

The Quantifier-Cooperating Adverbs in Modern Chinese

Xia Jun and Cui Xiaofang

Shenyang Normal University

No.253, Huanghe North Street, Huanggu District, Shenyang, China

xiajun024@163.com; cuixiaofang2009@163.com

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ABSTRACT. *This paper addresses a kind of adverbs which can co-occur with quantifiers and cooperate with them to express some sorts of quantitative meaning. The adverbs, which we call quantifier-cooperating adverbs, are comparatively special in modern Chinese, rendering it difficult to be handled in both Chinese information processing and Chinese teaching as a second language. The range of the adverbs, however, is so far not clear due to the lack of an explicit definition. Although many relative papers have touched the problem more or less, no research has been done upon it seriously. Based on these works, the paper attempts to set a definition for this kind of adverbs, according to which an investigation is done to find out how many adverbs meeting the standard there are in modern Chinese. More than 100 adverbs, roughly belonging to 23 small classes, are finally obtained, most of which are firstly put forward thanks to the comparatively strict procedure. The research outcome can serve as a basis for overall description of the syntactic and semantic properties of these adverbs and for improving disposition of the adverbs in various application fields such as Chinese information processing and Chinese teaching as a second language.*

Keywords: quantifier-cooperating adverbs; quantitative meaning; quantifier

1. Introduction.

1.1. **What are the quantifier-cooperating adverbs?** The quantifier-cooperating adverbs are a kind of adverbs which can co-occur with quantifiers and cooperate with them to express some sorts of quantitative meaning, such as the adverbs in follow phrases:¹

- (1) *yigong* *chi* *le* *san* *wan* *fan*
一共 吃 了 三 碗 饭
altogether eat Asp. three bowl rice
“ate a total of three bowls of rice”

¹ In the following examples involving Chinese, the Chinese pronunciations are written in italic type and put atop the corresponding Chinese characters, under which are their English translations, word-to-word translation and whole translation respectively, the latter being included in quotation marks. The quantifiers are marked in bold type and the quantifier-cooperating adverbs are underlined.

- (2) *shaowei* *qu* *guo* *ji* *ci*
 稍微 去 过 几 次
 slightly visit Asp. several time
 “have visited somewhere for only several times”
- (3) *duoshao* *zhan* *yixie* *youshi*
 多少 占 一些 优势
 more or less have some advantage
 “accounts for a little advantage, more or less”
- (4) *dou* *sunshi* *buxia* *shiwàn kuai* *le*
 都 损失 不下 十万 块 了
 even lose not less than 100,000 yuan Asp.
 “have lost more than 100,000 yuan”
- (5) *zhi* *diu* *le* *budao* *yibai kuai* *qian*
 只 丢 了 不到 一百 块 钱
 only lose Asp. less than 100 yuan money
 “merely lost less than 100 yuan”

In the history of relevant researches, Chinese scholars have given these kind of adverbs various names, such as “quantifier-modifying adverbs”[1], “quantitative adverbs”[2], “subjective-evaluation adverbs for quantifier”[3], “numeral adverbs”[4], “adverbs expressing subjective quantity”[5].² Zhang Yisheng[8] takes them as subcategories of Chinese scope adverbs. The different names show the different aspects on which they focus.

In this paper, these adverbs are called quantifier-cooperating adverbs due to two important properties: 1)formally, the adverbs have co-occurrence and mutual selectivity with quantifiers;

2)semantically, the adverbs have semantic connection with quantifiers—cooperating with them to express some kind of quantitative meaning.

We don’t use the term ‘quantifier-modifying adverbs’ or ‘quantifier-directing adverbs’ because in some cases when it is not suitable to think the adverbs ‘modify’ or ‘direct’ quantifiers, the adverbs are still possibly thought as quantifier-cooperating adverbs, as long as they can have co-occurrence and mutual selectivity with quantifiers and co-function with them to express some kind of quantitative meaning. For example, the adverbs in follow phrases are also taken into account.³

² There are some differences between the ranges of adverbs listed by different scholars, which will be described in more detail below. In fact there are more similar naming of adverbs, such as “numeral adverbs”[6] and “adverbs of scope and quantity”[7], but they don’t have much relation with quantifiers.

³ Please compare them with follow phrases:

- (6’) *geng* *tashi* *le* *yidingdian*
 *更 踏实 了 一丁点
 more relieved Asp. a shred of

(6) *geng tashi le jifen*
 更 踏实 了 几分
 more relieved Asp. a bit
 “a little bit more relieved”

(7) *bijiao hao yixie*
 比较 好 一些
 comparatively good some
 “comparatively a little bit better”

1.2. **Why do we research quantifier-cooperating adverbs?** The study of quantifier-cooperating adverbs has syntactic and semantic value: the adverbs can co-occur with quantifiers and have a mutual selectivity with them, which is naturally within the domain of study of distribution of syntactic units; the adverbs can cooperate with quantifiers to express some kind of quantitative meaning, which is absolutely the object of study of semantic category. According to the present publications, quantifiers-cooperating adverbs have a considerable scale in mandarin, but there is still a lot of research space. The range of the quantifier-cooperating adverbs, for example, is so far not clear yet.

From the application point of view, the study of quantifier-cooperating adverbs is also an inevitable task. Because the quantifier-cooperating adverbs are a little special in Mandarin, sometimes it is not easy to find corresponding expressions for them in other languages. Thus they are thorny points not only for Chinese teaching as a second language but also for Chinese information processing, especially for machine translation. To take an example, the following phrases are translated in <http://translate.google.com> and www.iciba.com respectively from Chinese into English, which indicates that a lot of quantifier-cooperating adverbs can not be correctly recognized and translated.

(8) *yilian qu le si ci*
 一连 去 了 四 次
 in succession visit Asp. four time
 “visited somewhere for four times in a row”

google: *series went four

iciba: *this four times

(9) *shaowei qu ji ci*
 稍微 去 几 次
 slightly visit several time
 “visit somewhere for a few times”

google: *a little go a few times

iciba: *slightly to several times

(7') *bijiao hao jifen*
 *比较 好 几分
 comparatively good a bit

(10) *hen shui le yihuier*
 很 睡 了 一会儿
 very sleep Asp. a while
 “slept for quite a long time”

google: *and very sleep a while

iciba: *is to sleep for a while

(11) *duoshao zhan yixie youshi*
 多少 占 一些 优势
 more or less have some advantage
 “accounts for a little advantage, more or less”

google: *how much accounted for some advantage

iciba: *how many accounts for some of the advantages of

(12) *geng youjiazhi yixie*
 更 有价值 一些
 more valuable a little bit
 “a little bit more valuable”

google: *more valuable to some

iciba: *greater value

So the study of quantifier-cooperating adverbs is a valuable job both to the theory and to the practice. There are many problems about these adverbs, but in this paper the attention will be paid exclusively to a fundamental one---the range of the quantifier-cooperating adverbs. That will lay a basis for the further study on the forms and semantics of these adverbs.

2. The quantifier-cooperating adverbs mentioned so far. Let us begin with a brief and necessary review of the quantifier-cooperating adverbs mentioned so far in relevant study of mandarin. According to materials in our possession, Ma[1] did the earliest exploration. Qu[2], Dong[3], Zhang[8], Zhu[4], Zhang[5] did more related research thereafter.

Ma[1] collected about 40 “quantifier-modifying adverbs”, which are listed below:

<i>zhenghao</i>	<i>ganghao</i>	<i>qiahao</i>	<i>qiaqiao</i>	<i>qiaqia</i>	<i>gang</i>	<i>ganggang</i>	<i>yijing</i>
正好	刚好	恰好	恰巧	恰恰	刚	刚刚	已经
just	just	just	just	just	just	just	already

<i>zhi</i>	<i>jin</i>	<i>jinjin</i>	<i>jiu</i>	<i>cai</i>	<i>buguo</i>	<i>zuzu</i>	<i>zu</i>	<i>dou</i>	<i>ye</i>
只	仅	仅仅	就	才	不过	足足	足	都	也
only	only	only	only	only	only	fully	fully	even	also

<i>dagai</i>	<i>dayue</i>	<i>yue</i>	<i>yuemo</i>	<i>dazhi</i>	<i>dadi</i>	<i>yexu</i>	<i>jiangjin</i>	<i>zuiduo</i>
大概	大约	约	约摸	大致	大抵	也许	将近	最多
maybe	about	about	about	about	about	maybe	close to	at most

<i>zhiduo</i>	<i>dingduo</i>	<i>zuishao</i>	<i>zhishao</i>	<i>dique</i>	<i>zhende</i>	<i>guozhen</i>	<i>guoran</i>
至多	顶多	最少	至少	的确	真的	果真	果然
at most	at most	at least	at least	indeed	indeed	indeed	really
<i>dangzhen</i>	<i>gong</i>	<i>zonggong</i>	<i>yigong</i>	<i>yizong</i>			
当真	共	总共	一共	一总			
really	altogether	altogether	altogether	in total			

As the earliest relevant study, Ma's collection is remarkable. Some of the quantifier-modifying adverbs she referred, however, are not quantifier-cooperating adverbs, because an adverb appearing before a quantifier does not necessarily mean the adverb quantitatively modify the quantifier or quantitatively cooperate with the quantifier. For example, 都(dou) and 也(ye) mean "the situations are the same"; 的确(dique), 真的(zhende), 果真(guozhen), 果然(guoran) and 当真(dangzhen) mean confirmation; 也许(yexu) expresses an inference. All these adverbs have meaning of modality, rather than meaning of quantity. What is more important, the adverbs above do not show mutual selectivity with the quantifiers appearing after them. Therefore they are quite different from those that have mutual selectivity with quantifiers. For instance, 至少(zhishao) and 足足(zuzu) co-occur with no smallness-emphasizing quantifiers. So 都(dou), 也(ye), 的确(dique), 真的(zhende), 果真(guozhen), 果然(guoran) and 当真(dangzhen) and 也许(yexu) should not be taken into account when we talk about quantifier-cooperating adverbs.

Qu[2] pointed out a dozen "numeral adverbs", listed as follows:

<i>zai</i>	<i>hai</i>	<i>lingwai</i>	<i>jiu</i>	<i>cai</i>	<i>gang</i>	<i>ganggang</i>
再	还	另外	就	才	刚	刚刚
again	still	aside	only	only	just	just
<i>yigong</i>	<i>zonggong</i>	<i>dayue</i>	<i>jihu</i>	<i>chabuduo</i>	<i>qiahao</i>	<i>ganghao</i>
一共	总共	大约	几乎	差不多	恰好	刚好
altogether	altogether	about	almost	about	exactly	exactly

To be frank, this is not a big set, but all of them are quantifier-cooperating adverbs and many of them are new to the set that was put forward by Ma[1].

Dong[3] adds a few members to Ma[1]'s findings, such as 区区(ququ) and 几乎(jihu). Because Dong inherits Ma's range of quantifier-modifying adverbs, his research has the same problem as Ma's.

Zhang[8] talks about a group of adverbs with quantitative meaning, listed as follows:⁴

<i>gong</i>	<i>zonggong</i>	<i>tonggong</i>	<i>yigong</i>	<i>yizong</i>	<i>zuiduo</i>	<i>dingduo</i>
共	总共	统共	一共	一总	最多	顶多
in total	in total	in total	in total	in total	at most	at most

⁴ The terms he used are "统括性数量副词(summative numeral adverb)", "限制性少量副词(restrictive adverb indicating few or little)", "限制性多量副词(restrictive adverb indicating many or much)", "限制性概量副词(restrictive adverb indicating fuzzy quantity)".

<i>zhiduo</i>	<i>buguo</i>	<i>zhiyou</i>	<i>jiushi</i>	<i>zhishi</i>	<i>zuishao</i>	<i>dingshao</i>	<i>zhishao</i>
至多	不过	只有	就是	只是	最少	顶少	至少
at most	only	only	only	only	at least	at least	at least

<i>qima</i>	<i>buzhi</i>	<i>zu</i>	<i>zuzu</i>	<i>dayue</i>	<i>dagai</i>	<i>dalue</i>	<i>dazhi</i>	<i>dati</i>
起码	不只	足	足足	大约	大概	大略	大致	大体
at least	not merely	fully	fully	about	about	about	about	about

<i>dashuai</i>	<i>daduo</i>	<i>dadi</i>	<i>dadou</i>	<i>daban</i>
大率	大多	大抵	大都	大半
mostly	mostly	on the whole	mostly	mostly

Except some members of the list which have no mutual selectivity with quantifiers, such as 大致(*dazhi*), 大体(*dati*), 大率(*dashuai*), 大抵(*dadi*), 大多(*daduo*) and 大都(*dadou*), all the rest are quantifier-cooperating adverbs.

Zhu[4] puts forward about 30 “numeral adverbs”:

<i>yigong</i>	<i>gong</i>	<i>zonggon</i>	<i>tonggong</i>	<i>tonggong</i>	<i>dagai</i>	<i>dayue</i>
一共	共	总共	通共	统共	大概	大约
in total	in total	in total	in total	in total	about	about

<i>yuemo</i>	<i>yue</i>	<i>zhi</i>	<i>cai</i>	<i>jiu</i>	<i>buguo</i>	<i>zu</i>	<i>zuzu</i>	<i>buzhi</i>
约莫	约	只	才	就	不过	足	足足	不只
about	about	only	only	only	only	fully	fully	not merely

<i>jihu</i>	<i>ji</i>	<i>chabuduo</i>	<i>zhishao</i>	<i>dingshao</i>	<i>zuishao</i>	<i>qima</i>
几乎	几	差不多	至少	顶少	最少	起码
nearly	nearly	almost	at least	at least	at least	at least

<i>zhiduo</i>	<i>dingduo</i>	<i>zuiduo</i>
至多	顶多	最多
at most	at most	at most

All the members in this set are quantifier-cooperating adverbs, but none of them is beyond that mentioned by former researchers. Zhu thinks that “numeral adverbs can make the originally objective and accurate quantity to be expressed not so exactly to a degree”, which, however, does not always meet the fact. For instance, 一共(*yigong*, “altogether”) still expresses an accurate quantity in the phrase 一共四天(*yi gong si tian*, “a total of four days”).

Zhang[5] collects more than 20 adverbs which indicate subjective quantity, including the following words:

<i>zhi</i>	<i>jin</i>	<i>jinjin</i>	<i>gang</i>	<i>ganggang</i>	<i>cai</i>	<i>jiu</i>	<i>dou</i>
只	仅	仅仅	刚	刚刚	才	就	都
only	only	only	just	just	only	only	even

<i>hai</i>	<i>hen</i>	<i>zhen</i>	<i>hao</i>	<i>jing</i>	<i>jingran</i>	<i>juran</i>	
还		很	真	好	竟	竟然	居然
still	very	really	how	actually	actually	actually	
<i>zuiduo</i>	<i>zhiduo</i>	<i>dingduo</i>		<i>chongqiliang</i>	<i>zhishao</i>	<i>zuishao</i>	<i>qima</i>
最多	至多	顶多		充其量	至少	最少	起码
at most	at most	at most		at most	at least	at least	at least

All the adverbs above are quantifier-cooperating adverbs. Compared to the existing studies, it is a progress that Zhang puts the adverb 很(hen, “very” or “quite”) in the phrase 很干了几天活(hen gan le ji tian huo, “did the works for many days”) and 很睡了会儿(hen shui le yihuir, “slept for quite long a while”) together with the other quantifier-cooperating adverbs.

Besides, Zhang[5] mentions some adverbs which can modify quantifiers directly, for examples:

<i>manman</i>	<i>zhengzheng</i>	<i>zuzu</i>
满满	整整	足足
fully	wholly	fully

All of these are also quantifier-cooperating adverbs.

Throughout the thirty-year studies since Ma[1], a number of papers relevant to the quantifier-cooperating adverbs have been published in field of Chinese study. At the same time, we must admit that the progress is relatively slow. The common problem for all the present studies is, without elaborating the way the adverbs are collected, we never know whether there are still similar adverbs in mandarin, and how many there are if the answer is affirmative. The reason underlying is that a clear and agreed concept of quantifier-cooperating adverbs is so far not formed between Chinese scholars and consequently all the researchers avoid naturally or half unconsciously the overall collection of the relevant adverbs. In fact, some common quantifier-cooperating adverbs have still not been mentioned yet in the summative researches, such as 一连(yilian) in “一连忙了三天(yilian mang le san tian, “worked busily for three days on end”)” and 拢共(longgong) in “拢共来了不到三十人(longgong lai le budao sanshi ren, “there came less than 30 people in all”)”.

3. The investigation of the range of quantifier-cooperating adverbs in Chinese. Aiming at the deficiency of the existing research, in order to get a comparatively overall set of quantifier-cooperating adverbs, we have designed an investigation procedure as below: 1) to determine the range of candidate adverbs and that of their co-occurring part—quantifiers; 2) to give a feasible definition of the quantifier-cooperating adverbs; 3) to do the investigation and get results.

3.1. The range of the candidate adverbs and quantifiers. As for the range of the

candidate adverbs, we take the adverbs in [9] as the main resource, with some other dictionaries and relevant summative papers as important supplementaries. Besides, the writers collect some adverbs in daily times. All told, the number of the candidate adverbs amounts to round 1400.⁵

The range of quantifiers is comparatively not so easy to determine, since the quantifiers are theoretically innumerable. In this case, we try to classify the enormous set of quantifiers in two fundamental ways so as to get some basic classes of quantifier to do the investigation.

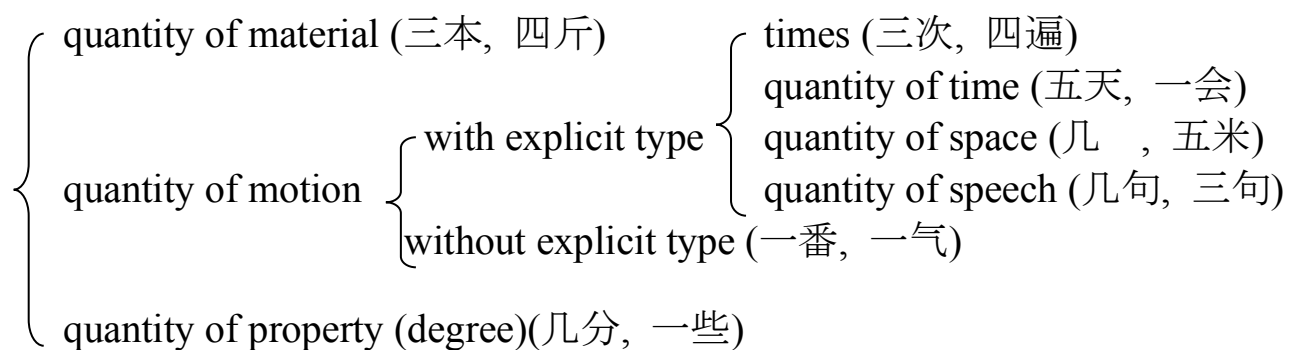
First, the quantifiers can be traditionally divided into three classes by their quantitative meanings. The first class, quantity of material, such as the quantifiers in the phrases “买了三本书(mai le san ben shu, “have bought three books””, “称了四斤肉(cheng le si jin rou, “have bought four jin meat””, “卖了一些西瓜(mai le yixie xigua, “have sold some watermelons””, “赚了一点(zhuan le yidian, “have made a small fortune””) and “损失不少士兵(sunshi bushao shibing, “have lost many soldiers””);⁶ The second class, quantity of motion, including many subclasses: some mean times, such as the quantifiers in the phrases “去过几次(qu guo ji ci, “have visited somewhere many times””, “抄过四遍(chao guo si bian, “have copied something for four times””) and “睡了一觉(shui le yi jiao, “had a sleep””); some mean quantity of time, such as the quantifiers in the phrases “去过几天(qu guo ji tian, “have stayed somewhere for several days””, “玩了一会(wan le yihui, referrint to “have played for a while””) and “跑三十分钟(pao sanshi fenzhong, “run for 30 minutes””); some mean quantity of space, such as the quantifiers in the phrases “走了几(zou le ji bu, “have walked a few steps””, “跑了一圈(pao le yi quan, “lapped””) and “降了五米(jiang le ji mi, “dropped five meters””)⁷; some mean quantity of speech, such as the quantifiers in the phrases “争执了几句(zhengzhi le ji ju, “have disputed with a few words””) and “夸了几句(kua le ji ju, “have praised with a few words””);⁸ some don’t have explicit quantitative type, such as the quantifiers in the phrases “争论了一番(zhenglun le yifan, approximately “have debated for a while””, “训过一通(xun guo yitong, “have rebuked someone severely””) and “商量一下(shangliang yixia, “have a discuss””). The third class, quantity of property, namely degree, such as the quantifiers in the phrases “结实一些(jieshi yixie, “more solid””, “暗淡了几分(andan le ji fen, “a little bit darker””, “松动了一些(songdong le yixie, “getting a little loose””) and “难了一百倍(nan le yibai bei, “much more difficult””). In summary, the semantic hierarchy of quantifiers is as below:

⁵ There are 1162 adverbs in [9], 1121 adverbs in [10], 1054 adverbs in [11], 1114 adverbs in [12]. We take the intersection of adverbs in [9] and [10], which amounting to 1379, as the main resources, with some reference to [11], [12], [13], [14], [15] and [16].

⁶ The quantifiers are those words or phrases being underlined. We introduce each quantifier within a verb phrase because not every adverb can collocate with a quantifier directly.

⁷ Generally speaking, quantity of space includes quantity with one dimension, quantity with two dimensions and quantity with three dimensions. The quantity of space in language, however, includes only quantity with one dimension, which usually relates to the distance of motion, while quantity with two dimensions and quantity with three dimensions always relate to quantity of materials.

⁸ As we can see, the quantity of speech, which can not fit suitably into any existing quantity type of motion, is firstly put forward in this paper.



Second, according to their structural property, the quantifiers can be divided into two classes: one is quantifier word, the other is quantifier phrase. The former consists of three main subclasses. The first one is with form of “一(yi, “one” or “a”) + classifier”, in which 一 usually can not be replaced by other numbers, such as 一会儿, 一阵子, 一时 which mean quantity of time, 一程, 一圈 which mean quantity of distance, 一些, 一点 which mean degree and 一番, 一通, 一气, 一下, 一把 which don't have quantitative meaning of any explicit type. A few of these quantifier words have limited expanding forms. For example, 一会儿 can be expanded to 一小会儿 and 一下 can be expanded to 一下下, 一小下, 一小下下. The second one is in form “quantifier word + quantitative noun”, such as 一段时间 and 一段时日, which mean quantity of time, 一段距离 and 一点路程, which mean quantity of distance. Quantitative nouns include 时间, 时期, 时日, 时光, 日子, 距离, 路程, 路, 路途, etc. The members of third subclass are some quantitative nouns and quantitative adjectives, such as 片刻, 半天, 许久 and 良久, which mean quantity of time, 不少 and 一些, which mean quantity of material or degree. The latter, namely quantifier phrase, comprised of a numeral constituent and a classifier, is the main part of quantitative expression in Chinese, such as 三本 and 四斤 (quantity of material), 十几天 and 多少年 (quantity of time), 四次 and 十一趟 (times), 七 (in 走了七) and 三厘米(in 升了三厘米) (quantity of distance), 几句 and 两句 (quantity of speech), 几分(in 坚定了几分) and 百倍(in 强大百倍) (degree).

3.2. The specified qualification for a quantifier-cooperating adverb. According to the illustration given in 1.1, a quantifier-cooperating adverb should meet the conditions as below: 1) the adverb can co-occur with a quantifier in at least one form; 2) the adverb and the quantifier co-occurring with it select and restrict each other; 3) the presence or absence of the adverb influences the quantitative meaning of the phrase in which the adverb and a quantifier co-occur. Let's further specify these conditions in detail.

Firstly, the adverb should have co-occurrence with a quantifier in at least one form. According to our statistics from the existing relevant studies, there are three basic forms in which an adverb and a quantifier co-occur: ⁹

⁹ In this paper, only the phrases in which the adverbs appear before the quantifiers are taken into account. As a matter of fact, there are also phrases in which the quantifiers appear before the adverb. For example:

(13) 两碗饭才吃饱((getting not stuffed until the second bowl of rice was eaten, here 才 makes the quantifier before it take meaning of subjective large quantity)

(14) 两碗饭就吃饱了(getting stuffed with only two bowls of rice, here 就 makes the quantifier before it take meaning of subjective small quantity)

(15) 两碗饭都吃不饱(getting not stuffed even with two bowls of rice, here 都 makes the quantifier before it take

- 1) adverb + quantifier, such as “整整一年(a whole year)”.
- 2) adverb + verb + quantifier (as complement), such as “稍微坐一会儿(sit a little while)”.
- 3) adverb + verb + NP (with a quantifier as attribute), such as “一共吃了三碗饭(have eaten three bowls of rice altogether)”.

Once we say an adverb is a quantifier-cooperating adverb, it should fit in at least one of these three forms.

Secondly, the verb should have mutual selection and restriction with the quantifier in their co-occurrence. The work of looking for the mutual relation depends to a great extent upon our knowledge about the types of quantifiers, by which we can check whether an adverb choose a certain kind of quantifier to collocate with or contradict with a certain quantifier. A definite set of quantifier types, however, is so far not available, because it has been being studied by Chinese scholars and is then still an open set. Actually, the selection of possible quantifier-cooperating adverb is just an effective way in which we can find the types of quantifiers. In the present situation, we will take some prevalent concepts of antithetic pairs of quantifier type to do a preliminary investigation. The antithetic pairs are mostly set from a semantic perspective, including quantifier of imaginary quantity and quantifier of real quantity, quantifier of accurate quantity and quantifier of vague quantity, quantifier of subjective large quantity and quantifier of subjective small quantity ([17], [18], [19] and [20]). With these quantifier types we can find the selectivity of some possible quantifier-cooperating adverbs. Look at the following examples:

(20) *yigong wan le sanbai duo tian*
 一共 玩 了 三百 多 天
 altogether play Asp. 300 more day
 “played for more than 300 days altogether”

(20') *yigong wan le yixie tian*
 *一共 玩 了 一些 天

meaning of subjective large quantity)

(16) 两碗饭竟然吃饱了(getting stuffed with only two bowls of rice, here 竟然 makes the quantifier before it take meaning of subjective small quantity)

We think the adverbs in these phrases have not only relation to the quantifiers in front of them, but also relation to the constituents after them, which are often restricted specifically and have influence on interpretation of the quantitative meaning of the adverb. For example:

(17) (三碗饭能吃饱,)两碗饭就吃不饱了(getting not stuffed with two bowls of rice, here 就 does not have meaning of subjective quantity)

(18) 两碗饭都吃饱了(getting stuffed even with two bowls of rice, here 都 makes the quantifier before it take meaning of subjective small quantity)

(19) 两碗饭竟然吃不饱(getting not stuffed even with two bowls of rice, here 都 makes the quantifier before it take meaning of subjective large quantity)

The situation seems complicated and then will not be discussed in this paper. As for the forms in which the adverbs appear before the quantifiers, there some other ones except the three forms listed, such as “adverb + quantifier + verb”(略微一推), “adverb + VP with a quantifier in between the verb and its object (the quantifier is not attribute of the object nor complement of the verb) (稍微请个假), “adverb + verb + noun + quantifier” (一共生产煤炭三万吨), “adverb + preposition + quantifier + noun + verb + particle” (一共被十五家报纸转载过), etc. But according to our observation, once an adverb can appear in each of these forms, it can also appear in at least one of the three basic forms. So we just use the three basic forms to do the investigation.

	altogether	play	Asp.	some	day
(21)	<i>jinjin</i>	<i>wan</i>	<i>le</i>	<i>san</i>	<i>tian</i>
	仅仅	玩	了	三	天
	only	play	Asp.	three	day
	“played only three days”				
(21')	<i>jinjin</i>	<i>wan</i>	<i>le</i>	<i>haoduo</i>	<i>tian</i>
	*仅仅	玩	了	好多	天
	only	play	Asp.	many	day

In the above phrases, the adverb “一共(altogether)” collocates with the quantifier of real quantity “三百多天(more than 300 days)” rather than the quantifier of imaginary quantity “一些日子(some days)”; the adverb “仅仅(only)” selects the quantifier “三天(three days)” which does not have any subjective quantitative meaning rather than the quantifier of subjective large quantity “好多天(many days)”. A quantifier-cooperating adverb should have at least one kind of mutual selection with quantifier type.

Thirdly, the presence or absence of the adverb influences the quantitative meaning of the phrase in which the adverb and a quantifier co-occur. Since a quantifier always has certain kind of quantitative meaning, if the existence of the adverb has quantitative influence on the meaning of the whole phrase, it follows that the adverb quantitatively modifies and restricts the quantifier. The connotation of the quantitative meaning is quite rich and still being studied. The differentiation of subjective quantity and objective quantity is a very popular way to further elaborate meaning of quantity. Subjective quantity is quantity containing individual perspective, while objective quantity is quantity that has definite value and does not vary with human will. The prerequisite to name a quantifier-cooperating adverb is to find that its existence or not influences the subjective quantity value or objective quantity value of the quantitative meaning of the phrase it appears with a quantifier.

3.3. The quantifier-cooperating adverbs collected from our investigation. According to the above criteria, an investigation is carried out to determine the range of quantifier-cooperating adverbs in Chinese. The investigation shows that it is not easy task to get the accurate set of quantifier-cooperating adverbs due to the difficulty to judge the mutually selective relations between the enormous set of quantifiers and adverbs and the difficulty to judge the quantitative influence of adverbs upon the phrase containing it. With such an exploratory but comparatively strict procedure, however, the investigation is essentially distinct from existing similar studies. Through the survey, a much bigger set of quantifier-cooperating adverbs is obtained, containing quite many new members. As many adverbs have very close meaning, the set of quantifier-cooperating adverbs will be displayed in 23 small groups as below.¹⁰

¹⁰ Only the situation in which an adverb appears before a quantifier are taken into account in this paper, while the situation in which a quantifier appears before an adverb or the situation in which there are two quantifiers in both sides of

- 1) “一连”class, such as: 一连, 一连气, 连, 连连, 接连, 连着.
- 2) “一共”class, such as: 一共, 共, 总共, 合共, 一总, 共总, 计, 共计¹¹.
- 3) “拢共”class, such as: 拢共, 笼共, 通共, 统共, 满共, 拢总, 笼总, 笼笼总总, 笼里笼总, 打总儿.
- 4) “各”class, such as: 各.
- 5) “再”class, such as: 再, 还, 又, 另, 另外.
- 6) “相当”class, such as: 相当, 好.
- 7) “很”class, such as: 很, 颇, 挺, 可, 且.
- 8) “稍微”class, such as: 稍微, 稍, 稍为, 稍稍, 稍许, 稍略, 略微, 略, 略略, 略为, 微微, 小, 小小, 些微.
- 9) “多少”class, such as: 多少, 多多少少, 或多或少.
- 10) “没”class, such as: 没, 没有, 不.
- 11) “哪”class, such as: 哪, 哪里, 何曾, 未尝.
- 12) “整整”class, such as: 整整, 足足, 满满, 整, 足.
- 13) “恰好”class, such as: 恰好, 恰恰, 恰巧, 恰, 恰恰好, 正好, 正正, 正巧, 正正好, 刚刚, 刚, 刚好, 刚巧, 刚刚好, 赶巧, 偏巧, 巧巧, 不多不少, 准准.
- 14) “大约”class, such as: 大约, 大约摸(莫), 约摸(莫), 约略, 大概, 差不多.
- 15) “至少”class, such as: 至少, 最少, 顶少, 起码, 不止, 不只, 岂止.
- 16) “至多”class, such as: 至多, 最多, 顶多, 充其量.
- 17) “竟然”class, such as: 竟然, 竟, 居然.
- 18) “比较”class, such as: 比较, 偏, 要, 相对.
- 19) “更”class, such as: 更, 更加, 更为, 更要, 还, 还要, 尤其, 尤为.
- 20) “太”class, such as: 太, 过, 过于.
- 21) “到底”class, such as: 到底, 究竟.
- 22) “只”class, such as: 只, 仅, 仅仅, 仅只, 不过, 才, 就.
- 23) “都”class, such as: 都, 已经.

Some of the above classes have been mentioned in existing studies, such as “一共”class, “稍微”class, “多少”class, “整整”class, “再”class, “恰好”class, “大约”class, “至少”class, “至多”class, “竟然”class, “只”class, “都”class. We replenish a lot of members to many of these classes, such as 合共, 共总, 计, 共计, 总计, 合计, 累计 in “一共” class, 颇, 挺, 可, 且 in “很” class. Some of the above classes are firstly put forward as quantifier-cooperating adverbs, which will be stated a little more in detail and accompanied with some sentences containing them in the real corpus (mostly from <http://ccl.pku.edu.cn>).

Quantifier-cooperating adverbs of “一连” class imply subjective large quantity. For example:¹²

an adverb are neglected. Therefore, the performances of “才” and “就” are comparatively simple and can be classified among the “只” class.

¹¹ “共计” is labeled as a verb in *Modern Chinese Dictionary* (edition 5th and edition 6th). However, the word, though with a verbal component, shows the same function as “一共”, able to directly modify verbs or quantifiers while unable to take objects or aspect auxiliaries as a verb. Therefore, we regard it as an adverb rather than a verb.

¹² For simplicity, only the parts of the sentences, which contain the quantifier-cooperating adverbs and the quantifier and are underlined, will be translated into English in the brackets. In the underlined parts, emphasis points are used to indicate

(22)不料天不从人愿，当日就下起瓢泼大雨，而且一连下了三天。(have rained three consecutive days)

(23)病愈后，为了报答热情的观众，她连演了3场《玉堂春》。(have performed 3 times continuously)

(24)有趣的是，自八十年代以来，在陈云身边工作的同志接连生了9个女孩。(have given birth to 9 girls one after another)

(25)家珍那天 上被拖走后，我就 始倒霉了，连着输了好几把，眼看着桌上小山坡一样堆起的钱，像洗脚水倒了出去。(have lost many time on end)

Quantifier-cooperating adverbs of “拢共” class express meaning of number counting and imply subjective small quantity. For example:

(26)《优语录》拢共收了五十条：唐代八条，五代三条，南北朝三十八条，明代一条。(have only collected 50 items altogether)

(27)整个纽约统共有150多个诗歌表演场所。(there are just 150 or so... places in total)

(28)再说动弹不动弹一样，去年倒动弹来，满共打了七石粮，让日本人要了个光打光；一家四口人，不用说稠饭，喝稀饭也喝不 了。(have gained a total of 7 piculs of grain)

(29)在诊疗费用方面拢拢总总不超过三千，比起我多年的漫长求诊路费用只是冰山一角！(totally less than 3000 yuan)

Quantifier-cooperating adverb “各” express meaning of respective number counting. For example:

(30)当日 A 组和 C 组各进行了两场比赛。(had two matches respectively)

(31)会议上，北京市和房山区领导向房山区建筑企业的 1 0 0 个图书室，各赠送了 1 0 0 本书。(have sent each library 100 books)

Quantifier-cooperating adverbs of “相当” class imply subjective large quantity. For example:

(32)现在有相当一部分演员不热爱自己的事业。(a quite big part of)

(33)我想了好一会儿，还是回答他不知道。(quite a while)

Quantifier-cooperating adverbs of “没” class imply subjective small quantity. For example:

(34)我小时候没吃过几块糖，这不牙也掉没了？(have seldom eaten candies)

(35)原本父王就没有给他多少士兵。(had not given him many soldiers)

(36)但一旦治理好，昔日不值多少钱的荒山荒沟就变成金山银山，引起人们的注意了。(worth nothing)

Quantifier-cooperating adverbs of “哪” class imply subjective small quantity. For example:

the position of the adverbs and bold type to the quantifiers. The following examples will be treated in the same way.

(37)你去看看，偌大个赣州车站，哪有这么几个人在干活儿，全是第一流的大机械！
(there are few people working)

(38)他听了一笑，说：那时哪里有多少稿费，就几块钱，还不一定拿得到手。
(there is little contribution fee)

(39)因我年纪尚轻，未曾经历多少事情，凡事谨慎小心，丝毫不敢泄露，因此不便来西京寻访。(don't have much experience)

(40)可是世上又有如此多的辛酸苦难，残酷斗争，何尝有多少“诗意”？(there is little poetry within)

Quantifier-cooperating adverbs of “比较” class imply common comparative quantity. For example:

(41)比较严谨一点的作品里，这 人更少之又少。(a little more rigorous)

(42)相比之下,德国队失误更多,中国队发挥要稳定一些。(more steady)

(43)“过誉”是说，你对我的评价比我对自己的评价偏高了一些。(a little bit higher)

(44)内陆地区相对低一些，全国最低的最低工资标准为1 2 0元，主要在贫困地区。(a little bit lower comparatively)

Quantifier-cooperating adverbs of “更加” class imply remarkable comparative quantity. For example:

(45)红的灯光把欧阳天风的粉面照得更艳美了几分。(much more beautiful)

(46)因此，2004年中央一号文件的主题可以更加集中一点。(a little more concentrated)

(47)神像不大，比一个常人还小一些。(even smaller than an ordinary adult)

(48)说到底，人的本性都是贱的，男人尤其严重一些。(especially serious)

Quantifier-cooperating adverbs of “太” class imply super high quantity. For example:

(49)他们的办法太严了一点儿。(too rigorous)

(50)他们可能想得过于天真了一些，过于简单了一些，过于直线了一些，然而他们是真正热情地这样做过来的。(too naïvely, too simply, too directly)

Quantifier-cooperating adverbs of “到底” class imply query of quantity. For example:

(51)希腊警方正在对事件展 调查,目前还不清楚这只小船上到底有多少非法移民。(how many illegal immigrants there are after all)

(52)但“茶马古道”究竟有几条,一直众说纷纭。(how many Tea-Horse Roads there are exactly)

4. **Conclusions.** On the basis of existing relevant researches, this paper does a large-scale investigation through comparatively clear operating procedures and finds more than 100 quantifier-cooperating adverbs, which belong roughly to 23 small groups. A lot of adverbs are newly put forward as quantifier-cooperating adverbs, such as 一连, 各, 相当, 好, 没有, 不, 哪里, 相对, 比较, 更, 尤其, 太, 过于, 到底, etc. It proves that, the finding

procedure helps greatly to transfer the hazy language experience into rational and explicit language knowledge, making up for the shortcomings of relying merely upon the sporadic and unsystematic introspection. The result of the investigation lays the groundwork for the overall syntactic and semantic description of these adverbs and relevant Chinese phenomena and will certainly better the disposal of related problems in Chinese information processing and Chinese teaching as a second language. The formal and semantic classification of quantifier-cooperating adverbs is an interesting and meaningful job, which will be done in other papers.

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