Debate on the Class Status of Mandarin Chinese Adjectives & Verbs: An Empirically-Based Evaluation + A Comparison of Stacking Behaviors

a Senior Thesis

by

Mariella Levy

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Haverford College

黄师哲教授
Huáng Shīzhé jiàoshòu
Prof. Shi-Zhe Huang, Advisor

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Abstract:

The question of whether Mandarin Chinese adjectives and verbs belong to the same word class or to separate ones is contested by linguists. I have conducted an empirically-based evaluation of the theories advanced by proponents of two competing hypotheses: a unified part of speech account (Hypothesis 1) and a separate part of speech one (Hypothesis 2).

Hypothesis 1 supporter, Chen-Sheng Luther Liu (2010), proposes a theory that I critique as a theory in general. However, I am most interested in a particular piece of his data that demonstrates how the pro-form nàgè ‘that-GE’ substitutes for and co-reference gradable adjectives and verbs alike. This is crucial evidence that strengthens Hypothesis 1, but the usage of nàgè is limited (e.g., can only replace things with adversely negative meanings).

Hypothesis 2 supporter, Waltraud Paul (2010), proposes that the marker of modification de is required for a prenominal verb because it forms a relative clause whereas it is optional for a prenominal adjective. Paul’s theory proves that absolute adjectives cannot form relative clauses and, unlike verb-noun constructions that ‘always’ form compounds, some adjective-noun constructions form phrases. However, the test she uses to prove that adjective-noun constructions form phrases is not reliable, as judged by some native Chinese speakers, and some verb phrase-noun constructions without de are indeed phrasal.

Hypothesis 2 supporter, Shi-Zhe Huang (2006, 2015, 2017), proposes that simple adjectives are of semantic type e because anything functioning as an argument in a sentence is of this type (Chierchia 1998). Huang’s theory proves that, unlike verbs (type <e,t>), simple adjectives cannot function predicatively in their bare forms and it explains why prenominal verbs require de, while simple adjectives do not. Although she acknowledges instances where verbs phrases and adjectives are re-analyzed as type e and <e,t>, respectively, she does not consider the ramifications of this data to a Hypothesis 2 stance.

Following the evaluation, I have contributed to this debate by comparing adjective and verb-phrase stacking in Mandarin Chinese. I discovered that the number of differences between their behaviors in this syntactic construction is greater than their similarities, which supports Hypothesis 2 (e.g., prenominal adjective ordering without de is restricted (Sproat & Shih 1987:471) whereas ordering of predicate-positioned verb phrases is relatively free (Chao 1968:326)). However, I suggest that the ordering of adjective stacking may be freer in some cases based on the type of nominal that is modified (e.g., chǒu dà gēshǒu ‘ugly big singer’ & dà chǒu gēshǒu ‘big ugly singer (approved by native speaker, Carey Zhang)). More importantly, if prenominal verbs are proven to form verb phrases instead of relative clauses, then C.-T. James Huang (2016)’s evidence for the existence of an adjunct-complement dichotomy in the nominal domain identifies shared stacking behaviors among adjectives and verbs (e.g., the complement must be closest to the head noun in order to combine with it before the relative clause does (Huang 2016:434)), which supports Hypothesis 1.
1.0 Introduction

Former work done in the field of Mandarin Chinese grammar generally classifies adjectives as a sub-section of the verb part-of-speech, often based on comparisons made between the behaviors of English adjectives and Mandarin ones. In his 1968 book called *A Grammar of Spoken Chinese*, proponent Yuen Ren Chao explains, “In Indo-European languages adjectives often have similar inflections, or at least parallel inflections, to those of nouns, and are thus more like nouns than verbs. Adjectives in Chinese, on the other hand, function readily as predicatives...” (p. 676). I suppose an example of the inflectional similarities between English adjectives and nouns is when the verb ‘to fear’ is transformed into the adjective ‘fearful’ and the noun ‘fearfulness.’ Chao’s main piece of evidence for the similarity between adjectives and intransitive, stative verbs in Chinese is that adjectives, such as the ones in examples (1) & (2), function as predicates without the copula *shì* 是 ‘to be’:

(1) 今儿天凉。
   *jīn ěr tiān liáng*  
   today weather cold  
   ‘Today the weather is cool.’

(2) 菜很咸。
   *cài hěn xián*  
   dish very salty  
   ‘The dish is very salty.’  

(Chao 1968:88)

Linguist James D. McCawley also considers required copula usage with adjectives to be an indicator of an adjective part-of-speech in his 1992 paper (p. 232). Therefore, like Chao, McCawley is a staunch supporter of a Chinese verb part-of-speech which adjectives fall under. Another piece of evidence McCawley (1992:232) uses to assert this stance is based on his adjective part-of-speech criteria that adjectives *directly* modify a nominal whereas verbs do not. At first, this seems to be the case based on example (3) below:
(3) 他是一个好人。

(4)

a. *他是一个很好人。

b. *他是一个比你好人。

(5)

a. 一杯好啤酒

b. ?一杯好葡萄酒

c. ??一杯好绍兴黄酒

He concludes that a word-formation rule rather than a syntactic one is licensing the combinations of [adjectives + nouns] because the phonological/morphological form of the nominal determines
grammaticality (p. 235).

The account of a verb part-of-speech which adjectives belong to is not unanimously agreed upon, especially with linguists who have conducted recent work in the field. For instance, Paul Waltraud counters in her 2010 paper that absolute adjectives do indeed require a copula to behave predicatively and Linguist Shi-Zhe Huang argues in her 2017 paper that simple adjectives in their bare forms cannot behave as predicates. Consequently, there are two competing hypotheses: a unified part of speech account (Hypothesis 1) and a separate parts of speech account (Hypothesis 2). Table 1 below identifies proponents of each hypothesis including their respective approaches to the topic:

<table>
<thead>
<tr>
<th>Hypothesis 1</th>
<th>Hypothesis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chen-Sheng Luther Liu (2010, 2018): formal theory from a syntactic perspective</td>
<td></td>
</tr>
</tbody>
</table>

My first objective is to conduct an evaluation of the theories of proponents for each hypothesis. I will not focus on Chao (1968) or McCawley (1992) in support of Hypothesis 1 because linguists including, but not limited to, Paul and Huang have engaged with their supporting data, acknowledging some aspects and critiquing others with counter-evidence. Linguist Chen-Sheng Luther Liu’s work, on the other hand, has not been analyzed in the scope of Hypothesis 1 because his theory is not directly related to the debate. However, in his 2010 paper, 2

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2 Although Chao and McCawley state support of Hypothesis 1 and Paul states support of Hypothesis 2, nowhere in either Chen-Sheng Luther Liu’s papers or Shi-Zhe Huang’s is support of a stance explicitly made. Nevertheless, there is a working assumption that Liu & Huang hold positions in this debate.
Liu examines a shared pro-form between adjectives and verbs in support of his theory, which inadvertently strengthens Hypothesis 1. I am also choosing Paul (2010) as a representative of Hypothesis 2 in this evaluation because she directly challenges Chao (1968) & McCawley (1992) with evidence that makes her theory convincing. Nevertheless, the tests she uses to assert her arguments are not consistently reliable and she acknowledges certain pieces of data that behave contrary to her theory. This demonstrates how the behavior of adjectives and verbs is so variable and diverse, to the point where it is difficult to identify a clear winner among the hypotheses. The other Hypothesis 2 representative I have chosen is Huang (2006, 2017) whose semantic-based theory substantiates observations that Paul made in her paper.

My method of evaluation is empirically-based because in order to test the explanatory power of each theory, I need to determine what linguistic phenomena and data the at-issue theory can and cannot reliably account for. Even though the ideal outcome is to find evidence that overwhelmingly supports one hypothesis over the other, the more practical yet equally-valuable goal is to investigate what areas Mandarin Chinese adjectives and verbs converge and diverge in behavior. Therefore, observations in the form of native-speaker grammaticality judgements and pattern recognition are necessary to know where a theory reinforces and undermines its respective hypothesis.

My other objective is to conduct a comparison of the stacking behaviors of Mandarin Chinese adjectives and verbs. Analyzing this syntactic phenomenon within the scope of this debate is relatively novel and may help tip the scale in favor of one hypothesis. If not, it will at least further clarify the outlines of adjective-verb convergence and divergence.

The evaluation proceeds as follows: in Section 2, I introduce Liu’s theory of a polarity-

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3 Stacking is when lexical elements are serialized in a single clause (e.g., “The large, round, white snowman.”)
like positive morpheme with covert and overt forms (section 2.1) and discuss the strengths of the theory in support of Hypothesis 1 (section 2.2) as well as the theory’s shortcomings, both related to the debate and to the theory itself (section 2.3). In Section 3, I introduce Paul’s theory of a de-less [adjective + noun] noun phrase (section 3.1) and discuss the strengths of the theory in support of Hypothesis 2 (section 3.2) as well as the theory’s shortcomings (section 3.3). In Section 4, I introduce Huang’s theory of simple adjectives as semantic type $e$ and of general type shifter $de$ as type $<<e,t>,e>$, followed by a discussion of the strengths of the theory in support of Hypothesis 2 (section 4.2) as well as specific missed opportunities (section 4.3). In Section 5, I introduce the ordering rules of adjectives stacks in contrast to those for verb-phrase stacks (section 5.1), followed by an exploration of adjunct-complement ordering in the nominal domain (section 5.2). Finally, takeaways from the evaluation and the stacking analysis are recapitulated in Section 6.
2.0 Chen-Sheng Luther Liu (2010, 2018)

2.1 Theory of a Polarity-like Positive Morpheme with Covert & Overt Forms

In his 2010 paper, linguist Chen-Sheng Luther Liu proposes that Mandarin Chinese has a polarity-like positive morpheme appearing in two different forms: a covert one (POS) and ṭèn, the overt one which is not used to express the degree adverb ‘very.’ Liu explains that both allomorphs 0-bind the degree argument of a gradable adjective in the predicate position.

In Government Binding Theory, 0-criterion states that every argument possesses one and only one 0-role (Chomsky 1981). Based on this criterion, Liu applies theta-roles to events; for example, the intransitive verb *sleep* in the sentence, “John slept,” bears two arguments: *John* and the ‘sleeping’ event. The former is assigned the 0-role *theme* (i.e., the entity that receives the action of the verb) while the latter is 0-bound by the past-tense operator so that the lexical verb *sleep* only denotes ‘each of the sleeping events that took place in the past’ rather than denoting all sleeping events regardless of time (Liu 2010:1048).

According to Liu (2010:1048), the gradable adjective *tall* also carries two arguments: a *theme* one and a referential degree one. Take a look at this adjective’s usage in the sentence below, as shown in (6):

(6) John is as tall as Bill is.  

(Liu 2010:1049)
Similar to the ‘sleeping’ event argument, the referential degree one must be $\theta$-bound by a degree phrase’s head (i.e., as) so that the lexical adjective *tall* only denotes ‘a property along a scalar dimension of degrees’ rather than denoting all the degrees of ‘tallness’ (Liu 2010:1048).

Returning back to Liu’s theory, he claims that the covert version of the positive morpheme (POS) must be licensed in a focus-sensitive domain. We will consider two such domains. The first one possesses a contrastive focus, as shown in sentence (7):

(7) 张三高，李四矮。

\[ \text{Zhāngsān} \text{ [FocP Op [Foc}^0 \text{ [+operator]} \text{ [DegP gāo-pos [AP [A tī]]]]],} \]

Zhāngsān tall-POS

\[ \text{Lǐsì} \text{ [FocP Op [Foc}^0 \text{ [+operator]} \text{ [DegP ěi-pos [AP [A tī]]]]] \]

Lǐsì short-POS

‘Zhāngsān is tall, Lǐsì is short.’

(Liu 2010:1040)

As stated by Liu (2010:1040), contrastive focus is a type of ‘predicate-accessible operator[-wh] domain’ where the head of a focus phrase (i.e., Foc) carries a ‘predicate-accessible operator[-wh] feature’ (i.e., +operator), which licenses the occurrence of POS in a degree phrase’s head position (Deg). Consequently, POS coerces *gāo* 高 ‘tall’ and *ěi* 矮 ‘short’ to raise into their respective degree head positions in order to $\theta$-bind them and so that they convey a degree meaning.
The second domain that we will look at possesses negation. The same thing in sentence (7) is happening in sentence (8), except that the ‘predicate-accessible operator[-wh] feature’ is overtly identified by the morpheme $\text{bù 不}$ ‘not,’ as shown below:

(8) 张三不$\text{高。}$

\[
\begin{align*}
\text{Zhangsan} &\quad [\text{NegP} \ [\text{Neg } \text{bù[+operator]}]] \ [\text{DegP} \ \text{gāo}-\text{pos} \ [\text{AP} [\text{A tǐ]}]]] \\
\text{Zhangsan} &\quad \text{not} \quad \text{tall-POS} \\
\text{‘Zhangsan is not tall.’} &\quad (\text{Liu 2010:1050})
\end{align*}
\]

Transitioning now to the overt form of the positive morpheme (HEN), Liu explains that it $\theta$-binds gradable adjectives in elsewhere cases, such as when an adjective is substituted and co-referenced by the predicative pro-form $\text{nàgè 那个 ‘that + [general classifier]}^4$.’ Take a look at the application of this phenomenon to (7) and (8) in (9) and (10), respectively:

(9) 张三*(很)那个，李四*(很)这个。

\[
\begin{align*}
\text{Zhangsan} &\quad [\text{DegP} \ [\text{Deg } \text{*}(\text{hěn})] \ [\text{AP} [\text{A nàgè}]]], \ \text{Lǐsì} \ [\text{DegP} \ [\text{Deg } \text{*}(\text{hěn})]] \ [\text{AP} [\text{A zhègè}]]] \\
\text{Zhangsan} &\quad \text{HEN} \quad \text{that-GE} \quad \text{Lǐsì} \quad \text{HEN} \quad \text{this-GE} \\
\text{‘Zhangsan is that way (i.e., tall), but Lǐsì is this way (i.e., short).’} \\
\text{(10) 张三不*(很)那个。}
\end{align*}
\]

\[
\begin{align*}
\text{Zhangsan} &\quad \text{bù } \text{*}(\text{hěn}) \quad \text{nàgè} \\
\text{Zhangsan not} \quad \text{HEN that-GE} \\
\text{‘Zhangsan is not that way (i.e., tall).’} &\quad (\text{Liu 2010:1050})
\end{align*}
\]

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$^4$ **general classifier (GE) =** although it is not behaving normally in the pro-form $\text{nàgè}$, the general classifier usually behaves like a classifier that can be used with many nominals, even if a nominal has a more specific classifier.

- **classifier (CL) =** it is a lexical item that usually precedes nominals and “… name[s] the unit that is already present in the semantic denotation of the noun” (Sybesma 2017:620).
The lexical item *hěn* in (9) and (10) is the overt positive morpheme (HEN) because removing it renders the sentences ungrammatical, which is not the case when an intensifying adverb like *hěn* ‘very’ is deleted (Liu 2010:1049). Liu also claims on page 1050 that while HEN does θ-bind *nàgè* and the variant form *zhègè* 这个 ‘this-GE,’ it cannot license their movement into Deg positions because these pro-forms are not clearly adjectival (will revisit in section 2.2).

However, Liu recognizes two linked problems that his 2010 paper cannot address.

Firstly, his original theory does not identify any constraint on the distribution of both covert and overt forms of the positive morpheme and therefore is arbitrary and not falsifiable. Secondly, he cannot account for why the following piece of data has a contrastive read because his original theory would not predict the covert positive morpheme to occur in (11) below:

(11) Q: 他们谁高呢?
   *tāmen shéi gāo* (ne)
   *them who tall* (SFP)$^5$
   ‘Which of them is taller?’
A: 老二高。
   *Lǎo Èr gāo*
   Lǎo Èr tall
   ‘Lǎo Èr is taller.’  

(Chao 1968:683)

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$^5$ (SFP) = sentence final particle
So, in his 2018 paper, Liu introduces the rule stated in (12) as a solution to these problems:

(12) Constraint on Multiple Foci (Liu 2018:95)
In Chinese, a construction with multiple foci requires each of the foci to be ‘definite’ enough.

Since focus-sensitive domains introduce multiple foci, they cannot evade the constraint rule. He argues that shéi 谁 ‘who’ in (11) is a contrastive focus-sensitive morpheme and therefore, the covert positive morpheme (POS) is used instead of the overt form (HEN) because the latter is not so ‘definite’ in its semantic meaning compared with other degree adverbs (e.g., hēnduō 很多 ‘a lot’).

This assertion is based on two pieces of data. First, in the comparative construction (i.e., with bǐ 比 ‘than’), the degree adverb shāowèi 稍微 ‘a little’ is more ‘definite’ than the degree adverb bǐjiào 比较 ‘more’ because although both have a target of comparison, only the former requires a specified standard of comparison while the latter does not. So, shāowèi can appear in a sentence with bǐ, as shown in (13a), whereas bǐjiào in (13b) cannot:

(13) a. 张三比李四稍微高*(一些)。
    Zhāngsān bǐ Lǐsì shāowèi gāo *(yīxiē)
    Zhāngsān than Lǐsì a-little tall *(a little)
    ‘Zhāngsān is a little taller than Lǐsì.’

b. 张三比李四(*比较)高。
    Zhāngsān bǐ Lǐsì (*bǐjiào) gāo
    Zhāngsān than Lǐsì (*more) tall

(Liu 2018:81)

In this case, the covert positive morpheme hěn is similar to shāowèi. The second piece of supporting evidence is shown in (14) where the covert positive morpheme is being used:

(14) *这个箱子重虽重，还好不重，我可以自己搬。
    *zhège xiāngzi zhòng suī zhòng háihǎo bù zhòng wǒ kěyǐ zìjǐ bān
    this-CL box heavy though heavy not-bad not heavy I can self carry
    ‘Although this box is heavy, it is not heavy. So, I can carry it by myself.’ (Liu 2018:97)

Although this sentence is syntactically grammatical, it is semantically ungrammatical because
the proposition that the box is ‘not heavy’ contradicts the previous proposition that it ‘is heavy.’

Looking now at (15), its grammaticality is based on the interpretation of the added element $hěn$ as functioning as a degree intensifier rather than the positive morpheme:

(15) 这个箱子虽重，还好不很重，我可以自己搬。

\[zhègè xiāngzi suī zhòng hǎihǎo bù hěn zhòng wǒ kěyǐ zìjǐ bān\]

This is interpreted as ‘Although this box is heavy, it is not very heavy. So, I can carry it by myself.’

Therefore, Liu concludes that the positive morpheme (HEN) is prohibited due to the multiple foci introduced by the sentence’s contrastive focus.

Implementing the Constraint of Multiple Foci rule is Liu (2018)’s attempt to reconcile the contrastive read in (11) with his theory of a polarity-like positive morpheme as well his attempt to identify a constraint on the distribution of the morpheme’s covert and overt forms.

2.2 Strengths of Liu’s Theory

I have identified two ways in which Liu’s theory supports Hypothesis 1. The first is that the pro-form $nàgè$ can also substitute for and co-reference a verb phrase, as shown in (16):

(16) a. 小心！那条狗会咬人。

\[xiǎoxīn nà tiáo gǒu huì [VP yǎo rén] \ ó\]

‘Be careful! That dog bites.’

b. 小心！那条狗*(会)那*个哦。

\[xiǎoxīn nà tiáo gǒu *(huì) [VP nàgè] \ ó\]

‘Be careful! That dog does that (i.e., bites).’

(Liu 2010:1050)

Similar to how the overt positive morpheme $hěn$ θ-binds the degree argument of gradable adjectives, the modal verb $huì$ 会 ‘will’ (i.e., tense) θ-binds the event argument of $yǎo rén$ 咬人 ‘bite people,’ narrowing its denotation from all ‘biting-people’ events to each of the future ones.

Another reason why $huì$ in (16b) is needed to make the sentence grammatical is because it marks $nàgè$ as a pro-verb, rather than a pro-adjective (Liu 2010:1048, 1050).
The second way Liu’s theory supports *Hypothesis 1* is that *nàgè* substitutes for both simple and complex gradable adjectives (will revisit in section 4.2), as demonstrated in (17) & (18), respectively:

(17) a. 他 *(很) 糊塗。
    * tā *(hěn)⁶  hútú
    ‘He is muddle-headed.’  SIMPLE ADJECTIVE
b. 他 *(很) 那个。
    * tā *(hěn)  nà-ɡè
    ‘He is muddle-headed.’  (my creation approved by native speaker Shi-Zhe Huang)

(18) a. 他 *(是) 糊裡 糊塗 的。
    * tā *(shì)  húlǐ  hútú  de
    ‘He is muddled-headed.’  COMPLEX ADJECTIVE
b. 他  那 个。
    * tā  hěn  nà-ɡè
    ‘He is that way (i.e., muddled-headed).’  (my creation approved by Shi-Zhe Huang)

These two pieces of data complement well-known evidence that gradable adjectives, like verbs, do not need the copula *shì* 是 ‘to be’ to function as predicates, as shown in (19) & (20), respectively:

(19) 那个女孩非常漂亮。
    * nàɡè  nǚhái  fēicháng  piàoliang
    ‘That girl is extremely beautiful.’  (Liu 2010:1010)

(20) 那个女孩昨天死了。
    * nàɡè  nǚhái  zuótiān  sǐ  le
    ‘That girl died yesterday.’  (my creation approved by Shi-Zhe Huang)

Furthermore, both verbs, as shown in (21), and gradable adjectives, as shown in (22), can fill conjunct positions in a *yòu...yòu 又...又 ‘not only __, but also __’ coordination construction.

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⁶ The overt form of the positive morpheme (HEN) is obligatory in a simple declarative sentence like (17a).
⁷ (PTM) = past-tense marker
These positions are only reserved for predicates since \( yòu \) ‘again’ is an adverb:

(21) 张三又挑水又打水。

\[
\text{Zhāngsān \textit{ yòu tiāo shuǐ yòu dǎ shuǐ} }
\]

‘Zhangsan not only carries water with a pole on his shoulder but also fetches water.’

(22) 张三又小气又很那个真是令人受不了。

\[
\text{Zhāngsān \textit{ yòu xiǎoqì yòu hěn nàgè zhēn shì líng rén shòu bùliǎo} }
\]

‘Zhangsan is not only stingy but is also so much so (e.g., rude), which makes him really intolerable.’

In (22), the gradable adjective \( \text{xìaoqì} \) 小气 ‘stingy’ (i.e., due to the covert positive morpheme POS) and the overt positive morpheme \( \text{hěn} \) with the pro-form \( \text{nàgè} \) are functioning as predicates just like the verb phrases in (21). Therefore, the argument that gradable adjectives and intransitive, stative verbs share characteristics and display parallel behaviors is enforced in these ways by Liu’s data.

2.3 Shortcomings of Liu’s Theory

I have identified three drawbacks of Liu’s theory. First, it predicts (9) & (10), replicated below in (23) & (24), to be grammatical but native Mandarin Chinese speaker and linguist Shi-Zhe Huang judges them to be ungrammatical:

(23) *张三(很)那个，李四(很)这个。

*Zhāngsān (\( \text{hěn} \)) nàgè, Lìsì (\( \text{hěn} \)) zhègè

*Zhāngsān (HEN) that-GE Lìsì (HEN) this-GE

Intended: ‘Zhāngsān is that way (i.e., tall), but Lìsì is this way (i.e., short).’

(24) *张三不(*很)那个。

*Zhāngsān bù (*\( \text{hěn} \)) nàgè

Zhāngsān not (*HEN) that-GE

‘Zhāngsān is not that way (i.e., tall).’

One issue is that the pro-form \( \text{nàgè} \) can only substitute for predicates with adversatively negative meanings, but \( \text{gāo} \) ‘tall’ and \( \text{ǎi} \) ‘short’ are neutral. Another issue is that the variant form of the pro-form \( \text{zhègè} \) ‘this-GE’ is ungrammatical in (23) and therefore it is difficult to use the pro-
form in such contrastive constructions. A final issue applying specifically to (24) is that hěn as an overt positive morpheme (i.e., not a degree intensifier) does not appear in negation construction, as demonstrated below:

(25) 他弟弟很奸诈, 可是他自己一点不那个。 (Chao 1968:659)
    tā dìdì hěn jiānzhà, kěshì tā zìjǐ yīdiǎn er bù nàgè
    his younger-brother very crafty, but he himself a little not that-GE
    ‘His younger brother is very crafty, but he himself is not that way at all.’

In (25), bù ‘not’ licenses both the degree adverb and negative polarity item yīdiǎn er ‘a little,’ and the pro-form nàgè. Therefore, we can infer that hěn makes (24) ungrammatical because bù is sufficient to license the pro-form.

The limitations of what types of adjectives nàgè can co-reference (i.e., only ones with negative meanings) and what contexts it can appear in (i.e., not contrastive focus ones like (23)) poses challenges to Hypothesis 1. An additional yet related and equally important limitation is that nàgè cannot co-reference absolute (i.e., not gradable/scalar) adjectives like fāngxíng ‘square,’ as shown in (26):

(26) a. 这个盘子是方的。
    zhège pánzi shì fāng de
    this-CL plate is square DE
    ‘This plate is square.’ (Paul 2010:118)

b. *这个盘子是那个。
   *zhège pánzi shì nàgè
   this-CL plate is that-GE
   Intended: ‘This plate is that way (i.e., square).’ (my creation approved by Shi-Zhe Huang)

The second drawback of Liu’s theory concerns the two allomorphs of the polarity-like positive morpheme. Typically, when there exists an overt form of a lexical item, the language with this form rejects a covert form, and vice versa. For example, the English iota operator is a mark placed in front of a variable in a quantifier and it gives an expression denoting the entity a definite description (i.e., the in a nominal reading) (Russell 1905). It has no covert counterpart as
shown in (27):

(27) a. The girl saw the boy.
   b. *Girl saw boy.

However, in Mandarin Chinese, definiteness in a nominal reading is covertly marked (will revisit in section 4.1), as shown in (28), and there is no overt counterpart:

(28) 女孩看见了男孩。
   nǚhái kànjiàn le nánhái
   girl see LE boy
   ‘The girl saw the boy.’
   (Huang 2006:349)

The last drawback of his theory deals with the **Constraint on Multiple Foci** because the requirement for each focus in a multiple foci construction to be ‘definite enough’ is vague.

Although the term *definite* is normally defined as a semantic feature of noun phrases that selects a specific referent and is marked by determiners like *the* and *that*, I am guessing that *definite* in this rule deals with the size of the domain of comparison (i.e., a smaller domain ensures a more specific, target comparison and therefore is more ‘definite’). This type of phenomenon occurs in English sentences with degree adverbs modifying *tall* and *taller*, as shown in (29):

(29) a. Tim is (very) tall.
    b. Tim is (*a lot) tall.
    c. Tim is (*very) taller.
    d. Tim is (a lot) taller.
   (my creations)

The lexical form of the English word ‘taller’ is comparative, but its meaning is absolute, unlike its gradable counterpart ‘tall.’ This explains why a degree intensifier that does not have an explicit standard of comparison (i.e., ‘very’) can modify (a) but not (c) while one that requires an explicit standard of comparison (i.e., ‘a lot’) cannot modify (b) but can modify (d).

The **Constraint on Multiple Foci**, however, is used to justify Liu’s complex mechanism for an overt and covert positive morpheme, which misses the fundamental big picture. In her chapter in the 2017 *Encyclopedia of Chinese Language and Linguistics*, linguist Shi-Zhe Huang
produces a more convincing account, namely that, “… the positive meaning of a bare gradable adjective under contrastive reading entails comparative reading” (p. 16). In English, this is overtly marked through inflection (i.e., [-er]), whereas in Mandarin Chinese, it is not. However, take a look at what happens if the comparative meaning of gāo ‘taller’ in (11) is re-imagined as having a positive meaning, as shown in (30):

(30) Q: 他们谁高?
   tāmen shéi gāo
   them who tall
   ‘Which of them is tall?’
   (Imagine this being a question asked by a volleyball scouting agent looking for tall players)
   A: 老二高。
   Lǎo Èr gāo  (Huang 2017:16)
   Lǎo Èr tall
   ‘Lǎo Èr is tall.’
   (Implying she might be the next Láng Ping, the legendary Chinese volleyball player and coach)

Huang (2017) explains that “Being tall makes one necessarily taller than someone who is short, or who is not short,” (p. 16). In other words, the comparative reading is part of the lexical item’s intensional meaning and is accessed in a contrastive context.

So, the shortcomings of Liu’s theory are as follows: 1) it overgeneralizes the application of nàgè to contexts where its usage is ungrammatical (i.e., gradable adjectives without adversely negative meanings and contrastive focus sentences with the pro-form’s variant zhègè ‘this-GE’); 2) it is contrary to the logic of recognizing only an overt or covert form in a language rather than both; 3) the constraint on the distribution of the positive morpheme’s two allomorphs (i.e., Constraint on Multiple Foci) does not explain and account for cross-linguist patterns.

3  Waltraud Paul (2010)
3.1 Theory of a De 的-less [Adjective + Noun] Noun Phrase

In her 2010 paper, linguist Waltraud Paul proposes that verbs in adnominal modifier positions require the modification marker de 的, as shown in (31), whereas de is optional when
the adnominal modifier is either a gradable or an absolute adjective, as shown in (32) & (33), respectively:

(31) 担忧 *(的)人
dānyōu *(de) rén
worry *(DE) person
‘persons who worry’

(32) 一个聪明 *(的)人
yīgè cōngmíng *(de) rén
one-CL intelligent *(DE) person
‘an intelligent person’

(33) 一个方形 *(的)盘子
yīgè fāngxíng *(de) pánzi
one-CL square *(DE) plate
‘a square plate’

She argues that if gradable adjectives like cōngmíng 聪明 ‘intelligent’ were truly similar to intransitive, stative verbs like dānyōu 担忧 ‘worry,’ we would expect de to be obligatory with cōngmíng and ungrammatical with absolute adjectives like fāngxíng 方形 ‘square.’ However, the optionality of de in (32) and (33) challenges this assumption.

Furthermore, Paul demonstrates how certain de-less [A N] (i.e., adjective + noun) constructions like (32) and (33) are phrases rather than compounds by testing whether the bare nominal can be removed from a noun phrase, as shown in (34) and (35):

(34) *阿梅不想吃红花, 黄的还可以。
*Amēi bù xiǎng chī [NP hóng huā] [NP huáng de Ø] hái kěyǐ
*Amēi not want eat red-flower yellow DE still ok
Intended: ‘Amei doesn’t want to take safflower [as medicine], yellow ones are still ok.’

(35) 我觉得**黄衬衫**比红的好看。
wǒ juédé [NP huáng chènshān] bǐ [NP hóng -de Ø] hǎokàn
I think yellow shirt compared:to red-DE pretty
‘I think that yellow shirts are prettier than red ones.’

This test is based on the Lexical Integrity Hypothesis, which states that “… the internal structure of compounds, i.e., of words, is inaccessible to syntactic rules” (Paul 2010:130). In (34), the
noun in the compound hóng huā 红花 ‘red-flower’ cannot be elided in the subsequent noun phrase (NP) whereas in (35), the noun in the phrase huáng chènshān 黄衬衫 ‘yellow shirt’ can be elided.

4.1 Strengths of Paul’s Theory

I have identified two ways in which Paul’s theory supports Hypothesis 2. The first is it successfully challenges the account that adjectives forming relative clauses in adnominal modifier positions just like verbs, as shown in (36) & (37) below:

(36) 一个喜欢笑的人
[DP yīgè [IP tī xiăhūn xiăo] de  rén]  
one-CL  like laugh  DE person  
‘a person who likes laughing’  
PREDICATE PHRASE

(37) 一个聪明的人
[DP yīgè [IP tī cōngmíng] de rén]  
one-CL  intelligent  DE person  
‘an intelligent person’

Since verbs are intrinsically predicative, they form relative clauses and are followed by de when functioning as adnominal modifiers. Therefore, Hypothesis 1 proponents argue that gradable adjectives also form relative clauses because they are predicative without the copula shì ‘to be.’ However, absolute adjectives cannot form relative clauses because they require shì to behave predicatively, but adding the copula in adnominal modification like (38) is ungrammatical:

(38) a. 这个盘子*是)方的。
zhègè páanzi *(shì) fāng de
this-CL plate *(is) square DE
‘This plate is square.’  
(Paul 2010:118)

b. 一个(*是)方形的盘子
yīgè (*shì) fāngxíng de páanzi
one-CL (*is) square DE plate
‘a square plate’

(Paul 2010:122)

Paul’s account of verbs requiring de in contrast to the optionality of de with gradable and
absolute adjectives alike further proves that such adjectives are not predicative and therefore, do not form relative clauses.

The second way Paul’s theory supports Hypothesis 2 is that her data of de-less adjective + noun [A N] phrasal constructions follows Chao (1968)’s distinction between compounds and phrases. One criterion for being a compound is that part of the item in question must be a bound form and hence the parts are inseparable from each other (Huang 1984:63). Examples (39) - (41) are all [A N] constructions but (39) and (40) are compounds because either one or both of the lexical items that make up the constructions are bound (B), respectively:

(39) 洋灰

\[
\text{yang huī}
\]

foreign dust (BF)
‘cement’

[A N] COMPOUND

(40) 国际法

\[
\text{guójì fǎ}
\]

international law (BB)

[A N] COMPOUND

(41) 好书

\[
\text{hǎo shū}
\]

good book (FF)

[A N] PHRASE (Chao 1968:278)

However, since both lexical items in (41) are free (F), it is a phrase similar to huáng chènshān ‘yellow shirt’ in (35). Another criterion for being a compound, particularly a verb + object one [V O], is that the internal structure has no explicit syntactic head (i.e., exocentric), which is adhered to in (42) & (43) below:

(42) 綁腿

\[
\text{bǎng tuǐ}
\]

tie leg
‘legging’

ACTION [V O] COMPOUND (Huang 1984:62)

(43) 当差

\[
\text{dāng chāi}
\]

be mission (FF)\(^8\)
‘to be at orders – messenger, servant’

STATIVE [V O] COMPOUND (Chao 1968:419)

---

\(^8\) Although dāng chāi 当差 ‘be mission’ is composed of two free morphemes, it is a compound due to exocentricity.
According to Huang (1984:63), these [V O] nominals violate the endocentricity principle that is applied to all phrase structures and which states that whole construction must have the same syntactic function as the head (e.g., bǎng 绑 ‘tie’ is a verb head, so bǎng tuǐ ‘tie leg’ should be a verb phrase). This may explain why all of the examples I saw in section 5.4.3.2. Restricted and idiomatic V-O of Chao (1968:306-308) seem to be nominal.

Another convincing reason why the limited de-less modification structures involve only adjectival adnominal modifiers is that “... when a modifier, as opposed to a governing verb, precedes a determinative expression, a de is required” (Chao 1968:305), as shown in (44):

(44) a. 逮着了那隻老虎
dǎi zhe le nà zhī lǎohǔ
‘caught that tiger’
GOVERNING VERB

b. 逮着了的那隻老虎
dǎi zhe le de nà zhī lǎohǔ
‘the tiger which was caught’
MODIFIER

(Chao 1968:305)

Therefore, evidence of adjectival adnominal modifiers forming both phrases and compounds in contrast to verbal adnominal modifiers forming only compounds strengthens Hypothesis 2.

4.3 Shortcomings of Paul’s Theory

I have identified two drawbacks of Paul’s theory. First, there are instances where the behavior of compounds contradicts the Lexical Integrity Hypothesis (LIH). For example, native Mandarin Chinese speaker JiangXue Han judged the omission of the nominal chá 茶 ‘tea’ in (45) to be grammatical even though lǜ-chá 绿茶 ‘green tea’ is a compound:

(45) 我喜欢绿茶，红的也可以。
wǒ xǐhuān [n0 lǜ-chá] [n0 hóng -de Ø] yě kěyǐ
I like green-tea red-DE also possible ((Paul 2010:131) but changed
Intended: ‘I like green tea, but black is also ok.’ to grammatical)
Another example comes from Huang (1984:64) where verb-object [V O] compounds like (46a) can be separated in certain positions like (46b):

(46) a. 他很担心这件事。
    tā hěn dānxīn zhèjiàn shì  COMPOUND
    he very worry this matter
    ‘He is very worried about this matter.’

b. 他担了三年的心。
    tā dānle sān nián de xīn  PHRASE
    he carry-LE three year DE heart
    ‘He worried for three years.’
    (Lit. ‘He worried three years-ry.’)  (Huang 1984:64)

The compound dānxīn 担心 ‘worry’ in (a) is not separated and it is followed by the object zhèjiàn shì 这件事 ‘this matter,’ which would be ungrammatical if it were phrasal. However, dānxīn in (b) behaves more like a phrase, therefore defying the LIH. Huang concludes that such [V O] sequences must be recognized as having dual status, either as words or as idiom phrases.

The second drawback of Paul’s theory concerns de-less verb phrase + noun constructions [VP N], which an anonymous reviewer of her paper pointed out. She conducted a small survey and three out of the seven examples were judged unanimously to be grammatical whereas the other four diverged in acceptability (Paul 2010:123-124). Although it is unclear whether these constructions are compounds or phrases, I argue that one of the unanimously-accepted examples is a phrase because the lexical item tóupiào 投票 ‘vote’ can be inserted, as shown in (47b):

(47) a. 报名日期
    bào mǐng qì  
    report name date
    ‘registration deadline’

b. 报名投票日期
    [VP bào mǐng tóupiào] qì  
    report name vote date

---

9 To learn more, please refer the Phrase Structure Condition in Huang (1984:54).
‘registration deadline to vote’

Notice that tóupiào is modifying the VP rather than the larger noun phrase (NP). It is worth investigating in future research whether the other constructions form phrases or compounds.

Ping Ling et al. (1993) also discusses how these types of constructions possess both a compound and a phrasal reading. Their rationale is based on a condition where the meaning of the whole is not compositional of its parts, which is called idiomaticity: a compound possess a higher degree of idiomaticity whereas a phrase possess a lower one. Although this criterion is debated10, Ping Ling et al. (1993:100) connect it to the semantic distinction of referential specificity, as demonstrated in (48) below:

(48) a. 洗衣粉
   xǐ - yī - fěn
   wash-clothes-powder
   ‘detergent’

b. 洗衣粉
   xǐ yī fěn
   wash clothes powder
   ‘The powder which is used in washing clothes’

c. *洗衣的粉
   *xǐ - yī - de- fěn
   *wash-clothes-DE-powder
   Intended: ‘detergent’

d. 洗衣的粉
   xǐ yī de fěn
   wash clothes DE powder
   ‘The powder which is used to wash clothes.’

The noun fěn 粉 ‘powder’ in compound reading (a) has no referential content or semantic accessibility without its modifier, while fěn in phrasal reading (b) does regardless of modifier presence. This is why adding de to the compound reading is ungrammatical in (c) while adding it to the phrasal reading is grammatical in (d). This weakens Hypothesis 2 because now we see that

10 Huang (1984:63) points out idioms that form phrases rather than morphemes exist, like the expression ‘kick the bucket.’ Therefore, idiomaticity is argued to not be sufficient criteria for compoundhood.
adjectives and verb phrases can modify *de*-less noun phrases (NP).

So, the issues with Paul’s theory include evidence of compounds composed of adjectives and verbs behaving contrary to the *Lexical Integrity Hypothesis* as well as limited consideration for the phrasal status of [VP N] constructions.


5.1 Theory of Simple Adjectives (type *e*) & General Type Shifter *de* (type <<e,t>,e>)

In her 2006 paper, linguist Shi-Zhe Huang proposes that in their bare forms, nominals and simple adjectives are of semantic type *e*, which means they denote kinds of things (e.g., blue and orange are kinds of colors). The category of *simple adjectives* (SA) includes items ranging from *gāo* 高 ‘tall’ (i.e., monosyllabic, gradable) to *gòngtóng* 共同 ‘common’ (i.e., disyllabic, absolute). On the other hand, the category of *derived adjectives* (DA) are of semantic type <*e*,*t*> and are derived from SAs through a number of processes as shown in (49) – (51):

(49) 小 → 小小 X → XX
    *xiǎo* → *xiǎoxiǎo* REDUPLICATION
    ‘small’ → ‘smallish’

(50) 臭 → 臭哄哄 X → X 嗆 嗆
    *chòu* → *chòu-hōnghōng* LIVELY SUFFIXES
    ‘stinky’ → ‘rampantly stinky’

(51) 凉 → 冰凉 X → YX
    *liáng* → *bīngliáng* PREFIX-LIKE INTENSIFIERS
    ‘cold’ → ‘ice-cold’

(Huang 2017:3)

Traditionally, linguists use a more complex ontology for event semantics. In (52), for instance, notice that the 2nd order predicate in (b) takes the 1st order one in (a) as its input, the 3rd order predicate in (c) takes the 2nd order one as its input, and so on:

(52) a. 1st-order predicate = ‘green’
    {green} (type *e*)

    b. 2nd-order predicate = ‘Green is a color, ’
    [[[color]]](green) (type <*e*,*t*>)

    c. 3rd-order predicate = ‘A color is needed in the room,’
    [[[needed in the room]]]([[color]]) (type <<*e*,*t*>,*e*>)

24
However, Chierchia (1998) diverges from this method by introducing a much simpler general type theory which states that anything functioning as an argument in a sentence belongs to type $e$. Huang (2006:349) provides evidence that both nouns and SAs, as shown in (53) & (54) respectively, follow this criterion by occupying subject positions in their bare forms (i.e., without determiners):

(53) 女孩看见了男孩。
$nǚhái kànjiàn le nánhái$
girl see PTM boy
The girl saw the boy.

(54) 勤奋是一个美德。
$qínfèn shì yīgè měidé$
diligent is one-CL beautiful virtue
‘Diligence is a beautiful virtue.’ (Huang 2006:349)

In her 2015 conference presentation, Huang considers $de$ to be a ‘general type-shifter,’ meaning that it facilitates intersection between an adnominal modifier and a bare nominal by ensuring that they are of the same semantic type, as shown in (55):

(55) a. $[XP_{<e,t>} * (de_{<e,t,e>}) YP_e]$
b. $[XP_e (de) YP_e]$
c. $[XP_{<e,t>} (de) YP_{<e,t>}]$ (Huang 2015:5)

Since XP is of type $<e,t>$ (i.e., a predicate) and YP is of type $e$ in (a), $de$ is obligatory because its job is to transform XP from $<e,t>$ to $e$. However, $de$ is optional in (b) and (c) because both XP and YP are already type matched. So, if an SA modified a bare noun, the structure would look similar to (b) since both are of type $e$, according to Chierchia (1998) and Huang (2017:9).

5.2 Strengths of Huang’s Theory

I have identified two ways in which Huang’s theory supports Hypothesis 2. The first is that it demonstrates how adjectives do not uniformly behave like verbs. In other words, derived adjectives (DAs) do behave like verbs because both are of type $<e,t>$ whereas simple adjectives
(SAs) do not because they are of type $e$. The rule in (56) is an example of this behavior divergence:

(56) Complementary distribution of SAs and DAs in the Predicate Position
   a. SA bare forms cannot appear in the predicate position, assuming normal intonation
   b. DA bare forms can appear in the predicate position

(Huang 2017:9)

As mentioned before, Hypothesis 1 argues that gradable SAs are similar to verbs because they do not require the copula *shi* ‘to be’ to function predicatively. However, (56) justifies why gradable SAs typically need an adverbial intensifier (or an overt positive morpheme, according to Liu (2010)) in simple declarative sentences (i.e., not focus-sensitive domains), such as (57a), whereas things of type $<e,t>$ including the DA in (b) and the verb in (c) do not:

(57) a. 张三*(很)聪明。
    *Zhāngsān*(hěn) cōngmíng
    Zhāngsān *(very) intelligent
    ‘Zhāngsān is intelligent.’
    (my creation informed by Paul (2010:117))

   b. 张三(很)糊裡糊涂的。
    Zhāngsān (hěn) húlǐ hútú de
    Zhāngsān *(very) muddled-headed DE
    ‘Zhāngsān is (very) muddled-headed.
    (my creation informed by Huang (2017:3))

   c. 张三(很)担心。
    Zhāngsān (hěn) dānxīn
    Zhāngsān *(very) worry
    ‘Zhāngsān worries (a lot).’
    (my creation informed by Paul (2010:123))

The second way Huang’s theory supports Hypothesis 2 is that the account of *de* as a generalized type shifter of type $<<e,t>,t>$ justifies its requirement for adnominal modifiers of type $<e,t>$ (i.e., DAs and verbs) and its optionality for things of type $e$ (i.e., SAs), as shown in (58):

(58) Complementary distribution of SAs and DAs in the Modifier Position
   a. SA bare forms can appear in the modifier position as in [SA *(de) N]
   b. DA bare forms cannot appear in the modifier position as in [DA *(de) N]

(Huang 2017:9)

5.3 Missed Opportunities of Huang’s Theory

There are two missed opportunities of Huang’s theory, both of which she recognized in
her literature but did not consider within the scope of her theory. First, verbs and verb phrases can be re-analyzed as nominals (i.e., type $e$) based on evidence that they are grammatical in a conjunction construction where $hè$ and ‘and’ can only take type $e$ conjuncts, as shown in (59):

(59) 打排球和游泳对身体有好处。

\[ dǎ páiqiú hé yóuyǒng duì shēntǐ yǒu hǎochù \]

‘Playing volleyball and swimming are good for (one’s) health.’  (Huang 2006:351)

The second missed opportunity of her theory concerns gradable SAs transforming into type $<e,t>$. Examples of this phenomenon have already been covered in sections 2.2 & 2.3, namely that only predicate conjuncts are allowed in a $yòu$... $yòu$ construction, as shown in (60) & (61). Furthermore, a positive gradable SA in a contrastive context entails a comparative reading (i.e., can appear in its bare form in a predicate position), as shown in (62):

(60) 张三又小气又那个真是令人受不了。

\[ Zhāngsān yòu xiǎoqì yòu hěn nàgè zhēn shì líng rén shòubùliǎo \]

‘Zhāngsān is not only stingy but is also so much so (e.g., rude), which makes him really intolerable.’

(61) 张三又佻水又打水。

\[ Zhāngsān yòu tiāo shuǐ yòu dǎ shuǐ \]

‘Zhangsan not only carries water with a pole on his shoulder but also fetches water.’ (Liu 2018:98)

(62) Q: 他们谁高?

\[ tāmen shéi gāo \]

them who tall

‘Which of them is tall?’

(Imagine this being a question asked by a volleyball scouting agent looking for tall players)

A: 老二高。

\[ Lǎo Èr gāo \]

Lǎo Èr tall

‘Lǎo Èr is tall.’

(Implying she might be the next Láng Píng, the legendary Chinese volleyball player and coach)

Consequently, these two pieces of data seriously challenge Hypothesis 2 because it is not so easy to distinguish adjectives and verbs as separate based on semantic types if both categories can
function as type $e$ and $<e, t>$. 

6 Comparison of Adjective & Verb-Phrase Stacking
6.1 Similarities & Differences

In their 1987 paper, linguists Richard Sproat & Chilin Shih describe syntactic and semantic characteristics of prenominal adjective stacking in Mandarin Chinese, and Chao (1968:326-342) introduces the behaviors of verbal expressions in series (i.e., V-V stacked series in the predicate position). One clear similarity among adjective and verb-phrase stacking is that the occurrence of more than two adjectives or verbs in a string is rare, as shown in (63) & (64):

(63) 小瘦(??黑)胳膊
[NP xiǎo shòu (??hēi) gēbó]
small skinny black arm

(64) 写信对他说年
[IC xiě xìn] [IC duì tā bàinián]
write letter to him wish-Happy New Year
‘write a letter to give New Year’s greetings to him’

Paul (2010:133) explains that adding the adjective 黑 ‘black’ in (63) creates questionable grammaticality because the more modifiers that are added to a noun phrase (NP), the harder is to form a ‘natural, plausible classification’ (will revisit at the end of this section). Although there are technically three verbal expressions in (64) (i.e., xiě xìn 写信 ‘write letter,’ duì tā 对他 ‘to him,’ & bàinián 拜年 ‘wish Happy New Year’), Chao (1968) demonstrates how the phrase can be re-analyzed as two verbal expressions by breaking it up into its immediate constituents (ICs). The complex form of the V-V series is like a coordinate structure.

Yet, there are stacks of 3+ adjectives and verb expressions which are difficult to account for:

(65) 细长白头毛
xi cháng bái máo
fine long white hair

---

11 Immediate constituents (ICs) are the elements that make up the most basic layer of a complex form. For instance, the ICs of a sentence are its subject & predicate, and the ICs of a word are its root & suffix (Chao 1968-4-5).
(66) 告假坐飛机回國省親

gào jiǎ zuò fēi jī huí guó xǐng qīn

take leave sit fly plane return home visit parent
‘take a leave to take a plane to return to his country to visit his parents’

For example (65), Chao (1968) explains, “… the order can be partially explained by taking into account... the nature of the qualities... because whiteness is considered inherent in the hair, length is incidental, and fineness even more fortuitous” (p. 689-690). By contrast, such ordering is potentially less clear in (63). Example (66) is also different from (64) because there is no one way of breaking it up into its ICs, although Chao (1968:329) does propose the following method: 

\[ [IC \text{gào kǒu}] + [IC (zuò fēi jī huí) + xǐng qīn] \text{(i.e., } V_1 + (V_2V_3 + V_4)) \].

So, prenominal adjective and V-V series stacking are normally composed of two elements, but there are rare instances in both cases where 3+ elements compose a stack.

However, there are four differences between adjectival and verbal iterations (i.e., stacks). First, prenominal adjectival ordering without the modification marker de 的 is restricted whereas verb phrase ordering in predicate positions is relatively free. In Table 2, for instance, ordering in (a) examples is grammatical while the reverse ordering in (b) examples is not:

**Table 2 Restrictive Ordering of De-less Prenominal Adjectives**

<table>
<thead>
<tr>
<th>Quality-Color</th>
<th>Quality-Shape</th>
<th>Size-Color</th>
<th>Size-Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 好红盘子</td>
<td>好圆盘子</td>
<td>小红盘子</td>
<td>小圆盘子</td>
</tr>
<tr>
<td>hào hóng pánzi</td>
<td>hào yuán pánzi</td>
<td>xiǎo hóng pánzi</td>
<td>xiǎo yuán pánzi</td>
</tr>
<tr>
<td>good red plate</td>
<td>good round plate</td>
<td>small red plate</td>
<td>small round plate</td>
</tr>
<tr>
<td>b. *红好盘子</td>
<td>*圆好盘子</td>
<td>*红小盘子</td>
<td>*圆小盘子</td>
</tr>
<tr>
<td>*hóng hǎo pánzi</td>
<td>*yuán hǎo pánzi</td>
<td>*hóng xiǎo pánzi</td>
<td>*yuán xiǎo pánzi</td>
</tr>
<tr>
<td>red good plate</td>
<td>round good plate</td>
<td>red small plate</td>
<td>round small plate</td>
</tr>
</tbody>
</table>

By contrast, flipping the order of the verbal expressions is grammatical for example (67):

(67) a. 他天儿写信会客。

tā tiān ěr xiě xìn huì kè

---

he everyday write letter meet guests
‘He writes letters and receives callers every day.’
b. 他天儿会客写信。
   tā    tiān er      huì kè      xiě xìn
   he everyday meet guests write letter
   ‘He receives callers and writes letters every day.’  

The second difference is that although prenominal adjectival stacking with the modification
marker *de* is not restricted, reversing the order does not change the truth conditions of the
proposition whereas it does with V-V series, as shown in (68) & (69), respectively:

(68) a. 好的圆的盘子
   hǎo-de    yuán-de pánzi
   good-DE round-DE plate
   ‘nice round plate’

b. 圆的好的盘子
   yuán-de hǎo-de pánzi
   round-DE good-DE plate
   ‘nice round plate’

(69) a. 等一会儿去
   děng yīhuǐ’er qù
   wait a while go
   ‘Wait a while (before you) go!’

b. 去等一会儿
   qù děng yīhuǐ’er
   go wait a while
   ‘Go and wait a while!’

The third difference is that the semantic rules which determine ordering for prenominal adjective
stacking in *direct-modification* constructions (i.e., without *de*) and verb phrase stacking in
predicate positions are unrelated. Adjective ordering depends on the *apparentness scale* in (70):

(70) LEAST APPARENT ----Quality----Size----Shape----Color---- MOST APPARENT\(^\text{13}\)

To attribute the color *red* to a car, for instance, “... one has to establish that a sufficiently large

---

amount of its surface looks red,” whereas to attribute the size large to a car, “... one first has to establish that the item is a car and that it is large for such items” (Sproat & Shih 1987:467). The latter example (i.e., size) is more apparent than the former one (i.e., color) because it requires more comparisons and therefore more cognitive computations. So, the less apparent an adjective is, the further left it is located in the prenominal string. Table 2 above includes examples of four different types of ordering combinations where (a) examples abide by the apparentness scale while (b) examples violate it.

The apparentness scale has nothing to do with verb expression stacking. Rather, ordering follows the ‘sequence of events,’ as shown in (71), or the ‘circumstances of event.’ Examples of the latter (i.e., (72) – (74)) are similar to modification constructions where the second expression has approximately the same function as the whole and is modified by the first verbal expression:

(71) a. 我起来了穿衣裳。
    wǒ qǐ-lái-le chuān yīshang
    I stand-up-PTM put-on clothes
    ‘I got up and put on my clothes.’

b. 我穿了衣裳起来。
    wǒ chuān-le yīshang qǐ-lái
    I put-on-PTM clothes stand-up
    ‘I put on clothes and got up.’

(72) 在年轻的时候做过这事。
    zài niángqīng de shíhòu zuòguò zhè shì
    at young DE time did this thing
    ‘at youthful time did this thing, --did this when young’

(73) 騎着馬找馬
    qízhe mǎ zhǎo mǎ
    riding horse look-for horse
    ‘look for a horse while riding a horse, —
     look for a job while holding a job, or do something absent-mindedly’

(74) 拿手打人
    nà shǒu dǎ rén
take hand hit people
‘use hand to hit people’  (Chao 1968:342)

The final difference is that the first prenominal adjective in a stack may be followed by *de* whereas the first verb phrase in a stack cannot. In the former, *de* makes (75) & (76) grammatical:

(75) a. 红*(的)圆盘子
   hóng *(de) yuán pánzi  COLOR - SHAPE
   red DE round plate
b. 圆*(的)红盘子
   yuán *(de) hóng pánzi  SHAPE - COLOR
   round DE red plate

(76) a. 好*(的)小盘子
   hǎo *(de) xiǎo pánzi  QUALITY - SIZE
   good DE small plate
b. 小*(的)好盘子
   xiǎo *(de) hǎo pánzi  SIZE - QUALITY
   small DE good plate  (Sproat & Shih 1987:472)

This is because these two permutations are ungrammatical in the *direct modification* construction (i.e., without *de*), even when they do abide ordering constraints set by the *apparentness scale*.

Sproat & Shih (1987) explain that they violate another rule which states that “… two adjectives of the same *predicativeness* cannot both directly modify a noun in Mandarin” (p. 472).

According to Kamp (1975:124), *predicative* adjectives behave independently from the nominals that they combine with (i.e., their extensions are unaffected) whereas the extensions of *non-predicative* ones are dependent on those nominals. Based on the test in (77), *color & shape* adjectives (i.e., more apparent) are *predicative* because (78c) & (79c), respectively, are true:

(77) *Predicativeness* (Kamp, 1975)
   All X’s are Y’s
   Z is an A(X)
   Therefore, Z is an A(Y).

(78) a. All mice are mammals.  COLOR  (Sproat & Shih 1987:470)
b. Freddy is a white mouse.
c. Therefore, Freddy is a white mammal. (apparently TRUE)

(79) a. All tables are pieces of furniture.  SHAPE
b. This is a square table.
c. Therefore, this is a square piece of furniture. (apparently TRUE)

However, size & quality adjectives (i.e., less apparent) are non-predicative because (80c) & (81c), respectively, are generally false:

(80) a. All mice are mammals.
   b. Freddy is a large mouse.
   c. Therefore, Freddy is a large mammal. (apparently FALSE)

(81) a. Agatha Christie novels are literature.
   b. The Murder of Roger Ackroyd is a good Agatha Christie novel.
   c. Therefore, The Murder of Roger Ackroyd is good literature. (possibly false)

In predicate positions, de rarely follows the first verbal expression and therefore, V-V series diverges in behavior from subordinative constructions, as shown in (82) & (83):

(82) 拿笔(??)写字
   ná bǐ (??de) xiě zì
   take pen DE write characters
   ‘write characters with a pen’

(83) 在屋裡(??)睡觉
   zài wū lǐ (??de) shuìjiào
   at in-the-house DE sleep
   ‘being in the room, sleep—sleep in the room’

As of this point, the overwhelming number of differences in stacking behaviors between adjectives and verb-phrases supports Hypothesis 2. I am skeptical, however, of the account that adjective ordering in direct modification constructions is restricted in all cases.

The reason is that the only types of nominals that Sproat & Shih (1987) look at in Mandarin Chinese are inanimate objects and, infrequently, animals. For instance, native Mandarin Chinese speaker, Carrie Zhang, judged example (84) to be grammatical without de:

(84) a. 丑大歌手
    chóng dà gēshǒu
    ugly large singer

b. 大丑歌手
    dà chóng gēshǒu
    large ugly singer

   (my creation)
Not only does example (a) contradict the *predicativeness* rule but example (b) contradicts the *apparentness* rule. This raises the question of whether the nominal being modified determines whether the rules introduced by Sproat & Shih (1987) apply to modifier ordering. In his 1998 paper, linguist Richard Larson examines adjectives that are intersective (i.e., *predicative*) or non-intersective (i.e., *non-predicative*) that modify people, especially agentive nominals:

(85) \[ \text{tall} \to \text{tall'} \]
\[ \text{tall friend} \to \lambda x[\text{tall'}(x) \& \text{friend'}(x)] \]

“Intersective Modification”

(86) Olga is a beautiful dancer.

\[ \text{a. Qe[dancing(e, olga) ... beautiful(olga, C)] “Intersective Modification”} \]
\[ \text{b. Qe[dancing(e, olga) ... beautiful(e, C)] “Non-intersective Modification”} \]

In this analysis, size adjectives like *dà* ‘large’ may be *predicative* like ‘tall’ in (85) and quality adjectives like *chǒu* ‘ugly’ may be *predicative* or *non-predicative* like ‘beautiful’ in (86a) & (b), respectively. I am not arguing that human and agentive nouns re-analyze size adjectives as *predicative* and quality adjectives as *predicative* and *non-predicative*.

Instead, I propose that the modified noun to some degree influences the *predicativeness* of the adjectives it combines with and hence the ordering of adjectival stacks. In (84), for example, neither *dà* ‘large’ nor *chǒu* ‘ugly’ seems to be a *more apparent* adjective of *géshǒu* ‘singer’ and the *predicativeness* of each adjective is not necessarily the same. Maybe this is why (a) & (b) are judged by Carrie Zhang to be grammatical.

The idea that nouns affect the behavior of their modifiers is not original. According to Paul (2010), “... a new subcategory is established [in *direct modification*], which must present a natural, plausible class...” (p.125-126). Such interpretation is demonstrated in example (87) where *hēi* ‘black’ in (a) is a defining property of the resulting subcategory of *tóujīn* ‘scarf’ while *hēi* in (b) is a purely intersective modifier contrasting with other modifiers like *bái* ‘white’:

(87) \[ \text{a. 黑头巾} \]
\[ \text{hēi tóujīn} \]
black scarf
b. 黑头的巾
   hēi de tóujīn
black DE scarf (Paul 2010:126)

In English, the criteria of creating a ‘natural, plausible class’ is applied to the prenominal position where the adjective occupying it expresses a characteristic property of the nominal it modifies. According to Bolinger (1967), it is difficult to predict what adjectives can occupy this position in a noun phrase (NP) because what constitutes a culturally relevant characterization is based on pragmatic factors. This phenomenon manifest cross-linguistically in the English prenominal position and in the Mandarin direct modification construction, as shown in (88) & (89), respectively:

(88) a. ill-behaved child
   b. *mistake-erasing secretary (Bolinger 1967:7)

(89) a. 聪明孩子
cōngmíng háizi
   intelligent child
   b. *聪明动物
   *cōngmíng dōngwù
   intelligent animal (Paul 2010:130)

Therefore, the pragmatic factors that determine which adjectives and nouns create ‘natural, plausible classes’ may possess greater predictive power of stacking characteristics than the apparentness and predicatives rules. Despite the possibility that prenominal adjective ordering in direction modification constructions is freer than what Sproat & Shih (1987) say, it is clear that the evidence shown thus far supports Hypothesis 2.

6.2 Stacking of Adjuncts & Complements

Chao (1968:327) mentions that linguists like Wang Fwutyng (1960) propose to change verbal expressions in series to predicate expressions in series. Chao counters that if V-V series were made up of predicate expressions, an auxiliary verb would apply to both expressions rather
than the first one:

(90) 不能光着头出去
     bùnéng guāngzhe tóu chūqù
     cannot bare head go-out
     ‘You cannot go out bare-headed.’  

(Chao 1968:328)

This is not the case, as demonstrated in example (90), because the proposition is neither, ‘You can’t go out,’ nor, ‘You can’t bare your head.’

Fwutyng’s question about whether verbs are verbal expressions or predicate ones runs parallel to a debate of whether prenominal verbs form verb phrases (VPs) or relative clauses. For instance, Paul (2010) explains that verbs must form relative clauses in order to modify a head noun and relative clauses must be followed by modification marker de, as shown in (91) & (92):

(91) 一个喜欢笑的人
     [DP yī-gè [IP tì, xīhuān xiào de rén]]
     one-CL like laugh DE person
     ‘a person who likes laughing’  

(Paul 2010:117)

(92) 担心*（的）人
     [RC dānxīn *(de)] rén
     worry DE person
     ‘persons who worry’  

(Paul 2010:123)

Yet, Paul (2010) does acknowledge that de is optional for some VPs that modify nouns, such as (93) & (94):

(93) 下雨天
     [VP xià yǔ] tiān
     fall rain day
     ‘a rainy day’

(94) #担心人命
     #[VP dānxīn] rén mìng
     worry life
     ‘a life of worries’  

(Paul 2010:123)

My intention is not to argue that prenominal verbs form either relative clauses or VPs. However,

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14 # = marks diverging judgements of grammaticality
if it is true that prenominal verbs do form VPs, then I propose that evidence of stacking from C.-
T. James Huang (2016) supports *Hypothesis I*. Huang (2016) does not assert such a stance, but
he does argue that there are two classes of prenominal modifiers: complements and adjuncts.

According to Comrie & Horie (1995:65), a complement clause is either an argument to
a verb or a noun, as shown in (95a) & (b), respectively:

\[(95) \quad \begin{array}{ll}
\text{a.} & \text{The teacher knows [that the student bought the book]} \\
\text{b.} & \text{the fact [that the student bought the book]} \\
\end{array} \quad \text{(Comrie & Horie 1995:65)}
\]

An adjunct, on the other hand, is a phrase that is not needed in a noun clause, but adds semantic
specificity. A relative clause, such as (96), is a type of adjunct where a constituent at the front
like ‘the book’ is indexed by a gap at the end of the relative:

\[(96) \quad \text{the book, [which the student bought ----]} \quad \text{(Comrie & Horie 1995:67)}
\]

Huang (2016:434) demonstrates in (97) how X-bar schema arranges complements and adjuncts
in Mandarin Chinese:

\[(97) \quad \begin{array}{ll}
\text{X'} \rightarrow \text{ZP}_{\text{Adjunct}} \, \text{X'} \\
\text{X'} \rightarrow \text{YP}_{\text{Comp}} \, \text{X}^0
\end{array} \quad \text{(Huang 2016:434)}
\]

There are three characteristics of stacking that apply to prenominal adjuncts and complements.
First, a complement must first combine with the nominal head before adjuncts since the former is
of type \(e\) while the latter is of type \(<e,t>\); therefore, a complement occurs in closer proximity to
the nominal head compared to an adjunct. Example (98) shows how this applies to adjectives
while example (99) demonstrates this with potential verbal expressions:
(98) a. [Adjunct]-[Complement]-[Head]
    长发的物理学生
    zhǎngfā - de  wùlǐ xuéshēng
    long-hair-ed DE physics student
    ‘long-haired physics student’

b. [Complement]-[Adjunct]-[Head]
    *物理长发的学生
    * wùlǐ  zhǎngfā - de xuéshēng
    physics long-hair-ed DE student

(Huang 2016:435)

(99) a. [Relative clause]-[Noun complement]-[Head]
    我们正在考虑的(那个)要不要扩大招生的问题
    [RC wǒmen zhèngzài   kǎolǜ   de] (nàgè) [NC yāo-bù-yào     kuòdà      zhǎoshēng    de]
    we currently consider DE (that-CL)         want-not-want expand recruitment DE
    wèntí
    question
    ‘the question whether to increase student enrollment that we are considering’

b. [Noun complement] [Relative clause] [Head]
    *要不要扩大招生的(那个)我们正在考虑的问题
    *[NC yāo-bù-yào     kuòdà      zhǎoshēng  de] (nàgè) [RC wǒmen zhèngzài   kǎolǜ    de]
    want-not-want expand recruitment DE (that-CL)        we currently consider DE
    wèntí
    question

(Huang 2016:441)

The second characteristic is that an individual-level prenominal must combine with the head
noun before a stage-level one. Individual-level prenominals express intrinsic properties of the
head noun while stage-level ones express transient properties of the head. Example (100) shows
how this applies to adjectives while example (101) demonstrates this with verbal expressions:

(100) a. [Stage level]-[Individual level]-[Head]
    英国的中文老师
    yīngguó     de zhōngwén   lǎoshī
    England-located DE Chinese teacher
    ‘The English Chinese teacher.’

b. [Individual level]-[Stage level]-[Head]
    *中文的英国老师
    *zhōngwén   de     yīngguó     lǎoshī
    Chinese DE England-located teacher

(Huang 2016:436), slightly revised

by linguist Shi-Zhe Huang)

(101) a. [Stage level]-[Individual level]-[Head]
    我昨天看见的喜欢音乐的人
    [RC wǒ zuótiān  kànjiàn    de] [RC xǐhuān yǐnyuè de]  rèn
    I yesterday     saw DE          like music DE person
    ‘the person who likes music who I saw yesterday’
b. [Individual level]-[Stage level]-[Head]
  *[RC xiǎihuān yīnyuè de] [RC wǒ zuótiān kànjiàn de] rén
    like music DE  I yesterday saw DE person  (Huang 2016:443)

Notice in (100) that the individual-level adjective zhōngwén ‘Chinese’ is a complement, but in (101) relative clauses can be either individual-level or stage-level predicates.

The last characteristic is that relative clauses can be iterated (i.e., stacked), but noun complements cannot, as shown in (102a) & (b), respective:

(102)a. +Iteration
    他发出来的令人害怕的声音
    [RC tā fā-chūlái de] [RC lìng  rén  hàipà de] shēngyīn
    he produce DE  cause person afraid DE sound
    ‘the sound that terrified others that he produced’

b. -Iteration
    *他弹钢琴的我拉小提琴的声音
    *[NC tā dàn gāngqín de] [NC wǒ lā xiǎotíqín de] shēngyīn
    he play piano DE  I play violin DE  sound
    (Huang 2016:448)

Although there are no examples of this iteration rule applied to Mandarin Chinese adjectives, it is implied by example (103) that this is a cross-linguistic phenomenon:

(103)a. +Iteration
    the tall, handsome, long-haired student
    b. -Iteration
    *the physics chemistry student
    (Huang 2016:448)

If noun complements composed of verb like example (104) and relative clauses composed of verb expressions like (105) below can be analyzed as VPs, then Huang (2016)’s data shows an overlap in the behavior of stacked prenominal verbs and adjectives, which supports Hypothesis I:

(104) 自申请的次年开始适用到毕业的次年停止
    zì [NC shēnqǐng de] cì-nián kāishǐ  shìyòng dào [NC bìyè de] cì-nián tíngzhǐ
    from  apply DE next-year begin applicable to graduate DE next-year stop
    ‘Effective from the year after application, until the year after graduation.’

(105) 長得高高的留著長頭髮的對手
    [RC zhǎng-dé gāo gāo de] [RC liūzhe zhǎng tóufà de] duìshǒu
    grow tall DE  keep long hair DE  opponent
    ‘the opponent who wears long hair and stands quite tall’   (Huang 2016:449)
7 Conclusion

I have demonstrated that neither Hypothesis 1 or Hypothesis 2 is noticeably superior in evidence quantity or quality compared to the other. The empirically-based evaluation has shown that each proponent’s theory possesses strengths as well as limitations or missed opportunities.

Chen-Sheng Luther Liu (2010)’s proposal that a polarity-like positive morpheme with two allomorphs 0-binds predicative gradable adjectives in Mandarin Chinese is questionable because natural language typically recognizes an overt or a covert form of a lexical item rather than both. Furthermore, Liu (2018)’s claim that the Constraint on Multiple Foci accounts for the distribution of both allomorphs does not capture cross-linguistic patterns. Despite the limitations of the theory itself, he crucially points out that the pro-form nàgè ‘that-GE’ can substitute for both verbs and gradable adjectives. The requirement of the modal operator huì and the overt form hěn to identify nàgè as a verb or an adjective, respectively, supports Hypothesis 1, but the pro-form can only co-reference things with adversely-negative meanings and in limited contexts.

Avid supporter of Hypothesis 2, Waltraud Paul, proposes that adnominal-modifying verbs require de, unless they form compounds, whereas adnominal-modifying simple adjectives (SAs) can form phrasal constructions without de. Although gradable simple adjectives do not require the copula shì ‘to be’ to function as predicates, they do form relative clauses because, unlike adnominal verbs, de is optional. Paul also demonstrates how some nominal constructions modified by adjectives are phrasal by grammatically eliding head nouns in subsequent NPs. However, the Lexical Integrity Hypothesis (LIH), which the eliding test is based on, can be violated (i.e., some compounds behave like phrases) and some adnominal verbs can indeed form phrases without de (i.e., [VP N]).

Shi-Zhe Huang (2006, 2015, 2017) proposes that SAs and bare nominals are of semantic
type e whereas verbs and derived adjectives (DAs) are of type <e,t>, and that de is a general type shifter of type <<e,t>,e> whose purpose is to ensure that two lexical items are type matched before intersecting. Huang’s theory accounts for why SAs in predicate positions cannot appear in their bare forms, but can modify a nominal without de. This behavior diverges from that of DAs and verbs where the opposite occurs, which supports Hypothesis 2. She does miss an opportunity to consider how Hypothesis 2 is weakened by certain situations where verbs and bare gradable adjectives are re-analyzed as nominals (i.e., type e) and predicates (i.e., <e,t>), respectively.

After conducting an analysis comparing stacking of Mandarin Chinese adjectives and verb-phrases, I conclude that the stacking behaviors do not decisively support one hypothesis over the other as of now. At first, the number of identifiable differences is overwhelmingly greater than the number of similarities, which further reinforces Hypothesis 2. Nevertheless, there are two pieces of evidence that may support Hypothesis 1. First, the claim that adjective stacking without de is restricted is based on modification of mostly inanimate and some animal nominal, and one native Mandarin Chinese speaker judged the ordering of adjectives to be freer with the human, agentive nominal ‘singer.’ Therefore, I propose that the prenominal adjective ordering of some NPs is relatively free, similar to verb ordering. Second, Huang (2016) demonstrates how stacking order of adjuncts and complements applies to both adjectives and predicates in the nominal domain. I am not in a position to claim that adnominal-modifying verbs form either verb phrases (VPs) or relative clauses; but if they do indeed form VPs, then I propose that such data from Huang (2016) supports Hypothesis 1.

Rather than dwell longer in this debate on part-of-speech status, I advise future research to further define the nuances of Mandarin Chinese adjectives and verbs in order to clearly outline what areas they converge and diverge in behavior. As a start, it seems to me that absolute SAs
are the only type of adjectives that consistently distinguish themselves from verbs.

8 Work Cited:


Huang, S.-Z. (2015), “Ineligibility for Ellipsis: Type <e,t> or Functional Category Status?”, presented at a conference at Tokyo University of Foreign Studies, 1-12.


