

Classification of Adjectives in Mandarin Chinese*

Qian WANG

Department of East Asian Languages and Literatures
The Ohio State University

Abstract

This study situates Zhu's (1956/1980) two-way dichotomy between simple adjectives and complex adjectives under the framework of degree semantics. It proposes to analyze simple adjectives as gradable adjectives and complex adjectives as ungradable adjectives. This study argues that simple adjectives and complex adjectives are type-theoretically different: the former denotes direct measure functions from individuals to degrees (type $\langle e, d \rangle$), while the latter denotes properties of individuals (type $\langle e, t \rangle$). In addition, this study proposes a further categorization of gradable adjectives based on their scalar differences. It provides a semantically motivated account for the contrast in gradability and compatibility with degree adverbs between gradable adjectives and ungradable adjectives. It also accounts for various entailment relations of different subtypes of gradable adjectives. Findings of this study support the introduction of scale structure in teaching Chinese to help learners better understand their distribution pattern.

Keywords: classification of adjectives, scale structure, type-theoretical difference

* I thank the two anonymous reviewers of JCLT and the audience at The Chinese Language Teachers Association (CLTA) Annual Conference 2019 for their insightful comments. I also thank Professor Zhiguo Xie, Chaofen Sun and Baozhang He for their input. All remaining errors are mine.

1. Introduction: The Two-way Dichotomy

Chinese adjectives are traditionally categorized into simple adjectives and complex adjectives (Zhu 1956/1980; See also Lü 1984; Huang 1997, 2006; Paul 2006, 2010; among others). In Zhu's influential two-way dichotomy proposal (1956/1980), simple adjectives, as shown in (1), can either be monosyllabic (e.g., 大 *dà* 'big') or disyllabic (e.g., 乾淨 *gānjìng* 'clean'). Complex adjectives, as shown in (2), have three heterogeneous subcategories.¹ Complex adjectives can be constructed from the corresponding simple adjectives. For example, complex adjectives 乾乾淨淨 *gān gān jìng jìng* '(thoroughly) clean' and 冰涼 *bīngliáng* 'ice-cold' can be derived from simple adjectives 乾淨 *gānjìng* 'clean' and 涼 *liáng* 'cold' through reduplication and compounding, respectively.²

(1) simple adjectives

大 *dà* 'big', 快 *kuài* 'fast', 聰明 *cōngmíng* 'smart', 乾淨 *gānjìng* 'clean'

(2) complex adjectives

a. reduplicated adjectives in various reduplication patterns (e.g., 遠遠兒 *yuǎnyuǎn-er*, 乾乾淨淨 *gān gān jìng jìng* '(thoroughly) clean', 糊里

¹ In Zhu (1956/1980), there is a fourth subcategory of complex adjectives, i.e., adjectival phrases in the form of 'adverb + adjective' (e.g., 很大 *hěn dà* 'very big', 非常漂亮 *fēicháng piàoliang* 'extremely beautiful'). This study follows Paul (2006) in excluding 'adverb + adjective' from the category of complex adjectives, because it is typologically odd to subsume adjectival phrases under the lexical category of adjectives. I thank the reviewers for their constructive comments that led to this modification.

² One anonymous reviewer questions whether simple adjectives can be distinguished from complex adjectives from the morphological perspective. Specifically, the review asks why 乾淨 *gānjìng* 'clean' is categorized as a simple adjective while 冰涼 *bīngliáng* 'ice-cold' a complex adjective given that both of them are compound words. According to Zhu (1956/1980), complex adjectives such as 冰涼 *bīngliáng* 'ice-cold' differ from disyllabic simple adjectives such as 乾淨 *gānjìng* 'clean' in the following two ways. First, they differ in reduplication patterns. The reduplicated form of the former is ABAB (e.g., 冰涼冰涼 *bīng liáng bīng liáng* 'ice-cold') while that of the latter is AABB (e.g., 乾乾淨淨 *gān gān jìng jìng* '(thoroughly) clean'). Second, 冰涼 *bīngliáng* 'ice-cold' is a modifier-head compound in which the preceding element modifies the element that follows. 乾淨 *gānjìng* 'clean', on the other hand, does not have a modifier-head structure. Thus, the binary categorization of simple adjectives and complex adjectives is supported from the semantic perspective as well as the morphosyntactic perspective.

糊塗 *hú li hú tu* ‘muddleheaded’)

- b. adjectives with ‘lively’ suffixes³ (e.g., 亂哄哄 *luàn hōng-hōng* ‘chaotic and noisy’, 酸不拉唧 *suān bù-lā-jī* ‘(unpleasantly) sour’)
- c. modifier-head compound adjectives⁴ in which the preceding element modifies the element that follows (e.g., 冰涼 *bīngliáng* ‘ice-cold’, 筆直 *bǐzhí lit.* ‘brush-straight’ ‘perfectly straight’)

Complex adjectives in (2) differ from simple adjectives in (1) in their compatibility with degree adverbs such as 很 *hěn* ‘very’, and *bǐ*-comparatives. Complex adjectives cannot co-occur with degree adverbs such as 很 *hěn* ‘very’, 非常 *fēicháng* ‘especially’, and 特別 *tèbié* ‘particularly’ while simple adjectives can. See the contrast between (3a) and (3b). Given that degree adverbs such as 很 *hěn* ‘very’, 非常 *fēicháng* ‘especially’, and 特別 *tèbié* ‘particularly’ intensifies the degree to which an adjective holds its argument, compatibility differences with these degree modifiers reveal a contrast in gradability between simple adjectives and complex adjectives. Simple adjectives are gradable, and complex adjectives are not. Gradability can also be testified via compatibility with *bǐ*-comparatives. Complex adjectives cannot occur in *bǐ*-comparatives while simple adjectives can. See the contrast between (3c) and (3d). The above discussion suggests that Zhu’s distinction between simple adjectives and complex adjectives corresponds to the distinction between gradable adjectives and non-gradable adjectives.

(3) compatibility with degree adverbs and *bǐ*-comparatives

- a. 這個房間 {很/非常/特別} 乾淨。 simple adjectives
Zhè-gè fángjiān {hěn/fēicháng/tèbié} gānjìng
 this-CL room very especially particularly clean
 ‘This room is {very/especially/particularly} clean.’

³ This term is cited from Huang (2006).

⁴ This subcategory is cited from Tang 1988. Zhu (1956/1980) identifies this category by listing examples. Tang names this category by their syntactic features.

- b. *這個房間 {很／非常／特別} 乾乾淨淨。 complex adjectives
 *Zhè-gè fángjiān {hěn /fēicháng /tèbié} gān gān jìng jìng
 this-CL room very especially particularly (thoroughly) clean
 intended: ‘This room is {very/especially/particularly} clean.’
- c. 這個房間比那個乾淨。 simple adjectives
 Zhè-ge fáng jiān bǐ nà-ge gān jìng
 this-CL room than that-CL clean
 ‘This room is cleaner than that one.’
- d. *這個房間比那個乾乾淨淨。 complex adjectives
 * Zhè-ge fáng jiān bǐ nà-ge gān gān jìng jìng
 this-CL room than that-CL (thoroughly) clean

Approaching gradability from the perspective of quantity properties (數量特徵 *shùliàng tèzhēng*, Shi 1991), Shi (1991, 2001) distinguishes unquantified adjectives (非定量形容詞 *fēi dìngliàng xíngróngcí*) from quantified adjectives (定量形容詞 *dìngliàng xíngróngcí*). The former group denotes three identifiable quantity levels (量級 *liàngjí*) diagnosed by an adjective’s compatibility with degree adverbs: 有點 *yǒu diǎn* ‘slightly’, 很 *hěn* ‘very’, and 最 *zuì* ‘the most, -est’. The latter group does not have identifiable quantity levels and is not compatible with any of the three degree adverbs. The former group includes adjectives such as 大 *dà* ‘big’, 漂亮 *piàoliàng* ‘beautiful’ and the latter group includes adjectives such as 疑難 *yínán* ‘difficult’ and 冰涼 *bīngliáng* ‘ice-cold’. The quantity properties differences in Shi (1991, 2001) is re-interpreted by Shen (1995) as a difference in boundedness (有界性 *yǒujièxìng*) in cognitive perception. Shen distinguishes bounded adjectives from unbounded adjectives. The former is associated with a boundary while the latter is not. To summarize, the consensus shared in many previous studies (e.g., Zhu 1956/1980; Shi 1991, 2001; Shen 1995; Zhang 2000, 2006; Paul 2006; among others) is that there is a two-way dichotomy in adjectives in Mandarin Chinese.⁵ One group is

⁵ Though the two-way categorization is widely supported in the literature, there are studies that propose finer-grained categorizations of adjectives in Mandarin Chinese. For instance, Shi (2003) identifies four categories: degree adjectives, percent adjectives, limit adjectives, and positive-negative adjectives. Piao (2009) proposes a

gradable/unquantified/unbounded. The other group is non-gradable/quantified/bounded. For clarity and consistency, the two-way classification is referred to as the distinction between gradable adjectives and non-gradable adjectives thereafter. Building on the above insight, I situate the traditional two-way distinction of adjectives in Mandarin Chinese under the framework of degree semantics and propose a type-theoretical based categorization of adjectives in Mandarin Chinese.

2. Type-theoretical Differences

Under the framework of degree semantics, I propose to model the observed gradability distinction in terms of type-theoretical differences: non-gradable adjectives are property-denoting, and gradable adjectives are not in Mandarin Chinese. Non-gradable adjectives are of type $\langle e, t \rangle$, and gradable adjectives are of type $\langle e, d \rangle$. This type-theoretical analysis provides a natural explanation to the compatibility contrast with degree modifiers in (3). In (3b), because the predicate 乾乾淨淨 *gān gān jìng jìng* ‘(thoroughly) clean’ is a non-gradable adjective, it is of type $\langle e, t \rangle$ under the proposed analysis. Thus, it can denotate properties by itself, and the occurrence of degree modifiers renders (3b) ungrammatical. In contrast, the predicate 乾淨 *gānjìng* ‘clean’ is a gradable adjective in (3a), and it is not property-denoting under the current proposal. In other words, the (non)co-occurrence of degree modifiers with adjectives in the predicate position is reduced to the determination of the semantic type of the adjective in question. If the adjective is a gradable adjective of type $\langle e, d \rangle$, a degree modifier might occur. If the adjective is a non-gradable adjective of type $\langle e, t \rangle$, the occurrence of a degree modifier is prohibited.

In addition, the proposed type-theoretical analysis echoes Zhu’s (1956/1980) original discussion on semantic denotational differences between gradable adjectives and non-gradable adjectives. Zhu claims that gradable adjectives describe qualities (性質 *xìngzhì*) while non-gradable adjectives describe the state

five-way categorization based on their compatibilities with pre-adjective degree adverbs 稍 *shāo* ‘slightly,’ 比較 *bǐjiào* ‘comparatively,’ 最 *zuì* ‘most,’ and 很 *hěn* ‘very.’

or mood of those qualities (性質的狀況或情態 *xìngzhì de zhuàngkuàng huò qíngtài*). For instance, a non-gradable adjective 乾乾淨淨 *gān gān jìng jìng* ‘(thoroughly) clean’ differs from the counterpart gradable adjective 乾淨 *gānjìng* ‘clean’ in introducing speakers’ subject evaluation. A non-gradable adjective 冰涼 *bīngliáng* ‘ice-cold’ specifies the extent of coldness to be “as ice” while the corresponding gradable adjective 涼 *liáng* ‘cold’ solely refers to the property of being cold. In other words, gradable adjectives denote qualities while non-gradable adjectives express qualities along with modifications or speakers’ subject evaluation of those properties in Zhu 1956/1980.

These denotational contrasts are materialized as type-theoretical differences in this paper. Under the current proposal, non-gradable adjectives are analyzed as type $\langle e, t \rangle$, that is, functions from individuals to truth values. This treatment is in line with Zhu’s claim that non-gradable adjectives state speakers’ judgement of the relevant properties or denote modified degrees. On the other hand, gradable adjectives are analyzed as direct measure functions from individuals to degrees ($\langle e, d \rangle$) following Bartsch and Vennemann (1973) and Kennedy (1999, 2007). Under the current proposal, gradable adjectives in Mandarin Chinese map individuals to the degrees that they possess on the relevant scale. A scale is an abstract representation of measurement or degrees that are totally ordered along some dimension (e.g., height, speed). For instance, a gradable adjective such as 高 *gāo* ‘tall’ maps an individual to the degree of tallness that the individual possesses along the dimension of height. See (4) for a formalization. Formalization under the degree semantics approach not only agrees with Zhu’s claim that gradable adjectives in Mandarin Chinese denote qualities but also specifies how qualities are denoted, i.e., via direct measure functions from individuals to degrees.⁶

⁶ There is another approach in formalizing the denotation of gradable adjectives. Instead of treating gradable adjectives as direct measure functions (type $\langle e, d \rangle$), the other approach suggests that gradable adjectives denote relations between degrees and individuals (type $\langle d, \langle e, t \rangle \rangle$) (Cresswell 1976; Kennedy and McNally 2005). See (a) and (b) for formalizations, respectively. For the purpose of this paper, the choice of either approach does not affect the core argumentation, that is, gradable adjectives are non-property-denoting in Mandarin Chinese.

$$(4) \llbracket \textit{gao} \rrbracket_{\langle e, d \rangle} = \lambda x. \text{height}(x) \quad (\text{measure function approach})$$

In addition, this analysis introduces the concept of scale, which allows subcategorizations of gradable adjectives under the degree semantics framework. Under this approach, a gradable adjective lexicalizes a certain scale on to which an individual-type argument is mapped along a dimension. Scales can differ in dimension (e.g., height, width, temperature, etc.), ordering relation (e.g., an increasing ordering relationship for *tall*, a decreasing ordering relationship for *short*), and whether to have endpoints (e.g., a maximum endpoint for *straight*, a minimum endpoint for *bent*, no endpoint for *tall*). Thus, introduction of gradable adjectives as mapping relationship between individuals and degrees on scales allow for further categorizations based on gradable adjectives' different scale structures. Detailed discussion is presented in section 3.

Furthermore, the current proposal improves upon Huang's (1997, 2006) type-theoretical analysis of adjectives in Mandarin Chinese. The current analysis crucially differs from Huang's (1997, 2006) study in treating gradable adjectives as direct measure functions of type $\langle e, d \rangle$ instead of nominalized properties of type $\langle e \rangle$. Building on examples in (5) and (6), Huang (1997, 2006) claims that simple adjectives such as 勤奮 *qínfèn* 'diligent' and 貧窮 *pínqióng* 'poor' are type $\langle e \rangle$ elements and 很 *hěn* + *gradable adjective* such as 很勤奮 *hěn qínfèn* 'very diligent' and 很貧窮 *hěn pínqióng* 'very poor' are of type $\langle e, t \rangle$. Following property theory (Chierchia 1984), Huang claims that gradable adjectives in Mandarin Chinese are nominalized properties because they can appear in subject position in (5a) object position in (5b). In addition, Huang claims that 很 *hěn* + *gradable adjective* are of type $\langle e, t \rangle$ because they can appear in the predicate position in (6a) and (6b).⁷

(a) $\llbracket \textit{tall} \rrbracket_{\langle d, \langle e, t \rangle \rangle} = \lambda d \langle d \rangle \lambda x \langle e \rangle. \text{height}(x) \geq d$ (relational approach, $g_{\langle d, \langle e, t \rangle \rangle}$)

(b) $\llbracket \textit{tall} \rrbracket_{\langle e, d \rangle} = \lambda x. \text{height}(x)$ (measure function approach, $g_{\langle e, d \rangle}$)

⁷ One anonymous reviewer asks how the direct measure function-based analysis of gradable adjectives can account for examples such as (5a) and (5b) in which gradable adjectives occur in subject or object position. This comment raises a more fundamental question: how lexical categories should be determined in Mandarin Chinese. More specifically: What are the lexical meanings and syntactic features that set adjectives apart from other lexical categories? As for lexical semantics, gradable

- (5) a. 勤奮是一個美德。

Qínfèn shì yí gè měi-dé.

diligent COP one-CL beautiful virtue

‘Diligence is a beautiful virtue.’ (Huang 2006:349)

- b. 我們要戰勝貧窮。

Wǒ-men yào zhànshèng pínqióng.

we want overcome poverty

‘We want to wipe out poverty.’ (Huang 2006:350)

- (6) a. 他很勤奮。

Tā hěn qínfèn.

she very diligent

‘She is very diligent.’ (Huang 2006:349)

- b. 他們那個地區很貧窮。

Tā-men nèi-ge dì-qū hěn pínqióng.

they that region very poor

‘Their region is very poor.’ (Huang 2006:350)

Huang (1997, 2006) suggests that 很 *hěn* in Mandarin Chinese is a type lifter of type <e, <e, t>> based on examples in (5) and (6). Huang claims that its function is to save the type mismatch between the simple adjective 勤奮 *qínfèn* ‘diligent’ (type <e>), and the adjectival phrase 很勤奮 *hěn qínfèn* ‘very diligent’ (type <e, t>). In other words, 很 *hěn* is a lexicalized Predicator (PRED) operator whose function is to make 很 *hěn* + gradable adjective eligible as a predicate. Though Huang’s claim is intriguing, it wrongly predicts that 很 *hěn* ‘very’ is mandatory when gradable adjectives are used alone as predicates. Contradictory to Huang’s predictions, a gradable adjective can function alone as a predicate in

adjectives describe qualities (性質 *xìngzhì*) while non-gradable adjectives describe the state or mood of those qualities (性質的狀況或情態 *xìngzhì de zhuàngkuàng huò qíngtài*) (Zhu 1956/1980). As for syntactic features, adjectives typically occur in the attributive, predicative, and adverbial positions. Given that adjectives in (5a) and (5b) do not describe qualities or the state of mood of those qualities and occur in positions which are typically filled by nouns, (5a) and (5b) do not represent the typical usage of adjectives. Given that the adjectives in (5a) and (5b) occur in nominal positions, they are proposed to be analyzed on a par with nouns in terms of semantics.

sentences (Zhu 1956/1980; Paris 1989; Paul 2010; Wang 2015). See the example in (7).

(7) 這本書貴。

Zhè běn shū guì.
this CL book expensive

‘This book is more expensive.’ (Paris 1989:112)

To summarize, this study supports the traditional two-way categorization of adjectives in Mandarin Chinese and proposes a type-theoretical distinction between gradable adjectives and non-gradable adjectives. Under the current proposal, gradable adjectives are direct measure functions of type $\langle e, d \rangle$, and non-gradable adjectives are property-denotating $\langle e, t \rangle$ elements. It successfully accounts for the compatibility differences between gradable adjectives and non-gradable adjective with respect to pre-adjectival degree modifiers such as 很 *hěn* ‘very’. It also captures the original denotation differences discussed in Zhu 1956/1980 and improves upon Huang’s (1997, 2006) type-theoretical analysis. Last, this study situates the traditional two-way distinction under the framework of degree semantics. By viewing gradable adjectives as direct measure functions from individuals to degrees, it introduces the concept of *scale*. Given that scales differ in dimension, ordering relationship, and whether they have endpoints, the type $\langle e, d \rangle$ treatment of gradable adjectives allows further subcategorization within gradable adjectives.⁸

⁸ This paper focuses on the distinction between simple adjectives and complex adjectives in the predicate position. I argue that the simple adjectives are of type $\langle e, d \rangle$ and complex adjectives are of type $\langle e, t \rangle$. In addition, I suggest that the proposed type-theoretical difference can potentially be extended to account for the distribution of simple adjectives and complex adjectives in the attributive position. When used attributively, simple adjectives differ from complex adjectives in their eligibility to appear to the left of the numeral + classifier. See the contrast between (a) and (b). In (a), the simple adjective 糊塗 *hú tu* ‘muddleheaded’ cannot appear to the left of the numeral + classifier. In contrast, the complex adjective 很糊塗 *hěn hú tu* ‘very muddleheaded’ in (b) can. Assuming that not all prenominal adjectival modification can be analyzed as relative adjectives (Paul 2005; cf. Sproat and Shih 1988), the contrast in grammaticality between (a) and (b) fits the generalization that unless preceded by a demonstrative, relative clauses can appear to the left of numeral +

3. Scale Structure and Subcategorization of Gradable Adjectives in Mandarin Chinese

3.1 The Inventory of Scale Structures

In the previous sections, I proposed to analyze gradable adjectives as direct measure functions from individuals to degrees. Such treatment introduces scale, which allows an exploration of scale structural differences within gradable adjectives and leads to subcategorizations of gradable adjectives. In this section, I will introduce the inventory of scale structures of gradable adjectives according to whether they have built-in endpoints. The scale of a gradable adjective can have no endpoints and be open on both sides or it can have at least one endpoint and be closed on at least one side. Thus, gradable adjectives can be further

classifier and attributives cannot (Paul 2005). In other words, the *complex adjective + de* in (b) can be analyzed as a relative clause and the *simple adjective + (de)* in (a) cannot. The observed contrast in syntactic status between (a) and (b) can potentially be accounted for by the proposed type-theoretical difference between complex adjectives and simple adjectives. The property-denoting <e, t> semantic type of a complex adjective matches its syntactic eligibility to occur as a relative clause in a prenominal position. In contrast, the non-property-denoting <e, d> semantic type of a simple adjective potentially disqualifies it from occurring as a relative clause.

Similarly, this type-theoretical difference-based account can potentially be extended to (c) and (d) as well. (a) and (b) can be derived from (c) and (d), respectively, via a focus-driven movement. However, given the syntactic constraint on the left peripheral of number + classifier, (a) is deemed ungrammatical given its non-relative clause syntactic status. Given the grammaticality contrast between (a) and (b), 糊塗 *hú tu* ‘muddleheaded’ and 很糊塗 *hěn hú tu* ‘very muddleheaded’ should be analyzed as an attributive in (c) and a relative clause in (d), which matches the proposed type-theoretical difference between simple adjectives and complex adjectives. I acknowledge that the above reasoning overlooks the semantic function of *de* in *Adjective + (de)* and I hope to return to this topic in future research. I thank an anonymous reviewer for bring prenominal modification to my attention and for providing the two examples in (c)-(d).

- | | |
|--|--|
| <p>(a) *糊塗 (的) 一個孩子
 <i>*hú tu (de) yí gè hái zi</i>
 Muddleheaded DE one CL child
 intended ‘a child who is muddleheaded’</p> | <p>(b) [很糊塗的]一個孩子
 <i>hěn hú tu de yí gè hái zi</i>
 very muddleheaded DE one CL child
 ‘a child who is very muddleheaded’</p> |
| <p>(c) 一個糊塗的孩子
 <i>yí gè hú tu (de) hái zi</i>
 one CL muddleheaded DE child
 ‘a muddleheaded child’</p> | <p>(d) 一個很糊塗的孩子
 <i>yí gè hěn hú tu (de) hái zi</i>
 one CL very muddleheaded DE child
 ‘a child who is very muddleheaded’</p> |

divided into open scale gradable adjectives and closed scale gradable adjectives according to whether their scales have endpoints. Within closed scale gradable adjectives, according to which end is closed, they can be further categorized into upper closed, lower closed, and totally closed.

Because open scale gradable adjectives and closed scale gradable adjectives interact with contextual information differently, they are also referred to as relative adjectives and absolute adjectives, respectively. The interpretation of a relative adjective is ‘relative’ to context while that of an absolute adjective is ‘absolute’ to context. The former shows a high level of context-sensitivity while the latter shows much less. The interpretation of a relative adjective such as *tall* is highly context-sensitive because the comparison class and standard of comparison change across contexts. Different sets of individuals are picked out as relevant to the predication under discussion, which in turn generates different cut-off points across contexts. For example, in (8), the standard that is used to determine whether John is tall varies with the comparison class in different contexts. When the context is set to discuss the height of basketball players, the threshold in determining whether an individual is tall is set to a higher value. However, the threshold will be much lower if the height of gymnasts is under discussion. Thus, John’s height being the same, he can be tall for a gymnast but not for a basketball player.

(8) John is tall.

Different from relative adjectives such as *tall*, there is another subgroup of gradable adjectives such as *open* that shows much less context-sensitivity. This subgroup is referred to as absolute adjectives. For instance, in (9a), the predication is true iff there is an aperture. In other words, the predication in (9a) is true iff the door possesses some minimum degree of openness. However, the predication in (9b) is true iff the door is fully open, i.e., possessing a maximal degree of openness. In other words, the standard of comparison for the absolute adjective *open* is a minimum degree of openness in (9a) but a maximum degree of openness in (9b). Thus, *open* is a totally closed scale adjective, whose scale is closed on both ends, and its standard of comparison is fixed to either the

minimum or the maximum endpoint.

- (9) a. The door is open. (totally closed scale, minimum endpoint)
b. The door is completely open. (totally closed scale, maximum endpoint)

Besides the totally closed scale as in *open*, the scale structure of an absolute adjective can be partially closed as well, which yields either an upper closed scale or a lower closed scale. The upper closed scale structure only has the maximum endpoints but no minimum endpoints, while the opposite is true for the lower closed scale structure. For example, *straight* in (10) is an absolute adjective with a maximum endpoint on its scale. (10) is true just in a case where the rod is completely straight, i.e., the rod reaches the maximum degree of straightness on the scale. The standard of comparison, i.e., the maximum endpoint is fixed on the scale of straightness. Conversely, *bent* in (11) is an absolute adjective with a minimum endpoint on its scale. (11) is true just in a case where the rod has some degree of bentness, i.e., exceeds the minimum endpoint of the scale.

- (10) The rod is straight. (upper closed scale, maximum endpoint)
(11) The rod is bent. (lower closed scale, minimum endpoint)

The above discussion suggests that the standard for the interpretation of an absolute adjective is inherently set to be the (maximal or minimum) endpoint. In contrast, the standard of comparison for the interpretation of a relative adjective is contextually determined. It varies in different contexts. The difference between relative adjectives and absolute adjectives in their choice of standard of comparison is linked to their scale structural differences: scales that relative adjectives use do not have endpoints and those that absolute adjectives use do (Kennedy 2007).

To summarize, depending on its standard of comparison and scale structure, a gradable adjective can either be categorized as a relative adjective or an absolute adjective (Kennedy and McNally 2005, Kennedy 2007). Relative adjectives such as *tall* have a totally open scale structure, which has no maximum or minimum endpoints. Thus, the standard of comparison can fall on any point on the totally open scale, depending on the comparison class provided by the context.

On the other hand, absolute adjectives have closed (totally or partially) scales, and their standard of comparison corresponds to either the maximum or the minimum endpoint of the scale. See Table 1 for a summary.

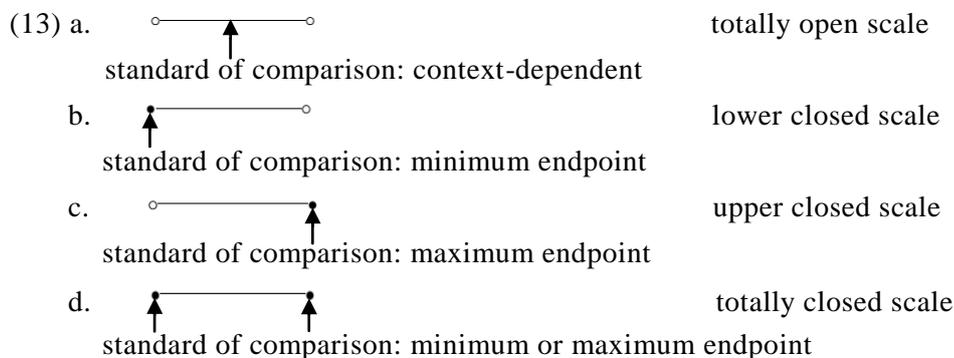
Table 1: The Categorization of Gradable Adjectives

		Scale structure	Standard of Comparison
Gradable Adjectives	Relative	totally open	context dependent
	Absolute Adjective	minimally closed	minimum endpoint
		maximally closed	maximum endpoint
		totally closed	maximum or minimum endpoint

3.2 The (Un)Reliability of the Use of Degree Modifiers as Diagnostics

After introducing the scale structure inventory, I proceed to discuss diagnostics to test for each scale structure in Mandarin Chinese. In this section, I first introduce the use of degree modifiers to diagnose the scale structure of gradable adjectives in English. Then I show that it is not a reliable diagnostic in distinguishing different scale structures among gradable adjectives in Mandarin Chinese. In English, to test whether a scale of a gradable adjective has endpoints, a set of degree modifiers was used to probe the maximal and minimal endpoint of a scale (Rotstein and Winter 2004; Kennedy and McNally 2005). Across a wide range of examples, the degree adverbs *perfectly* and *slightly* consistently pick out the maximal and minimal endpoints, respectively. As shown in (12a), neither *perfectly* nor *slightly* is compatible with gradable adjectives such as *tall*, *short*, *big*, and *small*. Given that *perfectly* and *slightly* pick out the maximal and minimal endpoint, respectively, the unacceptability of (12a) indicates that gradable adjectives such as *tall*, *short*, *big*, and *small* are relative adjectives with totally open scales. For this group of gradable adjectives, *X is A* is true iff the degree to which X is A exceeds some context-dependent standard of comparison. See (13a) for a visualization.

- (12) a. ??perfectly/??slightly {tall, big, short, small} totally open scale
 b. ??perfectly/slightly {bent, dirty, dangerous} lower closed scale
 c. perfectly/??slightly {straight, clean, safe} upper closed scale
 d. perfectly/slightly {open, full, closed, empty} totally closed scales



Different from relative adjectives, absolute adjectives have scales that are closed on at least one end. For absolute adjectives, the standard of comparison is fixed to either the maximum or minimum endpoint of a scale. Depending on whether a scale is closed on the upper and/or lower end, absolute adjectives can be divided into three subgroups: lower closed, upper closed, and totally closed. The three subgroups show different acceptability pattern with *slightly* and *perfectly*. In (12b), absolute adjectives such as *bent* and *dirty* are compatible with *slightly* but not *perfectly*, which indicates that this group of gradable adjectives have minimum endpoints but no maximum endpoints. See the scheme in (13b). For this group of absolute adjectives, the predication of the form *X is A* is true iff X has a non-zero degree of the relevant concept. Different from totally open scale adjectives in (12a), the standard of comparison of lower closed adjectives in (12b) is fixed to their minimum endpoints. On the other hand, upper closed scale adjectives in (12c) show an opposite pattern in their acceptability with degree modifiers *perfectly* and *slightly*. They are compatible with the former but not the latter which echoes the hypothesis that scales of absolute adjectives such as *straight* and *clean* are upper closed and the standard of comparison is fixed to the maximum endpoint. See the scheme in (13c). Absolute adjectives in (12d) are compatible with both *slightly* and *perfectly*, which indicates that they have both minimum and maximum endpoints on their scales. Totally closed scale adjectives show interpretive variability in the positive form because their standard of comparison can either be the maximum endpoint or the minimum endpoint in different contexts.

However, diagnostics based on the acceptability of degree modifiers do not work effectively in Mandarin Chinese (See also Lin and Peck 2016; Sun 2020). As shown in (14)-(17), degree modifiers that target on the maximum degree such as 完全 *wán quán* ‘completely’ and 百分之百 *bǎi fēn zhī bǎi* ‘100%’ are consistently incompatible with gradable adjectives regardless of their scale structures. In addition, degree modifiers that target the minimum degree such as 有一點 *yǒu yì diǎn* and 稍 *shāo* are compatible with almost all gradable adjectives regardless of their scale structures. In short, the acceptability pattern of degree modifiers in (13) does not hold for the corresponding Mandarin data in (14)-(17).

- (14) a. ??完全/??全/??全部/??百分之百 {高, 大, 矮, 小} totally open scales
 ??*wán quán*/ ??*quán*/ ??*quán bù*/ ??*bǎi fēn zhī bǎi* {*gāo, dà, ǎi, xiǎo*}
 completely/ fully/ fully/ 100% tall big short small
 ‘??completely/ ?? fully/ ??fully/ ??100% {tall, big, expensive, short, small, inexpensive}’
- b. 有一點/稍 {高, 大, 矮, 小}
yǒu yì diǎn/ shāo {*gāo, dà, ǎi, xiǎo*}
 a bit slightly tall big short small
 ‘a bit/slightly too {tall, big, short, small}’
- (15) a. ??完全/??全/??全部/??百分之百 {彎, 髒} lower closed scale
 ??*wán quán*/ ??*quán*/ ??*quán bù*/ ??*bǎi fēn zhī bǎi* {*wān, zāng*}
 completely/ fully/ fully/ 100% bent dirty
 ‘??completely/ ??fully/ ??fully/ ??100% {bent, dirty, dangerous}’
- b. 有一點/稍 {彎, 髒}
yǒu yì diǎn/ shāo {*wān, zāng*}
 a bit slightly bent dirty
 ‘a bit/slightly (too) {bent, dirty}’
- (16) a. ??完全/??全/??全部/??百分之百 {直, 乾淨} upper closed scale
 ??*wán quán*/ ??*quán*/ ??*quán bù*/ ??*bǎi fēn zhī bǎi* {*zhí, gān jìng*}
 completely/ fully/ fully/ 100% straight clean
 intended: ‘completely/100% {straight, clean}’

- b. 有一點/稍 {直, 乾淨}
- yǒu yì diǎn/ shāo {zhí, gān jìng}*
- a bit slightly straight clean
- ‘a bit/slightly too {straight, clean}’
- (17) a. ??完全/?全/??全部/??百分之百 {開, 滿, 關, 空} totally closed scales
- ??wán quán/??quán/??quán bù/??bǎi fén zhī bǎi {kāi, mǎn, guān, kōng}
- completely/ fully/ fully/ 100% open full closed empty
- intended: ‘completely/fully/100% {open, full, closed, empty}’
- b. 有一點/稍 {??開, 滿, ??關, 空}
- yǒu yì diǎn/ shāo {??kāi, mǎn, ??guān, kōng}*
- a bit slightly open full closed empty
- ‘a bit/slightly (too) {full, empty}’
- intended: ‘a bit/slightly {open, closed}’

The reasons why endpoint-oriented degree modifiers do not work effectively as a diagnostic in Mandarin Chinese might include: First, the concept of reaching endpoint degrees can be readily expressed through non-gradable adjectives in Mandarin Chinese. This can be expressed in the form of reduplication (e.g., 滿滿 (當當) *mǎn mǎn (dāng dāng)* ‘completely full’), in the form of adjectives with ‘lively suffixes’ (e.g., 空蕩蕩 *kōng dàng dàng* ‘completely empty’), and in the form of a modifier-head compound (e.g., 筆直 *bǐ-zhí* ‘perfectly straight’). Second, endpoint degrees can also be expressed through the addition of a resultative complement to a gradable adjective. For instance, 透 *tòu* ‘fully’ can be attached to gradable adjectives such as 乾 *gān* ‘dry’ to form a phrase 乾透 *gān tòu* to mean ‘fully dry’. This study suggests that the availability of competing linguistic forms for the same function eliminates the necessity of using endpoint-oriented degree modifiers to express endpoint degrees in Mandarin Chinese.⁹ Thus, endpoint-oriented degree modifiers do not constitute a

⁹ On a related note, extreme degree adverbs (極度副詞 *jídù fùcí*), like endpoint-oriented degree adverbs, are not an effective diagnostic in Mandarin Chinese either. Extreme degree adverbs include (but are not limited to) 最 *zuì*, 極 *jí*, 窮 *qióng*, 絕 *jué*, 盡 *jìn*, 至 *zhì* (all roughly mean ‘extremely’). Their grammaticalization process of changing into degree adverbs was completed by the

successful diagnostic in Mandarin Chinese.

3.3 Diagnostics Based on Entailment Pattern

Though endpoint-oriented degree modifiers do not work effectively in diagnosing scale structural differences in Mandarin Chinese, there are entailment-based diagnostics to successfully differentiate all four types of scale structures (totally open, totally closed, upper closed, lower closed) in gradable adjectives in Mandarin Chinese. In this section, I first apply diagnostic tests from Kennedy and McNally 2005 and Kennedy 2007 in Mandarin Chinese to show that gradable adjectives of different scale structures have different entailment patterns. In addition, I propose a new diagnostic test for the relative/absolute distinction in Mandarin Chinese based on whether a gradable adjective gives rise to an excessive reading in the Adjective + aspectual *le* structure.

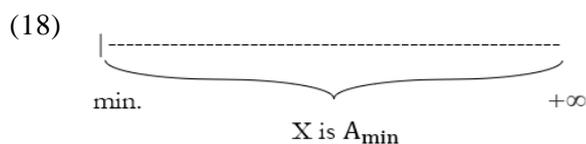
The core hypothesis underlying the proposed diagnostic tests is the scale structural contrast between relative adjectives and absolute adjectives. Absolute adjectives have built-in endpoints on their scales and relative adjectives do not. As a result, absolute adjectives employ an endpoint-oriented standard of comparison, and relative adjectives employ a context-dependent, non-endpoint-oriented standard of comparison. Thus, given the structural differences between absolute adjectives and relative adjectives, these two categories of adjectives are predicted to have different entailment patterns when negated, used in comparatives, used in antonymous pairs, and used in the Adjective + aspectual *le* structure. This prediction is borne out, as shown by the

Han Dynasty (Li 1992; Su 2011). According to Su 2011, 最 *zuì* and 極 *jí* originate from their original nominal denotation of the highest rank/point; 至 *zhì* and 窮 *qióng* originate from their verbal denotation of reaching the finish line/extreme; 絕 *jué* and 盡 *jìn* originate from their verbal denotation of exhaustion. The semantic shift of this set of ‘extreme degree adverbs’ reveals the crucial difference between them and endpoint-oriented degree adverbs. The semantic foci of the former are on the highest possible degree of the relevant concept, while the latter targets on the maximum endpoint. These ‘extreme degree adverbs’ are functionally comparable to the superlatives in Modern Chinese, evidenced by their translation in Modern Chinese using superlative markers such as 最 *zuì* and 極 *jí*. As a result, this set of degree adverbs are compatible with gradable adjectives, regardless of their scale structures, and therefore are not good candidates for testing endpoints on a scale.

rest of this section.

3.3.1 Testing for the Minimum Endpoint

In this subsection, I will present data to show that in Mandarin Chinese if a gradable adjective yields contradiction in *X is not A but X has some degree of A-ness*, it has a built-in minimum endpoint on its scale. If *A* is an absolute adjective with a minimum endpoint, noted as A_{min} , a sentence of the form *X is A_{min}* is true iff the degree to which *x* is A_{min} exceeds the minimum endpoint. See (18) for an illustration. Assuming the minimum endpoint corresponds to a zero degree of the relevant property, *X is A_{min}* is true iff *X* possesses a non-zero degree of *A-ness*. Thus, a negation in the form *X is not A_{min}* equals the denial of any possession of the relevant property. It is predicted to contradict any predication that claims a possession of a non-zero degree of the concept denoted by A_{min} . The predicted contradiction is borne out, as shown by examples in English in (19a) and (19b). Following the same reasoning, the same diagnostic test is applicable to Mandarin Chinese to identify absolute adjectives with a minimum endpoint. (20a) and (20b) are the corresponding Mandarin translations of (19a) and (19b), respectively. In (20a) and (20b), the predicted contradiction is warranted and 彎 *wān* ‘bent’ in (20a) and 開 *kāi* ‘open’ in (20b) are diagnosed to be absolute adjectives with a minimum endpoint.



- (19) a. # The rod is not bent, though there is a small bend in the middle.
 b. # The door isn't open, but it is ajar. (Kennedy 2007:26)
- (20) a. # 棍子沒彎，但是中間有點弧度。 lower closed scale
 # *Gùnzi méi wān dànshì zhōngjiān yǒudiǎn húdù.*
 rod NEG bent but middle a.bit bend
 # 'The rod is not bent, but is slightly bent in the middle.'
- b. # 門沒開，但是敞／開着。 totally closed scale
 # *Mén méi kāi, dànshì chǎng/kāi zhe.*
 door NEG open but ajar open ASP
 # 'The door is not open but is ajar/open.'

Unlike absolute adjectives with a minimum endpoint, if *A* is a relative adjective (noted as *A_{open}*), a predication in the form *X is not A_{open}* denotes that *X* does not stand out in context relative to the comparison class. It is a negation of the exceeding relationship between the argument and standard of comparison, but it does not deny the argument's possession of the relevant concept. Thus, contradictions in (19)-(20) are not predicted to hold. As shown in (21)-(22), a negation of *X is not A_{open}* is compatible with a non-zero degree of the concept in both English and Mandarin Chinese. As shown in (23), because the standard of comparison for relative adjectives is context dependent, (21) and (22) negate the exceeding relationship between John's height and standard of comparison but do not deny John's possession of some degrees of tallness on the scale of height.

(21) John is not tall, but he has reached 160 cm already.

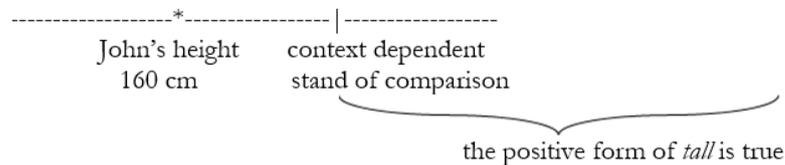
(22) 約翰不高，但也有1米6了。 totally open scale

Yuēhàn bù gāo, dàn yě yǒu 1 mǐ 6 le.

John NEG tall but also have 1 meter 6 ASP

'John is not tall, but he is 160 cm already.'

(23)



3.3.2 Entailment Pattern in Comparatives

Given that relative adjectives and absolute adjectives differ in how they pick up their standards of comparison and that comparatives impose an asymmetric relationship, relative adjectives and absolute adjectives are predicted to have different entailments when used in comparatives. Comparatives with absolute adjectives yield either positive or negative entailments of the positive form while comparatives with relative adjectives do not. *Wet* in (24a) is a lower closed scale absolute adjective. As illustrated in (25), its scale has a minimum endpoint. For (24a) to be true, the degree to which the floor is wet must fall to the right of the minimum endpoint. The floor must have some degree of wetness to ensure the

possession of a greater degree of wetness than the countertop. Thus, lower closed scale adjectives in *X is A_{min}-er than Y* entails *X is A_{min}*. On the other hand, the upper closed scale adjective *dry* in (24b) yields a negative entailment of the positive form. As shown in (26), the scale of *dry* is upper closed and an argument is dry iff it has the maximum degree of dryness. Thus, if *the countertop* is dry, i.e., falling on the maximum endpoint, it gives no position for *the floor* to fall on the scale to form a greater-than relationship. Thus, *the countertop* cannot have the maximum degree of dryness for (24b) to be true. Absolute adjectives with maximum endpoints generate negative entailment: *X is A_{max}-er than Y* yields *Y is not A_{max}*. (27a) and (27b) are the corresponding translations of (24a) and (24b) in Mandarin Chinese. The same entailment pattern is observed, and following the same reasoning, 濕 *shī* ‘wet’ in (27a), like *wet* in (24a), is a lower closed scale adjective, and 乾 *gān* ‘dry’ in (27b), like *dry* in (24b), is an upper closed scale adjective.

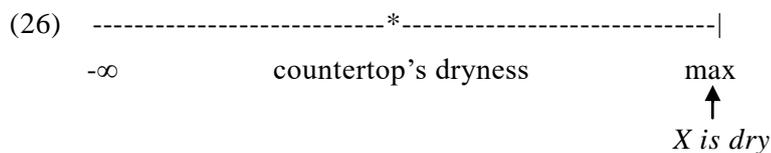
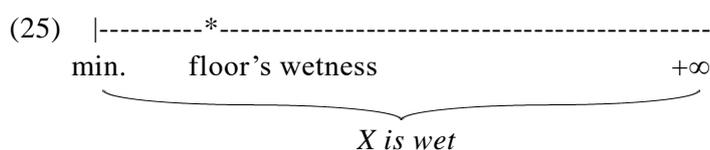
(24) a. The floor is wetter than the countertop.

→ The floor is wet. lower closed scale

b. The floor is drier than the countertop.

→ The countertop is not dry.

upper closed scale
(Kennedy 2007:27)



(27) a. 地上比檯面濕。

→ 地上（是）濕（的）。

lower closed scale

Dì shàng bǐ tái miàn shī.

→ *Dì shàng (shì) shī (de).*

floor than countertop wet

floor COP wet DE

‘The floor is wetter than the countertop.’ ‘The floor is wet.’

- b. 地上比檯面乾。 → 檯面不（是）乾（的）。
upper closed scale
Dì shàng bǐ tái miàn gān. → *Tái miàn bú (shì) gān (de).*
 floor than countertop dry countertop NEG COP dry DE
 ‘The floor is drier than the countertop.’ ‘The countertop is not dry.’

In contrast, relative adjectives do not give rise to entailments as discussed above. As shown in (28), relative adjectives in comparatives do not yield positive or negative entailments as absolute adjectives do. *Tall* in (28) is an open scale adjective with no maximum or minimum endpoint, as illustrated in (29). The comparative in (28) only imposes an asymmetric relationship between Mary’s height and John’s height and does not restrict their relationship in relation to the context-dependent standard of comparison. Thus, relative adjectives in comparatives do not generate positive or negative entailments of the corresponding adjective in the positive form: *X is A_{open-er} than Y* does not yield *X/Y is (not) A_{open}*. The same prediction is born out, as shown in the corresponding Mandarin example in (30).

- (28) John is taller than Mary. !→ John/Mary is (not) tall.
 (29) -----*-----*-----
 -∞ Mary’s height John’s height +∞
 (30) 約翰比瑪麗高。 !→ 約翰／瑪麗(不)高。 totally open scale
Yuēhàn bǐ Mǎlì gāo. *Yuēhàn/Mǎlì (bù) gāo.*
 John than Mary tall John Mary NEG tall
 ‘John is taller than Mary.’ ‘John/Mary is (not) tall’

3.3.3 Antonymous Pairs in Negation

In addition, antonymous pairs of relative adjectives and absolute adjectives show different entailment relations (Rotstein and Winter 2004; Kennedy 2007). As shown in (31), for positive and negative pairs of absolute adjectives, negations of one polar entail the assertions of the opposite polar. As shown in (32), the same entailment pattern does not exist for relative antonym pairs. The same pattern is observed in the corresponding Chinese data in (33)-(34), which

shows that absolute adjectives and relative adjectives in Mandarin Chinese have different entailments when negated.

- (31) a. The rod is not straight. → The rod is bent.
b. The rod is not bent. → The rod is straight.
c. The cloth is not wet. → The cloth is dry.
d. The cloth is not dry. → The cloth is wet.
- (32) a. John is not tall. !→ John is short.
b. John is not short. !→ John is tall.
- (33) a. 這根棍子不(是)直(的) → 這根棍子(是)彎(的)。
Zhè-gēn gùnzi bú (shì) zhí (de). Zhè-gēn gùnzi (shì) wān (de).
this-CL rod NEG COP straight DE this-CL rod COP bent DE
'This rod is not straight.' 'This rod is bent.'
- b. 這根棍子不(是)彎(的) → 這根棍子(是)直(的)。
Zhè-gēn gùnzi bú (shì) wān (de). Zhè-gēn gùnzi (shì) zhí (de).
this-CL rod NEG COP bent DE this-CL rod COP straight DE
'This rod is not bent.' 'This rod is straight.'
- c. 布不(是)濕(的) → 布是乾的。
Bù bú (shì) shī (de). Bù shì gān de.
cloth NEG COP wet DE cloth COP dry DE
'The cloth is not wet.' 'The cloth is dry.'
- d. 布不(是)乾(的) → 布是濕的。
Bù bú (shì) gān (de). Bù shì shī de.
cloth NEG COP dry DE cloth COP wet DE
'The cloth is not dry.' 'The cloth is wet.'

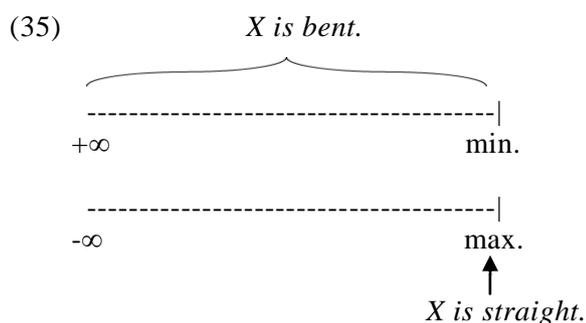
- (34) a. 約翰不高。 !→ 約翰很矮。¹⁰
Yuēhàn bù gāo. *Yuēhàn hěn āi.*
 John NEG tall John very short
 ‘John is not tall.’ ‘John is short.’
- b. 約翰不矮。 !→ 約翰很高。
Yuēhàn bù āi. *Yuēhàn hěn gāo.*
 John NEG short John very tall
 ‘John is not short.’ ‘John is tall.’

In (33a), the predicate 直 *zhí* ‘straight’ is a positive polar absolute adjective with a maximum endpoint, and 彎 *wān* ‘bent’ is a negative polar absolute adjective with a minimum endpoint. Note that this antonymous absolute adjective pair provides the same kind of information of the object in question. Both 直 *zhí* ‘straight’ and 彎 *wān* ‘bent’ provide information on how much they diverge from 180 degrees. In other words, degrees of these two absolute adjectives are ordered along the same dimension. However, scales of 直 *zhí* ‘straight’ and 彎 *wān* ‘bent’ have a different ordering relationship: increasing for the former and

¹⁰ One reviewer points out that (34) is not fully comparable to (32) as 高 *gāo* ‘tall’ and 很矮 *hěn āi* ‘(very) short’ in (34a) and 矮 *āi* ‘short’ and 很高 *hěn gāo* ‘(very) tall’ in (34b) do not form relative antonym pairs because 很 *hěn* + A is analyzed as a complex adjective in this paper. I agree with the reviewer. However, to my knowledge, a true parallel is not possible, because without 很 *hěn*, the resulting simple adjectival predication can either denote a positive predication or a comparative predication in appropriate context. The contrast between <(a), (b)> and <(c), (d)> indicates that a string-identical utterance *Lao Er gao* can either denote a positive predication or a comparative predication depending on the preceding context.

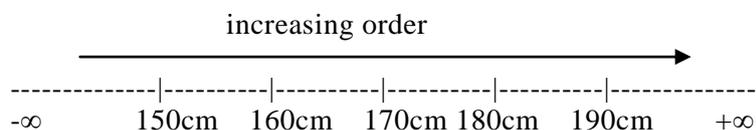
- (a) 他們誰高？ (b) 老二高。 (comparative reading)
Tāmen shuí gāo? *Lǎo Èr gāo.*
 they who tall Lao Er tall
 ‘Which of them is taller?’ ‘Lao Er is taller’ (Huang 2016:113)
- (c) 她們誰高？ (d) 老二高。 (positive reading)
Tāmen shuí gāo *Lǎo Èr gāo.*
 they who tall Lao Er tall
 ‘Which of them is tall’ (Imagine this ‘Lao Er is tall.’ (Implying she might be
 being a question asked by a the next Lang Ping, the legendary
 volleyball scouting agent looking Chinese volleyball player and coach)
 for tall players) (Huang 2016:113-114)

decreasing for the latter. The relationship between 直 *zhí* ‘straight’ and 彎 *wān* ‘bent’ is shown in (35), which shows that scales of these two absolute adjectives minimally differ from each other in ordering relationship and the maximum endpoint of former corresponds to the minimum endpoint of the latter. Thus, negation of one polar entails the assertion of the opposite polar for absolute adjectives antonymous pairs in Mandarin Chinese.

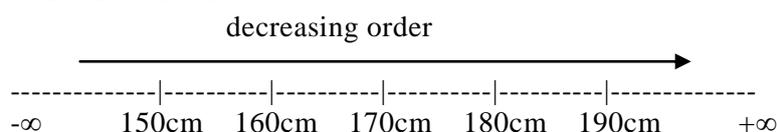


Relative antonyms do not show the same entailment relations. The scale of 高 *gāo* ‘tall’ and 矮 *ǎi* ‘short’ are presented in (36) and (37), respectively. The former minimally differs from the latter in ordering relationship. Both scales share the same dimension (height) and are open on both ends, though the scale of 高 *gāo* ‘tall’ and 矮 *ǎi* ‘short’ has an increasing order of degrees in the former but a decreasing order in the latter. Given that there is no built-in endpoint, the standard of comparison of these relative antonyms depends on context. Suppose the standard for being considered tall is 180 cm and the standard for being short is 170 cm. If John is 175 cm, he is shorter than 180 cm (the standard for tall) but taller than 170 cm (the standard for short). Thus, John can be neither tall nor short in this context, and relative adjectives such as 高 *gāo* ‘tall’ and 矮 *ǎi* ‘short’ do not have the same entailment pattern as absolute adjectives due to lack of endpoints.

(36) scale structure of *tall*



(37) scale structure of *short*



3.3.4 Excessive Reading of *Gradable Adjective + le*

A new diagnostic test is proposed to differentiate relative gradable adjectives from absolute gradable adjectives in Mandarin Chinese: the former can have excessive readings in the *gradable adjective + le* structure, but the latter cannot. Excessives are traditionally treated as a form of comparison between a degree associated with the subject and a standard of comparison that is critical for the realization of a situation (von Stechow 1984; Heim 2000). In Mandarin Chinese, excessiveness can be expressed in the *gradable adjective + le* structure to denote “excess over some expected norm” (Chao 1968:692; See also Lü 1980). See (38) and (39) for examples. The gradable adjective 鹹 *xián* ‘salty’ in (38) and 貴 *guì* ‘expensive’ in (39) can appear in the *gradable adjective + le* structure to denote an exceeding relationship between the degree of the subject and a contextually given maximal appropriate degree of saltiness and expensiveness, respectively. However, the denotation of excessiveness is lost when the gradable adjective is instantiated as 彎 *wān* ‘bent’ or 直 *zhí* ‘straight’ in the *gradable adjective + le* structure in (40).¹¹ Note that 鹹 *xián* ‘salty’ in (38) and 貴 *guì* ‘expensive’ in (39) are relative adjectives while 彎 *wān* ‘bent’ and 直 *zhí* ‘straight’ in (40) are absolute adjectives. The contrast between (38) & (39) and (40) suggests that absolute adjectives cannot appear in the *gradable adjective*

¹¹ Though (40) cannot denote an excessive interpretation, it gives rise to an inchoative reading ‘This rod became bent/straight.’ Note that (38) and (39) can also have an inchoative reading in addition to the excessive reading. In other words, the inchoative reading can be available in (38)-(40), however, excessive reading is only available in (38)-(39) but not in (40). I thank the reviewers for their comment towards better clarity.

+ *le* structure to express excessiveness in Mandarin Chinese. Thus, the denotation of excessiveness in the *gradable adjective + le* structure can be used to differentiate relative adjectives from absolute adjectives in Mandarin Chinese.

- (38) 湯鹹了。 relative adjective
Tāng xián le.
soup salty ASP
‘The soup is too salty.’ (Chao 1968:692)
- (39) 這東西貴了。 relative adjective
Zhè dōngxi guì le.
this thing expensive ASP
‘This thing is too expensive.’ (Chao 1968:692)
- (40) %這根棍子彎/直了。 absolute adjective
% *Zhè-gēn gùnzi wān/zhí le.*
this-CL rod bent/straight ASP
Intended: This rod is too bent.

The above distribution contrast between relative adjectives and absolute adjectives can be explained in terms of scale structural difference. Given that excessiveness is defined in relation to a contextually provided standard of comparison, the distribution of excessiveness is boiled down to the availability of a contextually provided standard. Since the scale of an absolute adjective is closed on at least one end, it entails a “natural transition” (Kennedy 2007). It can be a move from a non-maximal degree to a maximal degree in the case of 直 *zhí* ‘straight’ or it can be a move from a zero degree to a non-zero degree in the case of 彎 *wān* ‘bent’. Given the readiness of scale-based standard, truth conditions of absolute adjectives are computed based on conventional properties of their scales to the extent possible. Thus, contextual norm-based standard is ruled out for the truth conditions of absolute adjectives, making it difficult for absolute adjectives to stand in an exceeding relationship with a context-dependent standard to yield an excessive reading. In contrast, relative adjectives have totally open scales with no endpoints. Thus, they do not have ‘natural transitions’ or a scale-based standard. Their truth conditions are computed based on some

context-dependent standard, which allows them to yield an excessive reading.

4. Summary

In this paper, I support the traditional two-way distinction of adjectives in Mandarin Chinese. I provide a type-theoretical account of differences between gradable adjectives and non-gradable adjectives in Mandarin Chinese. Gradable adjectives are analyzed as direct measure functions of type $\langle e, d \rangle$. Non-gradable adjectives are analyzed as property-denoting propositions of type $\langle e, t \rangle$. Based on scale structural differences, gradable adjectives in Mandarin Chinese are subcategorized into relative adjectives and absolute adjectives. The scale of a relative adjective is totally open, while the scale of an absolute adjective is closed on at least one end. Depending on which end is closed, absolute adjectives can be further divided into totally closed, upper closed, and lower closed absolute adjectives. In addition, this paper applies and proposes a set of diagnostics to testify each scale structure in Mandarin Chinese. This study can also have a pedagogical application. It supports the introduction of scale structures of gradable adjectives as it helps students visualize the semantic differences between different subtypes of gradable adjectives.

References

- Bartsch, Renate, and T. Theo Vennemann. 1973. *Semantic Structures: A Study in the Relation Between Syntax and Semantics*. Frankfurt: Athenäum Verlag.
- Chao, Yuen-ren. 1968. *A Grammar of Spoken Chinese*. Berkeley: University of California Press.
- Chierchia, Gennaro. 1984. *Topics in the Syntax and Semantics of Indefinites and Gerunds*. Amherst: University of Massachusetts Ph. D. dissertation.
- Cresswell, Maxwell. 1976. The semantics of degree. *Montague Grammar*, ed. by Barbara Partee, 261-292. New York: Academic Press.
- Heim, Irene. 2000. Degree operators and scope. *Proceedings of Semantics and Linguistics Theory (SALT) X*, eds. by Brendan Jackson, and Tanya Matthews, 40-64. Cornell University Ithaca, NY: CLC Publication.
- Huang, Shi-zhe. 1997. Some remarks on adjectives in Mandarin Chinese. Paper

- presented at the *International Association of Chinese Linguistics-6 (IAL-6)*, June 19-21, 1997. Leiden, the Netherlands.
- Huang, Shi-zhe. 2006. Property theory, adjectives, and modification in Chinese. *Journal of East Asian Linguistics* 15: 343-369.
- Kennedy, Christopher. 1999. *Projecting the Adjective: The syntax and Semantics of Gradability and Comparison*. New York: Garland.
- Kennedy, Christopher. 2007. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30: 1-45.
- Kennedy, Christopher, and Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 2: 345-381.
- Lin, Jingxia, and Jeeyoung Peck. 2016. Classification of Mandarin Chinese simple adjectives: A scale-based analysis of their quantitative denotations. *Language and Linguistics* 17: 1-30.
- Paris, Marie-Claude. 1989. Quelques aspects de la gradation en mandarin. *Linguistique Générale et Linguistique Chinoise: Quelques Exemples D'argumentation*, ed. by Marie-Claude Paris, 99-119. Paris: UFR.
- Paul, Waltraud. 2005. Adjectival modification in Mandarin Chinese and related issues. *Linguistics* 43: 757-793.
- Paul, Waltraud. 2006. Zhu Dexi's two classes of adjectives revisited. *Studies in Chinese Language and Culture*, eds. by Christoph Anderl, and Halvor Eifring, 303-315. Oslo: Hermes Academic Publishing.
- Paul, Waltraud. 2010. Adjectives in Mandarin Chinese: The rehabilitation of a much ostracized category. *Adjectives. Formal Analyses in Syntax and Semantics*, eds. by Patricia Cabredo Hofherr, and Ora Matushansky, 115-152. Amsterdam-Philadelphia: John Benjamins.
- Rotstein, Carmen, and Yoad Winter. 2004. Total adjectives vs. partial adjectives: Scale structure and higher-order modifiers. *Natural Language Semantics* 12: 259-288.
- Sproat, Richard, and Chilin Shih. 1988. Prenominal adjectival ordering in English and Mandarin. *Proceedings of NELS 18*, eds. by James Blevins, and Juli Carter, 465-489. Amherst, MA: GLSA.
- Sun, Chaofen. 2020. Non-specific degree: Chinese gradable adjectives. A

- Typological Approach to Grammaticalization and Lexicalization*, ed. by Janet Zhiqun Xing, 319-350. Berlin/Boston: De Gruyter Mouton.
- von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3: 1-77.
- Wang, Qian. 2015. *Focus Placement and Interpretations of Bare Gradable Adjective Predicates in Mandarin Chinese*. Columbus: The Ohio State University MA thesis.
- 石毓智。1991。〈現代漢語的肯定形容詞〉，《中國語文》，第3期，167-174。
[Shi, Yu-zhi. 1991. Adjectives in modern Chinese. *Zhongguo Yuwen* 3: 167-174]
- 石毓智。2001。《肯定和否定的對稱與不對稱（增訂本）》。北京：北京語言文化大學出版社。[Shi, Yu-zhi. 2001. *Symmetry and Asymmetry Between Affirmation and Negation* (2nd edition). Beijing: Beijing Language and Culture University Press.]
- 石毓智。2003。〈形容詞的數量特徵及其對句法行為的影響〉，《世界漢語教學》，第2期，13-26。[Shi, Yu-zhi. 2003. The effect of the quantity properties of adjectives on their syntactic behaviors. *Shijie Hanyu Jiaoxue* 2: 13-26.]
- 呂叔湘。1984。《漢語語法論文》。北京：商務印書館。[Lü, Shu-xiang. 1984. *Studies in Chinese Grammar*. Beijing: The Commercial Press.]
- 朱德熙。1956/1980。〈現代漢語形容詞研究〉，《語言研究》，第1期。1980重印《現代漢語語法研究》，3-41。北京：商務印書館。[Zhu, De-xi. 1956/1980. A Study of Adjectives in Modern Chinese. *Yuyan Yanjiu* 1, reprinted in *Modern Chinese Grammar Research*, 3-41. Beijing: The Commercial Press.]
- 朴鎮秀。2009。《現代漢語形容詞的量研究》。上海：復旦大學博士論文。[Piao, Zhen-xiu. 2009. *Study of Quantity in Modern Chinese Adjectives*. Shanghai: Fudan University Ph. D. dissertation.]
- 呂叔湘。1980。《現代漢語八百詞》。北京：商務印書館。[Lü, Shu-xiang, 1980. *Modern Chinese Eight Hundred Words*. Beijing: The Commercial Press.]
- 李杰群。1992。〈上古漢語程度副詞考辯〉，《紀念王力先生九十誕辰文集》，326-348。濟南：山東教育出版社。[Li, Jie-qun. 1992. Analysis on degree adverbs in Old Chinese. *In Memory of Mr. Wang Li's Ninetieth Birthday Analects*, 326-348. Jinan: Shandong Educational Press.]

- 沈家煊。1995。〈「有界」與「無界」〉，《中國語文》，第 5 期，367-380。[Shen, Jia-xuan. 1995. Bounded and unbounded. *Zhongguo Yuwen* 5: 367-380.]
- 張國憲。2000。〈現代漢語形容詞的典型特征〉，《中國語文》，第 5 期，447-458。[Zhang, Guo-xian. 2000. Typical features of modern Chinese adjectives. *Zhongguo Yuwen* 5: 447-458.]
- 張國憲。2006。〈性質形容詞重論〉，《世界漢語教學》，第 1 期，5-17。[Zhang, Guo-xian. 2006. Rethink quality adjectives in Mandarin Chinese. *Shijie Hanyu Jiaoxue* 1: 5-17.]
- 湯廷池。1988。〈國語形容詞的重疊規律〉，《漢語詞法句法論集》，湯廷池（主編），29-57。臺北：台灣學生書局。[Tang, Ting-chih. 1988. Reduplication rules for adjectives in Mandarin Chinese. *Studies on Chinese Morphology and Syntax*, ed. by Ting-chih Tang, 29-57. Taipei: Taiwan Student Book Company.]
- 粟學英。2011。《中古漢語副詞研究》。南京：南京師範大學博士論文。[Su, Xue-ying. 2011. *Research on Degree Adverbs in Middle Chinese*. Nanjing: Nanjing Normal University Ph. D. dissertation.]

[審查：2019.9.24 修改：2019.10.21 接受：2020.3.2]

王倩

Qian WANG

43210 美國俄亥俄州哥倫布市大學路 1775 號

俄亥俄州立大學東亞語言文學系

Department of East Asian Languages and Literatures

The Ohio State University

398 Hagerty Hall, 1775 College Rd. Columbus OH, 43210, U.S.A.

wang.5026@osu.edu

漢語形容詞分類

王倩

俄亥俄州立大學東亞語言文學系

摘要

本文在程度語義學框架下重新解讀了朱德熙（1956/1980）對漢語形容詞的劃分。本文提出將形容詞的簡單形式分析為等級形容詞，將形容詞的複雜形式分析為非等級形容詞。兩者的語義類型不同：前者是<e, d>，後者是<e, t>。此外，根據量級結構的不同，本文對等級形容詞進行了進一步的分類，並從語義的角度對等級形容詞內部不同的語義蘊含關係做出了解釋。本文建議在中文教學中引入量級結構的概念以幫助學生更好地理解等級形容詞內部分類以及蘊含關係。

關鍵詞：形容詞分類 量級結構 語義類型