Sentence-Final Particles in Mandarin

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Abstract: Mandarin Chinese is rich in sentence-final particles, which have to follow a rigid linear order when they cluster. In much of the literature, researchers focus on clarifying the functions of individual particles, with much less attention being paid to the explanations of their highly restricted order. Based on corpus data and using the framework of Functional Discourse Grammar (FDG, Hengeveld & Mackenzie 2008), this paper explores the question which particles can cluster and why they cluster in a specific order. We show that maximally three Mandarin sentence-final particles can cluster, and we argue that their sequence is restricted by their positioning in a strict four-layered hierarchical structure, in which each particle pertains to a specific semantic or pragmatic layer. In addition, Mandarin particles provide evidence that there are operators at a higher discourse level than so far assumed to exist in FDG.

Key words: sentence-final particles; Mandarin; Functional Discourse Grammar; cluster; order

1. Introduction

Mandarin is rich in sentence-final particles which, though not obligatory, have a high frequency of occurrence in daily conversations. One of the prominent features of Mandarin is that sentence-final particles can cluster in a rigid linear order. For instance, any permutation of the order of the particles *de*, *le*, and *a* (的了啊) in (1) results in an ungrammatical sentence.[1]

(1)	*jiu*	*shi*	*zhe*	*fang-mian*	*de*	*zhuan-jia,*	*ye*	*mei*	*na-me*	*duo*	*ke*
	Even	COP	this	aspect	ATTR	expert	also	not	that	much	can

	jiang	*de*	*le*	*a!*
	say	CERT	MIR	MIT

'Even an expert in this field surely does not have that much to say, either.'

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[1] The alternative order *le de a* is acceptable only when *le* is not a mirative marker but an aspectual marker, in which case it is not a sentence-final particle.

The meanings and functions of Mandarin sentence-final particles are notoriously elusive and surprisingly controversial, which has led to a focus on the specific contextual interpretations of individual particles by many researchers, rather than to attempts to assign individual particles to specific semantic or pragmatic categories such as modality or mirativity. As compared to the many studies on the interpretations of individual particles, much less attention has been paid to the explanation of their highly restricted order. There is much support in the literature for the idea that the ordering can be explained by a three-way split among particles, albeit with variations as regards which particles are included in the discussions (cf. Zhu 1982; Hu 1981; Huang & Liao 2011; Paul 2014; Simpson 2014). This split, however, has been challenged by Pan (2015), who proposes a different split of more than three. One of the problems with several of these explanations is that they are limited to constructed sentences or sentences taken from classical literary works. As observed by Simpson (2014: 177), "[c]urrently, the full range of permitted SFP sequences has not been established, despite predictions and expectations that a range of multiple SFP clusters should be possible." To the best of our knowledge, there is only one study that attempts to investigate the ordering possibilities using corpus data (Wang 2017). By comparison, extensive research has been carried out on a far greater number of sentence-final particles in spoken Cantonese (e.g. Law 2002; Li 2006; Sybesma & Li 2007). There is, therefore, still a definite need to establish the full range of permitted orderings based on large amounts of naturally occurring data, and provide a systematic explanation for it.

This paper aims first of all to determine which semantic or pragmatic category each individual particle falls into and then to explore the full range of combinatory possibilities of particles, using the CCL corpus[2]. Secondly, we propose a systematic explanation for why some particles can be combined and why they are restricted to a rigid linear order in a sentence. The theoretical framework adopted in this paper is Functional Discourse Grammar (FDG, Hengeveld & Mackenzie 2008), and more specifically its multi-layered approach to Tense-Aspect-Modality/Mirativity-Evidentiality-Polarity (TAMEP) (Hengeveld 2017), in which each TAMEP category is assigned to a hierarchical layer.

The organization of this paper is as follows. After a brief introduction to the relevant aspects of the theoretical framework adopted in this paper in Section 2, Section 3 formulates predictions and explains the methods used in this study. Section 4 discusses the semantic and pragmatic categories that the individual sentence-final particle falls into. Section 5 provides the corpus findings, discusses the clustering of the particles and explains why the clustering is rigid and highly restricted. Section 6 presents the conclusions.

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[2] All the examples, unless otherwise stated, are from this corpus. Further information can be found in Section 3.

2. Hierarchies in FDG

This section will give a short and selective introduction to the hierarchical approach used in this study, focusing on the points that are directly relevant to our later discussion.

Functional Discourse Grammar (Hengeveld & Mackenzie 2008) is a top-down model of language structure, and is typologically-based. It consists of several levels of organization: the Interpersonal Level, dealing with pragmatics, the Representational Level, dealing with semantics, and the Morphosyntactic and Phonological Levels. Only the first two levels are relevant here.

Each level is hierarchically organized in terms of scopal layers. At the Interpersonal Level, the highest layer is the *Move*, which is a complete contribution to a discourse; the next highest layer is the *Discourse Act*, which is the smallest unit of communicative behaviour. The Discourse Act consists of an *Illocution*, the speech act *Participants*, and a *Communicated Content*, which is the message that is being communicated. The Communicated Content itself is built up with *Subacts of Ascription* and *Reference*. At the Representational Level, the highest layer is the *Propositional Content*, which is a mental construct. It contains one or more *Episodes*, which are coherent combinations of States-of-Affairs which share participants, absolute time, and location. A *State of Affairs* is an event or state that can be situated in relative time. It contains a *Configurational Property*, which is a predication frame specifying a combination of a property/relation and its arguments that describes the State of Affairs. Finally, the *Lexical Property* represents the predicate on which the predication frame is built.

Each layer may be modified by a corresponding set of operators, which are grammatical expressions of aspectual, temporal, modal, etc. categories Recent years have witnessed the development of a systematic hierarchical approach within FDG to Tense, Aspect, Modality, Mirativity, Evidentiality, and Polarity (TAMEP) systems (Hengeveld 1989; Hengeveld 2017; Hengeveld & Olbertz 2018) as shown in Table 1. This approach aims at predicting, describing, and explaining a number of properties of relevant systems, such as "the ordering and co-occurrence or non-occurrence of the relevant morphemes, as well as the degrees of their grammaticalization" (Hengeveld & Olbertz 2018: 323).

Table 1. Tense, aspect, mood, evidentiality, mirativity, polarity, and localization categories in FDG (adapted from Hengeveld & Olbertz 2018: 325)

	Interpersonal Level				Representational Level				
	Discourse Act (A)	Illocution (F)	Communicated Content (C)	Ascriptive Subact (T)	Propositional Content (p)	Episode (ep)	State-of-Affairs (e)	Configurational Property (f^c)	Lexical Property (f)
Mood	illocutionary modification	basic illocution; illocutionary modification			proposition-oriented modality	episode-oriented modality	event-oriented modality	participant-oriented modality	
Polarity	rejection	negative basic illocutions	denial	metalinguistic negation	disagreement	co-negation	non-occurrence	failure	local negation
Evidentiality	quotative		reportative	reportative	inference	deduction	event perception		
Mirativity			mirative						
Tense						absolute tense	relative tense		
Aspect							event quantification	qualitative aspect, participant-oriented quantification	property quantification
Localization							event location		directionality

As can be seen in Table 1, semantic and pragmatic categories are organized in terms of their scope. More specifically, they pertain to the various hierarchical levels and layers distinguished above. Semantic categories are organized at the Representational Level whereas pragmatic categories are organized at the Interpersonal Level. The Interpersonal Level has scope over the Representational Level and within each level, reading from left to right, each layer has higher scope than the next. Let us illustrate the scope relations by means of (2) from Hidatsa.

(2) *Wíra i ápáari ki   stao   ski*.
    tree it grow   INGR   REM.PST   CERT
    'The tree must have begun to grow a long time ago.' (Hengeveld 2017: 14, citing Matthews 1965)

In (2), the ingressive aspect *ki*, specifying the internal temporal structure of the event, is at the layer of Configurational Property; the absolute tense marker *stao*, indicating the external temporal structure of the event, is at the layer of Episode; the modality marker *ski*, indicating certainty, is at the layer of Propositional Content. Thus their hierarchical relations are as follows: *ski* (Propositional Content) > *stao* (Episode) > *ki* (Configurational Property). This hierarchy precisely mirrors their relative order in (2). This also holds for the clustering of expressions at other layers or of other categories allocated in Table 1 when they use the same morphological strategy, such as affixes, auxiliaries or particles (Hengeveld 2017: 15).

We propose two modifications of the system proposed in Table 1. First of all, as explained above, the Discourse Act contains the Illocution, the speech act Participants, and the Communicated Content as elements of like rank. It is therefore incorrect to say that the Illocution has scope over the Communicated Content, as these are sisters, though it is correct to say that the Communicated Content is within the scope of the Discourse Act. Secondly, we do not agree with the distinction made by Hengeveld & Mackenzie (2008) between two types of illocutionary modification: one at the layer of the Discourse Act and one at the layer of the Illocution. Hengeveld & Mackenzie (2008: 66-68) argue that illocutionary modification applies at the layer of the Discourse Act when one and the same marker of mitigation or reinforcement can be combined with more than one Illocution; it applies at the layer of the Illocution (Hengeveld & Mackenzie 2008: 83) when it can be combined with one Illocution only. This approach means that, contrary to the general principles of FDG, operators with exactly the same pragmatic effect end up at different layers on distributional grounds only. We therefore will treat all instances of illocutionary modification as operators of the Discourse Act, as their function is to mitigate or reinforce the effects of a Discourse Act as a whole.

With these modifications in mind, the layers relevant to our discussion of Mandarin sentence-final particles are from among those listed in Table 1 are the Propositional Content, the Communicated Content, and the Discourse Act. The *Propositional Content* is defined as a mental construct entertained about a series

of states of affairs; the *Communicated Content* is the message transmitted in an utterance; the *Discourse Act* represents the basic unit of communicative behavior (Hengeveld & Olbertz 2018: 324; for more details see Hengeveld & Mackenzie 2008; 2010). Their scope relations are as follows: Discourse Act > Communicated Content > Proposition.

The operator categories relevant for our discussion are proposition-oriented modality, mirativity, polarity, and illocutionary modification. There are four types of modality in FDG, but what is relevant here is just proposition-oriented modality, which expresses the degree of commitment of a speaker with respect to the truth value of a proposition. Mirativity is concerned with the information status of the content of a speech act in terms of whether the information is newsworthy or surprising; polarity operates at every layer of the Interpersonal and Representational Levels. We will show below that the subtype of polarity of denial, which operates at the layer of the Communicated Content, is relevant for the analysis of sentence final particles in Mandarin Illocutionary modification, finally, modifies a Discourse Act by either mitigating or reinforcing it.

Table 2 summarizes the layers and operator categories from Table 1 that are relevant for the current paper. Note that we will add a further layer and category later on based on our discussion of the Mandarin particles below.

Table 2. Relevant mood, mirativity, and polarity categories in FDG

	Interpersonal Level		Representational Level
	Discourse Act	**Communicated Content**	**Propositional Content**
Mood	illocutionary modification		proposition-oriented modality
Polarity		denial	
Mirativity		mirative	

3. Predictions and methods

The following predictions follow from the hierarchical FDG approach: (i) each sentence-final particle can be assigned to a pragmatic or semantic layer once its functions are identified; (ii) particles that pertain to the same layer but belong to different categories, or particles that pertain to different layers, can cluster together; (iii) the linear ordering within clusters is determined by the particles' hierarchical positioning in the layered FDG framework, which it iconically reflects.

In order to test our predictions, we use corpus data. The corpus we use is the CCL modern corpus[3], made up of 509,913,589 words and including various text types, ranging from novels, newspaper articles, academic papers, talk shows, to cyber texts. We searched the CCL corpus for all logically possible combinations of the sentence-final particles under investigation. We first searched for all combinations of two and then for all combinations of three particles. Starting from the latter, we also searched for combinations of four, which turned out not to occur in the corpus.

We also designed a questionnaire to test the acceptability of certain orderings of the particles in those cases in which these had a frequency lower than five and went against the intuition of the first author. Based on these criteria, we collected seven sentences in total from the corpus, which were given in the questionnaire along with their counterparts with a reversed particle order. The sentences were randomized before they were submitted to the informants. Fifteen native speakers of Mandarin were asked to fill out the questionnaire. Two extra pairs of sentences whose particle ordering is undisputed were also included as controls with the aim to test the reliability of the answers.

4. Sentence-final particles in Mandarin

4.1. Introduction

The most frequently used sentence-final particles in Mandarin Chinese are the following six: *de* (的), *le* (了), *ne* (呢), *ba* (吧), *ma* (吗)[4], and *a* (啊) (Huang and Liao 2011: 31).[5] Since, as we will show, there are two homophonous particles with the form *ne*, we are in fact dealing with seven particles here. Apart from these

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[3] http://ccl.pku.edu.cn:8080/ccl_corpus/
[4] The graphic form of *ma* can also be 嘛. Further explanation can be found in Section 4.4.
[5] Less frequently used particles are *ma* (嘛), *bei* (呗), *ba le* (罢了), *er yi* (而已), *ye ba* (也罢), *ye hao* (也好), *la* (啦), *lei* (嘞), *lou* (喽) and *zhe ne* (着呢) (Huang and Liao 2011: 31).

seven particles, this paper will also study the particle *ou*[6] (哦), as *ou* is a particle that is recently increasingly used (Zhang 2013: 82). In all, then, the article will deal with eight particles.

In this section, we shall explore each individual particle's semantic or pragmatic function(s)[7].

4.2. The sentence-final particle *de*

The sentence-final particle *de* is a modal marker of certainty (Chao 1968:800; Huang & Liao 2011:32; Li 2007:270; Lü 2016:162; Paul 2014:99). For instance, in (3), the presence of *de* indicates that the speaker is quite certain about the propositional content *wo wen guo Lao-wu*, whereas its absence leads to a neutral statement.

(3) *wo   wen   guo   Lao-wu   **de**.*
     1SG   ask   EXP   Lao-wu   CERT
     'Surely I have asked Lao-wu.' (Lü 2016: 162)

If certainty is the meaning that *de* expresses, it has scope over the entire proposition and thus can be assigned to the category of proposition-oriented modality.[8] In FDG, it is a subjective epistemic modal that operates

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[6] Actually, the Pinyin for 哦 is '*o*'; for the sake of convenience we use *ou* to refer to 哦. Further explanations can be found in Section 4.7.

[7] If not otherwise stated, the term 'particle' means sentence-final particle.

[8] However, what is complicated in its identification is that the particle *de* can also be an attributive marker that marks a modifier of a noun or a noun phrase. Very often, the modified element is omitted if the contextual information is sufficient to retrieve it. When the original last element of the sentence happens to be the omitted one, this leaves the attributive *de* to occupy the sentence-final position as in (i).

(i) *(wo   bu   zai-hu),   xian-zai   ni   shi   zui   zhong-yao   **de**.*
     1SG   not   care   now   2SG   COP   most   important   ATTR
     '(I don't care), now you are the most important one.'

In this case, one of the most effective ways to distinguish the attributive de from the modal *de* is to see whether the deletion of *de* results in incompleteness of the sentence or a change of its basic meaning. In (3), the modal *de* can be deleted with the loss concerning the modal meaning only, whereas the deletion of the attributive *de* in (i) leads to ungrammaticality of the sentence.

The copula *shi* occurs highly frequently with *de*, which avails a negation test to distinguish the two kinds of *de* (Huang & Liao 2011: 33-34). If the negative word *bu* or *mei* can be added before *shi*, then *de* is attributive; if *bu* immediately follows *shi*, then *de* is modal. When *shi* is added to (3), the negative word has to follow *shi* as in (iia) and cannot precede *shi* as in (iib); conversely, as regards (iii), *bu* can precede but not follow *shi* as shown in (iiia) and (iiib).

(ii) a. *wo   shi   mei   wen   guo   Lao-wu   **de**.*
         1SG   COP   not   ask   EXP   Lao-wu   CERT
         'Surely I haven't asked Lao-wu.'
      b. **wo   bu/mei shi   wen   guo   Lao-wu   **de**.*

(iii) a. *(wo   bu   zai-hu),   xian-zai   ni   bu   shi   zui   zhong-yao   **de**.*

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at the layer of the Propositional Content at the Representational Level.

4.3. The sentence-final *le₃*[9]

Sentence-final *le₃* is a mirative marker, encoding newsworthiness or surprise (Fang 2018). In (4), the speaker uses *le₃* to signal to the addressee that this information transmitted is worthy of notice in the sense of, for instance, trying to remind him/her to make less salty dumplings next time.

(4) *wan-shang de   jiao-zi   you   dian   xian   le₃*
     night   ATTR   dumpling   have   a.little salty   MIR
     'The dumplings I had last night were a little salty!'

The meaning of the sentence-final *le₃* is highly controversial. The opinions are surprisingly divergent as regards the functions that it realizes as well as the category that it falls into. It is believed to indicate "change of state" (Zhu 1982: 209; Lü 2016: 352), or "currently relevant state" (Li & Thompson 1981: 240), and the completion of a sentence (Lü 2016: 351; Huang and Liao 2011/2015: 32). According to other authors, it expresses mood (Lü 2014: 321, Peng 2009), tense (Liu 2002, Chen 2005), aspect (Jin 2003), and even evidentiality (Shi 2000). However, as argued by Fang (2018: 590-594), sentence-final *le₃* is a mirative marker in its own right as it always occurs in contexts involving a new situation. In other contexts the sentence would be infelicitous. She further demonstrates this by applying Peterson's (2017) tests for mirativity. One further reason for controversy about *le₃* is that there are two more *le*'s: a perfective *le₁* and a perfect *le₂* (Fang 2018: 598). The former occupies the post-verbal position, encoding completion, whereas the latter occupies the sentence-final position, encoding that a state-of-affairs started in the past and continues to the present. As such, the sentence-final *le* could be a mirative *le₃* or a perfect *le₂*. Despite the fact that there are clear cases in which sentence-final *le* is mirative as in (4), sometimes the perfect *le₂* and the mirative *le₃* can coincide as shown in (5).

(5) *Xiao   Ming   ye   xi-huan   tiao-wu   le₂.₃*

     1SG   not   care   now   2SG   not   COP   most   important   ATTR
     '(I don't care), now you are not the most important.'
*b. *(wo   bu   zai-hu),   xian-zai   ni   shi   bu   zui   zhong-yao   de*.

A negation test like this might prove not to be effective when there is a complex sentence, the negation of which might involve the interaction with other constituents. Hence, in the following relevant sections, we will use the deletion test only.

[9] There are three different particles *le*: *le₁* — a perfective marker; *le₂* — a perfect marker; and *le₃*— a mirative marker. In this paper, we only take *le₃* into consideration.

Xiao	Ming	too	like	dance	PRF.MIR

'(You may not know that) Xiao Ming has come to like dancing, too.'   (Lü 2016: 352)

In (5), the speaker not only means that Xiao Ming began to like dancing, but also indicates that this information is newsworthy to the addressee.[10] In this case, *le* expresses both perfect and mirative meanings which are impossible to separate. Hence, we incorporate perfect *le₂* into our investigation.

The sentence-final *le₃*, as a mirative marker, presents the communicated content as newsworthy or surprising, thus operating at the layer of the Communicated Content at the Interpersonal Level.

4.4. The particle *ma*

The particle *ma* has two common graphic forms: 吗 and 嘛. The first has been argued to be an interrogative marker in polar questions (Simpson 2014: 160), while the second would be used in the remaining sentence types. However, the fact that the second written form can also occur in polar questions in the CCL written corpus, as in (6), shows that it is not really different from the first.

(6) *wo   xi-huan jiao-dao bie-ren, bang bie-ren na   zhu-yi,*
      1SG   like   instruct others   help others   make ideas
      *zuo   jue-ding… zhe   hen   rong-yi **ma**?*
      make   decide   this very easy   REINF
      'I like to instruct people and help them to make a decision… Can you call this very easy? Not at all!'

We therefore follow Li (2006: 28-36), who convincingly argues that *ma* is a single particle that should be given a unified treatment, because the two graphic forms come from one and the same etymological source and are furthermore used in complementary textual distribution in terms of sentence types. The general function of *ma* is to reinforce a speech act.

(7) is a further example of the use of *ma* in a polar question, in which the speaker's interrogative intention is made explicit with the presence of *ma*. If we compare the corresponding sentences with and without *ma*, the difference lies in the explicitness of the interrogative force; therefore, *ma* can be said to reinforce this interrogative force.

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[10] We have found that sentence final *le* may express mirativity only, both mirativity and perfect meaning, but never just perfect meaning. This may have to do with the fact that in many languages the mirative is historically derived from the perfect (Hengeveld & Olbertz 2012).

(7) *ni dong wo de yi-si **ma**?*
  2SG understand 1SG ATTR meaning REINF
  'Do you understand what I mean?'

  Ma also has a reinforcing effect in other sentence types, such as declaratives, directives, and prohibitives. (8a) is a declarative in which *ma* reinforces the assertiveness, in the sense that what's being asserted is very obvious; (8b) is a *wh*-question in which *ma* indicates that the speaker is insisting on the addressee providing an answer; (8c) is a directive in which ma_2 makes the directive force stronger; and (8d) is a prohibitive in which the speaker is urging the addressee to not be nervous.

(8) a. *zai da ye shi hai-zi **ma**!*
    whatever old also COP child REINF
    'No matter how old, (he) is still a child (in front of me). Don't you see?'

  b. *wo fan le na-men-zi fa **ma**?*
    1SG violate PFV what   law REINF
    '(I insist to tell me) What crime did I commit?'

  c. *zai ren-nai yi xia **ma**!*
    continue tolerate one CLF REINF
    'Please have some patience.'

  d. *bu-yao jin-zhang **ma**, man-man de   jiang*
    don't nervous REINF slowly   COMPspeak
    'Don't be nervous, don't. Speak slowly.'

  As *ma* expresses illocutionary modification, it pertains to the layer of Discourse Act at the Interpersonal Level in the FDG framework.

4.5. The sentence-final *ne*

The sentence-final *ne*, one of the most controversial particles, is by some believed to have a unified function (Li & Thompson 1981:300-307; Hu 1981:108-109; Chauncey 2006:127-134; Li 2006:11-19; Wu 2009:1-25), and by others to have multiple separate functions (Chao 1968:804-805; Zhu 1982:208; Lü 2016:412-413). Both approaches, however, agree that sentence-final *ne* has an interrogative use and a non-

interrogative use. According to Qi (2002:128), these two uses are generally believed to originate from different sources and to have undergone different grammaticalization paths. Although *ne* has finally grammaticalized into the same pronunciation and written form, its functions remain different. In our opinion, *ne$_1$* is a marker of contradiction while *ne$_2$* is a reinforcer which enhances the interrogative illocutionary force of all question types except the polar one.

  Fang (in prep.) argues that *ne$_1$* is used to signal that what's being said is in contradiction with the preceding utterances or with the existing expectation, assertion, claim, belief, assumption, etc. Consider the following example from Chao (1968:805):

(9) *ta*   *hai*   *hui*   *che*   *huang*   ***ne$_1$***

     3SG   even   can   pull   lie   CTR

     'He can even tell lies, which is not expected.'

Without *ne$_1$*, (9) is just a neutral statement; with *ne$_1$*, the speaker is highlighting that the information being conveyed contradicts the existing assumption that the third person subject cannot tell lies. Similarly, in (10), the speaker tries to signal that the information provided is against the assumption that hospitals do not test on dogs. In both cases, the previous belief or assumption is being contradicted and abandoned.

(10) *yi-yuan*   *yong* *gou*   *zuo*   *shi-yan*   ***ne$_1$.***

      hospital   use   dog   make   experiment   CTR

      'The hospital tests on dogs.'

  The intention of the speaker to call attention to the contradicted information can be further proven by the fact that *ne$_1$* is very often followed by an exclamation mark despite the fact that the sentence is not exclamative as such, as observed by Hu (1981:108). The use of an exclamation mark is triggered by the emphatic stress on other constituents of the sentence, as, in the case of (11), on *xia ban er*.

(11) *hai* *mei* *dao*   ***xia*** ***ban*** ***er***   *de*   *shi-hou* ***ne$_1$!***
      still   not   arrive   down work FILL   ATTR   time   CTR
      'It's not yet time to get off work!'   (Hu 1981: 108)

  It is generally believed that *ne$_1$* occurs in statements only; however, Hu (1981: 109) notices that *ne$_1$* can

occasionally occur in directives, having the function of calling the addressee's attention. In the following two sentences, the speaker is urging the addressee to do something that the addressee is not willing to do, as can be revealed by the adjacent clauses *wei-shen-me bu shuo* in (12a) and *hao mei-mei* in (12b). Therefore, *ne₁* in directives, as in statements, also functions to signal a contradiction, more specifically with the addressee's unwillingness/reluctance to carry out the proposed action.

(12) a. *Shuo*   **ne₁,**   *wei-shen-me*   *bu*   *shuo?*
        say   CTR why   not   say
        'Say, please, why not say it?'   (Authors' own example)

     b. *hao*   *mei-mei,*   *ti*   *wo*   *shu*   *shu*   **ne₁.**
        good   sister   for   1SG comb   comb   CTR
        'Good sister, come on. Comb for me.'   (Lü 2014: 422)

The function of *ne₁* is argued by Chauncey (2006: 127-134) and Lin (1984:237) to indicate contrast, by Wu (2009: 20-23) to indicate discrepancy, and by Xu (2008: 159) to indicate difference. 'Contrast', 'discrepancy' and 'difference' share the same semantic domain --- difference, focusing on varying degrees of it. The reason why we prefer the term 'contradiction' is because it more accurately captures *ne₁*'s corrective or eliminating property. *Ne₁* not only indicates that the information being communicated is contrastive with and different from the previous belief, assumption, claim etc., but also indicates that the information provided or implied is corrected and eliminated.

    Sentence-final *ne₂* can occur in all interrogative types other than polar questions, namely *wh*-questions such as (13), Verb-Not-Verb questions such as (14), alternative questions such as (15).

(13) **shen-me** *shi*   *jiao-yu-xue* *de*   *yan-jiu* *dui-xiang*   **ne₂?**
      what   COP pedagogy ATTR   study   object   REINF
      'What is the object of study for pedagogy?'

(14) *zhe*   *ge*   *kuai-le*   *ta*   **de-dao**   **mei**   **de-dao**   **ne₂?**
      DEM CLF happiness 3SG gain   not   gain   REINF
      'Has he gained this kind of happiness?

(15) *ta*   *xuan-chuan*   *ta*   *na-xie*   *dai-ban*   *de*   *dong-xi,* *dui*   *wo-men* *shi*   *hao*
      3SG advertise   3SG those   rigid   ATTR   things   for   we   COP good
      ying-xiang   **hai-shi**   *huai* *ying-xiang*   **ne₂?**
      influence   or   bad   influence   REINF
      'As for the rigid things he advertised, do they have a good or bad impact on us?'

In addition, the sentence-final *ne₂* can occur in truncated questions and phatic questions. The truncated questions in which *ne₂* occurs, are made up of a noun or a noun phrase with the *wh*-word being unambiguously retrievable from the context, either *zai na er* 'where' or *zen me yang* 'what/how about' (Lü 2016: 412; Hu 2003: 109) as in (16a) and (16b).

(16) a. *Chen Bai Lu: ... gao-su   wo,   ni   ma-ma   **ne₂**?*
        Chen Bai Lu   tell   1SG   2SG   Mum   REINF
        Xiao Dong Xi: zai   lou-shang.
        Xiao Dong Xi   exist   upstairs
        'Chen Bai Lu: Tell me. Where is your Mum?
        Xiao Dong Xi: Upstairs.'
    b. *wo   ming-tian   hui   Shanghai,   ni   **ne₂**?*
        1SG   tomorrow   back   Shanghai   2SG   REINF
        'I will go back to Shanghai tomorrow. What about you?'   (Lü 2016: 412)

Actually, there is another type of truncated questions in which *ne₂* occurs very often as in (17).

(17)   *ru-guo   ni   shi   zheng-zhi   ren-wu   **ne₂**?*
    if   2SG   COP   politics   figure   REINF
    'What if you are a political figure?'

As opposed to (16), (17) involves a conditional clause plus *ne₂*, with a meaning similar to 'what if…' in English. The 'what' reading of the sentence is attributed to the occurrence of *ne₂*, without which the sentence becomes incomplete and ungrammatical.

The last type of questions in which *ne₂* occurs is phatic questions, which are not real questions asked by the speaker to solicit an answer, but serve pragmatic functions such as 'How are you?' in English.

(18)   (Situation: the son comes home in the evening and sees his father drinking alone, as he often does.)
    Son: *He   zhe   **ne₂**?*
        drink PROG   REINF
        'Having a drink?'
    Father: *Ng,   hui   lai   le?*
           Yes   back come PRF

'Yes, you are back?' (Wu 2009: 4)

In whatever type of question, the occurrence of *ne₂* makes the sentence more explicitly inquisitive as compared its counterparts without *ne₂* (Chauncey 2006: 18; Li 2006: 14). In other words, *ne₂* has the function of reinforcing the interrogative illocution.

Sentence-final *ne₁* and *ne₂* have different functions and thus operate at different layers in FDG. *Ne₁* indicates contradiction, signaling the inconsistent information status of the ongoing information with the previously existing one, so it is at the layer of the Communicated Content. *Ne₂,* is an illocutionary modifier, and thus operates at the layer of the Discourse Act at the Interpersonal Level.

4.6. The sentence-final *ba*

Fang & Hengeveld (fc) argue that the sentence-final *ba* has a unified function of mitigating the illocutionary force of all sentence types. We follow Han (1995: 100) and Li (2006: 35) here, who made a similar point, though using a different terminology. In different contexts, this general mitigating function accommodates different specific values. Let's look at the following sentences.

(19) a. *ni   zai   kai   wan-xiao   **ba***
          2.SG PROG make joke   MIT
          'You are joking, I suppose.'

      b. *ni   ming-bai   wo-de   yi-si   **ba***?
          2.SG understand 1.SG-ATTR meaning MIT
          'You understand what I meant, right?'

      c. *yi-gong   **duo-shao**   qian   **ba***?
          altogether how.much   money   MIT
          'How much altogether? Please tell me.'   (Zhu 1982: 211)

      d. *ni   gei   wo-men   man-man   dao   lai   **ba***
          2.SG give us   slowly   say   come MIT
          'Tell us and speak slowly, OK?'

      e. *ye-ye   nai-nai   xiang   du   tun   bu-cheng?   Tai   xiao-qi   le   **ba**!*
          Grandpa grandma want   alone take RHET   too   mean   MIR MIT

'How could grandpa and grandma want to take exclusive possession of it? This is too mean, isn't it!'

f. ***bie*** *diao* *le* ***ba***.

PROH sling MIR MIT

'Don't sling it any more, OK?'

g. (The son is afraid of swinging. His father is trying to encourage him to have a try by showing him how. Seeing that his father is enjoying himself on the swing, the son says,)

*Hao **ba**, dan wo bu yao dang de na-me gao*

okay MIT but 1.SG NEG want swing ATTR that high

'Alright then, but I don't want to swing that high.'

In comparison with the absence of *ba*, the illocutionary force of all the sentences in (19) is mitigated and different mitigating effects are obtained depending on the sentence type: (19a) sounds less assertive and less committed by the speaker; in (19b), the speaker is soliciting confirmation rather than giving a direct statement; in (19c), the speaker is urging the addressee to give an answer to the content question without sounding too inquisitive; in (19d), *ba* softens a request, making it less face-threatening; in (19e), *ba* mitigates the intensity of strong negative emotions, making it less harsh; in (19f), a prohibition sounds less offensive; in (19g), the presence of *ba* reduces the degree of the willingness embedded in the actional *yes* '*hao*'. In general, in all the sentences in (19), the speaker is using the mitigator *ba* to negotiate with the addressee in order to maintain their interpersonal relationships. Hence, negotiation is *ba*'s general mitigating function.

The functions of the particle *ba* are highly controversial in the literature. As shown in Fang & Hengeveld (fc.), it has been interpreted in the literature as expressing modal meanings (e.g. Li 2007:274–276; Wang 1985:174; Zhu 1999:234–241; Chu 1998:139; Zhao & Sun 2015:121–132; Zhang 1997:19) as well as in many other ways, for instance as a particle expressing estimation (Wang 1985: 174), soliciting agreement (Li & Thompson 1981: 307–311), encoding a suggestion (Wiedenhof 2015: 241–242), or undetermined intention (Zhao & Sun 2015: 121–132). In addition to categorizing the sentence-final *ba* as a mitigator, Fang & Hengeveld (fc.) have argued on the basis of the following five aspects that *ba* is not a modal marker: first of all, unlike a modal marker that occurs only in declaratives and restrictively in interrogatives, *ba* can occur in all basic sentence types of Mandarin, as also emphasized in Li (2006); secondly, *ba* can co-occur with all different subtypes of modal elements; thirdly, *ba* is used even when the speaker assumes a high confidence in the propositional content; fourthly, *ba* can occur in non-propositional utterances (such as imperatives), and fifthly, the hierarchical ordering of *ba* and other sentence-final particles when they cluster shows that *ba* has scope over the utterance as a whole.

As an illocutionary modifier, the sentence-final *ba* operates at the layer of the Discourse Act, and is thus similar to *ma* and *ne₂* which are its reinforcing counterparts (see Sections 4.3 and 4.6).

4.7. The sentence-final *ou*[11]

We argue that the sentence-final *ou* is a marker of reinforcement, highlighting the importance of the information being conveyed. As shown in the following examples, *ou* can modify, more specifically, reinforce the illocutionary force of all sentence types. (20a) is a statement, in which the speaker uses *ou* to call the addressee's attention to his/her assessment that the addressee is not like a Shanghainese at all; (20b) is a directive in which the speaker is highlighting his/her request for the addressee to do something in case that the addressee would forget or fails to take it seriously; (20c) is an interrogative in which the speaker questions strongly what they are doing; (20d) is an exclamative in which the speaker is emphasizing his/her excitement.

(20)   a.   *ni   yi-dian   bu   xiang Shanghai   ren   ou*!
            2SG   a little   not   like Shanghai   people   REINF
            'You are not like a Shanghainese at all. Maybe even you yourself are not aware of this.'

       b.   *bai-tuo   le   ou*.
            entrust   MIR   REINF
            'I leave all that to you. Please don't forget.'

       c.   *wo-men zhe   shi   zai   gan   shen-me ou*?
            1PL   this COP   be   do   what   REINF
            'What are we doing now?'

       d.   *wo   hao   xing-fen ou*!
            1SG   good   excited   REINF
            'I am so excited! You should know this.'   (Zhang 2013: 83)

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[11] One of the issues concerned with *ou* is what its written form is. Some (Chao 1968:810; Zhu 1982:207; Hu 1981: 83) use the form 呕, but others (Li & Thompson 1981:311-313; Wu 2005:967-995) do not specify the form. The attribution of *ou* to 呕 could be either a mistake or be chosen for reasons not yet known. *A Dictionary of Current Chinese* (2012:962) defines 呕 only as a verb that has a third tone ([ɔw]3) and means 'vomit'. Hence, 呕 couldn't be the right form for *ou* for the obvious reasons that a lexical verb cannot be a grammatical particle. Furthermore, a sentence-final particle cannot have a third tone, because all particles have a neutral tone. In modern Mandarin, 哦 is a sentence-final particle that has a similar pronunciation to the third toned 呕. If we replace 呕 with 哦, or assign 哦 to *ou* in the examples provided in the literature, the sentential meanings remain unchanged. Hence, despite the fact that the Romanized form for 呕 is *ou* and for 哦 is *o*, in this paper, we equal 呕 in the literature to 哦 but our corpus data are confined to 哦 only.

In whatever sentence type *ou* may occur, its presence shows that the speaker intends that the addressee should pay special attention to what he/she says. In the literature, there are not many studies on sentence-final *ou*, and opinions are divergent about the functions of *ou*. It is believed to function as a 'warning reminder' (Chao 1968:810; Paul 2014:92; Pan & Paul 2016:25), as just a 'reminder' (Zhu 1982:208; Hu 1981:109), as a 'friendly warning' (Li and Thompson 1981:311), or to 'highlight the salience and newsworthiness of a focal event' (Wu 2005:993). Li and Thompson (1981:311) claim that *ou* is often used in a command, which is also implicitly agreed upon by most as can be gathered from the examples given in the literature. However, as shown in (20c) and (20d), *ou* can occur in interrogatives and exclamatives as well, in both of which it does not function as expressing a warning or reminder. Let us look at (21), an example given by Li and Thompson (1981:311), in which *ou* is believed to have the function of converting the command into a concerned warning. However, if we remove *ou* from (21), it is still a warning issued by the speaker to ask the addressee to be careful. Therefore, the warning reading of (21) is not due to *ou*, but to *xiao-xin*.

(21) *xiao-xin* ***ou***

     careful   REINF

     'Be careful. Please do!'

Nevertheless, even if *ou* occurs in a 'warning' or as a 'reminder', it has the effect of reinforcement as both highlight the importance of the information in a more specific way. Hence, reinforcing is a general function that *ou* realizes in different sentence types.

    As *ou* is a reinforcing illocutionary modifier, similar to the particles *ma* and *ne2*, it also seems to operate at the layer of the Discourse Act at the Interpersonal Level. However, as we will show in Section 4.9, some aspects of its behaviour show that it operates at an even higher layer.

4.8. The sentence-final *a*

The sentence-final *a* is another particle that has a unified function of mitigation, mitigating all kinds of sentence types. As observed by Li and Thompson (1981:313-317), sentence-final *a* performs the function of reducing the forcefulness of the sentence and indicating friendliness. In (22a), the occurrence of *a* softens the force of an assertion, making it less blunt; in (22b), the *wh*-question is asked in a more polite and welcoming way; in (22c), the request sounds more suggestive and thus much less pushy and face-threatening; in (22d), the intensity of strong emotions is softened and in (22e), the interjection *hao* is given with willingness and gladness.

(22)   a.   *shi-zai* *shi*   *mei-you* *shi-jian*   ***a****.*

                really   COP not   time   MIT

                'I really don't have the time. I wish I had the time.'

    b.   *na*   *ben*   *shu*   ***a****?*

                which   CLF   book   MIT

                'Which book is it then?'

    c.   *da-jia*   *ji-zhu*   ***a***

                everyone   learn.by.heart   MIT

                'Everyone, please learn it by heart.'

    d.   *zhe*   *duo-me*   *hao-xiao*   ***a****!*

                this   how.much   funny   MIT

                'How funny this is! '

    e.   *hao*   ***a****.*

                good MIT

                'Okay! I'd love to.'

As discussed in Section 4.6, sentence-final *ba* is also a mitigator. The difference between *ba* and *a* in mitigation is that the former mitigates to negotiate with the addressee while the latter mitigates to show friendliness towards the addressee.

Similar to the particle *ba*, there is much controversy concerning the functions of sentence-final *a*. This controversy is largely due to two kinds of misinterpretations. First, very often the meanings of other elements of the sentence, or the illocutionary force, are attributed to the particle *a*. Chao (1968:805-808) lists ten uses of *a*, most of which have been argued by Li and Thompson (1981:313-317) to be unrelated to the occurrence of *a*. For example, Chao (1968:807) holds that *a* can signal commands, but Li and Thompson (1981:314-315) argue that *a* does not signal commands because the sentence itself is a command as in (23), in which *a* instead has the function of reducing the forcefulness of the command, thus making the sentence more of a suggestion or an encouragement than a command.

(23) *ni*   *lai*   ***a***

      2SG   come MIT

      'Come here then.'   (Li &Thompson 1981:315)

Paul (2014:92) believes that *a* expresses astonishment as in (24).

(24) *ni   yao   qu   **a**?*
     you   want   go   MIT
     'You are going as well? Did I hear you right?'   (Paul 2014:92)

There is indeed a surprise reading in the sentence; however, this reading is due to the remaining elements of the sentence as well as to a certain intonation rather than to the occurrence of *a,* as this reading persists even after *a* is removed. Apart from surprise, the particle *a* is also considered to express emotions and feelings (e.g. Hu 1987:86) such as lamentation in (25). The speaker is expressing intense emotions about how pitiable certain children are. However, again, the particle *a* is not responsible for expressing the emotions of the sentence as the sentence still sounds emotive after the removal of *a*. The presence of *a* just reduces the intensity of the emotions; therefore, *a* is also a mitigator in highly expressive sentences.

(25) *xiang   xiang   hai-zi-men   **ba**,   duo   ke-lian   **a**!*
     think   think   children   MIT   more   pitiable   MIT
     'Come on, think about children. How pitiable they are!'

The second misinterpretation involves the secondary connotation of sentence-final *a*. This connotation results from the interaction between the interrogative illocutionary force of the sentence and the generalized mitigating function that the sentence-final *a* carries. For instance, sentence-final *ba* has a confirmation-soliciting reading in interrogatives. However, this is not a direct function that *ba* realizes; instead, it is a mitigating effect resulting from the interaction between the general mitigating function and the inquisitiveness of a question. With regard to sentence-final *a,* it is also considered to have the function of seeking confirmation (Chao 1968:806; Lü 2016:46-47; Zhu 1982:212), which has been argued against by Li and Thompson (1981:314), who show that the particle *a* does not signal a confirmation question. The sentences in (26) both have a confirmation reading but differ in degrees and explicitness. When compared on a question continuum, (26a) is closer to a polar question while (26b) is closer to a tag question. The inquisitiveness of a polar question is higher and more imposing than that of a tag question. Therefore, the function that *a* plays in (26b) is not to encode confirmation-seeking but to reduce the potential face-threatening effect that a question might have, as a result of which the confirmation-seeking intention becomes more explicit.

(26) a. *ni   bu   qu?*
        2SG   NEG   go

'Aren't you going?'

b. *ni bu qu a?*
 2SG NEG go MIT
 'Aren't you going then?'   (Chao 1968:806)

Furthermore, in (26a), the speaker expresses a high expectation that the addressee is going, whereas in (26b) the speaker still implies this expectation, but its intensity is much softened and the question sounds more friendly and consultative. Again, this effect is a result of the interaction between the mitigating function of *a* and the force of an interrogation.

   Note that there is a difference between the confirmation-soliciting sentences with *ba* and those with *a*, although both function as mitigators. With *a*, as in (31b), the speaker is trying to show friendliness and kindness with the implicature that the speaker expects the addressee to go but that it is also fine if the addressee is not going. With *ba*, on the other hand, as in (27), the speaker is trying to leave space for negotiation with the implicature that the speaker assumes that the addressee is not going and is just confirming this assumption. As a consequence, the sentence with *ba* is more confirmation-inviting than that with *a*.

(27) *ni bu qu ba?*
  2SG NEG go MIT
  'You are not going?'

 From the above discussions about the pragmatic functions of *a*, it seems that the particle *a* functions also at the layer of the Discourse Act in FDG. However, some aspects of its behavior, such as its combinability with *ba* in (25), for instance, suggest that it operates at an even higher layer. We will pursue this issue further in Section 5.2.

4.9. The positioning of Mandarin sentence-final particles in FDG

In the previous sections, we have categorized each individual particle according to its semantic or pragmatic function(s). The way in which each particle operates at a specific layer in the FDG framework can be preliminarily summarized as follows:

de: a modal marker of uncertainty at the layer of the Propositional Content;

le$_3$: a mirative marker of newsworthiness and surprise at the layer of the Communicated Content;

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ma: a reinforcer of different illocutionary forces at the layer of the Discourse Act;

ne₁: a contradiction marker at the layer of the Communicated Content;

ne₂: a reinforcer of interrogative force at the layer of the Discourse Act;

ba: a mitigator of negotiation at the layer of the Discourse Act;

ou: a reinforcer of emphasis at the layer of the Discourse Act, or perhaps at a higher layer;

a: a mitigator of friendliness at the layer of the Discourse Act, or perhaps at a higher layer.

After we locate each particle into Table 2, we get Table 3.

Table 3. The predicted hierarchical layering of Mandarin sentence-final particles (preliminary)

	Interpersonal Level		**Representational Level**
	Discourse Act	**Communicated Content**	**Propositional Content**
Mood	*a, ba, ma, ne₂, ou*		*de*
Polarity		*ne₁*	
Mirativity		*le₃*	

Table 3 shows which layer each individual particle pertains to and how the particles are hierarchically related. As seen from this table, the particles *a*, *ba*, *ma*, *ne₂*, and *ou*, as illocutionary modifiers, operate at the layer of the Discourse Act (or at an even higher layer); particles *ne₁* and *le₃*, as markers of contradiction and mirativity, respectively, are located at the layer of the Communicated Content; the particle *de*, a modal marker of uncertainty, operates at the layer of the Propositional Content. The particle *de* is the only one that applies at the Representational level while the remaining seven apply at the Interpersonal Level.

As in FDG pragmatics governs semantics, the Interpersonal Level occupies a hierarchically higher position than the Representational Level, the particle *de* occupies the lowest layer while for those that are at the Interpersonal Level, the hierarchy that applies from higher to lower layers is: *a*/*ba*/*ma*/*ou*/*ne₂* > *ne₁*/*le₃*. As all layers maintain hierarchical relations with each other, we expect that particles pertaining to these layers manifest themselves in such a way that the higher the layer at which they operate, the more remote from the predicate they will be expressed. With regard to the particles that pertain to the same layer, either they are mutually exclusive if they fall into the same category, or they can co-occur if they belong to

different categories. Therefore, it is predicted that the linear orderings of particle clusters should be restricted by their hierarchical positioning in Table 3.

5. Particle layering

5.1. Introduction

In order to test the above prediction and to see the actual full range of possible sequences of these particles, we searched the CCL corpus for all logically possible permutations of these eight particles. Since two of these are homophonous and cannot be distinguished graphically in the corpus (ne_1 and ne_2), we would in theory expect that there would be $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$ possibilities for combining them. The result will be discussed in detail in this section.

5.2 The three-particle sequence and the layering of *de* and *le*

Although there are immense possibilities for the eight particles to combine with each other, in reality maximally three sentence-final particles are found to cluster in a sentence, which is consistent with Wang's (2017) findings. After extracting the raw frequencies of the combinations of three particles from the corpus, we manually annotated each sentence, eliminating non-final uses such as attributive *de* and aspectual *le*. In this phase we also split out the two different uses of *ne*. The results are presented in Table 4.

Table 4. Frequencies of three particle sequences

Particle sequence	Frequency
de la (*le$_{3+}$ a*)	229
de le$_3$ ba	26
de lou (*le$_3$ +ou*)	23
de le$_3$ ma	4
de le$_3$ ne$_1$	1
de le$_3$ ne$_2$	2
de le$_3$ a	1

de ma le₃	1

The most frequent cluster is *de la* (*le₃+a*). In (28), *de la* indicates that the speaker is certain about the smell of the petroleum because as a local, he/she smells it all the year around and presents this information as newsworthy to the addressee, who fusses about it, in a less assertive and thus friendlier way.

(28)　(The locals smell petroleum after it rained. Some think this is serious but more others don't regard it as right, commenting,)

qi-you	*wei?*	*Zheng*	*nian*	*dou*	*you*	***de***	***la***,	*you*	*shen-me*
petroleum	smell	whole	year	all	have	CERT	MIR.MIT	have	what

zhi-de	*da-jing-xiao-guai*	*de!*
worthy	fuss	CERT

'Petroleum smell? (We) have it all the year around. There is nothing to fuss about.'

As shown in Table 4, the second and third most frequent combinations are *de le₃ ba* and *de lou* (*le₃+ou*). In (29a), with *de le₃ ba*, the speaker is soliciting confirmation (*ba*) from the addressee about the propositional content that he/she is quite sure of (*de*), which is however beyond the present knowledge of the addressee (*le₃*). In (29b), with *de lou*, the speaker is not only certain about the positive answer (*de*), but also signals its newsworthiness (*le₃*), and presents it in a forceful way (*ou*) to the addressee, although immediately after this he/she corrects his/her strong commitment to it.

(29)　a.
wo	*shuo*	*de*	*gou*	*qing-chu*	***de***	***le₃***	***ba?***
1SG	speak	COMP	enough	clear	CERT	MIR	MIT

'I have surely made it clear, right?'

b.
shi	***de***	***lou***,	*a,*	*ye*	*bu*	*yi-ding,*	*bu*	*yi-ding*
yes	CERT	MIR.REIN	INTJ	too	not	certain	not	certain

'Yes, indeed. Ah, it may not be so certain, not so certain.'

Table 4 shows the high degree of combinability of *de le₃* with all the other particles (*ba, ou, ma, ne₁/ne₂* and *a*)[12]. This is in agreement with the hierarchical relations predicted in Table 3 between *de* and *le₃* themselves as well as between both *de le₃* and the other particles. Although there are quite a lot of sentences

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[12] The combinability of *le₃* and *ne₁* will be discussed in Section 5.5.

in our data that have a sequence of *le de*, the particle *le* is in those cases always an aspectual marker *le₂*, as exemplified in (30).

(30) a. *da-yue   ye   shi   "ming   zhong   zhu-ding"   **le₂**   **de**   **ba**.*
       perhaps   too   COP   fate   middle   destined   PRF   CER   MIT
       'Perhaps, this has been destined.'

   b. *ni   bao-zheng   **le₂**   **de**   **a**.*
      2SG   promise   PRF   CERT   MIT
      'You have promised.'

In both linear orders *le₂ de ba* and *le₂ de a* in (30), *le₂* is a perfect marker which encodes that the state-of-affairs concerned has occurred in the past and that its effect continues to the present. The legitimacy of the sequence *le₂ de* can also be understood from the fact that perfect aspect is an operator at the layer of the State of Affairs within the Representational Level, a layer lower than that of the Propositional Content, at which *de* is situated.

To sum up, our corpus data confirms the hierarchical positioning of *de* and *le₃* as predicted in Table 3: *de* is located at the lowest layer and *le₃* is at the second lowest. This hierarchical layering not only determines their sequential order when they co-occur, but also the sequential orders when they combine with the other five particles. There is only one counterexample to this generalization, which is the sequence *de ma le₃*, which occurs only once in the corpus. We will come back to this counterexample in Section 5.6.

5.3 The layering of *ne₁*, and *a*

As the maximal number of Mandarin sentence-final particles in a cluster is three and these clusters are always made up of *de le₃* along with one of the other six particles, the hierarchical distribution of the other six (*ba*, *ma*, *ne₁, ne₂*, *ou*, and *a*) has to be investigated through the data on the linear ordering of pairs of these particles. Their combinatory frequencies are given in Table 5, in which the frequencies of the combinations of *de* or *le₃* with any other particle are not presented, as the hierarchical relations of *de* and *le₃* with the remaining six have already been clarified in Section 5.2.

Table 5. Frequencies of two particle sequences (among *ba*, *ma*, *ne₁/ne₂*, *ou*, and *a*)

Particle sequence	Frequency

ne₁ le₃	1
ne₂ le₃	2
ne₁ ba	32
ne₁ ma	54
ne₁ a	12
ne₂ a	2
ma le₃	3
ma a	4
ba a	13
b'ou (*ba+ou*)	211[13]
a ne₂	1

Basically, the hierarchical relations presented in Table 3 are confirmed by our data on combinations of two particles. The particle *ne₁* does not follow but precedes *ba*, *ma* or *a* (*ne₁ ba*, *ne₁ ma*, *ne₁ a*) as in (31), which shows that *ne₁* occupies a lower layer than *ba*, *ma* and *a*.[14]

(31) a. *ni   jiu   deng zhe   wo   shuo   zhe   ju   hua   ne₁ ba?*
        2SG right.way wait PROG 1SG speak this CLF words CTR MIT
        'You are just waiting for me to say this sentence, right? (You think I don't know. I know it!)'

      b. *wo   bu   shi   zheng   shui-jiao   ne₁   ma?*
        1SG not   COP PROG   sleep   CTR   REINF
        'Aren't I sleeping? (Do you think I am not?)'

      c. *wo   zhe   yi   hui   hai   de   hui   jia   chi   fan   qu   ne₁   a.*
        1SG this   one CLF still have.to back home eat   meal go   CTR   MIT
        'You may not realize that I have to go back home to eat now.'

Also, as seen from Table 5, *a* mostly follows *ba*, *ma* and *ne₂* (*ba a*, *ma a*, *ne₂ a*) and only in one case

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[13]More than half are fixed sentences such as *hao bo* 'OK?', *shi bo*" 'Is it?' and *xiao de bo* 'you know?'. Their relative frequencies are 30%, 21% and 6% respectively. However, as each is uttered in a different context, we consider them as separate instances. Note that even without these cases the combination *ba ou* would be the one with the highest frequency in Table 5.

[14] There is only one counter-example (*a ne*) in our data as shown in the last row of Table 5. We will discuss this exception in Section 5.6.

precedes *ne₂*, which shows that *a* occupies the outermost position of all sentence final particles, and is therefore supposed to operate at the highest layer in terms of FDG. The position of *a* is illustrated in (32). We will return to the counterexample in Section 5.6.

(32) a. *xing, dai zhe ba, dai zhe **ba** a.*
　　　 fine stay PROG MIT stay PROG MIT MIT
　　　 'Fine, stay where you are, all right, stay where you are, all right, please do that.'

　　 b. *ni-men zhong-chai-yuan shi xia le **ma** a.*
　　　 2PL arbitrator COP blind PRF REINF MIT
　　　 'Is the arbitrator of yours blind?! Isn't he?'

　　 c. *Sun Cao xin hua shuo zen-me zhe-yang le **ne₂** a*
　　　 Sun Cao heart words say how like.this happy REINF MIT
　　　 'Sun Cao spoke to himself, how could (she) be so happy? Please tell me.'

However, the ordering of *ba* and *a* is not compatible with the layering presented in Table 3, in which *ba* and *a* fall into the same category and are at the same layer, that of the Discourse Act, which means that *ba* and *a* would be expected to be mutually exclusive and never co-occur. Thirteen instances of the surface sequence *ba a* suggest that *a* functions at a layer even higher than the one occupied by *ba,* a conclusion that Li (2006:63-65) also arrives at. However, in Table 3, *ba* already operates at the highest layer. Actually, FDG acknowledges the existence of such a higher layer, which is the layer of the Move, defined as an autonomous contribution to an ongoing interaction (Hengeveld & Mackenzie 2008:50-60). The reason why the layer of the Move is not included in Table 1 in Section 2 is that few operators (defined as grammatical expressions) have so far been encountered for this layer (Hengeveld & Mackenzie 2008: 59-60; Keizer 2015:91-92). The particle *a* could be a further example of the expression of a Move operator. The difference between a Move and a Discourse Act is that the former is the minimal free unit of discourse (Hengeveld & Mackenzie 2008:50) and furthers the communication in terms of approaching a conversational goal, whereas the latter is the smallest identifiable units of communicative behavior and does not further the communication in the same sense as a Move does (Hengeveld & Mackenzie 2008: 60). Hence, *a* would not be used to modify a Discourse Act that may constitute only part of a Move; instead, it would modify a complete and minimal unit that advances the communication. Evidence for this can be found in the following examples.

(33) a. (The interviewee talks about her experience of buying a dress at a children's clothing store in a foreign country.)

Lu Yu: *zhen-de zai   tong   zhuang dian mai dao   le   **a**?*
Lu Yu   really be   children clothes shop buy arrive PFV   MIT
Lu Yu: 'You really finally bought it at a children's clothing shop?'
Zhou Xun: *dui **a**.   er-qie   na   jian yi-fu   hai ting you   zhong-guo de*
Zhou Xun   right MIT   besides that CLF   clothes even very have China   ATTR
gan-jue.
feel
Zhou Xun: 'Right. Besides, that dress even has a Chinese feel.'

b. (Two people are arguing about whether it is the wind that moves or it is the flag that moves. A Master monk asks them to stop the fight and says,)

wo   yuan-yi wei   ni-men zuo   ge   gong-zheng de   cai-pan,
I   willing for   you   make CLF   fair   ATTR   judgment
qi-shi   bu   shi   feng dong,   ye   bu   shi   fan   dong, er-shi   er   wei
actually not   COP   wind move   also   not   COP   flag move instead   two   CLF
*ren-zhe   xin   dong   **a**!*
the.virtuous   heart move   MIT

'I am willing to judge your dispute objectively. Actually it is not the wind that moves, nor is it the flag that moves; instead, it is the hearts of you two virtuous' that move.'

In (33a), *a* is used in the adjacency pair of a question asked by Lu Yu and an answer given by Zhou Xun. Both serve as Moves that further the communication between the two interactants. In the answer part, *dui a* is a complete answer to the question whether she has bought the clothes, while the follow-up sentence is additional information not solicited by the question and therefore constitutes a new Move. Therefore, the answer is not made up of two Discourse Acts but of two moves, in which *a* mitigates the first Move.

While (33a) is a case in which the Move and the Discourse Act coincide, (33b) shows that *a* has scope over three Discourse Acts that collectively serve as the contents of the monk's promised judgment. The three Discourse Acts are manifested by the serial sentences *bu shi…, ye bu shi…, er shi…* 'it is not the case that…, nor is the case that…, it is actually that…'. Each of the three forms part of the Monk's overall judgment he makes in order to stop the fight. The particle *a* here is used at the end of the sequential sentences to mark the friendliness over the three Discourse Acts, thus having scope over the entire Move.

The fact that *a* and *ba* are both mitigators but operate at different layers reflects their different communicative strategies. The particle *a* has a more general strategy of expressing the speaker's intention to be friendly in all kinds of illocutions with which it occurs, whereas the particle *ba* interacts directly with specific types of illocutions which results in different pragmatic effects. For instance, in declaratives, the

presence of *ba* reduces the assertiveness of the statement; in directives, its presence provides more space for negotiation and the request is thus less face-threatening for the participants involved. Hence, *ba* reinforces in a less general way than *a* does, thus functioning at a lower scope.

In this section, we have confirmed from corpus data the hierarchical relations of ne_1, a marker expressing contradiction, with the other particles predicted in Table 3 and also proposed that a new layer, the Move, at which *a* operates, should be added to the TMAEP operator system based on the sequence *ba a*.

5.4 The layering of *ma*, *ne₂*, *ba* and *ou*

Among the six particles discussed in the previous subsection, the layers of *a* and ne_1 have now been determined. In the following, we will move on to discuss the hierarchical relations between *ma* 'REINF' ne_2 'REINF', *ba* 'MIT' and *ou* 'REINF'.

In our data, *ma*, ne_2, and *ba* never co-occur. This is as we would expect, as we have initially classified them as belonging to the same layer, that of the Discourse Act, at which they serve as illocutionary modifiers. The fact that they never co-occur is consistent with our prediction in Table 3 that they pertain to the same layer of the Discourse Act, and confirms that these three particles fall into the same category, as otherwise they could still co-occur as elements of different categories.

However, as also mentioned in the literature (Chao 1968; Pan 2015; Pan & Paul 2016), *ba* and *ou* can co-occur. This happens despite the fact that we have classified *ou* as an illocutionary modifier, just as the other three. An example is given in (34):

(34) *dou   jiu   dian   le,   kuai qi-lai   **b'ou**.*
      already   nine   o'clock PRF   hurry get.up   MIT.REINF
      'It's already nine o'clock. Get up quickly.'   (Zhu 1982:207)

Zhu (1982:207) suggests that the fused graphic form of *b'ou* is 啵 (*bo*). The searching for this form in CCL corpus results in 211 instances, as shown in Table 5. Consider example (35).

(35) *xia   ci   rang ni   qing   ke,   hao   **bo**?*
      next   time let   2SG   invite   guest good MIT.REINF
      'Next time you pay, OK?'

In (35), the mitigating effect of *ba* interacts with the reinforcing effect of *ou*, which results in less space for negotiation compared with the single occurrence of *ba*, as well as in a less demanding tone compared with

the single occurrence of *ou*. The sequence *b'ou* or *bo* thus actually suggests that, just as *a*, *ou* also operates at a layer higher than that of the Discourse Act, that is, the layer of Move.

The fact that *ou* and *ma* are both reinforcers but operate at different layers reflects their different communicative strategies. *Ou* has a more general strategy as in whatever sentence types in which *ou* occurs, it invariantly reinforces the cruciality of the message being conveyed, whether it is a proposition that should be paid special attention to or an action that should be carried out because of earnest and insistent necessity. In comparison, *ma* interacts specifically with every type of the illocutionary force, thus leading to different reinforcing effects. For instance, in declaratives, *ma* brings the effect of a dogmatic assertion; in polar interrogatives, it can strengthen the inquisitiveness of the question; in content questions, it explicitly expresses the speaker's insistence on an answer. Hence, *ma* reinforces in a less general way than *ou* does, thus functioning at a lower scope.

To summarize, the hierarchical layering of *ma*, *ne₂*, *ba* and *ou* is: *ou* > *ba/ma/ ne₂.* Specifically, *ou* operates at the layer of the Move, *ba*, *ma*, and *ne₂* operate at the layer of Discourse Act.

5.5 The sequence *le₃ ne₁*

In Table 3, both *le₃* and *ne₁* are at the same layer, that of the Communicated Content; however, in our data, *le₃* precedes *ne₁* as in (36).

(36)	*ni*	*xie*	*de*	*tai*	*da*	*le.*	*Wo*	*kan*	*hai*	*xiao*	***le₃***	***ne₁.***
	2SG	write	COMP	too	big	MIR	1SG	see	still	small	MIR	CTR

'Your writing is too big? I think it is still small.'

This does not contradict the prediction that *le₃* and *ne₁* operate at the same layer as they fall into different categories. *le₃* belongs to the category of mirativity while *ne₁* belongs to the category of polarity. The principle of mutual exclusivity applies only to elements of the same category. Actually, it is quite legitimate for *ne₁* to have scope over *le₃* as *ne₁* indicates the opposite relationships between communicated contents, either with the previous communicated content or the implicit communicated content in the context, whereas *le₃* encodes the information status of the single ongoing communicated content. This again confirms our prediction that particles of different categories can co-occur despite pertaining to the same layer.

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5.6 Exceptional cases

In both Table 4 and Table 5, there are unusual sequences with extremely low frequencies: *de ma le₃* in Table 4 and *ne₁ le*, *a ne₂* and *ma le₃* in Table 5. As *de ma le₃* and *ma le₃* are actually the same sentence and it is not unusual for *de* to precede *ma le₃*, we then narrowed down the exceptional sequences into three: *ne₁ le₃*, *a ne₂*, *ma le₃*. We asked 15 native speakers about the acceptability of these sequences as well as their counterparts with a reversed sequential order of the particles, where acceptability was tested in three degrees: 'acceptable', ' unacceptable', and 'dubious'. The results are presented in Table 6.

Table 6. The acceptability of the unusual sequences

Sequence		Sentence number	acceptable %		unacceptable %		dubious %	
found	expected		found	expected	found	expected	found	expected
ne₁ le₃	*le₃ ne₁*	1	60.0	86.7	40.0	6.7	0	6.7
ne₂ le₃	*le₃ ne₂*	1	13.3	93.3	53.3	6.7	33.3	0
		2	13.3	66.7	53.3	20.0	33.3	13.3
ma le₃	*le₃ ma*	1	13.3	80.0	86.7	13.3	0	6.7
		2	6.7	60.0	93.3	26.7	0	13.3
		3	13.3	46.7	80.0	26.7	6.7	26.7
a ne₂	*ne₂ a*	1	0	6.7	80.0	53.3	20.0	40.0
ba de	*de ba*	1	6.7	86.7	93.3	6.7	0	6.7

In Table 6, the orders found and the orders expected are given, as well as their evaluation by 15 native speakers, given as percentages. As can be seen in Table 6, there is a general tendency that the expected orders are more acceptable than the unexpected ones that were found in the corpus. There is no absolute unacceptability even concerning the sequence *ba de,* which is not from our data and is the reversed order of *de ba* as it occurs in a sentence from the CCL corpus. The pair *ba de* and *de ba* are given in the questionnaire to test the reliability of the results. Among the three orders investigated, there is a higher rate of unacceptability as regards the ordering *ma le₃* and *a ne₂* as shown in the fourth column. However, as for the ordering *ne₁le₃/ne₂ le₃*, the rate of unacceptability for the first two sentences is just slightly above 50% while 60% of the participants think that the third sentence is acceptable, although in comparison the reversed ordering *le₃ ne₁* is more acceptable with a high rate of 86.7%. It is unclear whether this difference in the third sentence is brought about by the context or other constituents of the sentence. Further

investigation is needed in this respect. Nevertheless, the results in Table 6 show that usual orders are definitely more acceptable in Mandarin.

6. Discussion and conclusion

In this paper, we used naturally-occurring data and the Functional Discourse Grammar framework to explore the full range of possible orderings of eight Mandarin sentence-final particles and offered a systematic explanation for why these particles have to follow a rigid order when they co-occur. We found that maximally three particles can cluster and that the sentence-final particles investigated are organized in a strict four-layered hierarchical organization as presented in Table 7, in which each particle pertains to a specific semantic or pragmatic layer. Their surface ordering is restricted by their hierarchical positioning in the underlying structure. Particles of different layers may cluster according to their hierarchical scope over each other while particles of the same layer either are mutually exclusive or can cluster if they fall into different categories.

Table 7. The hierarchical layering of Mandarin sentence-final particles

	Interpersonal Level			Representational Level
	Move	**Discourse Act**	**Communicated Content**	**Propositional Content**
Mood	*a, ou*	*ba, ma, ne$_2$*		*de*
Polarity			*ne$_1$*	
Mirativity			*le$_3$*	

Based on the sequential ordering of these Mandarin particles and on their special pragmatic characteristics, we have shown that the particles *a* and *ou* prove to be operators at the layer of the Move in FDG; thus a category of Move operators should be added to the Interpersonal Level in FDG as indicated in Table 7.

In Table 8 we show how our conclusions relate to those arrived at by other scholars.

Table 8 Comparison with findings of other scholars

	A	B	C	D
This paper	*a, ou*	*ba, ma, ne$_2$*	*ne$_1$, le$_3$*	*de*
Paul (2014)	*a, ou, ne$_3$*	*ba, ma, ne$_2$*	*ne$_1$, le, lai-zhe*	--
Hu (1981)	*a, ou, ai*	*ba$_1$, ba$_2$, ma, ne, mə*	*de, le*	--
Zhu (1982)	*a, ou, ne$_3$, ei, mə*	*ba$_1$, ba$_2$ ma, ne$_2$*	*ne$_1$, le, lai-zhe*	--
Li (2006)	*a*	*ba, ma*	*ne*	--

As shown in Table 8, our four-layered hierarchy shows remarkable consistency with the results arrived at by other scholars, working in different theoretical frameworks. It is consistent with the three-split structures proposed by Hu (1981:99), Zhu (1982:210-211), and Paul (2014:83) in that *ba* and *ma* pertain to a layer lower than *a* and *ou* yet higher than *le*. Our proposal differs, however, from theirs in the following respects. Firstly, a different set of particles is included in our investigation and these particles are categorized quite differently as to their functions (e.g. according to Paul, the particle *a* is to express astonishment; in the proposals of Paul, Hu and Zhu *ma* is considered to modify the interrogative force only). Secondly, we differentiate *ne* into *ne$_1$* and *ne$_2$* and they operate at different layers. Zhu (1982:210-211) and Paul (2014:83) propose three *ne*s, which operate at three different layers while Hu (1981:99) believes that there is only one particle *ne*, which shares the same layer with *ba* and *ma*. Li (2006:65) also proposes a three-layered structure for the four particles she investigates (*a*, *ba*, *ma* and *ne*). Like Hu (1981:99), she gives *ne* a unified treatment, but argues that *ne* occupies a layer lower than *ba* and *ma*. Thirdly, we treat *de* and *le* as pertaining to different layers. However, only Hu includes both *de* and *le* in his analysis which, however, locates these two particles to be at the same layer. In all, we feel that our analysis is not only supported by the data from our corpus, but also finds support in work done by other scholars on this topic.

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