de in Mandarin ↔ *e* in Taiwanese

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Abstract

Despite the more than half-century study by numerous linguists on the properties of the attributive marker *de* and the structure of the nominal phrase [XP *de* YP] in Mandarin Chinese, a consensus has yet been reached. This work provides a new perspective to the issues through the investigation of the properties of the corresponding marker *e* in Southern Min-Taiwanese. The empirical support is built on the structural factors determining the occurrence of *e* and its tone values in different contexts. The study helps provide answers to (i) how the seemingly conflicting facts in constituency structures [XP *e* YP] can be accommodated: some facts indicate that *e* forms a unit with the preceding XP but some others suggest that it forms a constituent with the following YP; and (ii) what principles determine the tone changes of *e*. The core of the answers is the observation that Southern Min-Taiwanese allows the sequence e_0-e_5, indicating that the structure of [XP *e* YP] actually can be [[XP e_0][e_5 YP]]. Correspondingly, the structure of the Mandarin nominal phrase [XP *de* YP] can also be the result of reduction from two *de*'s, thereby resolving the debate on whether Mandarin [XP *de* YP] should be [[XP *de*] YP] or [XP [*de* YP]].

Keywords

The issues that need to be addressed in adequately characterizing the nominal structure [$_{DP/NP}$ XP *de* YP] in Mandarin and similar ones in other dialects have been interesting but very challenging, as shown by the large quantity of the relevant works with long debates on how to define the basic properties of the structure. Among the numerous works inspired by Zhu on *de* (such as Zhu 1961, 1966, 1983, 1993, among others) and the many formal analyses of *de* in the Mandarin nominal expression [$_{DP/NP}$ XP *de* YP], there has been no agreement on the most fundamental issues: what is the grammatical status of *de*? What is the constituent structure of [$_{DP/NP}$ XP *de* YP]? Does *de* form a constituent with XP or YP? For instance, a series of papers in *Contemporary Linguistics (Dangdai Yuyanxue)* debated about whether *de* can be a head (for instance, Si 2004, 2006, Xiong 2005, Zhou 2005, 2007, Tang 2006, Lu 2006, Li 2008, Shi 2008). Others have argued that *de* is a complementizer taking the preceding XP as its complement (e.g. Cheng 1986, Paul 2007), or that it is part of a relative clause (Lu 1982), or that it is a nominalizer (e.g. Paris 1979, small *n* in Zhang 1999), or a determiner (Simpson and Wu 2002). Some relate *de* to Case, saying it assigns Case to the preceding XP (e.g. Li 1985, 1990, Larson 2009). *De* has also been likened to conjunction words in the sense that it requires two constituents (XP and YP) and does not contribute categorial features to the phrase dominating it (Li 2008, Zhang 2009, Zhang 1987). It has also been suggested that *de* is some kind of modification marker inserted in an appropriate structure (Huang 1982) or is the head of a ModP (see, for instance, Rubin 2003, Sio 2006). It has also been suggested that it might be the marker of the division of two domains allowing two different types of modification (Paul 2005), a type-shifter (Huang 2006), a marker of predicate inversion (den Dikken and Singhapreecha 2004, den Dikken 2006), a type of classifier (Arsenijevic and Sio 2007, Cheng and Sybesma 2009, also see Xu and Matthews 2011), a relativizer, (Lü 1982), or a preposition (Li 1992 [1924], Wang 1984) among other possibilities. Indeed, probably all the logical and imaginable possibilities for the status of *de* and the constituent structure of [$_{DP/NP}$ XP *de* YP] have been considered. The choice of the category for *de* affects the structures; *de* could form a constituent either with XP, with YP, or with both. That is, both [[XP *de*] YP] and [XP [*de* YP]] have been proposed, in addition to the option of a flat structure [XP *de* YP].

This work approaches the issues from a cross-dialectal perspective through the comparison of the properties of *de* in Mandarin and the corresponding Taiwanese marker *e* within nominal expressions. The empirical focus will build on the contextual factors governing the distribution of the varieties of the marker *e* in the nominal expression [$_{DP/NP}$ XP *e* YP].[1] This marker can have different tones: *e* in its citation tone e_5, e_5 having undergone tone sandhi becoming e_7,[2] and *e* with the

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[1] *De* in Mandarin and *e* in Taiwanese can be within the projections of Noun Phrases (NPs) or Determiner Phrases (DPs). See section 3 for some details.

[2] After the tone change, the fifth tone becomes mid-level or low-level in different dialects. The fifth tone becomes tone 3 (low-level) in the *pian-Chuan-accent* (偏泉腔), tone 7 (mid-level) in the

neutral tone e_0. The study will help provide answers to (1) why the various forms of e are the way they are and (2) how seemingly conflicting facts in constituency structures [$_{DP/NP}$ XP e YP] can be accommodated. The conflict is that some facts indicate that e forms a unit with the preceding XP but some others suggest that it forms a constituent with the following YP.

I first show that the behavior of e in Taiwanese, with different tones reflecting constituency and tone group formation, argues for the head status of e in [$_{DP/NP}$ XP e YP]. That is, e is a functional head within a nominal phrase. The structure should be analyzed as [$_{DP/NP}$ XP [e YP]], where YP is a complement to the functional head e, forming a constituent with it. However, a difficulty challenging the adoption of the structure [$_{DP/NP}$ XP [e YP]] is the fact that XP and e seem to be able to function as a constituent. Supporting evidence can be found in the fact that XP and e act as a constituent in coordination patterns, just like what is observed with de and the preceding XP in Aoun and Li (2003), who argue that de and the preceding XP form a unit because they can participate in coordination with another conjunct. In other words, there is evidence for both [e YP] and [XP e] as constituents. It will be shown that this conflict can be resolved through a detailed investigation of the variations of e: the sequence of e_0-e_5 is possible in some cases. This recalls Zhu's (1961) distinction of different types of Mandarin de and the possibility of more than one type of the corresponding markers co-occurring in some dialects. It will be proposed that the sequence of a nominal phrase containing e_0-e_5 should be analyzed as [[XP-e_0] [e_5 [YP]]], with e_0 forming a constituent with XP and e_5 being a head that takes YP as its complement. The two e's in the sequence are generally collapsed into one by dropping e_5 when YP is empty and deleting e_0 when YP is overt. However, these variations apply only to the cases where the XP is adjectival or clausal. In the cases where the XP is a DP, the form is always [XP [e_5 YP]], with e_0 never being present at any point in the derivation. The basic e_5 undergoes the regular tone change rule to become e_7 when YP is overt. Accordingly, the tonal changes of e in the relevant patterns are captured.

The implication of this analysis is that the Mandarin [XP de YP] might actually be [[XP de] [de YP]], with the two de's merged into one (haplology), thereby solving the controversy regarding the constituency structure of [XP de

variety $pian$-$Zhang$-$accent$ (偏漳腔) (Lau Seng-hian, personal communication). See Wang (1967), Cheng (1968), Hsieh (1970), Yip (1980), Chen (1987, 1996, 2000), Tsay (1994), Meyers and Tsay (2008), among many others for the tone sandhi rules in Taiwanese or Southern Min: a "basic" or "citation" tone is changed to a different tone if it is not at the end of a tone group. This work disregards the variations in the exact tone values because they are not central to the concerns in this paper. In addition, the terms "basic tone" and "sandhi tone" will be used, disregarding other possibilities, again, simply due to the lack of direct consequence to the focus of this work. For instance, Meyers and Tsay (2008) suggest to label the alternate tone forms "juncture tone" and "context tone", rather than the more commonly used "basic tone" and "sandhi tone". According to them, "The tone alternations are between tones as they appear in juncture position (i.e. the right edge of a prosodic constituent called a tone group) and in context position (elsewhere)." (p. 50)

YP]. The results of this study will additionally have implications for the different behavior in conjunction possibilities involving XP-*de* in Mandarin and the analysis of nominal structures.

1. The properties and variations[3]

In a Taiwanese nominal expression [$_{DP/NP}$ XP *e* YP], the XP can be nominal, adjectival or clausal.[4] The YP is always nominal, exactly as it is with the nominal *de* in Mandarin. However, *e* shows some variations in pronunciation not found with *de*, which is always pronounced with the neutral tone. These varieties of *e* are described in the following paragraphs.

The tone value of *e* has much to do with the category and function of XP and the presence/absence of the following YP. In the form [$_{DP/NP}$ XP *e* YP], the nominal YP can appear overtly or be empty:

(1)   a. hit-e   haksing e   (pio-a)   --- XP is nominal
         that-Cl   student   E   watch
         'that student's (watch)'

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[3]   The marker *de* in Mandarin Chinese can be used in many contexts. Zhu (1961) distinguishes three types: the adverbial *de*1, the adjectival *de*2, and the nominal *de*3.

(i) a. manman-**de** zou
       slow- DE   walk
       'walk slowly.'
    b. yifu   shi xuebai-de
       clothes be snow.white-DE
       '(The) clothes are snow white.'
    c. bai-**de**   (yifu)
       white-DE clothes
       'white (clothes).'

De has also been regarded as a general modification marker: the *de* between a verb and a following descriptive or result expression, as illustrated in (ii), is sometimes written in the same way to indicate the presence of some modification relation between the verb and the following adjectival expression (as well as verbal/clausal expressions), although distinct characters have also been used by many people for the various usages of *de*.

(ii) a. Ta pao-de hen kuai.
        he run-DE very fast
        'He runs fast.'
     b. Ta pao-de hen lei.
        he run-DE very tired
        'He got tired from running.'

As noted frequently, Taiwanese uses different morphemes for these structures: *tioh* or *kah* for (iia-b), a for (ia) and *e* for (ib-c). This work focuses on *e*.

[4]   Contrary to the claim in a number of works that PPs can be the XP in the structure [XP *de* YP] (for a recent one, see Cheng and Sybesma 2009), I argue that true PPs are not possible in such a position. Apparent PPs actually are contained in a clause with an invisible subject (see Li 2008).

b. gua hoo hit-e   haksing e (pio-a)   --- XP is clausal
   I   give that-Cl student E   watch
   'the (watch) that I gave to that student'

c. kui   e (pio-a)   --- XP is adjectival
   expensive E   watch
   'expensive (watch)'

When YP is overt, *e* has the basic fifth tone (low-rising) but obligatorily undergoes tone sandhi and becomes the seventh tone (mid-level). This applies regardless of whether XP is nominal, clausal or adjectival.

When YP is missing, *e* takes different tones depending on what precedes it in the pattern $[_{DP/NP}$ XP-*e* $[_{YP}\_\_\_]]$. Yang (1991) and Lien (2008), among others, note that when the XP is a possessor, *e* is tone 5 (and remains tone 5 because YP is empty); whereas it has the neutral tone in the other cases. That is, the marker *e* in (1a) is pronounced as e_5 because XP is nominal and it is e_0 in (1b, c) because XP is clausal/adjectival. This is a highly pronounced and significant distinction; yet, it is not clear why such variations are the way they are. The tonal alternations have remained a mystery so far. In addition, it is interesting to note that the XP cannot be a nominal that clearly does not express possession,[5] such as when it expresses the status or property of YP, as illustrated by the impossibility of the following expressions.

(2)   a. *haksing e huegwan[6]
     student   E   member
     'student member'

   b. *hautiunn e hit-e lang
     principal E   that-Cl person
     'principal person'

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[5] The notion of possession has to be interpreted very broadly. For instance, temporal and locative nominals should be included as in English: *yesterday's temperature, last year's protest against war, Taipei's weather* (see Saito, Lin and Murasugi 2008: 255). Essentially, it is the nominal phrase that appears in the Specifier position within a nominal phrase, quite similar to the nominal followed by *'s* in English. Therefore, a theme is also included: 'the city's destruction'. So are expressions like 'women's shoes (shoes for women)' 'men's clothing (clothing for men)'. Therefore, it is not surprising that a sentence like (i) below noted by a reviewer is acceptable:

(i) Gua sammi tshu   long u   beh, kau-e, lang-e.
   I   what   house all   have sell dog-E people-E
   'I sell all kinds of houses, dog's, people's.'

[6] Saito, Lin and Murasugi (2008) note the unacceptability of expressions like *yu de tian* 'rainy day' and *xuesheng de ren* 'a person who is a student'. They claim that *de* is always in the Determiner (D) position and what appears in the Specifier (Spec) of D must be an argument, not an adjunct and that *xuesheng* 'student' in this example is an adjunct, supporting the D position of *de* in Chinese. On the other hand, relative clauses do appear in the Spec of D position in their account, following the analysis by Simpson (2003). It seems difficult to designate the element before *de* as only in the Spec of D position. In contrast, the distinction advocated in this work is chiefly between possessor (Specifier) DPs and relative clauses/adjectives. See further discussions in section 3.

Instead, the copular verb 'be' has to occur to make the expression a relative clause.

(3)   a. si haksing e huegwan
         be student E member
         'member that is a student'
      b. si hautiunn e hit-e lang
         be principal E that-Cl person
         'the person that is a/the principal'

Without elaborating further on why (2a-b) are not acceptable, it suffices, for the present purpose, to point out that the XPs in (2a-b) cannot be possessors (in a very broad sense, structurally in the Specifier position, see note 5). Accordingly, for convenience, the following discussions will take the distinction between nominal vs. adjectival/clausal within the nominal expressions in [XP *de* YP] to be identical to the contrast between possessive vs. non-possessive.

The generalization so far is this: when YP is overt, the marker *e* is always e_5: [$_{DP/NP}$ XP e_5 YP], with e_5 undergoing obligatory tone sandhi to become e_7, regardless of whether XP is nominal, adjectival or clausal. It is only when YP is empty that a distinction is made: e_5 following a nominal XP and e_0 following an adjectival or a clausal XP.

The tonal behavior of the elements within XP is also relevant. XP is generally a tone group by itself. The final syllable of XP retains its citation tone, followed by $e_{5/0}$ (e_5 becomes e_7 when YP is overt):[7]

(4)   a. thauke e_5 hue   - e_5 undergoes tone change, low-rise becoming mid-level
         boss   E   flower
         'boss's flowers'
      b. thauke e_5 - 'boss' without tone change; e_5 is in its citation tone, low-rise
         boss   E
         'boss's'

There is only one exception - when XP consists of only a pronoun. In this case, the XP pronoun must form a tone group with the following *e* and undergoes tone sandhi. The marker *e,* as with all the other cases discussed above, is in its citation tone (tone 5) when the following YP is empty. If YP is overt, e_5 undergoes the regular tone sandhi rule. In the following examples, each tone group is represented by { } and the final syllable of each tone group, not undergoing tone sandhi, is underlined.

(5)   a. {gua-e_5 <u>hue</u>} - pronoun undergoes tone change; e_5 undergoes tone change
         I-e   flower
         'my flowers'

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7   What ends a tone group is a nominal phrase, a verb phrase (predicate) or a clause. The final syllable of a tone group keeps the citation tone, i.e. not undergoing tone change (unless de-stressed to become the neutral tone).

b. {gua-e$_5$}   - pronoun undergoes tone change; e$_5$ is in its citation tone
   mine

These examples show that a pronominal XP forms a tone group with the following one; otherwise, XP is a tone group by itself.

The variations exhibited in (4)-(5) parallel the tone change patterns in the clausal structure [Subject + VP] (or, more generally, any [Specifier + [Head + Complement]]). Take (6a-b) below for instance. The last syllable of a non-pronominal subject in (6a) retains its basic tone; i.e., it does not undergo tone change. In contrast, when the subject consists of only a pronoun, the pronominal subject in (6b) undergoes tone sandhi.[8]

(6)   a. {In kiann} {beh khi hakhau}.
     his child   will go   school
   'His child is going to school.'
  b. {I   beh khi hakhau}.
     he will go   school
   'He is going to school.'

Following the general tone sandhi rules, the verb in (6a-b) also undergoes tone sandhi. When the verb is at the end of the tone group, it keeps the citation tone, as in the examples below.

(7)   a. {In kiann} {beh khi}.
     his child   will go
   'His child is going.'
  b. {I   beh khi}.
     he will go
   'He is going.'

The facts discussed so far indicate that the tonal behavior of the relevant [$_{DP/NP}$ XP e YP] is identical to that of [Subject V Object] (or other [Specifier [Head Complement]] structures). Thus, we may conclude that XP is a constituent separate from [e YP]. The marker e is a head and forms a constituent with the following YP (see Wu 2004). The structure of [$_{DP/NP}$ XP e YP] should be bracketed as [$_{DP/NP}$ XP [e YP]].

There is further support for the structure [$_{DP/NP}$ XP [e YP]], where e is a head taking YP as its complement. The head-complement structure of [e YP] can be supported by the fact that ellipsis is possible in the position of YP, as illustrated by (4b), (5b) and other examples where YP is missing.[9] This contrasts with the following examples with an adverbial modifying the following verb:

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8   The tone sandhi rule in Taiwanese can be roughly stated as this: every syllable except the last one of an NP/DP or VP or clause must undergo tone change.
9   No stance is taken here regarding the proper analysis of ellipsis, whether it is phonological non-spell-out (Merchant 2001) or base-generation of an empty category (Lobeck 1995) or any other options.

(8) a. Mandarin: b. Taiwanese:
     Ta xiaoxin-di *(nian).   I   seji-a   *(liam)
     he careful-ly   read   he careful-ly   read
     'He read carefully.'   'He read carefully.'

In the extensive literature on ellipsis, it has generally been observed that only the complement of a head can be missing (see, among many others, Lobeck 1995, Merchant 2001, Aoun and Li 2008, Li 2005, Cheng and Sybesma 2009, Huang and Ochi 2011).[10]

The facts above regarding the tonal behavior of [XP *e* YP] and the possibility of YP being null argue for the structure of [$_{DP/NP}$ XP [*e* YP]], where *e* is a head, forming a constituent with the following YP complement.[11]

However, this conclusion faces a serious challenge. Many proposals mentioned at the beginning of this work take *e* to form a constituent with the preceding XP. Specifically arguing for such a constituency is Aoun and Li (2003), who use the conjunction constituency test to show that XP and *de* can form a constituent in Mandarin.[12] As illustrated by the example below, the two conjuncts conjoined by the non-nominal conjunction word *erqie* 'and' both contain the marker *de*. This

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[10] However, not all heads can license deletion (see, for instance, Lobeck 1995, Merchant 2001).

[11] J. Huang (personal communication) suggests another option. A "syntax-phonology mismatch" is observed in the case of pronouns - a pronoun in the subject position, which by itself should be a tone group, actually forms a tone group with the following VP and undergoes tone change as in (5a-b). Could it be that *e* still forms a unit with the preceding XP, instead of forming a constituent with the following YP syntactically, and the tone change is just another instance of syntax-phonology mismatch? The answer is probably negative. Consider the subject pronoun case. It can be attached to the following tone group only when the pronoun constitutes the entire tone phrase. If the pronoun is part of a larger constituent/tone group (such as a VP, NP), it cannot change its affiliation and form a tone group with the following constituent. This is illustrated by the DP example in (i) and the VP example in (ii):

(i) {Gongtai gua} {bo   thaunau}.
    silly   me   not.have brain
    'Silly me has no brains.'

(ii) {Koo gua} {bo tiongiau}.
     care me   not important
     'Caring for me is not important.'

The pronoun in (i) and (ii) each is part of the subject DP/VP and forms a tone group with the rest of the phrase in the subject position. Because it is the last syllable of the tone group, it does not undergo tone change. The pronoun in (ii) has the option of being de-stressed and becoming a neutral tone. Either way, the pronoun does not form a group with the following VP and take the sandhi tone. In other words, the "syntax-phonology mismatch" occurs only when the pronoun is a tone group by itself; it does not happen when the pronoun is part of the preceding tone group/syntactic phrase. Similarly, the fact that *e* forms a tone group with YP in [XP *e* YP] means *e* cannot form a tone group or a syntactic phrase with the preceding XP.

[12] See Zhang (2000), Xiong (2005), and Zhou (2005, 2006) among others for the discussion of the judgment regarding [*de* YP] as a constituent in Mandarin.

shows that *de* forms a constituent with the preceding XP and the two conjuncts combine to modify the nominal following *de*.[13]

(9) a. [hen xin-de]   erqie [feichang gui-de]   dongxi
         very new-DE and   very   expensive-DE thing
         'things that are new and very expensive'
     b. [na-ge   gongchang zuo-de] erqie [tamen dou hen xihuan de] dongxi
         that-Cl factory   make-DE and   they   all   very like   DE thing
         'things that the factory makes and that they all like'

Exactly the same holds in Taiwanese. The marker *e* can appear in both conjuncts:

(10) a. [siong sin-e]   jitshiann [tekbek   kui-e]   mihkiann
         most new-DE and   especially expensive-DE thing
         'things that are very new and very expensive'
     b. [hit-e   kangtshiunn tsetso-e] jitshiann [in   long kahi-e] mihkiann
         that-Cl factory   make-E and   they all like-E   thing
         'things that that factory makes and that they all like'

The conjunction test shows that *e* in Taiwanese nominal expressions [$_{DP/NP}$ XP *e* YP] forms a constituent with the preceding XP, just like *de* in Mandarin. Clearly, this result contradicts with the constituency structure noted earlier according to the tonal behavior of *e* and the possibility of an empty YP. How should the conflict be resolved? In the following section, it will be shown that the clue to answering the question lies in the availability of the sequence e_0-e_5 in some patterns in Taiwanese.

2. Two *e*'s

Recall that the generalizations regarding the tone variations of *e* are:

(11) The distribution of e_0 and e_5 in [$_{DP/NP}$ XP *e* YP]
      a. e_5 is used when the YP is overt (but undergoes tone sandhi to become e_7).
      b. When the YP does not appear overtly, the category of XP determines the value of *e*. It is e_5 if XP is a DP (possessor in a very broad sense); when XP is adjectival or clausal, the form is e_0.

An additional fact that is quite interesting and relevant is that, besides the pattern noted in (11a) [[$_{DP/NP}$ XP e_5 YP], the form [$_{DP/NP}$ XP e_0-e_5 YP] is possible when YP appears overtly and XP is adjectival or clausal. When YP is missing, both the options of e_0 and e_0-e_5 are also available (though the latter sounds more redundant). These are demonstrated by the following examples. (The examples are marked with the citation tone e_5, even when e_5 followed by an overt YP should become e_7.)

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[13] Mandarin has a number of conjunction words, the choice of which varies with the category of the conjuncts (see, for instance, Aoun and Li 2003, Zhang 2009). The use of *de* in both conjuncts might sound redundant to some speakers. These two points also apply to Taiwanese.

(12) a. I   ka   sin/ku-e$_0$ long theh-khi   a.
       he take new/old-E   all   take-away   Part
       'He took away all the new/old ones.'
   b. I   ka   sin/ku-e$_0$-e$_5$ long   theh-khi   a.
       he take new/old-E-E   all   take-away   Part
       'He took away all the new/old ones.'

Such adjectives are generally mono-syllabic, although they can be modified by an adverbial expression and the e_0-e_5 sequence is still available.

(13) a. I   ka   khah   ho/sin/ku-e$_0$(-e$_5$)   long   theh-khi   a.
       he take more   good/new/old-E   all   take-away Part
       'He took away all of the better/newer/older ones.'
   b. Gua   ai   siong   ho/sin/ku-e$_0$(-e$_5$).
       I   want   most   good/new/old-E-E
       'I want the best/newest/oldest.'
(14) a. khah   sin/kui(-e$_0$)-e$_5$ sann
       more   new(-E)-E   clothes
       'newer/more expensive clothes'
   b. siong   ho/kui(-e$_0$)-e$_5$ tsheh
       most   good/expensive(-E)-E   book
       'best/most expensive book'
   c. tsiok   sui(-e$_0$)-e$_5$ gin-a
       very   pretty(-E)-E   children
       'very pretty children'

In addition to an adjectival XP, a clausal XP also allows the sequence e_0-e_5, in addition to the option of only e_0.[14]

(15) I   ka gua tso-e$_0$(-e$_5$)   long theh-khi   a.
       he KA I   make-E(-E)   all   take-away Part
       'He took away all that I made.'
(16) I   ka gua tso-e$_0$(-e$_5$)   mihkiann   long   theh-khi   a.
       he KA I   make-E(-E)   thing   all   take-away   Part
       'He took away all the things that I made.'

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[14] If the adjective is bi-syllabic, such as *lah-sap* 'dirty', *tshing-khi* 'clean', *pin-tuann* 'lazy', *kut-lat* 'diligent', then using the sequence of two *e*'s sounds much more redundant than using only the neutral tone *e*:

(i) I   ka   lah-sap/tshing-khi-e$_0$(??-e$_5$)   long   theh-khi a.
     he KA   dirty/clean-E-E   all   take-away Part
     'He took away all of the dirty/clean ones.'

The same is true with verbs. Multi-syllabic verbs are worse with the sequence of e_0-e_5 than with only e_0.

(ii) I   ka   gua   kah-i-e$_0$(??-e$_5$)   long   theh-khi   a.
      he KA   I   like-E-E   all   take-away   Part
      'He took away all those that I liked.'

For noun phrases, the e_0-e_5 sequence is most noticeable in the cases involving a proper name or title, some of which normally end with e_0.

(17)   a. Li-e_0-e_5 (sann)
           Li's (clothes)
       b. sun-e_0-e_5 (mihkiann)
           grandson's (stuff)

The ones referring to individuals by their titles also allow the e_0-e_5 sequence, such as the CEO, the president, the superior, etc.

(18)   tsong/tang/tiunn-e_0-e_5 (mihkiann)
       the general/CEO/superior-E-E (stuff)

The pattern can also be used with expressions that refer to people or things by location:

(19)   a. tshupinn-e_0-e_5 (mihkiann)
           house-side-E-E (stuff)
           'the (stuff) belonging to the person(s) that is/are next door'
       b. aupiah-e_0-e_5 (mihkiann)
           back.side-E-E (stuff)
           'the (stuff) belonging to the person(s) that is/are behind (a known entity)'

When a person is referred to only by his/her family name and the family name is mono-syllabic, e_0 is generally obligatory, as in (17a). The form can also be used as a vocative for a limited set of intimate family members, although it is not limited to such usage, as illustrated by the examples in (17a-b).

(20)   a. sun-e_0 'the one that is grandson'
       b. kiann-e_0 'the one that is son'
       c. ang-e_0 'the one that is husband'
       d. boo-e_0 'the one that is wife'

The translations in (20a-d) (and similar translations can be rendered for the examples in (17)-(19)) suggest that these forms are not simple nominals. Rather, they are reduced relative clauses. This is supported by the use of e_0 in these cases. Further support is their identical behavior as that of regular relative clauses without a modified head illustrated by (21) and (22) below.[15]

(21)   a. sun-e_0-e_5 (mihkiann)   'the (stuff) belonging to the one that is grandson'
       b. kiann-e_0-e_5 (mihkiann) 'the (stuff) belonging to the one that is son'
       c. ang-e_0-e_5 (mihkiann)   'the (stuff) belonging to the one that is husband'
       d. boo-e_0-e_5 (mihkiann)   'the (stuff) belonging to the one that is wife'

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[15] A reviewer asked if there were differences in meaning between *sun-e_5 mihkiann* 'grandson's stuff' and *sun-e_0-e_5 mihkiann* 'the stuff of the one who is grandson'. The two mean exactly like what their English translations indicate. Both have a DP possessor. The former is a simplex DP and the latter is a complex one, containing a relative clause.

cf.

(22) a. i tshuah lai-e_0-e_5 (mihkiann) 'the (stuff) belonging to the one he brought here'
     b. tshuah i lai-e_0-e_5 (mihkiann) 'the (stuff) belonging to the one that brought him here'

In these cases, e_0 indicates the presence of a relative clause and the nominal modified by the relative clause is empty - a complex DP. The DP in turn precedes e_5, like all other DPs do.

However, nouns that are not titles or proper names or entities referred to by locations are generally not possible with e_0; therefore the e_0-e_5 combination is not available.[16] In such cases, only e_5 is possible.

(23) *pit-e_0,   *tsua-e_0,   *lang-e_0,   *kau-e_0
     pen-E   paper-E   person-E   dog-E

(24) pit-(*e_0)-e_5 kesiau, tsua-(*e_0)-e_5 ketat, lang-(*e_0)-e_5 miann, kau-(*e_0)-e_5 tshui
     pen-E   price   paper-E   worth person-E   name dog-E   mouth

The contrast between (20)-(21) on the one hand and (23)-(24) on the other provides confirmation that the former should be grouped with relative clauses. Simplex DPs as XPs in the form [XP *e* YP] do not allow the sequence e_0-e_5.

These interesting facts reveal the following generalizations:

(25) a. The sequence e_0-e_5 can occur in place of a single *e* in the form [$_{DP/NP}$ XP *e* YP] when XP is adjectival or clausal, but not when it is nominal: [$_{DP/NP}$ DP e_5 YP] vs. [$_{DP/NP}$ Adj/Clause e_0-e_5 YP].
     b. When only one *e* is used, the form is e_5 (and undergoes tone change) when an overt YP follows. When YP is null, a nominal XP is followed by e_5 and an adjectival or clausal XP is followed by e_0: [$_{DP/NP}$ DP e_5 Ø] vs. [$_{DP/NP}$ Adj/Clause e_0 Ø].

Why are there such differences? What principles govern the distribution of these varieties of *e*? The next section shows that a proper understanding of *e* not only helps us understand the generalizations in (25a-b) but also resolves the conflict concerning the constituent structure of [$_{DP/NP}$ XP *e* YP].

3. Analysis

The possibility of [$_{DP/NP}$ XP e_0-e_5 YP] provides a straightforward answer to the observed conflict related to the constituency structures of [$_{DP/NP}$ XP *e* YP], where *e*

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[16] A reviewer asked why the set is restricted to "titles or proper names or entities referred to by locations". This is probably an issue of world knowledge in how a unique entity can be identified solely by its property. The property must be prominent and, in particular, unique enough so that the intended referent is clear to the hearer. The entities that are a son or a wife or a husband or in a specific location well-known to the hearer are easier to uniquely identify through the unique property of being son/wife/husband/at the specific location than the general properties of common nouns such as pens, people.

seemingly forms a constituent with XP and also with YP. This conflict ceases to exist, when e in fact should be analyzed as e_0-e_5 – with e_0 forming a constituent with XP and e_5 forming a constituent with YP: $[_{DP/NP}$ [XP e_0] [e_5 YP]]. This is a welcome result.[17]

Moreover, deriving one e from the sequence e_0-e_5 also accounts for the distribution of the different tonal varieties of e's, as shown below.

What is at work is the phonological simplification of the sequence of e_0-e_5 into one e, a process that is sensitive to constituency structures. When YP appears overtly, the head to the complement YP e_5 stays and the first e_0 is "deleted" from [[XP e_0] [e_5 YP]], resulting in [XP e_5 YP] and e_5 undergoing the regular tone change.

The contrast in tone values between DPs and Adj/Clauses when YP is empty can also be captured. For a YP to be empty, the entire constituent [e_5 YP] is not pronounced, resulting in $[_{DP/NP}$ [Adj/Clause-XP e_0] Ø]. However, as noted, in the case of DPs, the base form does not have the sequence e_0-e_5. It is consistently [DP-XP e_5 YP] throughout the derivation. Because of the need to pronounce at least one e, the only possibility is not to pronounce YP and the result is [DP-XP e_5 Ø], with e_5 retaining its citation tone. These variations are summarized below:

(26) a. adjectival and clausal XP
$[_{DP/NP}$ XP e YP] is phonologically simplified from $[_{DP/NP}$ [XP e_0] [e_5 YP]]
    i.   When YP is overt, the constituent [e_5 YP] is intact and the neutral-tone e_0 attached to the preceding XP is not pronounced, deriving $[_{DP/NP}$ XP e_5 YP], where e_5 undergoes tone change to become e_7.
    ii. When YP does not appear overtly, [e_5 YP] is not spelled out. The form that surfaces is $[_{DP/NP}$ XP e_0 Ø].
  b. nominal XP
$[_{DP/NP}$ XP e YP] has only one possible form: $[_{DP/NP}$ XP e_5 YP]
    i.   When YP is overt, e_5 undergoes tone change to become e_7.
    ii. When YP does not appear overtly, YP is not spelled out. The form that surfaces is $[_{DP/NP}$ XP e_5 Ø], and e_5 retains its citation tone.

According to (26a-b), the variations of e are the results of spell-out or non-spell-out, governed by the syntactic structures and the formation of tonal groups.[18]

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[17] Interestingly, Arsenijevic and Sio (2009) propose that the counterpart of the Mandarin marker *de* in Cantonese, *ge,* should be analyzed as having two different features checked in two different positions (thanks to a reviewer for this reference). The proposal in this work has the same double position idea, except that the duality does not apply to the cases when the XP is a DP.

[18] In the case of using a family name to refer to a person, such as *Li-e_0* or *Ong-e_0* (only applicable to male adults), very much like *xing Li de* or *xing Wang de* in Mandarin (the one whose last name is Li/Wang), the structure is a complex NP containing a relative clause and the sequence of -e_0-e_5 is maintained. No deletion takes place. The same is true with those referred to by status/title or location. See (17)-(21)):

Avoiding changes of meanings is also an important factor in determining whether to spell out *e* or not. For instance, consider those with entities referred to by location such as (19a-b). The sequence e_0-e_5 is required to express the intended meaning that it is the person uniquely identified by the location (complex DP) that is being referred to rather than the location itself.

(27) I   ka   aupiah-e$_0$ e$_5$ long   thehlai-a.
      he   KA   back.side-E   E   all   bring-Part
      'He brought all the stuff that belongs to the one(s) in the back.'

In brief, although the sequence e_0-e_5 is not manifested in all the cases involving clausal and adjectival XPs, its presence is supported by the fact that both e_0 and e_5 do occur: they sometimes occur simultaneously, and sometimes only one or the other occurs according to the context.

A subsequent question that should be raised is why there are two *e*'s. What are e_0 and e_5 and what are their functions? Several options are available. Following Li (2008), we can take the marker e_5 to be a conjunction-like morpheme that relates the preceding XP (and e_0) and the following YP.[19] The two "conjoined" phrases need to be of the same category. The identity of the category can be stated in semantic terms as in Huang (2006): YP is a type *e* expression. When XP is a DP, it is also a type *e* expression and e_5 can conjoin the two phrases. A non-type *e* expression, such as an adjective or a clause, has the marker e_0 to turn it into a type *e* expression. Alternatively, it can be stated in syntactic terms. YP is always a nominal category. XP must also be a nominal category. When it is not, e_0 makes it so. A third option is to say that the existence of XP needs to be licensed. When it is a DP, possessor in a very broad sense, the possessor theta-role licenses its existence and e_0 is not necessary. In contrast, when it is not a possessor, i.e. when it is a modifier, it needs e_0 to license its existence (in the spirit of the Mod projection in Rubin 2003). The licensing can be cast in terms of thematic roles (possessor theta-role and adjunct theta-role) or structural relation. This latter structural option would distinguish a Specifier vs. an adjunct position.[20] A Specifier of a functional category inside a DP

(i) a. Li-e$_0$-e$_5$ sann
       Li's   clothes
       'clothes of a person whose surname is Li'
    b. Ong-e$_0$-e$_5$ tshupinn
       Wang's   neighbors
       'neighbors of a person whose surname is Wang'

[19] Cormack and Smith (2005) assume that in nominal modification, a covert asymmetric conjunction operator is specified for selecting an element of the <e, t> type on the one hand and a noun on the other. What Li (2008) notes regarding the conjunction-like behavior of the nominal marker *de* is the lack of categorical contribution by *de*.

[20] A reviewer asked how the possessor reading in an example like (27) is derived. Because the possessor is a complex DP, it will be in a Specifier position like all other possessor DPs and receive the vague possessor structural theta-role according to the structure: it is in a Specifier position in a DP.

would have the interpretation of a very broad possessor[21] but an adjoined element is a modifier. Regardless of which option is adopted, e_5 always plays the linking role. Such a licensing condition, if obligatory, might accommodate the unacceptability of (2a-b): the occurrence of e_5 indicates that the preceding nominal XP should be a possessor. A possession reading is not possible in (2a-b).

Some of these options need clarifications. For the option of syntactic categories, the nominal categories involved can be NP or DP or even NumP (Li 1998), because these categories can all follow e. This should not be an issue because some conjunction words in Mandarin Chinese, as well as in Taiwanese, are less restrictive in what their conjuncts can be, such as *huo* 'or' in Mandarin, which can conjoin phrases of any category. *Erqie* can conjoin any category from VP up to CP. Similar expressions in Taiwanese also behave like this.

Regarding the semantic option of taking e_0 as a type shifter, the assumption should be that any adjective, simplex or complex, is a candidate to undergo type-shifting, because they can always occur with e_0. This does not follow straightforwardly from Huang's (2006) proposal for the Mandarin Adjective + Noun expressions. According to her, simplex adjectives are of the same semantic type as the modified nouns, both being type e expressions. Being identical in semantic type makes it possible for a simplex adjective and a noun to be combined without any marker. This contrasts with the impossibility of nouns combining with complex adjectives directly, complex adjectives being type <e, t> expressions. The marker *de* is required. *De* is a type shifter, shifting type <e, t> to type e. Her work does not address the issue of why simplex adjectives in Mandarin can also occur with *de*, like complex adjectives. That is, even though simplex adjectives can be directly combined with nouns, any adjective can take *de* when modifying a noun. The cases of simplex adjectives occurring with *de* cannot be dismissed by analyzing them as reduced relative clauses because some of them can only be used

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[21] A nominal expression in Mandarin or Taiwanese can have multiple possessors in different positions – before or after a demonstrative, before or after a number-classifier phrase (the examples below are only given in Mandarin. Taiwanese behaves alike in this respect):

(i)   Zhangsan-de na-ben Lisi-de shu
      Zhangsan-DE that-Cl Lisi-DE book
      'That book of Lisi's that Zhangsan has'
(ii) na-ben Zhangsan-de Lisi-de shu
      that-Cl Zhangsan-DE Lisi-DE book
      'That book of Lisi's that Zhangsan has'
(iii) Zhangsan-de yi-ben Lisi-de shu
      Zhangsan-DE one-Cl Lisi-DE book
      'a book of Lisi's that Zhangsan has'

This shows that *de* (or *e5*) should be able to function as a head in the spine of nominal projections and allow its Specifier to host a possessor DP (regardless of how broad the possessor interpretation is). The distinction between a DP and an Adjective/Clause-e_0 is that the former occupies the Specifier position but the latter is an adjoined phrase.

attributively. There are adjectives that cannot serve as predicates but can occur prenominally with *de* (e.g., Aoun and Li 2003, Paul 2005). Further note that, the so-called complex adjectives sometimes can modify nouns without *de*, as illustrated by the following examples found through google search.

(28) a. binleng yutian 'icy-cold rainy days'
   b. yanre diqiu de bingleng hexin 'the icy cold nuclear of the fiery hot earth'
   c. yige zhangze xuebai datui de mei nü 'a beauty with snow-white legs'
   d. xuebai jifu youhuo ren xin 'snow-white skins lure people's hearts'
   e. jiao nin xuebai yeziqiu zenme zuo 'teach you how to make snow-white coconut ball'
   f. jingxin tiaoxuan de qihei dilao 'carefully selected pitch-dark dungeon'
   g. fenhong jiayuan 'pink home'
   h. fenhong sidai 'pink ribbon'
   i. fenhong nülang 'pink lady'
   j. ba hui-mengmeng zhaopian tiao qingxi 'adjust clear the gray misty photo'
   k. zhe shi yi-zhang dianxing de hui mengmieng zhaopian 'this is a typical gray misty photo'
   l. huo-re qishi 'fire-hot rider'
   m. huo-re wu niang 'fire-hot dancing lady'

Taiwanese behaves the same in these respects. All adjectives can occur with e_0 Some of them can be combined with nouns without *e*, which probably can be better analyzed as compounds.[22]

Because a prenominal adjective can always occur with *e* but the combination of an adjective and noun without *e* is not always possible, it would be a plausible option to take all adjectives to be of the same semantic type and the occurrence of *e* to be generally required unless the adjective is compounded with a noun. Accordingly, if the option of *e* as a type-shifter is adopted, it means that *e* occurs with all adjectives unless the adjective is compounded with the following noun.

4. Implications

The analysis proposed in this work offers a solution to the debate on what the constituent structure should be for the nominal [$_{DP/NP}$ XP *de* YP] in Mandarin: the constituent structure can have both [XP *de*] and [*de* YP] because of the evidence from the corresponding structure in Taiwanese. *De* can simply be the conflation

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[22] It has been controversial as to whether the *de*-less [Adj + N] should be analyzed as compounds (see some of the works against this view, Huang 2006, Paul 2005). The position this work adopts is that it is possible that the use or non-use of the Mandarin *de* or the Taiwanese *e* is not between simplex and complex adjectives but between compounding and syntactic phrases, even though the two overlap extensively. Simplex adjectives are more likely to be compounded with nouns. In other words, the non-use of *de/e* always involves compounding and the compounding is subject to various considerations such as frequency of occurrences, syllabic structures, etc.

of two morphemes corresponding to e_0 and e_5 in Taiwanese. This predicts that in the cases where only e_5 can appear, as in those involving a possessor XP, the only option for the Mandarin structure should be [$_{DP/NP}$ Possessor XP [*de* YP]]. In other words, even though the surface strings might appear the same [$_{DP/NP}$ XP *de* YP], the constituent structure varies based on the type of XP. When the XP is an adjective or a clause, the structure is [$_{DP/NP}$ [XP *de*] [*de* YP]], the first *de* corresponds to the Taiwanese e_0, and the second, the Taiwanese e_5. When the XP is a possessor DP, the structure is simply [$_{DP/NP}$ XP [*de* YP]], *de* corresponding to e_5. This prediction is borne out by the conjunction facts. As demonstrated by the data involving adjectival and clausal modifiers like (9a-b) earlier, a clausal/adjectival XP + *de* can conjoin with another [XP *de*], modifying the following YP: [[[XP *de*] and [XP *de*]] [*de* YP]]. However, when a possessor XP with *de* is conjoined with another possessor XP-*de*, the interpretation must contain an empty YP, because this *de* is a head taking YP as its complement: [$_{DP/NP}$ Possessor XP [*de* ___] + Possessor XP [*de* (YP)]]. This is illustrated by (29), which, importantly, cannot express co-ownership.

(29) Zhangsan de gen/yiji Lisi de dongxi
      Zhangsan DE and   Lisi DE stuff
      'Zhangsan's and Lisi's stuff'

    If co-ownership is intended, the first *de* cannot appear, as predicted:

(30) Zhangsan gen/yiji Lisi de dongxi
      Zhangsan and   Lisi DE stuff
      'Zhangsan and Lisi's stuff'

    That a possessor XP behaves quite differently and therefore should be distinguished from an adjectival/clausal XP has other interesting implications for the analysis of nominal structures and the status of *de* in Mandarin. For instance, it rules out the option to analyze a possessor XP as a reduced relative clause. This contrasts with the line of analysis by Kayne (1994) and Simpson and Wu (2002), among others. In the spirit of Kayne's (1994) anti-symmetric approach to relative clauses and possessor expressions within nominal phrases, Simpson and Wu argue that the phrase preceding *de*, the XP in [$_{DP}$ XP *de* YP], should be some variety of relative clause. YP is raised from within the clause containing XP; then, the rest of the clause moves to the Spec of DP, preceding *de*. What this work has shown is that a relative clause must be able to take e_0, but possessors cannot. This distinction is missing if the two are analyzed as the same.

    The result of this study will also have implications for other constructions containing *e* and the counterpart in Mandarin such as those involving the so-called sentence final particle *de* (see, among many others, Paris 1979, Teng 1979 and Tang 1983, Huang 1982, 1988, Chiu 1993, Simpson and Wu 2002, Cheng 2008). It will help to disambiguate the "*shi* ...*de* constructions" in Mandarin, a pattern having received much attention because of the ambiguous status of *de* in the relevant

Mandarin patterns: *de* can be a past-tense marker or a nominalizer (Simpson and Wu 2002, and the references cited there). Taiwanese can bring a new perspective to the discussions because

(i)   Taiwanese has e_0 vs. e_5, the latter is always an indication of nominal expressions,
(ii)   complex adjectives in Taiwanese cannot be followed by *e*; i.e., the adjectival *de*2 discussed in Zhu (1961) does not have a corresponding *e* in Taiwanese, illustrated by (31)-(32) below, and
(iii) Taiwanese does not have tense markers that follow a verb.

(31) a. I-e tshiu ling-ki-ki (*e_0).
          his hand cold
          'His hands are very cold.'
       b. Thinn peh-bang-bang (*e_0).
          sky   white
          'The sky is very gray.'
cf.
(32) a. Ta-de shou leng-bing-bing *(de).
          his   hand cold
          'His hands are very cold.'
       b. Tiankong hui-meng-meng *(de).
          sky   gray
          'The sky is very gray.'

       Because of the scope a fuller discussion of these relevant issues requires, they will be left to a separate work.

Acknowledgments

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從台灣閩南語"*e*"看漢語含"的"名詞短語結構

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提要

雖然經過了過半世紀眾多學者的研究,對於漢語含"的"名詞短語的結構,至今還是眾說紛紜,百家爭鳴。本文從台灣閩南語相應之 *e* 的聲調變化及分布來看台灣閩南語名詞短語 [XP *e* YP] 的結構,從而爲解決漢語名詞短語 [XP 的 YP] 的結構問題開拓一個新方向。主要論點是:台灣閩南語名詞短語 [XP *e* YP] 其實可以含有兩個 *e*,結構是 [[XP *e*][*e* YP]]。由此推論對漢語 [XP 的 YP] 結構應該是 [[XP 的] YP] 或 [XP [的 YP]] 的爭論是可以解決的:兩方的看法合起來就是正確的,因爲表面上的一個"的"其實是兩個"的"縮減而成 - 漢語 [XP 的 YP] 其實可以是 [[XP 的][的 YP]]。

關鍵詞

定語標記 - 中心語,領屬性定語標記,關係子句 / 形容詞標記,名詞短語結構,台灣閩南語