifier and complement, such that the possessed element is conceptualised as a *characteristic attribute* of the possessor, defined as a property whose possession delineates a *kind*. The surface distribution of *-lao* is explained by its being one possible exponent of [Poss_{attr}], specifically the else-

where realisation of a head containing it. When such a head is further incorporated into a complex head, however, the result is a null exponent. This accounts for the failure of *-lao* to surface in constructions involving degree modifiers (including comparative and superlative forms) and negation, as well as yes/no questions. Interestingly, the semantics of *-lao*, in particular in its role as nominaliser, seem to show some variability. We suggest that this is a diachronic residue of the grammaticalisation process which the marker has undergone, which can be accounted for synchronically if we assume this is a case of *contextual allosemy*, involving late insertion of semantic features. Mechanisms like this are also shown to be important when accounting for the distribution of *lao* in yes/no questions. Yixing, then, represents an exemplary case where the distributed nature of semantic, phonological and syntactic features is key to understanding a complex phenomenon. This in turn led us to consider the wider implications of these sorts of cases, in particular in terms of a substance-free approach to syntactic features, and it is hoped that the Yixing case provides an argument that these sorts of approaches may be worth pursuing further.

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