ON PREFIXATION IN MODERN CHINESE*

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1. Introduction

In the literature on Chinese word formation, the (possible) distinction between the processes of 'derivation' and 'compounding' is still an unresolved issue. Word-formation elements which display high productivity and always appear in a fixed position with respect to the base word (in a particular usage), such as *xué* 学 'branch of knowledge' (as in *xīnlǐxué* 心理学 'psychology') have been analysed as affixes, as 'affixoids', or just as compound constituents. Also, it is often claimed that many proposed affixes of Modern Chinese, as e.g. *-huà* 化 '-ise, -ify', developed following a foreign model: specifically, it has

* The *Pinyin* romanisation system and simplified Chinese characters have been used as a default throughout the article. However, traditional characters are also used when needed for consistency with the source. The glosses follow the general guidelines of the Leipzig Glossing Rules: additional glosses include MOD 'marker of modification' and SFP 'sentence-final particle'.

been suggested that they entered the Chinese lexicon as constituents in complex words coined in Japan, which in turn followed European models (Masini 1993). In the case of possible prefixes, which received less attention than suffixes in the literature (see Arcodia 2012b), it has even been claimed that they all (or virtually all) derive from a foreign (usually, English or Japanese) model (Jia 2019). However, this largely depends on the definition of prefix(oid) which one chooses to adopt: for instance, Zhao (2018) proposes a number of prefixoids for which a foreign origin seems unlikely.

In this paper, we propose a reassessment of prefixation in Modern Chinese. Following Arcodia (2012b), we discard the 'prefix' *vs.* 'prefixoid' distinction, also because grammaticalized morphemes in Chinese (as well as in most languages of the Mainland East- and Southeast Asian area; Bisang 2004) very often do not show the formal correlates of grammaticalization. In the framework of Construction Morphology (Booij 2010), we treat potential prefixoids as fixed slots in a construction. In this analysis, the main differences between affixes/affixoids and regular compound constituents lie in their fixed position, their stable selectional properties and, above all, in the fixed, conventionalized meaning they contribute, as opposed to the more 'open' interpretation for compound constituents. The sample items we chose for our analysis are drawn from a selection of the literature on the topic; following Basciano and Bareato (2020), we also rely on web corpora and searches for the analysis of the use of complex words.

We will show that potential prefixes in Chinese have different properties: there are class-maintaining prefixes, class-changing prefixes, as well as prefixes with ambiguous properties with respect to word-class assignment. We will compare 'native' patterns and patterns which seem to follow a foreign model, showing that they do not constitute coherent subsets in terms of their behaviour. We will argue that the differences between prefixes and suffixes in Chinese may be partly explained by the different role of lefthand constituents and righthand constituents in compounding (unlike e.g. Romance languages). However, as conventionalised constructions used for word formation, prefixation patterns also have properties which do not fit in the general picture of headedness and word-class assignment in the morphology (and syntax) of Modern Chinese: above all, the fact that the word class

of 'prefixed' words is often inconsistent with that of the corresponding base (non-prefixed) word, as e.g. *màoyì* 贸易 'commerce' > *fēi-màoyì* 非贸易 'non-commercial', but both endocentric nouns and adjectives are generally right-headed in Chinese (Ceccagno and Basciano 2007). We will argue that this is a major difference between prefixed and suffixed items in Chinese, since the latter always seem to define the word class of the complex word; also, it can be taken as an argument in favour of analysing prefixes as a separate morphological phenomenon, distinct from suffixation and from compounding.

This paper is organised as follows. In Section 2, we shall provide a critical overview of key notions in word formation, focussing on the distinctions between derivation and compounding, and between prefixation and suffixation, and on their application to Chinese. In Section 3, we shall introduce our sample and research methodology, and we shall present the results of our survey, offering our analysis of the data collected. In Section 4, we provide a summary of our findings, as well as some hints for further research.

2. Word formation: derivation *vs.* compounding, prefixation *vs.* suffixation

In the general literature on word formation, the definition of derivation and compounding are notoriously thorny issues (for an overview, see Lieber 2017; ten Hacken 2017). Both derivation and compounding have the function of creating new words, and their difference is normally associated with the nature of their constituents: while compounding is traditionally defined as a combination of words (e.g. Fabb 1998), stems (Bauer 1998), or lexemes (Lieber and Štekauer 2009), derivation involves affixes, or even nonconcatenative exponents (e.g. tone change, ablaut). This, in turn, leads to the issue of the delimitation of 'lexemes' and 'affixes', which is also far from controversial. Due to space limitations, we cannot provide an in-depth critical discussion of these issues here: we shall limit ourselves to a concise overview of these *vexatae quaestiones*, focussing on the aspects which are most relevant for the research described in the present paper.

2.1 Derivation and compounding: an overview

The categories of compounding and derivation may have fuzzy borders. Compounds may be hard to distinguish from syntactic phrases, on the one hand, and from derivation, on the other hand; derivation, in turn, may overlap not only with compounding, but also with inflection (Lieber 2017). As pointed out by Dressler (2006) and ten Hacken (2017), the delimitation of these processes of word formation tends to be theory-dependent: for instance, not all theoretical frameworks assume a strict boundary between words and phrases (more generally, between morphology and syntax), or between compound constituents and affixes (see e.g. Booij 2010). Moreover, any criteria set up to distinguish between compounding and derivation (or between compounds and phrases) might not necessarily work for all (or even just most, or many) languages. For instance, in Dutch, words ending in a voiced obstruent (as e.g. *hoofd* 'head, main') undergo final devoicing: this happens also when a word is used as the first constituent in a compound (*hoofdingang* 'main entrance'), but not when a derivational or inflectional affix starting with a vowel is added (as in *tweehofdig* 'two-headed'; ten Hacken 2017). This criterion might be used to distinguish affixation from compounding, but its application is limited to Dutch or any other language that follows a similar pattern, if existent (and it works only for items with specific sounds, thus lacking general applicability).

In our view, what really matters in this case is the relevance of any notion to be defined. As ten Hacken (2017) puts it,

> The question is not whether a definition is accurate but whether it delimits a useful theoretical concept. In a pretheoretical sense, it is no problem to use a language-specific definition with criteria that are easy to apply.

Thus, while the aim of the present paper is understanding whether prefixation can be established as a distinct phenomenon in Chinese word formation, our main concern is not applying a specific cross-linguistic definition of prefixation based on formal criteria (i.e. a derivational affix located to the left of the word/root). We rather focus on

the issue of whether prefixation in Chinese possesses features which set it apart from other forms of derivation (mostly, suffixation) and from compounding: in other words, we want to find out whether prefixation is a "useful theoretical concept" for our understanding of Chinese morphology. Following Haspelmath, we distinguish between 'comparative concepts', i.e. "concepts created by comparative linguists for the specific purpose of crosslinguistic comparison" (Haspelmath 2010: 665), and language-specific descriptive categories, which have reality and may be defined only in individual languages: here we deal with the latter, rather than with the former.

Going back to the issue of the borderline between different processes (and objects), the distinction between compounding and phrases, and that between derivation and inflection, are not particularly significant for the purposes of the present study: Chinese has (almost) no inflection, and the distinction between compounds and phrases, while being sometimes problematic[1], is not called into question when we try to distinguish compounds from derived words.

As for the borderline between compounding and derivation, while there may be different definitions of these two phenomena (again, often also theory- and language-dependent), the *communis opinio* is that the most fundamental distinction concerns form, rather than function: as already pointed out above, compounding and derivation share the same basic function, but involve items of a different nature. However, as pointed out by Lieber (2017),

> [w]here word formation involves the combining of robustly contentful free lexemes we can be confident that we have compounding. Where one or more of the

[1] Indeed, several diagnostics have been proposed in the literature to assess wordhood for Chinese, as e.g. lexical integrity, conjunction deletion between coordinate items, freedom of the constituents, semantic compositionality, the number of syllables, exocentricity, productivity, and more (see Chao 1968; Huang 1984; Duanmu 1998, *inter alios*). However, these sometimes give conflicting results. For instance, a verb-object construction as *dān-xīn* 担心 'worry', lit. 'carry-heart', may often be separated, thus lacking lexical integrity, but it has a opaque/lexicalised meaning, and may be followed by an object: it thus shows properties which are intermediate between compound and phrase.

> formatives involved in word formation is bound, semantically less robust, and fixed in position, we may be confident that we have affixal derivation. The fuzzy borderline between compounding and affixal derivation lies where we find the combination of bound forms that are not fixed in position, or semantically more robust than typical, or that derive historically from or are related to free forms.

Thus, despite the traditional emphasis on form in the delimitation of compounding and affixation, meaning actually does play a role in this connection: Lieber (2017) speaks of "robustly contentful" (for compound constituents) and of "semantically less robust" (for affixes), but in practice the type of meaning which may be expressed by affixes is not easy to delimit. For instance, Bauer (2002) analysed the semantics of derivation in a sample of 42 languages, showing that there is a wide range of meanings which are associated with derivation in grammatical descriptions (as e.g. 'payment for N' or 'have a pain in N'). According to Beard (1998: 57 ff.), there are as many as four types of derivation, based on their function/meaning:

> a. "Featural derivation", i.e. the processes which do not change the category of the base, but rather alter its "inherent features", as e.g. gender (Italian *studente* 'student' > *studentessa* 'female student').
> b. "Functional derivation", i.e. the processes that alter the lexical semantics of the base (Italian *pizza* > *pizzeria* "pizza parlour"; English *employ* > *employee*).
> c. "Transposition", i.e. the processes which change the word class of the base only (English *lonely* > *loneliness*).
> d. "Expressive derivation", also known as evaluative morphology, i.e. the processes which add meanings such as GOOD, SMALL or BAD to the base, without assigning a part of speech to the base and without shifting its reference (Italian *gatto* 'cat' > *gattino* 'kitty'; see Grandi and Körtvélyessy 2015).

Thus, while categories a., c., and d. do fit in the label "semantically less robust" and are generally easy to identify as derivational, the same does not necessarily hold for b., i.e. functional derivation, as the meanings which can be expressed may overlap with that of lexemes: that is, they may be "semantically more robust than typical", as Lieber puts it[2]. In other words, if inflection involves grammatical meaning, and compounding involves lexical meaning, derivation is somehow in between the two, from the semantic point of view.

There are thus several cases of items which have an ambiguous status between compound constituent (hence, lexeme) and affix. Take, for instance, the case of French prepositions as *avant* 'before' and *sur* 'on/over': these are used also as prefixes in words like *avant-guerre* 'pre-war (years)', *sur-exposition* 'overexposure'. Amiot (2005) holds that they should be analysed as prefixes, since they never change the gender of the base, they can combine with words belonging to different classes, they form endocentric nouns and they are used to convey at least one meaning which is different from that (or those) of the corresponding preposition: for instance, *sur* conveys the meaning 'excessively, in excess', rather than 'on/over' (e.g. *surcharge* 'overload'). Indeed, wordhood (or, better, 'lexemehood') and affixhood are not immutable statuses, and items which are in between the two stages may be hard to classify (Bauer 2005). Compare, for instance, German *-heit*/*-keit* '-hood, -ness', as in *Freundlichkeit* 'friendliness', and *-voll* '-ful', as in *ehrenvoll* 'honourable': they are both derivational suffixes which originate from a lexeme, a free word. However, in Modern German *-heit*/*-keit* lost the connection with the Old High German word *heit* / *heid* 'person, status, rank, nature, kind' from which it derives (Lightfoot 2005), and hence its affixal status is not generally called into question; *-voll*, on the other hand, may still be easily related to the adjective *voll* 'full'. Just as seen above for French *avant* and *sur*, the affixal status of *-voll* may be argued on the basis of semantic and distributional differences with the

[2] In fact, even apparent instances of transposition (c.) may be ambiguous in this respect. For instance, English *-ness* may be interpreted as a case of transposition, as its main function is that of turning an adjective into a noun, it can be analysed as carrying the meaning 'the state of being X' / 'the quality of being X' (e.g. *loneliness* as 'the state of being lonely'), arguably more lexeme-like.

corresponding adjective: *-voll* has a conventionalised meaning which only partly overlaps with that of *voll*, it is always bound, and is always found in the same position (attached to the right of the base).
In order to label the formatives whose status is ambiguous between lexeme and *bona fide* affix, mostly because they also occur as free lexemes, the terms 'affixoids', 'pseudo-affixes' or 'semi-affixes' have often been used (see Lieber 2017 and the references cited therein). However, as hinted at earlier, not everybody agrees on the necessity of having an additional category of affixoids. For instance, the difference between 'affix' and 'affixoid' may not be very relevant if we see word formation as construction-based, as in the framework of Construction Morphology (Booij 2010; henceforth, 'CxM'). In a nutshell, CM applies the basic principles of Construction Grammar (Goldberg 1995; Michaelis and Lambrecht 1996) to morphology: in CxM, all word formation patterns are constructions, i.e. form-meaning-function complexes. According to Booij (2007:34), "[w]ord formation patterns can be seen as abstract schemas that generalize over sets of existing complex words with a systematic correlation between form and meaning". Thus, for instance, the construction underlying all English and Dutch endocentric compounds may be represented as such (see Booij 2010):

(1) $[X_i\ Y_j]_{Yk} \leftrightarrow [SEM_j \text{ with relation R to } SEM_i]_k$

A schema as (1) represents a very high level of generalisation, with many variables which may be filled by a broad range of items; the main restriction included in the schema is that the construction is right-headed, i.e. the right-hand constituent (Y_j) defines the whole compound (as e.g. in *swordfish*). In CxM, "affixoids" are defined as "morphemes which look like parts of compounds, and do occur as lexemes, but have a specific and more restricted meaning when used as part of a compound" (Booij 2005: 114). However, the 'affixoidal' meaning is part of the construction, rather than of the item itself, and as such it is available only in its use within a specific word formation schema. The difference between affixoids and affixes proper, in this framework, is that the former bear a word class, as they still have an obvious connection with a lexeme of the language, whereas affixes do not have a word class of their own, as "they only exist as parts of com-

plex words, and as parts of abstract schemas for these complex words" (Booij 2007: 34).

Thus, in a CxM analysis, the distinction between affixoids and affixes is relatively unimportant: what matters most, in our opinion, is that both affixoids and affixes with a lexemic origin undergo similar processes of semantic evolution and, above all, they do so within a construction, based on generalisations over a set of paradigmatically related words; while affixoids have a word-level equivalent, they do not exist *as such* outside a word formation schema, just as ordinary affixes. Moreover, as pointed out earlier, the affix *vs.* affixoid distinction is arguably even less relevant for Chinese. We'll get back to this in the next section.

2.2 Derivation and compounding: the case of Modern Chinese

The delimitation of derivation and compounding is even more controversial for Chinese. Indeed, the issue of what is an 'affix' and what is a 'root', or possibly a 'word' in the Chinese lexicon is about as old as Modern Chinese linguistics (see Pan *et al.* 2004 for a brief history of the debate). To sum up very briefly the work that has been done on the topic of affixes and derivation in Chinese word formation, we may just say that there is a very small number of morphemes almost devoid of meaning which are regarded by most authors as affixes, and a large number of very productive bound constituents which, as said above, have a 'floating' status, as they may be analysed as derivational affixes as well, as affixoids, or just as compound constituents. Thus, there appears to be no general consensus either on what constitutes a 'genuine' derivational affix in Modern Chinese, or on whether productive derivation exists at all in Chinese, and on whether it is a significant word formation process (see Pan *et al.* 2004 and Arcodia 2012b for an overview).

The lack of general agreement on the interpretation of the fundamental constituents and processes of word formation in Modern Chinese is related to the nature of the lexicon of this language. In Chinese, both grammatical and lexical morphemes can be either free or bound; the great majority of Chinese morphemes are lexical and correspond to roots. About 70% of Mandarin roots are bound, just as affixes (Packard 2000): however, the distinction between bound and free roots is

not always clear-cut, since some bound roots can be used as free roots in specific contexts, and there are no formal or semantic differences between the two. Compare:

(2) 我不喜欢那个人。
wǒ *bù* *xǐhuan* *nà-ge* *rén*
1SG NEG like that-CLF person
'I don't like that person'

(3) a. 你是哪国人？
nǐ *shì* *nǎ-guó-rén*
2SG COP which-country-person
'where are you from?'
b. 我是法国人。
wǒ *shì* *Fǎ-guó-rén*
1SG COP France-country-person
'I am French'

In (2), the lexical morpheme *rén* 人 'person' is used as a free root, i.e. as a syntactic word, while in (3a-b) it is used as a bound constituent in complex words: note that there are no formal or semantic differences between those uses. In (3a-b), the lexical morpheme *guó* 国 is used as a bound lexical root: this is the only option available for this item, i.e. it can (almost) never be a syntactically free form. However, the type of meanings conveyed by free and bound lexical roots are the same, and both classes of roots are equally active in word formation (Sproat and Shih 1996; Basciano and Ceccagno 2009); thus, there appears to be no real reason to treat complex words formed by bound roots as different from those formed by free roots only (see Arcodia and Basciano 2017).

Just as seen in the preceding section for French and German (and other languages of Europe), in Chinese too we may find roots which appear in a specific position with a specific meaning, somehow different from that of the other uses of that root. As mentioned above, these have been treated either as affixes (e.g. Yip 2000), as 'affixoids' (*lèicízhuì* 类词缀 or *zhǔncízhuì* 准词缀; Ma 1995) or just as compound constituents (Dong 2004). As for items in the prefix position, we may take as

an example *duō* 多 'many, much'. *Duō* 多 has different meaning and distribution when used as a free word (4a-b, 5) and as a prefix (6; exx. from Arcodia 2012b: 192-193):

(4) a. 她認識很多外國人

tā	*rènshi*	*hěn*	*duō*	*wàiguórén*
3SG.F	knows	very	many	foreigner

b. *她認識多外國人

tā	*rènshi*	*duō*	*wàiguórén*
3SG.F	knows	many	foreigner

'She knows many foreigners'

(5) 王朔的著作很多

Wáng	*Shuò*	*de*	*zhùzuò*	*hěn*	*duō*
Wang	Shuo	MOD	work	very	many

'Wang Shuo's works are numerous'

(6) 中國是多民族國家

Zhōngguó	*shì*	*duō-mínzú*	*guójiā*
China	COP	many-nationality	country

'China is a multiethnic country'

With the exception of a few set phrases, the adjective *duō* 多 'much, many' can modify a noun only if preceded by another modifier (Lü 1980), sometimes semantically redundant, as *hěn* 很 'very' in (4a); (4b) is therefore ungrammatical. Also, *duō* 多 can have a predicative function and appear after the topic, as in (5). In (6), however, *duō* 多 is conjoined to the noun *mínzú* 民族 'nationality' without being itself modified. Also, it carries a different semantic value from the adjective *duō* 多: whereas adding *hěn duō* 很多 to *wàiguórén* 外国人 in (4a) 'adds' meaning to the noun without altering its word class and distributional properties, in (6) the morpheme apparently turns the base noun into a non-predicative adjective, an attributive form. Here *duō* 多 does not only mean 'many' as in (4a), but rather 'having many X'[3]; in the formalism of CxM, it may be represented as such:

[3] Note that we do find *duō* 多 complex words belonging to the nominal class, as e.g. *duōbiānxíng* 多边形 'polygon' (lit. 'many-side-shape'). However, we analyse

(7) $[duō\ [X]_{Ni}]_{ADJk} \leftrightarrow [\text{having many SEM}_i]_k$

So, we have clear distributional and semantic differences between the adjectival use and the prefixal use of *duō* 多: therefore, we believe that *duō* 多 may be analysed as a prefix.

As for the prefix *vs.* prefixoid distinction, we already pointed out that its significance is limited in a constructional perspective: this is even truer for a language as Chinese, for at least two reasons. Firstly, as hinted at earlier, we often see items with lexical and (more) grammatical functions without (clear) formal differences, i.e. primary grammaticalization without secondary grammaticalization (in the sense of Traugott 2002)[4]; this is the case not only for Chinese, and it is also generally true for languages found in a region within East and Mainland Southeast Asia (Bisang 2004). While there are indeed cases of grammaticalised items which underwent significant formal changes (reduction) in Chinese too, this is the exception, rather than the norm: thus, having derivational (or, better, derivation-like) formatives which are identical to lexical (bound or free) roots is to be expected. Secondly, in the preceding section we pointed out that, in CxM, the fundamental difference between affixoids and affixes proper is that the former bear a word class: however, Chinese bound roots cannot be unambiguously assigned to a word class, unless we assume semantic criteria to distinguish word classes, since words and roots have no category-specific morphology or phonological features (Basciano 2017). Arcodia and Basciano go as far as to propose that, for Chinese, (CxM) word formation schemas are specified only for meaning and for the word class of the whole construction (word; Arcodia and Basciano 2018: 237-238):

> any element, free or bound can enter the schema as long as its semantics is compatible with it. In other

such cases as formed through a two-step process: *duōbiān* 多边 'multilateral, having many sides' + *xíng* 形 'shape' = *duōbiānxíng* 多边形 'polygon (in CxM terms, [[*duō* [X]Ni]ADJj [Y]Nk]Nl; see Arcodia 2012b: 194 for a similar proposal for *wú-* 无 '-free, -less'). On nominal uses for *duō* 多 complex words, see also Yang (2007).

[4] For instance, in Modern Chinese *zài* 在 is a verb, meaning 'to be at', but also a locative preposition ('at, in') and a marker of progressive aspect (Bisang 2004).

> words, the lexical category of the compound constituents is not specified […] The constituents […] can be in principle any root, free or bound, or any other word type chosen only by virtue of their semantics and inserted as such in the schemas. […] Once the individual item is matched to a constructional schema, features as word class assignment for constituents do not appear to be relevant, as what matters most to the language user are the properties of the construction as a whole.

While we do not necessarily agree *in toto* with this view, we do believe that one should not attach too much importance to the word class attributes of a formative to distinguish different degrees of affixhood, at least for Chinese[5].

Thus, to sum up, we treat as derivational affixes all instances of formatives which develop a different meaning from that of the corresponding lexeme, if this meaning is available only when the morpheme at issue is part of a complex word, appearing in a fixed position; also, we expect that, typically, the 'affixal' meaning be somehow more general or 'abstract' (for lack of a better word) than that of the corresponding lexeme (see Arcodia 2011: 127-128). Note that, in a CxM perspective, we treat those properties as being part of the construction, rather than belonging to the formative by itself.

2.3 Prefixation *vs.* suffixation

In the literature on Chinese word formation, prefixation has apparently received less attention than suffixation, and the criteria proposed to define prefixes seem to be even vaguer than those proposed for suffixes (Arcodia 2012b; see the overview in Xu and Cai 2007 and Yang 2007). Indeed, in the Western linguistic tradition too the recognition

[5] In the Chinese linguistic literature, opinions differ as to the necessity of having two distinct categories of 'affix' and 'affixoid': for instance, Sun (2000) argues against this distinction for Chinese, while Jia (2019), as well as many others (see the sources quoted in Arcodia 2012b) believe that these two categories actually have different properties, and should be kept apart. Due to space constraints, we shall not discuss the argumentations proposed for and against the differentiation of affixoids from 'true' affixes in Chinese.

of the existence of prefixes came much later than that of suffixes, and for a long time prefixing was regarded as a special kind of compounding, rather than derivation. This was because, among other reasons, many present-day prefixes in Standard Average European languages were actually prepositions or adverbs in Latin and Ancient Greek; also, just as seen above for French (Section 2.1), there still are prefixes whose phonological form is identical to that of prepositions (Montermini 2008). Also, the treatment of prefixes in the literature on word formation has sometimes suffered from a 'Eurocentric' bias: for instance, much emphasis has been put on the fact that prefixes do not normally bear a word class (i.e. the word class of prefixed words is the same as that of the base), but this does not necessarily hold for non-European languages (and, indeed, we have cases of class-changing prefixation also in the languages of Europe)[6]. To this we may add the fact that, generally speaking, there is a cross-linguistic robust trend to prefer prefixes to suffixes, both for derivation and for inflection (see e.g. Himmelmann 2014).

In a recent paper, Jia (2019) offers a discussion of the fundamental differences between prefixation and suffixation (she actually speaks of 'prefixoids' and 'suffixoids'; see fn. 5) in Chinese. The main differences she lists are the following:

a. While suffixes may be native or 'imported' (i.e. loans or calques of affixes in other languages, chiefly English and Japanese), virtually all prefixes have a foreign origin.
b. While suffixes add various types of meaning to the base they attach to, and bear a word class, the semantic contribution of prefixes tends to be the expression of logical notions as 'true', 'false', or 'similar'(/'divergent').
c. While suffixes may attach to words (or bound roots) or phrases, and always form words, prefixes generally attach to words (or bound roots) only.
d. While suffixes tend to offer background information, the focus being on the base, prefixes are focal, with the base offering background information.

[6] For instance, English *en-* in *ennoble*, or Italian *anti-*, forming adjectives from nouns (*antiforfora* 'anti-dandruff' Micheli 2020: 49).

e. Suffixes are generally more grammaticalised than prefixes, i.e. prefixes tend to retain a meaning closer to that of the corresponding lexeme, while suffixes tend to undergo more semantic bleaching.

Most of the above, however, require further discussion. Firstly, as hinted at in Section 1, the claim that virtually all prefixes derive from a foreign model largely depends on what items one chooses to treat as prefixes(/prefixoids). For instance, Zhao (2018) proposes a number of prefixes for which a foreign origin seems unlikely, as e.g. *bèi* 被 'PASS' for 'being X-ed falsely or forcedly': see *bèi-jiù-yè* 被就业 'PASS-get-job', 'being counted as employed while unemployed', or also 'being forced to take up a job' (see also Han 2012)[7]. Moreover, as we shall see in Section 3.2, even when a correspondence with a construction in a foreign language may be found, this does not entail that there is a (total or partial) overlap.

The same applies to b.: elements which can be claimed to be prefixes may express a fairly broad range of meanings, depending again on what one chooses to include in this category (see the case of *bèi-* 被). However, it is true that Chinese prefixes all modify the meaning of the base, and hence they are somehow functionally restricted: this is arguably related to a more general principle, namely that modifiers are invariably located to the left in Chinese, both in syntax and in word formation (we will get back to this later)[8]. On the other hand, class-changing prefixes seem to do more than just modifying the meaning of the base, and do bear a word class. Indeed, as mentioned in Section 1, prefixal formatives in Chinese can be either class-maintaining, class-changing, or both (Arcodia 2012b): for instance, *fù-* 副 'deputy, vice-' is class-maintaining (*huìzhǎng* 会长 'president [of an associa-

[7] Occasional examples of constructions as *he was suicided* (= he was actually murdered, but they made it look as if it were a suicide) may be found also in English (and elsewhere). However, this overlaps only partly with the Chinese pattern at issue here, and we believe the two are not directly related.

[8] Interestingly, the range of meanings expressed by prefixation seems to be more limited than that of suffixation also in an Indo-European language of Europe as Italian. Prefixes tend to express meanings belonging to a rather restricted list of functions, as e.g. negation, quantification, repetition, while suffixes have a much broader range of functions (see Micheli 2020: 54-58, 62-64).

tion]' > *fùhuìzhǎng* 副会长 'vice-president'); *duō-* 多 'multi-' often forms (non-predicative) adjectives (6); *fēi-* 非 'non-, un, in-' may both be class-maintaining (*huìyuán* 会员 'member' > *fēihuìyuán* 非会员 'non-member') and class-changing (*màoyì* 贸易 'trade' > *fēimàoyì* 非贸易 'non-commercial'). Moreover, note that *duō-* 多 'multi-' forms items which are used not only as non-predicative adjectives, but also as adverbial modifiers (Yang 2007). This is the case e.g. for *duōfāngmiàn* 多方面 'many-faceted', 'in many ways' (example from the BCC corpus; note the use of the marker of adverbial modification *de* 地):

(8) 在阿富汗战争中，伊朗不仅与
zài Āfùhàn zhànzhēng zhōng Yīlǎng bù-jǐn yǔ
in Afghan war in Iran not-only with
沙特进行了合作，而且也
Shātè jìnxíng-le hézuò érqiě yě
Saudi carried.out-PFV cooperation moreover also
多方面地与美国进行了合作。
duōfāngmiàn-de yǔ Měiguó jìnxíng-le hézuò
in.many.ways-ADV with US carried.out-PFV cooperation
'During the Afghan War, Iran not only cooperated with the Saudis, but also carried out cooperation on many fronts with the US'

As for d., Jia's arguments are not really convincing: it remains unclear to us how prefixes, which, as said just above, mostly perform the function of modifiers, should be seen as more 'foregrounded' than suffixes. Point e., namely that suffixes are more 'bleached' than prefixes, may also be related to the type of meanings conveyed by prefixes. While the grammaticalization of derivational affixes, as said above, generally involves some degree of abstraction (see Arcodia 2011, 2012b), meanings conveyed by prefixes are often more generic, as e.g. negation or quantification, and hence more apt to be used as prefixes with a meaning very close to that of the corresponding lexeme (6); suffixes, on the other hand, sometimes derive from lexical morphemes with a 'richer' (for lack of a better word) intentional meaning (see e.g. *xìng* 性 'inherent property', 'immutable nature' > *-xìng* 性 'the property of X / connected with X'; Arcodia 2012b). This does not entail, however, that the mechanisms by means of

which prefixes and suffixes are created are necessarily different: for instance, metaphorical abstraction (in the sense of Heine, Claudi and Hünnemeyer 1991) seems to be involved in the evolution of *luǒ* 裸 'naked' into *luǒ-* 裸 'lacking, unprepared' (e.g. *luǒhūn* 裸婚 'naked marriage', i.e. getting married without a car, a house, a wedding ceremony).

Thus, to sum up, what we may learn from the literature on word formation in Chinese is that prefixes and suffixes appear to have very different features. However, not all of those seem to be able to stand the empirical test; also, some differences between prefixes and suffixes may be related to general principles of word formation (and constituent order) in Chinese, or may not necessarily apply to all the items which can be considered as valid 'candidates' for affixal status.

3. Our survey

As said earlier, the aim of this paper is to assess whether prefixes form a consistent class of morphological formatives in Chinese, separate from suffixation and compounding, and whether they are significant for our understanding of Chinese word formation. To this end, we shall analyse the behaviour of a sample of items which are often treated as prefixes(/prefixoids) in the literature.

3.1 Sample and methodology

The formatives considered for this study were chosen from a selection of works on the topic (Xu and Cai 2007; Yang 2007; Hu 2018; Jiang and Li 2018; Zhao 2018; Jia 2019). Note that we decided not to include some items which are nearly universally regarded as prefixes, namely *dì* 第, added to cardinal numerals to form ordinals, *ā* 阿, a prefix expressing endearment (usually with kinship terms and names), *lǎo* 老 'old' and *xiǎo* 小 'young', used before names for people, respectively, older (or of the same age) or younger. The first of those is extremely regular and predictable, and is used with any number: it is actually somehow close to inflection, due to the generality of its meaning and to its universal applicability. The latter three are used with very specific subsets of lexemes and belong to the domain of evaluative morphology (see Arcodia 2015), which usually deserves a separate treatment due

to its peculiarities. In Table 1, we list the items we considered for our study.

Item	**Gloss**	**Example**
非 *fēi-*	'non-, un-, in-'	非官方 *fēiguānfāng* 'unofficial'
副 *fù-*	'deputy, vice-'	副校长 *fùxiàozhǎng* 'vice-principal'
多 *duō-*	'multi-'	多功能 *duōgōngnéng* 'multi-functional'
高 *gāo-*	'high-'	高蛋白 *gāodànbái* 'high protein'
低 *dī-*	'low'	低糖 *dītáng* 'low sugar'
零 *líng-*	'zero'	零风险 *língfēngxiǎn* 'zero risk'
无 *wú-*	'-free, -less'	无糖 *wútáng* 'sugar free'
半 *bàn-*	'half, semi-'	半导体 *bàndǎotǐ* 'semiconductor'
准 *zhǔn-*	'quasi-'	准词缀 *zhǔncízhuì* 'quasi-affix'
类 *lèi-*	'pseudo-'	类词缀 *lèicízhuì* 'pseudo-affix'
超 *chāo-*	'ultra-'	超声波 *chāoshēngbō* 'ultrasonic wave'
反 *fǎn-*	'anti-'	反间谍 *fǎnjiàndié* 'counterespionage'
软 *ruǎn-*	'soft'	软暴力 *ruǎnbàolì* 'non-physical violence'
轻 *qīng-*	'light'	轻移民 *qīngyímín* 'short-distance immigrants'
被 *bèi-*	'forcedly, falsely'	被自杀 *bèizìshā* 'death claimed to be suicide'
裸 *luǒ-*	'naked, unprepared'	裸婚 *luǒhūn* 'marriage without material basis'
前 *qián-*	'former'	前总统 *qiánzǒngtǒng* 'former president'
闪 *shǎn*	'fast, unexpectedly'	闪退 *shǎntuì* 'to crash'
可 *kě-*	'-able'	可吃 *kěchī* 'edible'
好 *hǎo-*	'easy. pleasant to'	好听 *hǎotīng* 'pleasant to hear'
难 *nán-*	'hard, unpleasant to'	难看 *nánkàn* 'ugly'

Table 1. List of the items included in the present study.

Since the formatives analysed have all been treated as prefixes(/prefixoids) in the literature, we rely on our sources for their basic characterisation. However, as stated in Section 1, we also rely on web corpora (chiefly, the BCC Corpus) and on raw web searches to validate our conclusions. Due to space limitations, we shall not discuss in detail the origins of each of these items and their pathway of diachronic evolution.

3.2 Data and analysis

As pointed out in Section 2.3, not all the formatives which may be regarded as prefixes in Chinese may be claimed to be foreign origin. Looking at the items in Table 1, we may remark that this applies also to those formatives which could be related to foreign word formation patterns. For instance, *wú* 无 'lacking X' is close to the English formatives'-free, -less', but with an obvious constructional difference. Moreover, even those who seem to correspond to prefixes in English (or other languages) do not necessarily overlap wholly with the foreign model, both in terms of meaning and in terms of distribution. For instance, *fēi-* 非 corresponds to more than one English formative, namely 'non-' and 'un-'; *duō-* 多 corresponds to *multi-* and *poly-*. Also, several words formed with *qīng-* 轻 to the left of the root do correspond to English complex words (or phrases) with *light*, as e.g. *qīngshí* 轻食 'light meal', and could well be calques (see Jiang and Li 2018); however, there are other *qīng-* 轻 words which do not seem to be directly related to English words (see *qīngyímín* 轻移民 'short-distance immigrants' in Table 1), and, anyway, the 'prefixal' meaning developed by *qīng-* 轻 does not completely overlap with the use of *light* in English word formation. For instance, *qīngshíshàng* 轻时尚 '(lit.) light fashion' is used to refer to a fashionable but simple, minimalistic lifestyle (green and low-impact): this shows that the meanings of *qīng-* 轻 is not only quite distinct from that of the corresponding adjective (*qīng* 轻 'light'), but also from the metaphorical senses of *light* in English.

Moreover, even if we limit our analysis to prefixes which have been claimed to be of foreign origin, we can see that their behaviour is not consistent in terms of word-class assignment. In Section 2.3, we provided an example for each type, namely a class-maintaining prefix (*fù-* 副 'deputy, vice-'), a class-changing prefix (*duō-* 多 'multi-', and a prefix which is sometimes class-maintaining, and sometimes class-changing (*fēi-* 非 'non-, un-, in-'): however, e.g. in Jia (2019) these three formatives are all seen as being coined due to the influence of English (they are basically described as calques). On the other hand, a clearly native prefix as the above-mentioned *bèi-* 被 'forcedly, falsely' appears to be class-changing: it can attach to words belonging to virtually any word class, and the construction is generally predicative, i.e. basically a verb (Han 2012). See the following example (from the BCC corpus):

(9) 大家都被小康了吧。

dàjiā	*dōu*	*bèi-xiǎokāng*	*le*	*ba*
everybody	all	PASS-moderately.affluent	PFV/PERF	SFP

'Let's say that everybody has been turned into 'moderately affluent"

In (9), the combination of *bèi-* 被 with the adjective *xiǎokang* 小康 'moderately affluent' is used as an inchoative verb[9]. Han (2012) points out that, in a minority of cases, *bèi-* 被 complex words may be used as topics or objects, which is the typical function of nouns: however, given the degree of word class flexibility of Modern Chinese, this is hardly surprising, as it is often the case that verbs can be 'nominalised' without any overt formal change (see Kwong and Tsou 2003).

Thus, in short, 'imported' and 'native' patterns of prefixation do not appear to form a consistent set, and even prefixes which likely follow a foreign model are not necessarily consistent with the 'source' construction. Incidentally, this is hardly unusual in Chinese word formation: there are plenty of examples of word formation patterns which are first coined after the model of a parallel construction in another language, but then develop independently in Chinese, as e.g. the suffix *-zú* 族 'clan, a category/group of people with common characteristics or behaviour' (*dītóuzú* 低头族 'smartphone zombies', lit. 'lower head clan'), originally from Japanese *-zoku* 族 (see Basciano and Bareato 2020).

The issue of word-class assignment is indeed relevant for our understanding of the place of the constructions considered here in Chinese word formation. In Chinese compounds, the head may be located either on the left or on the right, depending on the specific pattern: generally speaking, subordinate endocentric (in the sense of Bisetto and Scalise 2005) complex verbs are left-headed (as e.g. *kāibān* 开班 'open a class / course', *kāi* 开 'open, operate' being a verb); all other subordinate and attributive endocentric compounds are right-headed (Ceccagno and Basciano 2007). Thus, only verbs can be left-headed, while endocentric compounds belonging to all other word classes (and

[9] This expression was created as a form of satire on statistics which are aimed at obtaining a certain result, rather than at providing a faithful picture of the situation, just as *bèi-jiù-yè* 被就业 'being counted as employed while unemployed' seen above (Section 3.2).

attributive endocentric compound verbs) are right-headed (with the exception of coordinate endocentric compounds, in which all constituents may be regarded as heads). Then, needless to say, we have subordinate, attributive and coordinate exocentric compounds, in which no constituent has the role of the head: in a CxM perspective, features as the word class of the complex word belong to the construction (and may be inherited from superordinate constructions; see Arcodia and Basciano 2018). Thus, Jia's (2019) proposal mentioned earlier that only suffixes, but not prefixes may bear a word class, and that the semantic contribution of prefixes is limited to a subset of meanings, would be in line with an analysis of Chinese word formation in which derivation is analogous to compounding: prefixes, as all modifiers, are not heads, do not determine the word class of the complex word, and provide a semantic contribution of a certain type; suffixes would be treated as heads (see e.g. Scalise 1990), determining the word class of the complex word.

However, as hinted at above, this is certainly true for suffixes, and might work for class-maintaining prefixes, but definitely not for class-changing prefixes. Indeed, the application of the notion of 'head' to derivation is problematic also for the languages of Europe (for an overview, see Arcodia 2012a): if we consider (only or mostly) headedness in the categorial sense (see Scalise and Fábregas 2010), this may apply to derivation too, but then it would be quite different from the notion of head used for compounding (which is much broader; Arcodia 2012a). Indeed, not everybody agrees on attributing head properties to either the base or the affix in derivation (see e.g. Zwicky 1985): in CxM, as mentioned earlier (Section 2.1), the semantic and categorial features of complex words are part of the construction itself in derivation; in endocentric compounding, the schema contains the specification of which constituent is co-indexed for word class (and other features) with the whole word (Booij 2010). Indeed, in a constructionist lexicon one may have schemas which generalise over what, at face value, look like 'left-headed' derived word, i.e. prefixed words whose word class (and selectional features) are not determined by the base, as e.g. English *be-* in *behead* (adapted from Booij 2010: 29):

(10) $[\textit{be}\ [X]_{Nj}]_{Vi} \leftrightarrow [\textsc{remove}\ [\textsc{sem}_j]\ ]_i$

Thus, instead of attributing a word class (which would 'percolate' to the whole word) and other features to the prefix, in the framework of CxM we may say that (Arcodia 2012a: 382):

> […] the notion of 'head' in derivation is superseded by that of construction; the inconsistencies which result from the application of the syntactic notion of 'head' to derivation are not characteristic of an approach in which affixes are just exponents, the semantic contribution is a property of the construction and the identity or non-identity of the part of speech label of the base lexeme and of the derived word is also construction-specific.

This represents a major difference from what we said above about compounding: in the only productive construction for left-headed compounds in Chinese, categorial features are anyway co-indexed with that of the lefthand constituent.
In this approach, we may easily account for cases as *bèi-* 被, in which what was(/is) a passive marker, i.e. a function word, may turn a noun or an adjective into a verb. We may represent the construction underlying *bèi-* 被 complex words as such:

(11) $[bèi\ [X]_{Xj}]_{Vi} \leftrightarrow [\text{BE FALSELY/FORCEDLY } [\text{SEM}_j]\ ]_i$

The fact that items belonging to just about any word class may be used as bases in the schema in (11) is indicated by the 'X' in the word class slot for the variable, and the 'V' associated with the whole construction is not co-indexed with *bèi-* 被: it is a property of the construction, not of any of its constituents. Note that schemas as (11) are not created arbitrarily: as said above (Section 2.1), in CxM schemas are generalisations over existing words with a regular correspondence between form and meaning: in other words, the creation of *bèi-* 被 words provides language users with a stimulus to posit a generalisation, which guides them in the interpretation and creation of novel words formed according to the schema. This is different from simple analogy, since the connection with the model word(s) which is part of the process of analogy may be lost once a schema is established. Indeed, with the coining of new words

according to a schema, the schema itself may develop further, and subschemas may be created.

Thus, to sum up, prefixal items of Modern Chinese do seem to possess features which set them apart both from suffixes and from regular compound constituents. While suffixes (or, better, constructions based on suffixes) always seem to determine the word class of the whole word, and they tend to adhere to the same general principles of constituent order and category/feature assignment as compounding, prefixes stand out as having distinct properties. Class-maintaining prefixes resemble compound constituents: their semantic contribution is similar to that of modifiers in attributive compounding, with which they share the lefthand position, and they never alter the word class (or other major features) of the complex word. Class-changing prefixes, on the other hand, are unlike any compound schema, not only since they do change the word class of the base lexeme, while in compounding the lefthand constituent determines the word class of the compound only in subordinate endocentric verbs but also because the word class they assign may not be associated with the prefixal item itself (as shown e.g. in 11).

Also, note that even though, as said above, class-maintaining prefixes are similar to modifiers in attributive compounding, there is indeed an important difference between the two (as hinted at in Section 1): as conventionalised constructions, prefixes tend to have a more 'regular' behaviour than compound constituents, as for semantic interpretation and selectional properties. Thus, for instance, in an attributive compound as *snail mail*, the modifier *snail* is used metaphorically to mean 'slow', and all other features of the noun *snail* are ignored; also, at least in some languages, as English (and other Germanic languages) and Chinese (Basciano, Kula and Melloni 2011), the interpretation e.g. of noun-noun compounds is less predictable, and may even be context-dependent, while derived words tend to have a regular interpretation (as specified in the word formation schema; on selection in derivation and compounding, see Scalise *et al.* 2005). Compare, for instance, the contribution of *lóng* 龙 'dragon' in the compounds *lóngchuán* 龙船 'dragon boat' (i.e. a dragon-shaped boat), *lóngtào* 龙套 'dragon costume' (costume with dragon designs), and *lóngwǔ* 龙舞 'dragon dance' (traditional dance in which a team of dancers manipulate a puppet dragon). A class-maintaining prefix as e.g. *qián-* 前 'former-', however,

always contributes the same meaning to the complex word formed according to its schema: compare *qiánzǒngtǒng* 前总统 'former president', *qiánxiàozhǎng* 前校长 'former principal', and *Qiándōngdé* 前东德 'former East Germany'.

4. Summary and conclusions

In this paper, we tried to show that, in Modern Chinese, prefixation is a distinct word formation process with features which set it apart both from compounding and from suffixation. Firstly, based on Arcodia (2011, 2012b) we argued that derivation may be regarded as independent from (albeit related to) compounding, as derivational affixes (generally) emerge from compound constituents, but they develop different features from their source items/constructions: while a further distinction between affixes proper and affixoid might be viable for some languages and for some items, we maintain that it is not particularly significant for Chinese, especially in the perspective of CxM. Secondly, we proposed that prefixes may both be native to Chinese and (possibly) coined due to the influence of foreign languages, but these two sets are not consistent in terms of behaviour: more generally, while suffixes tend to share a number of fundamental features (chiefly, word-class assignment), prefixes are more varied, with different relationships with the whole word. Applying the formalism of CxM, we attributed those semantic and categorial features of prefixes to the word formation schema itself, rather than to individual constituents (i.e. either to the prefix or to the base). We then discussed how prefixes differ from modifiers in compounding, arguing that the former, but not necessarily the latter, provide a stable semantic contribution to the complex word, and may even be part of schemas which bear a word class independent from that of the base. Suffixes, on the other hand, are more consistent with compound constituents in this respect, since they conform to the most common model in Chinese word formation: namely, having the righthand constituent determining the word class of the complex word. However, again, we argued that it is the construction, rather than the suffix itself, which bears the word class.

Unfortunately, due to space limitations, we could not discuss the semantic evolution of the formatives considered here, nor could we

provide quantitative measures of the 'ambiguity' of those prefixes which may be both class-maintaining and class-changing. Also, we could not discuss in detail the trends in part of speech assignment for class-changing prefixes: Yang (2007) suggests that prefixes can build both non-predicative adjectives and manner adverbs (see Exx. 6-8), but in our sample we have also constructions whose output is a verb (11). We leave this for further research.

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