Demonstratives and DP Structure in Formosan Languages[*]

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This paper studies the noun phrase structure of Paiwan demonstratives by examining in detail the typology of demonstratives, possessives and numerals in Formosan languages. Four main issues are addressed: in Formosan languages (A) whether the word order variation in nominals may be best accounted for along the lines of the antisymmetry condition in Kayne (1994); (B) whether demonstratives, possessives and numerals all need to be categorized as (denominal) verbs; (C) whether all types of nominal modification involve relative clauses; and (D) whether demonstratives are always definite in reference. The answer to these four questions seems to be all negative in view of the Paiwan observations that (A) the form and distribution of these three types of elements may not agree with one another; (B) the predicative elements may be nominal in nature; (C) attributive modification and predicative modification may be syntactically distinguished among modifiers; and (D) the referential properties of demonstratives may be grammatically marked.

Key words: demonstratives, possessives, numerals, antisymmetry, Formosan lan-
guages

1. Introduction

The phrase structure of clauses and nominals has been an important issue in linguistic and typological study. Various kinds of claims have been made to account for the language-specific and cross-linguistic variations of word order in clauses and nominals.

Within the framework of government and binding, for example, together with the postulation of binary branching and verb movement, the head-initial/final parameter has been assumed for the projection of lexical and functional categories, and the adjunction structure for the generation of adjuncts and modifiers. The operation of the raising of any element, head or non-head and argument or non-argument, needs to be subject to a restrictive and universal theory of movement.

Kayne (1994), by contrast, posits a restrictive and universal theory of phrase structure in which asymmetrical c-command invariably maps into linear precedence. One of its implications is that there are no right-adjunction structures, base-generation or derived. Under this assumption, adjuncts and modifiers are argued in Alexiadou (1997) and Cinque (1999) to be projected in the specifier positions of functional categories, for instance (cf. Kayne 1994).[1] And the surface word order may be derived in terms of the operation of non-operator movement of adjuncts and modifiers and/or that of head movement of verbs and nouns (cf. Chomsky 1995).[2] They claim further that the postulated hierarchies of clausal and nominal functional categories as well as those of adverbials and adjectivals are universal (cf. Borer 2005).

By examining Chinese and Formosan clauses and nominals, Tang (2001, 2003, 2005a, b, c) suggests that among other things, Alexiadou's and Cinque's universal hierarchies of functional categories based on the specifier analysis of adjuncts as well as Kayne's antisymmetry condition on phrase structure are all problematic for languages like Chinese and Formosan. A question thus arises with respect to the relationship between conditions on phrase structure and those on movement. That is, which kind of theory should be considered more optimal? The kind that may permit option in the projection of (right-)adjunction structure but disallow freedom in the operation of movement or the kind that may require more restrictive phrase structure but allow less constrained movement?

To answer this and other related questions, this paper studies in detail the noun phrase structure of demonstratives in Formosan languages, in particular, the word order variation of demonstratives and nouns. An important reason to focus our study on the noun phrase structure is that the surface word order possibilities in nominals generally do not parallel those between predicates and arguments in clauses. In other words, they do not necessarily follow the word order characteristics of the predicate-initial/final contrast.

Paiwan and Atayal, for example, are of two different sub-groups of Formosan languages. While both are the so-called predicate-initial languages, Paiwan exhibits VSO

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[1] In Kayne's theory of antisymmetry, left-adjunction structures are allowed.

[2] Chomsky (1995) suggests that operator movement is the only kind of movement that adjunct phrases are subject to.

and VOS patterns, and Atayal only VOS pattern. As for the word order requirements in nominals, the observations are rather complicated. Depending on the types of co-occurring modifiers and non-modifiers, Paiwan and Atayal may exhibit N-initial and/or N-final constructions.

By examining in detail the typology of demonstratives, possessives and numerals, in this paper it is first shown that the standard analyses of nominals and modifiers may better account for the cross-linguistic similarities and differences in the form and distribution of these elements in Formosan nominals.[3] In addition, by examining the referential properties of demonstratives in Paiwan, it is also suggested that a distinction in interpretation is found between definiteness and specificity.

2. Modifier-like demonstratives vs. non-modifier-like demonstratives

In the following discussion of Formosan nominals the relevant facts in Paiwan and Atayal will be carefully examined and those in other languages will be pointed out whenever possible.[4]

In Abney (1987) a DP hypothesis as shown in (1) below is posited for the projection of noun phrase.

Abney (1987)

(1)   DP
            / \
              D'
             / \
            D   NP
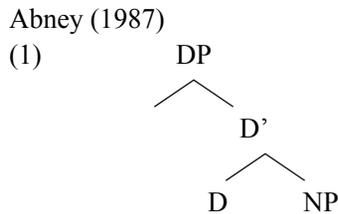
Under Abney's analysis in (1) D may be lexically realized in English as the determiner *the*, the demonstratives *this*/*that*/*these*/*those* and the genitive marker *'s*, among other things.

While an approach along this line of thought may account for the grammaticality contrast between cases like English (2a) and (2b), it however fails to capture the observation that in other languages like Spanish (3), Hungarian (4), Javanese (5), and

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[3] See Tang (2001, 2003), respectively, for problems raised for the specifier analyses of adverbs/adverbials, as in Alexiadou (1997) and Cinque (1999), and the D-CP analyses of modifiers, as in Kayne (1994) and Simpson (2001), between Chinese-type and English-type languages.

[4] The Paiwan dialect under consideration is the so-called Northern Paiwan. As for Atayal, both Squliq Atayal and C'uli' Atayal are examined in this paper: the former is spoken in the Taoshan village and the latter is spoken in the Da'ai village.

Ewondo (6), the determiner may co-occur with the demonstrative.

English
(2) a.   the book/this book
     b. *the this book/*this the book

Spanish (Bernstein 1997)
(3) el   hombre este
     the   man   this
     'this man'

Hungarian (Bernstein 1997)
(4) ez   a   haz
     this the house
     'this house'

Javanese (Bernstein 1997)
(5) ika   n   anak
     this the   child
     'this child'

Ewondo (Diessel 1999)
(6) e   mod   ngo
     Art   man   Dem
     'this man'

In addition to co-occurrence with the determiner, the demonstrative may be reinforced with adverbial-like elements, as Swedish (7) illustrates.

Swedish (Bernstein 1997)
(7) a.   den har   mannen
          the here   man-the
          'this man'
     b.   den dar   bilen
          the there   car-the
          'that car'

In view of examples like (3)-(5) and (7), Bernstein (1997) proposes a DP structure as in (8), in which, while determiners remain located in D, demonstratives occupy the specifier position of FP, and reinforcers the head position of FP (cf. Bruge 2002).[5]

Bernstein (1997)

(8)
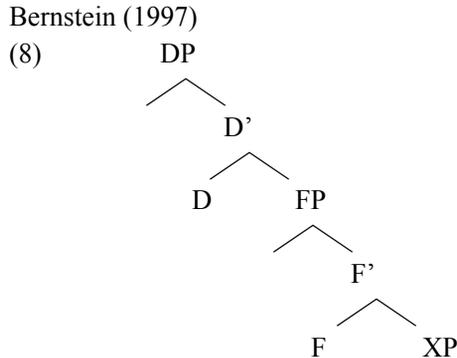
Bernstein claims further that the demonstrative must be located as the specifier of FP for it is syntactically homogeneous cross-linguistically.

Like Javanese (5) above and Chamorro (9) below, Formosan languages also belong to the Austronesian language family. Nevertheless, it does not seem to be the case that Formosan languages exhibit overt realization of determiners.

Chamorro (Chung 1998)
(9) i   a'paka na chinina
    the white   L   shirt
    'the white shirt'

Instead, in addition to the presence of demonstratives, the definiteness interpretation of arguments in Formosan languages may be determined by factors like grammatical functions, case markers, etc., as demonstrated in Paiwan (10a-b).

Paiwan
(10) a. na-v-en-eLi ti   kai tua kun.
           Perf-AV-buy Nom Kai Obl skirt
           'Kai bought a skirt.'

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[5] According to Bernstein, the presence/absence of co-occurrence of the determiner with the demonstrative may be attributed to the contrast in the presence/absence of a strong demonstrative feature that may trigger an overt movement of the demonstrative to D (cf. Bruge 2002).

    b.   v-in-eLi   ni   kai   a   kun.
         buy-PV   Gen Kai Nom skirt
         'The skirt was bought by Kai.'

It has been claimed that the projection of D has to do with the (in)definiteness interpretation of noun phrases. We thus assume that like noun phrases in Javanese and Chamorro those in Formosan languages may also be projected to DP.[6]

On the basis of Paiwan examples like (11), to be compared with English (12) and Chamorro (13), we also assume that cross-linguistically both demonstratives and possessives need not occur as D.

Paiwan (Tang et al. 1998)
(11)   icu a kun ni   kai
       this A skirt Gen Kai
       '(lit) Kai's this skirt'

English
(12)   *that John's book/*John's that book

Chamorro (Chung 1998)
(13)   i   gima'   Maria gi   halum tanu'
       the house-agr Maria Loc inside   land
       'Maria's house in the forest'

In (11) and (13), like that of the determiner and the demonstrative, the co-occurrence of the demonstrative/determiner and the possessive is also observed in languages like Paiwan and Chamorro.

We however do not follow Bernstein's claim that demonstratives must be generated as the specifier of FP, a projection immediately dominated by D (cf. Bruge 2002). Consider again Paiwan (11). Two facts about Paiwan demonstratives need to be mentioned here. That is, in Paiwan demonstratives like *icu* 'this' and *z(u)a* 'that' must appear in pre-nominal position and must be associated with the noun by markers like *a*,[7] hence the ungrammaticality of cases like (14a-c).

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[6] In the discussion of the distribution of the Formosan possessives in §3, other kinds of arguments will be given for a DP analysis of Formosan noun phrases (see also footnote 11).
[7] See Tang et al. (1998) and Tang (1999) for a detailed discussion of the morphological and syntactic structures of various kinds of *a* in Paiwan nominals and clauses.

Paiwan (Tang et al. 1998)

(14) a. *icu   kun
          this   skirt
      b. *kun   a   icu
          skirt   A   this
      c. *kun   icu
          skirt   this

By contrast, in Squliq Atayal demonstratives must occur in post-nominal position and no markers may be allowed between the noun and the demonstrative. Compare, for instance, well-formed (15a-b) with ill-formed (16a-e).

Squliq Atayal (Wulai) (Huang 1993)

(15) a. kuzu   qani
          shoe   this
          'this shoe'
      b. laqi'   qasa
          kid   that
          'that kid'

Squliq Atayal (Taoshan) (Yayut Isaw, personal communication, 2003)

(16) a. *qasa   laqi'
          that   kid
      b. *qasa   na   laqi'
          that   NA   kid
      c. *qasa   ka   laqi'
          that   KA   kid
      d. *laqi'   na   qasa
          kid   NA   that
      e. *laqi'   ka   qasa
          kid   KA   that

na in (16b, d) and *ka* in (16c, e) are the markers that may be found with possessives and relative clauses in Taoshan Squliq Atayal, respectively. As opposed to Squliq Atayal (16c), *a* in Paiwan (11) may be observed with other types of modifier-like elements.

Paiwan (Tang et al. 1998)

(17) a. telu a kun
        three A skirt
        'three skirts'

   b. va'uan a kun
      new   A skirt
      'new skirt'

   c. [k-in-asengseng ni   kai] a kun
       make-PV   Gen Kai A skirt
      'the skirt that was made by Kai'

In view of examples like Paiwan (11) and Squliq Atayal (15), it does not seem true that the non-bare Paiwan demonstrative and the bare Squliq Atayal demonstrative should be both generated in the specifier position of FP (cf. Chung 1998 and Kahnemuyipour & Massam 2004). In other words, it seems that the demonstrative is not syntactically homogeneous cross-linguistically.

In addition to the above-given problems for Bernstein's approach in (8), several other kinds of questions may also arise with respect to the derivation of cases like Paiwan (11) and Squliq Atayal (15) in terms of Kayne's (1994) D-CP analysis of English restrictive non-wh-*that*-relative clauses as in (18) below (cf. Bernstein 1997).

English (Kayne 1994)

(18) a. the picture that Bill liked

   b.

   c.

In Kayne's theory of relative clauses, nominals like *the picture that Bill liked* in (18a) are base-generated as (18b). In (18b) the determiner *the* of the noun phrase *the picture* heads the projection of DP and the remnant of the relative clause *that Bill liked*, together with the in-situ object *picture*, projects as the complement of the determiner *the*. And the surface structure as in (18c) is derived by a syntactic operation of movement of the in-situ object *picture* to the specifier position of CP.

Now, given the assumption that the demonstrative is not generated in D and the fact that *a* is required for Paiwan (11), in (19a) Paiwan demonstratives may be analyzed as (19b-d) in the sense of Kayne's D-CP hypothesis.

Paiwan

(19) a. icu a kun
　　　　　this A skirt
　　　　　'this skirt'

b.
```
              DP
             /  \
           D      CP
                 /  \
              [icu kun] a
```

c.
```
              DP
             /  \
           D      CP
                 /  \
              kun_i    C'
                      /  \
                    IP     C
                   /  \    |
                [icu t_i]   a
```

d.
```
              DP
             /  \
          C'      D'
         /  \    /  \
  [[icu t_i] a]_j  D   CP
                      /  \
                   kun_i   t_j
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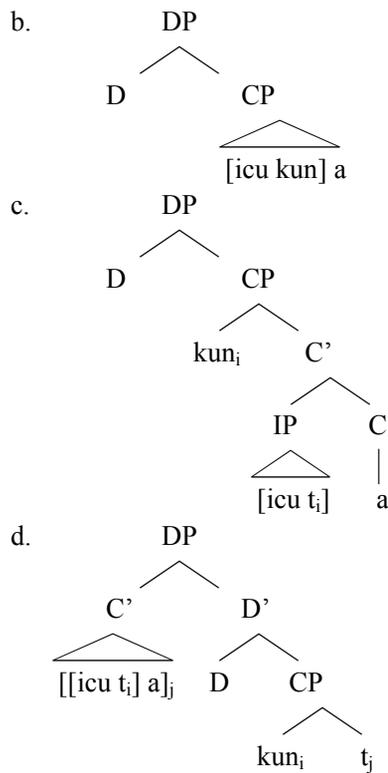
Structures like (19b-d) nevertheless seem to be rather arbitrary. For example, is there any evidence that *icu a* in (19a) should be treated as a relative clause in (19b), in which

icu acts as a predicate of *kun* and *a* as a complementizer of the relative clause?[8] Also, why is it that in Paiwan (19d) raising of C' to the specifier of DP is obligatory whereas in English (18c) it is disallowed. In fact, movement of single-bar elements like C' in (19d) is generally disallowed.[9] And the specifier position of DP is assumed in Kayne

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[8] In fact expressions like *icu kun* are ill-formed in the so-called equational construction in Paiwan.

    Paiwan

    (i) a.   a   icu   a   ku-kun.

              A   this Nom my-skirt

              'This is my skirt.'

          b. *icu   ku-kun

              this   my-skirt

    See also Tang et al. (1998) for a discussion of Paiwan restrictive and non-restrictive relative clauses.

[9] The same kind of question will be raised even if *kun* in (19c) is adjoined to CP rather than moved to the specifier of CP. Note that the answer to this question nevertheless cannot be for the lexical realization or licensing of the empty D in (19c) with the relevant claims about the overt D in Longobardi (1994) and the observation about the lexical realization of D as *the* in English (18b-c). This is because, as shown in (17) and (27)-(29), *a* can be attached to non-demonstrative elements. And while all the non-demonstrative XP-*a* sequences may appear pre-nominally, all the non-demonstrative *a*-XP sequences may occur post-nominally. Note also that in Paiwan modifiers and modifier-like elements marked with *a* need not be interpreted as definite and thus *a* should not be treated as D in the sense of Kayne (1994) and Kahnemuyipour & Massam (2004).

    Another point that needs to be mentioned here concerns the projection of temporal adjuncts in clauses. In Tang (1990, 1999, 2001), for example, it is pointed out that *inter alia* the possibility of the occurrence of a sentence-final temporal may vary cross-linguistically.

    English

    (i)   He came yesterday.

    Mandarin (Tang 1990)

    (ii) *ta   lai-le   zuotian.

          he   come-LE yesterday

          'He came yesterday.'

    Paiwan (Tang 1999)

    (iii) na-vaik ti   kai   katiau.

           Perf-go Nom Kai yesterday

           'Kai went yesterday.'

    Hence, an analysis along the line of Larson (1988) may be problematic, in which the post-verbal temporal is projected as the innermost argument of the verb. The considered grammaticality contrast between English/Paiwan-type languages and Mandarin-type languages also holds with adjuncts like locatives, etc. As stated in Tang (2001), observations of this sort and the presence of aspectual markers like *le* in (ii) argue against an account of cases like Mandarin (ii) via feature checking of [tense] in terms of obligatory movement of the Mandarin post-verbal temporal

(1994) for the LF location of IP in (18c), thereby deriving the non-restrictive counterpart of (18a).

Cases like Squliq Atayal (15) are also problematic for Kayne's antisymmetry condition on phrase structure. Consider again Bernstein's (8), repeated below as English (20) and Squliq Atayal (21a-b).

English
(20)

```
              DP
             /  \
               D'
              /  \
            D     FP
                 /  \
              this    F'
                     /  \
                    F    NP
                          |
                        child
```

Squliq Atayal
(21) a.

```
              *DP
              /  \
                D'
               /  \
             D     FP
                  /  \
                F'    qani
               /  \
              F    NP
                    |
                  laqi'
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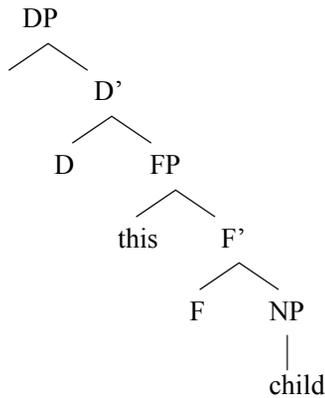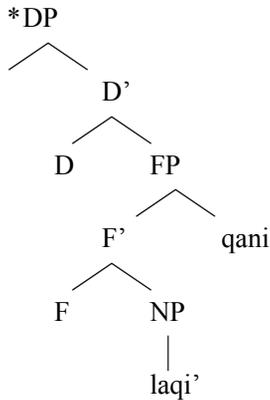
in the sense of Alexiadou (1997). And, as already shown in the discussion so far, similar problems may be found with Kayne's D-CP analysis of the relative clause, in which the post-nominal modifier is also generated as the innermost argument of D.

b.

```
              DP
             /  \
           NP    D'
           |    /  \
        laqi'ᵢ  D    FP
                    /  \
                 qani   F'
                       /  \
                      F    tᵢ
```
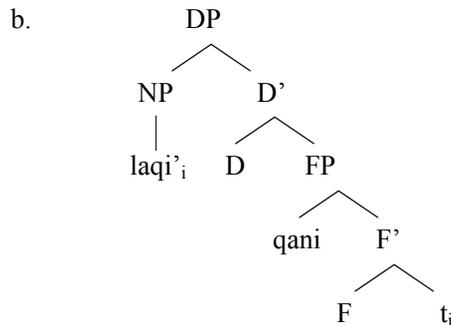
In English (20) *this* asymmetrically c-commands *child* and thus *this* may precede *child*. In Squliq Atayal (21a), by contrast, *laqi'* does not asymmetrically c-command *qani*, hence an ungrammatical phrase structure for Kayne. To derive Squliq Atayal (15), a structure like (21b) may be needed, in which *qani* projects first to the left of *laqi'* and *laqi'* is further raised to the specifier position of DP. Similar questions may be raised here with respect to English (20) and Squliq Atayal (21b). What is it that triggers such obligatory movement of the noun phrase in Squliq Atayal and why is it that the same operation cannot take place in English?[10]

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[10] As already pointed out in (3), the post-nominal demonstrative in languages like Spanish may co-occur with the determiner. Another relevant fact is that in these languages the pre-nominal demonstrative cannot appear with the determiner.

    Spanish (Bruge 2002)

(i) a. este libro
          this book
          'this book'
    b. el   libro este
         the   book this
         'this book'

To account for Spanish cases like (ia-b), Bruge (2002) proposes a DP structure similar to Bernstein's (1997) (8), both of which assume with Kayne's (1994) antisymmetric approach to phrase structure. In Bruge's analysis the post-nominal demonstrative in (ib) is derived by head movement of the noun *libro* to a head position below D and above F (cf. Bernstein 1997). The pre-nominal demonstrative in (ia), by contrast, is derived by movement of the demonstrative *este* from the specifier position of FP to that of DP. And the (im)possibility of the operation of movement of the demonstrative may be attributed to the strong-weak distinction in the feature marking of the demonstrative. However, she does not discuss what triggers the obligatory head movement of the noun in (ib) and only assumes with Kayne that the noun must move in the derivation of (ia-b). Other remaining questions include how to decide whether the feature in question is strong in one language and weak in another as well as how to decide whether the noun may move to the head X in one language and to Y in another.

It should also be pointed out that in Formosan languages the typology of the form and distribution of demonstratives are rather complicated. In languages like Kavalan (22), for instance, the demonstrative may appear on either side of the noun, though their form is distinct.

    Kavalan (Chang 2000)
(22) a. sunis zau
          kid   this
          'this kid'
      b. zau ay   razat
          this AY man
          'this man'

According to Chang, Kavalan exhibits both VSO and VOS patterns. *ay* is also found with relative clauses which may precede or follow the noun.

    So far the general pattern of the form and distribution of demonstratives in Formosan languages like Paiwan, Squliq Atayal, and Kavalan thus seems to be the case that non-modifier-like demonstratives tend to appear in N-initial constructions and modifier-like demonstratives tend to occur in N-final constructions. To capture this and other relevant observations, it is proposed that the form and distribution of Formosan demonstratives may be attributed to the following factors. First, morphologically and syntactically speaking, demonstratives in Formosan languages may be classified with respect to whether they are free morphemes and whether they may act as modifier-like elements.[11] Non-modifier-like free demonstratives tend to be projected in specifier position whereas modifier-like free demonstratives tend to be located in adjunction structure.[12]

Bruge's theory of demonstratives nevertheless does not seem to work with all languages. For example, as shown in Hungarian (4) and Javanese (5), the pre-nominal demonstrative not only co-occurs with the determiner but also precedes the determiner, an observation that according to Bruge should not be allowed. Also, Bruge claims that her analysis can correctly predict that in the Spanish post-nominal position the genitive must follow the demonstrative. The opposite ordering requirement is however found in Squliq Atayal, as shown in (40). Furthermore, as shown in (40b) and (64)-(65), elements like genitive phrases, stative modifiers and relative clauses may intervene between the noun and the demonstrative, a fact that is not compatible with Bruge's postulation of N-movement in (ib).

[11] See Tang (2005d) for a discussion of the [+/- definite] interpretation of demonstratives in English, Chinese, and Paiwan.

[12] See Diessel (1999) for a discussion of the morphology and syntax of demonstrative clitics. It is assumed in this paper that free demonstratives may be DemPs, and bound demonstratives Dems, of which the latter may be located in the head position of FP (cf. Kahnemuyipour & Massam 2004).

Second, no universal directionality condition is imposed on the phrase structure. While the specifier positions of nominals, like those of clauses, tend to follow the predicate-initial pattern of most Formosan languages, the adjunction structures of nominals, like those of clauses, may be leftward or rightward.

Third, in Formosan nominals the form and distribution of demonstratives may be subject to conditions that have little to do with those on phrase structure, an observation that has also been pointed out for other types of languages.

As stated in Himmelmann (1997) for instance, in Tagalog, noun modifiers like adjectives, as in (23a), relative clauses, as in (23b), numerals, as in (23c), and demonstratives, as in (23d), are all associated with the following nouns by the marker *na* (allomorph *-ng*).

> Tagalog (Himmelmann 1997)
> (23) a. ang   maliit   na   langgam
> SPEC small   LK   ant
> 'the little ant'
>
> b. ang   paa   ng   mama... na   babaril   sa   kanya
> SPEC foot   GEN man   LK   gun   LOC   3sg.DAT
> 'the feet of the man who was going to shoot at him'
>
> c. sa   isa-ng   manlalakbay
> LOC   one-LK   traveler
> 'about a traveler'
>
> d. ay   yuu-ng   mama
> PRED DEM-LK   man
> 'when that man'

In Albanian, by contrast, the considered markers are obligatory with adjectives in (24a) and genitive nouns in (24b) but do not occur with demonstratives in (24c).

> Albanian (Himmelmann 1997)
> (24) a. (nje) shok   i   mire
> one   friend.INDEF.M   LK.NOM.SG.M   good
> 'a good friend'
>
> b. nen-a   e   vajz-e
> mother.DEF.NOM.SG.F   LK   girl.INDEF.GEN.SG.F
> 'a girl's mother'
>
> c. ky   liber
> this.NOM.SG.M   book.INDEF.M
> 'this book'

It then seems that the so-called linkers occur more frequently with lexical attributes such as adjectives and relative clauses than with noun operators like demonstratives. Himmelmann (1997) thus argues that the grammaticalization of linkers originates in constructions involving a noun and a lexical attribute and that the use of linkers with noun operators is due to later extensions. If Himmelmann's claim is correct, the linkers in Tagalog may be considered as further grammaticalized than those in Albanian. In other words, in languages where the so-called linkers may have undergone further grammaticalization, demonstratives may have developed further into modifier-like elements.

Note also that syntactically demonstratives may occur in four different contexts as in (25a-d) below, among other things.

Diessel (1999)
(25) a. They may be used as independent pronouns in argument positions of verbs and adpositions.
b. They may appear with a noun in a noun phrase.
c. They may act as verb modifiers.
d. They may occur in copular and non-verbal clauses.

These four kinds of demonstratives are referred by Diessel to pronominal, adnominal, adverbial and identificational demonstratives, respectively. Different demonstratives thus may not only have distinct diachronic origins but also exhibit distinct functions. Such variations may also be reflected in the syntactic behavior of demonstratives.[13]

Now, let us turn to a discussion of how the above-mentioned factors may play a role in accounting for the word order variation of demonstratives among Paiwan, Squliq Atayal, and Kavalan. First, a simplified noun phrase structure like (26) below is posited for Paiwan and Squliq Atayal.[14]

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[13] As pointed out in Tang (2005c), demonstratives may not be used in all four of these contexts. In Paiwan, for instance, while demonstratives like *icu* and *zua* may both be found in the contexts of (25a, b, d), only *zua* may appear in (25c). *Sa*, by contrast, may only be used as (25b).

[14] In §3 more functional projections of NP in (26) will be discussed.

Paiwan and Squliq Atayal

(26)　　　　　　　DP

```
              DP
             /  \
            D    FP
                  \
                   F'
                  /  \
                 F    NP
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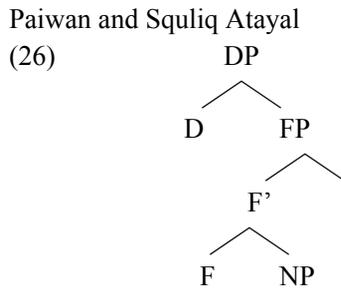
Given the fact that both Paiwan and Squliq Atayal are predicate-initial languages, in (26) the head-initial parameter is assumed for the specifier and complement projections of FP.

　　Second, given the contrast in the presence of an association marker between Paiwan (10) and Squliq Atayal (15), it is proposed that modifier-like Paiwan demonstratives are licensed by F and generated in its adjunction structure whereas non-modifier-like Squliq Atayal demonstratives are located in the specifier position of FP.[15]

　　Third, assuming that generally no directionality condition is imposed on the projection of adjunction structure in Paiwan, it thus follows that non-demonstrative modifier-like elements and modifiers may occur on either side of the noun, as indicated in (27)-(29).[16]

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[15] A third sub-group of Formosan languages is the VOS language Tsou, in which the demonstrative also appears post-nominally without any marker between the noun and the demonstrative.

　　　Tsou (Zeitoun 2000b)
　　(i) a. oko eni
　　　　　 kid this
　　　　　 'this kid'

Note that the projection of this kind of demonstrative is phrasal and may be used as pronominal argument.

　　　Tsou (Zeitoun 2000b)
　　(i) b. (zou) cuma na　 eni?
　　　　　　 be　 what Nom this
　　　　　　 'What is this?'

We assume with Travis (1988) and Tang (1990, 2001) that the generation of adjuncts and modifiers needs to be subject to a theory of adjunct licensing in which adjuncts and modifiers are classified in accordance with the features of their licensing heads in clauses and nominals. For the licensing of modifier-like demonstratives the relevant semantic feature in question may be along the lines of Bernstein (1997) or Bruge (2002), though we do not assume their claims about the antisymmetry condition and operation of obligatory overt movement.

[16] In different contexts there however might be some preferred orderings among these variations. Note however that, as discussed in Tang et al. (1998), the (a) noun phrases of (27)-(29) are not

Paiwan (Tang et al. 1998)

(27) a. telu   a   kun
         three A   skirt
         'three skirts'

     b. kun   a   telu
        skirt A   three
        'three skirts'

(28) a. va'uan a   kun
         new   A   skirt
         'new skirts'

     b. kun   a   va'uan
        skirt A   new
        'new skirts'

(29) a. [k-in-asengseng ni   kai] a   kun
          PV-make   Gen Kai A   skirt
         'the skirt that is made by Kai'

     b. kun   a   [k-in-asengseng ni   kai]
        skirt A   PV-make   Gen Kai
        'the skirt that is made by Kai'

A question then arises with respect to the ordering requirement that in Paiwan the modifier-like demonstrative needs to appear to the left of the noun. Before approaching this question, two more facts need to be mentioned here. One related fact is that in Paiwan, unlike free demonstratives, free possessives may appear to the left or right of the noun. However, like demonstratives, they behave like modifiers in pre-nominal position and like non-modifiers in post-nominal position.

Paiwan (Tang et al. 1998)

(30) a. kun   ni   kai
        skirt Gen Kai
        'Kai's skirt'

     b. *kun   a   [ni   kai]
         skirt A   Gen Kai

---

transformationally related to their (b) noun phrases. One reason is that in the (a) phrases the association marker *a* appears in final position whereas in the (b) phrases it occurs in initial position. This contrast in the position of the marker *a* with Paiwan pre-nominal and post-nominal modifiers raises a further problem for Kayne, Alexiadou, and Cinque in their analyses of modifiers.

(31) a. *[ni kai] kun
          NI Kai skirt
      b. [ni kai] a kun
          NI Kai A skirt
          'Kai's skirt'

That is, they need to be marked with *a* in pre-nominal position and the opposite holds for the post-nominal position. Similar facts are also found with Kavalan and Puyuma, as stated in Chang (2000) and Huang (2000a), respectively.

Kavalan (Chang 2000)
(32) a. bawa' zaku
          boat my
          'my boat'
      b. zaku ay bawa'[17]
          my AY boat
          'my boat'

Puyuma (Huang 2000a)
(33) sagar=ku   kanDini na buLabuLayan.
      AF-like=1sg.Nom this-Obl NA girl
      'I like this girl.'

Another related fact is that in Puyuma (33) above and Thao (34a-b) below, according to Huang (2000a, b), while the demonstrative may precede the noun, it is not marked with the marker associated with the relative clause.[18]

Thao (Huang 2000b)[19]
(34) a. haya wa 'azazak mi-La-liLi'.[20]
          that WA kid   AF-Red-stand
          'That kid is standing.'

---

[17] In Formosan languages like Thao, according to Huang (2000b), the possessive may also precede the noun and is marked with markers like *wa*, *ya* or *a*. Also, as pointed out in Huang (2000b), the word order of Thao is changing from VSO to SVO. By contrast, Huang (2000a) states that Puyuma exhibits both VSO and VOS patterns.

[18] For a discussion of relative clauses in Puyuma and Thao, see Huang (2000a, b).

[19] According to Huang (2000b), the markers *wa*, *ya*, and *a* in question are allomorphs, the choice of which is phonetically determined.

[20] Like the demonstrative, as stated in Huang (2000b) and footnote 17, the possessive in Thao may also precede the noun and carry markers like *wa*, *ya* or *a*.

    b. 'izay ya   'azazak paLay   yakin.
        that   YA kid   hit-AF   I
        'That kid hit me.'

So far, all these facts about Squliq Atayal, Paiwan, Kavalan, Puyuma, and Thao demonstratives seem to indicate three things. The development of a demonstrative into a modifier-like element may vary among Formosan languages; such a development may not take place for all Formosan languages; and modifier-like demonstratives may involve a different kind of modification from that of relative clauses (cf. Himmelmann 1997). As a result, even though Paiwan and Kavalan may use the same kind of marker for modifier-like demonstratives and relative clauses, only the projection of the former is subject to a directionality constraint.

Among the Formosan languages, are there any rules governing what kinds of demonstratives may: act as non-modifiers, as in Squliq Atayal; serve as modifier-like elements, as in Paiwan; or function as either non-modifiers or modifier-like elements, as in Kavalan? In addition to Himmelmann's (1997) claim about the degree of the grammaticalization of the so-called linkers, one factor may be whether they are free or bound morphemes, given the observation that bound morphemes generally cannot stand alone to act as phrasal modifiers. Other factors may be attributed to their distinct diachronic origins and syntactic functions. However, in Paiwan, Squliq Atayal, and Kavalan, for instance, the demonstratives in question may all be used as pronouns and in equational constructions. We will leave this issue for further study.

Note that while the distribution of modifier-like demonstratives may differ from that of relative clauses which are real modifiers, their generation is not restricted to the left-adjunction structure, another problem for theories of modifiers and demonstratives as in Kayne, Alexiadou, Cinque, Bruge, and Kahnemuyipour & Massam, the last of which claim that elements with association markers need to appear pre-nominally whereas those without markers need to occur post-nominally. In C'uli' Atayal, for instance, the modifier-like demonstrative needs to occur to the right of the noun. Cases like (35) are of this sort, to be compared with (36).

C'uli' Atayal (Mayrinax) (Huang 1995)
(35) si-pakahuy=mu   ku'   takiis ka'   hani.[21]
      IF-cut:wood=1S.BG Nom.Rf knife KA' this
      'I cut the meat with this knife.'

---

[21] In Mayrinax and Da'ai C'uli' Atayal *ka'* is also found with the relative clause which, unlike the demonstrative, may appear before or after the noun. Like Squliq Atayal, C'uli' Atayal is also a VOS language.

C'uli' Atayal (Da'ai) (Ciwa Taymu', personal communication, 2004)

(36) sawgal-an ni' Sayun ku' 'ala'i' (ka') hani.
     like-LF   Gen Sayun Nom kid   KA'   this
     'Sayun liked that kid.'

While it remains a question as to what triggers this sort of distributional variation of modifier-like demonstratives among Formosan languages, there seems to appear a clue for rules that may govern the above-mentioned contrast between Paiwan/Kavalan and C'uli' Atayal. Recall that, as shown in Paiwan (30a) and (31b), non-modifier-like possessives follow the noun and modifier-like possessives precede the noun. Similarly, in Kavalan (32a) and Atayal (37a-b), non-modifier-like possessives, like non-modifier-like demonstratives, tend to appear to the right of the noun.

Atayal

(37) (Squliq, Taoshan) (Yayut Isaw, personal communication, 2003)
      a. laqi' (na)   sayun
          kid   Gen   Sayun
          'Sayun's kid'
      (C'uli', Da'ai) (Ciwa Taymu', personal communication, 2004)
      b. 'ala'i' (ni')   sayun
          kid   Gen   Sayun
          'Sayun's kid'

In §3, an NP structure like (38) below will be posited, in which the head-initial parameter is also assumed for the projections of the specifier and complement positions of N.

(38)
```
              DP
            /    \
           D      FP
                   \
                    F'
                   /  \
                  F    NP
                        \
                         N'
                        /
                       N
```
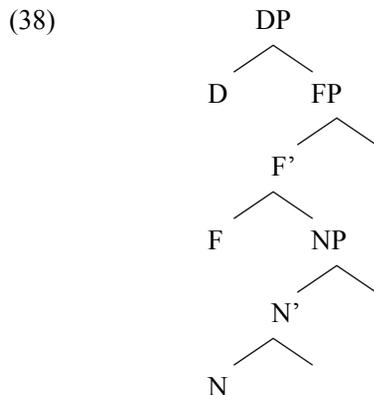
Given Paiwan cases like (11), repeated as (39), and Squliq Atayal cases like (40), in which the demonstrative may co-occur with the possessive and the non-modifier-like possessive must precede the non-modifier-like demonstrative, the possessive is proposed to be located in the specifier position of NP in (38).

    Paiwan (Tang et al. 1998)
(39) icu a kun ni   kai
        this A skirt Gen Kai
        '(lit) Kai's this skirt'

    Squliq Atayal (Taoshan) (Yayut Isaw, personal communication, 2004)
(40) a. *laqi' qasa (na)   sayun
            kid   that   Gen   Sayun
      b. laqi' (na)   sayun qasa[22]
            kid   Gen Sayun that
            'Sayun's that kid'

    Recall also that as illustrated in Paiwan (30)-(31) and Kavalan (32), the modifier-like possessive needs to appear before the noun, and the non-modifier-like possessive after the noun. This observation and the similar fact about their demonstratives seem to suggest two different conditions in accordance with the head-initial pattern of the specifiers of FP and NP. For languages like Paiwan and Kavalan, modifier-like demonstratives tend to take the opposite direction of the specifier position of their licensing head, whereas for languages like C'uli' Atayal they tend to take the same direction. We will leave this issue for further research.

    To summarize, so far we have demonstrated that the form and distribution of demonstratives in Formosan languages are rather complicated. To properly account for their variation in form and distribution, several things need to be taken into consideration. For example, the status of development of demonstratives into modifier-like elements may be distinct for different demonstratives and languages; the directionality of the projection of the specifier position may be different from that of adjunction structure; modifier-like elements may be generated in adjunction structure; and non-modifier-like elements may be projected as specifiers.[23] In this type of account, while there might

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[22] Cases like (40b), with the post-nominal possessive preceding the demonstrative, also pose problems for Kayne (1994), Alexiadou (1997), Cinque (1999), Bruge (2002), and Kahnemuyipour & Massam (2004).

[23] In J. Huang's (1982) and Chung's (1998) analyses of phrase structure of Chinese and Chamorro, similar proposals are also suggested. For example, demonstratives may be projected as specifiers;

appear some rules governing the general patterns of the distribution of the Formosan demonstratives, a seemingly idiosyncratic variation may still be permitted that may be attributed to distinct diachronic origins, morphological properties, etc. By contrast, an analysis along the lines of Kayne (1994), Alexiadou (1997), Cinque (1999), Bruge (2002), and Kahnemuyipour & Massam (2004) will involve the operation of arbitrary movement of various kinds in order to derive the surface word order. This is because among other things the antisymmetric constraint and the functional category hierarchy are both imposed on the projection of phrase structure, which rule out right- or any adjunction structure.[24]

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modifiers may appear in adjunction structure; and the directionality of the projections of specifiers and non-specifiers may be distinct.

So far the directionality contrast between specifiers and non-specifiers in Formosan languages reminds us of the directionality condition of the assignment of theta-role, case and function-role within the framework of government and binding. It seems that some relation of this sort may still be relevant for the projection of phrase structure, in addition to the strong-weak contrast in feature marking.

[24] In Formosan languages there appear some other sets of data that may be problematic for Kayne's restrictive theory of phrase structure. Consider first Kavalan cases like (ic) below, to be compared with (ia-b).

Kavalan (Chang 2000)
(i) a. razat zau/'nay
　　　man　this that
　　　'this/that man'
　　b. zau/'nay ay razat
　　　this that　AY　man
　　　'this/that man'
　　c. razat a yau
　　　man　A that
　　　'that man'

In Kavalan, according to Chang (2000), demonstratives like *yau*, as opposed to those like *zau* and *'nay*, may act as a modifier-like element and occur to the right of the noun. And the marker *a* in question does not appear in relative clauses.

Second, as shown in (iia-b), Rukai, a VSO/VOS language, seems to exhibit non-modifier-like demonstratives that may appear to the left of the noun, as in (iia), and that may have more than one occurrence, as in (iib).

Rukai (Budai) (Zeitoun 2000a)
(ii) a. kai ababayane/*ababayane kai
　　　this woman　　woman　this
　　　'this woman'
　　b. kai aagaane-li　kai urasi ay akanaane ki bazabaza.
　　　this will-cook-my this taro　AY will-eat　KI guest
　　　'This taro that I will cook is for the guest to eat.'

Note that in OV languages like Tibeto-Burman, for instance, the distribution of demonstratives is also rather complicated, as shown in Bodic (41).

Bodic (Dryer 2000)
(41) a. Dem N: Newari, etc.
      b. N Dem: Modern Literary Tibetan, Lhomi
      c. Dem N/N Dem: Sikkimese

And the demonstrative may also co-occur with the determiner, as in (42)-(43), or the reinforcer, as in (44).

Lai Chin (Dryer 2000)
(42) mah   lam   hi...
      DEM   road   this
      'this road...'

Maling (Dryer 2000)
(43) yo   miu   yo
      this   boy   this
      'this boy'

Nishi (Dryer 2000)
(44) sa   nyem   si
      here   woman   this
      'this woman'

Within the framework of government and binding it has been assumed that language-specific differences should be derived from their lexical/morphological structure and phrase structure where their idiosyncrasy may lie. Thus, the word order variation of demonstratives in Formosan and Tibeto-Burman languages seems to argue against an antisymmetry approach to modifiers and non-modifiers in nominals.

Before turning into the discussion of possessives, it should be pointed out that in Formosan languages demonstratives have been claimed to exhibit case inflection. For instance, recall that, as illustrated in (33), repeated below as (45b), in Puyuma the modifier-like demonstrative may precede the noun and exhibit case property.

Puyuma (Huang 2000a)

(45) a. maDina iDini   na   samekan.
          big-AF   this.Nom NA   mosquito
          'This mosquito is big.'
      b. sagar=ku   kanDini   na   buLabuLayan.
          AF-like=1sg.Nom   this-Obl NA   girl
          'I like this girl.'

In (45a) the modifier-like demonstrative is marked with nominative case and in (45b) it is assigned oblique case. The four kinds of case system of Puyuma noun phrases, according to Huang (2000a), are as in (46) below.

Puyuma (Huang 2000a)

(46)	Nom	Obl	Loc
Proper Nouns (per, pl):	na	kana	
Proper Nouns (per, sg):	i	kan	i
Common Nouns (sp):	na	kana	i
Common Nouns (nsp):	a	Da	

And in accordance with factors like distance, visibility, etc., the six kinds of case system of Puyuma modifier-like demonstratives are as in (47).

Puyuma (Huang 2000a)

(47)	Nom		Obl	
a.	iDi	naDi	kanDi	kanaDi
b.	iDini	naDini	kanDini	kanaDini
c.	iDu	naDu	kanDu	kanaDu
d.	iDunu	naDunu	kanDunu	kanaDunu
e.	iDiyu	naDiyu	kanDiyu	kanaDiyu
f.	iDi:yu	naDi:yu	kanD:yu	kanaDi:yu

In (47) above the *i*-demonstrative and *kan*-demonstrative patterns are of [+ human, + singular] nouns and [- human, α singular] nouns, and the *na*-demonstrative and *kana*-demonstrative patterns are of [+ human, - singular] nouns. In other words, the case realization of the Puyuma modifier-like demonstrative is composed of the demonstrative itself and the case marking of the singular person proper noun or that of the plural person proper noun.

Similar observations are also found with Amis.

Amis (Wu 2000)

(48) a. k<um>aen-an ni dongi kuni a tali.
PF-eat-PF Gen Dongi this.Nom A taro
'Dongi ate this taro.'

b. ma-fana' kaku tuni a demak.
AF-know I.Nom this.Acc A matter
'I know this matter.'

As given in (48a-b) above, the Amis modifier-like demonstrative seems to be assigned nominative case in (48a) and accusative case in (48b). Note that, according to Wu (2000), in Amis the non-modifier-like demonstrative may also appear before the noun, an observation that is also found with Rukai in (iia) of footnote 24.

Amis (Wu 2000)

(49) t<um>angic kuni wawa.
AF-cry this.Nom kid
'This kid is crying.'

In Wu's analysis the case realization of the demonstrative in Amis is composed of the demonstrative itself and the case marking of the common noun, not that of the person proper noun.

Note that bound demonstratives, according to Zeitoun (2000c), may also be inflected for case.

Bunun (Zeitoun 2000c)

(50) a. 'is'anat mas tina' 'uvaz-a' pandian.
RF-cook-soup Obl mother kid-that.Nom vegetable
'Mother cooks the soup for that kid.'

b. 'isubu' tina' baial 'iskaan-tan.
RF-wrap mother leaf fish-that.Obl
'Mother wraps that fish with the leaf.'

Note also that not every demonstrative preceding or following the noun may be treated as case-inflected itself. For Paiwan and Kavalan, for instance, this does not seem to be the case.

Paiwan

(51) a. na-v-en-eLi   ti   kai tua icu a kun.
         Perf-AV-buy Nom Kai Obl this A skirt
         'Kai bought this skirt.'

   b. v-in-eLi ni   kai a   icu a kun.
         buy-PV Gen Kai Nom this A skirt
         'This skirt was bought by Kai.'

Kavalan (Chang 2000)

(52) a. qan-an-ku=pa ya   tiRuR   'nay.
         eat-PF-I=Imp Nom egg   that
         'That egg will be eaten by me.'

   b. supaR=iku   tu   sunis 'nay.
         know(AF)=I Acc kid   that
         'I know that kid.'

To account for the case facts about Formosan demonstratives in languages like Puyuma, Amis, Bunun, Kavalan, and Paiwan, as proposed in the previous discussion, we assume that for languages like Kavalan the caseless non-modifier-like demonstratives are generated in the specifier position of FP in a structure like (38), repeated below as (53).

Kavalan

(53)

```
                    DP
                   /  \
                  D    FP
                      /  \
                    F'    DemP
                   /  \
                  F    NP
                      /  \
                    N'   possessive phrase (= DP)
                   /
                  N
```
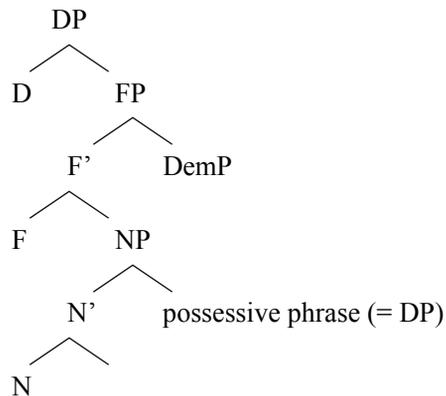
As for languages like Paiwan and Kavalan, the caseless modifier-like demonstratives are licensed by F and adjoined to the left of FP.

Paiwan/Kavalan

(54)

```
                    DP
                   /  \
                  D    FP
                      /  \
               DemP-a/ay  FP
                         /  \
                        F'
                       /  \
                      F    NP
                          /  \
                        N'   possessive phrase
                       /  \
                      N
```
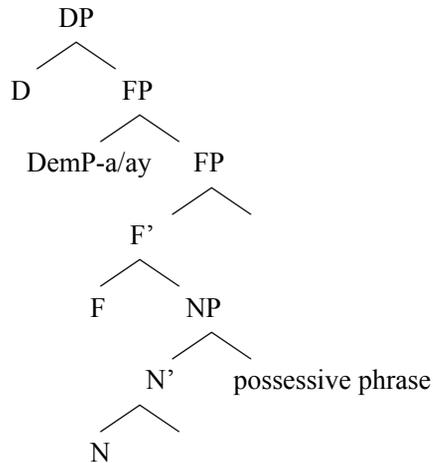
For languages like Puyuma and Amis, modifier-like demonstratives also appear in adjunction structure. However, if F in (54) also licenses these demonstratives, why is it that those in Paiwan and Kavalan are not case-marked? Another relevant question is whether the case marking in question is lexically or syntactically derived. Due to the limited set of data accessible, no conclusion may be made here and only several suggestions are given for future research. As already pointed out, the case inflection of Puyuma and Amis demonstratives does not agree with the case system of all the relevant types of nouns in these two languages. Such being the case, the inflection under consideration seems to be lexically listed in the lexicon rather than syntactically assigned and some sort of feature matching needs to be satisfied between the demonstrative and the noun. If an account along this line of thought is plausible, then in Formosan languages only demonstratives lexically marked with case properties may exhibit case inflection.[25]

---

[25] Like the case inflection of demonstratives in Puyuma and Amis, that in Bunun, as stated in Zeitoun (2000c), does not seem to agree with the case system of the relevant kinds of nouns, either. One difference between Bunun demonstratives and Puyuma/Amis ones however seems to be the generation site. Being a bound morpheme, the Bunun demonstrative may project as the head of FP, which in turn may trigger some kind of noun movement.
According to Diessel (1999), multiple inflection of case may be found in the demonstrative and the noun, as shown in (i).
   Guugu Yimidhirr (Diessel 1999)
  (i) nhayun nambal   bada   gada-y   iii
     that.abs rock.abs down come-past ...
     'That rock dropped...'
In Formosan languages like Bunun, according to Elizabeth Zeitoun (personal communication, 2006), lexically case inflected bound demonstratives may optionally co-occur with case markers

3. Modifier-like possessives vs. non-modifier-like possessives

In the previous discussion of demonstratives in Formosan languages, several morphological and syntactic properties of Formosan possessives have already been pointed out. For example, as shown in Paiwan (30)-(31) and Kavalan (32), repeated below as (55)-(57), the non-modifier-like possessive, as in (55a) and (57a), and the modifier-like possessive, as in (56b) and (57b), differ in form and distribution.

Paiwan (Tang et al. 1998)
(55) a. kun ni   kai
          skirt Gen Kai
          'Kai's skirt'
      b. *kun a [ni   kai]
          skirt A Gen Kai
(56) a. *[ni kai] kun
          NI Kai skirt
      b. [ni kai] a kun
          NI Kai A skirt
          'Kai's skirt'

Kavalan (Chang 2000)
(57) a. bawa' zaku
          boat   my
          'my boat'
      b. zaku ay bawa'
          my   AY boat
          'my boat'

That is, in both languages the non-modifier-like bare possessive follows the noun and the modifier-like non-bare possessive precedes the noun.

In addition, as exemplified in Paiwan (39) and Squliq Atayal (40), repeated as (58)-(59), the possessive, non-modifier-like or modifier-like, may co-occur with the demonstrative, as in (58a-b) and (59b).

---

like nominative *a* and oblique *mas*, though they need to agree with one another. By contrast, according to Stacy Teng (personal communication, 2006), in Formosan languages like Puyuma no such freedom in co-occurrence is allowed. That is, lexically case marked demonstratives in Puyuma nominals cannot be preceded by other agreeing case markers. See Tang (2006) for a detailed discussion of comparison of the relevant data in Paiwan, Bunun and Puyuma.

Paiwan (Tang et al. 1998)

(58)　a.　icu　a　kun　ni　　kai
　　　　　　this　A　skirt　Gen　Kai
　　　　　　'(lit) Kai's this skirt'

　　　b.　icu　a　[ni　kai]　a　kun
　　　　　　this　A　NI　Kai　A　skirt
　　　　　　'(lit) Kai's this skirt'

　　　c.　*[ni　kai]　a　icu　a　kun
　　　　　　　NI　Kai　A　　this　A　skirt

Squliq Atayal (Taoshan) (Yayut Isaw, personal communication, 2004)

(59)　a.　*laqi'　qasa　(na)　　sayun
　　　　　　kid　　that　Gen　Sayun

　　　b.　laqi'　(na)　sayun　qasa
　　　　　　kid　　Gen　Sayun　that
　　　　　　'Sayun's that kid'

And the modifier-like possessive needs to appear after the modifier-like demonstrative, and the non-modifier-like possessive before the non-modifier-like demonstrative, as shown in the ungrammaticality of (58c) and (59a).

　　　Based on these observations, a phrase structure of the possessive is proposed in (53), repeated as (60), in which, like the non-modifier-like demonstrative, the non-modifier-like possessive is generated in the specifier position of NP (cf. Chomsky 1995 and Carstens 2000).[26]

---

[26] Among other things, in Carstens' (2000) minimalist DP structure the possessive is generated in a light NP shell external to NP. Here we shall leave the issue open about a separate projection for the generation of the possessive phrase and for further study the related issue about the licensing of modifiers.

(60)

```
              DP
             /  \
            D    FP
                /  \
              F'    DemP
             /  \
            F    NP
                /  \
              N'    possessive phrase
             /  \
            N
```
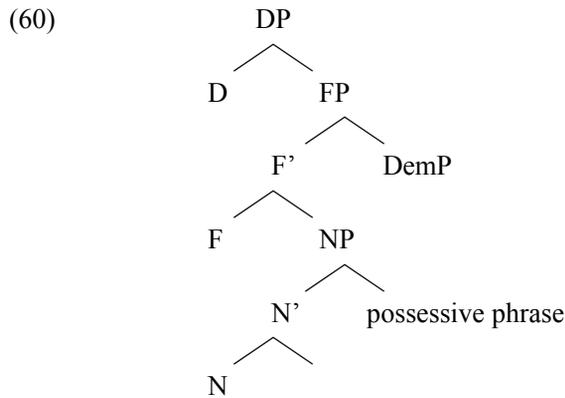
And, like the modifier-like demonstrative, the modifier-like possessive may be licensed by N and adjoined to the left of NP.[27]

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[27] We assume that in Paiwan, like the modifier-like demonstrative, the possessive may undergo development into a modifier-like element and thus may be subject to the same distribution condition as the demonstrative.

Note that like the discussed word order variation of demonstratives within Formosan languages, the distribution of the possessive may also vary among Formosan languages. See, for example, Huang's (2000a, b) discussion of languages like Puyuma and Thao for a different distribution of the possessive.

Also, as stated in Yeh (2000), in Saisiyat, which is an SVO language, both the demonstrative and the possessive may precede the noun, non-modifier-like or modifier-like, as in (ia-c).

    Saisiyat (Yeh 2000)
  (i) a. hini' korkoring
   this   kid
        'this kid'
     b. sia sarara' ka   'amana'a taw'an.
        he like   Acc my   house
        'He likes my house.'
     c. hiza' 'an 'iban a   tatpo'.
        that Gen 'iban A hat
        'That is 'iban's hat.'

This seems to indicate that as an SVO language, the directionality of the projection of the specifier position in Saisiyat is generally head-final.

(61) a. Paiwan

```
                    DP
                   /  \
                  D    FP
                      /  \
                 DemP-a   FP
                         /  \
                        F'
                       /  \
                      F    NP
                          /  \
           [possessive phrase]-a   NP
                              /  \
                             N'   possessive phrase
                            /  \
                           N
```

      b. Kavalan
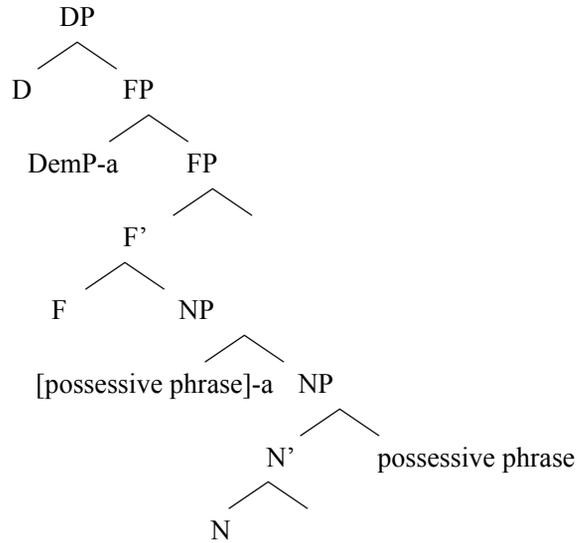
```
                    DP
                   /  \
                  D    FP
                      /  \
                 DemP-ay  FP
                         /  \
                        F'   DemP
                       /  \
                      F    NP
                     /  \
     [possessive phrase]-ay   NP
                          /  \
                         N'   possessive phrase
                        /  \
                       N
```
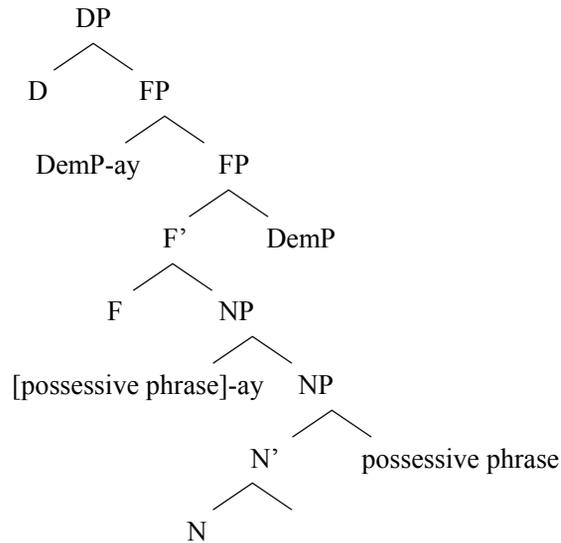
Under phrase structures like (61a-b), the just-given ordering requirements between demonstratives and possessives in Paiwan (58) and Kavalan (59) are correctly derived.

As also pointed out in Paiwan (27)-(29), modifiers may appear on the left or right of the noun. However, like the above-mentioned precedence condition on the co-occurrence of the non-modifier-like possessive and demonstrative in Squliq Atayal, the

modifier in Paiwan may not intervene between the noun and the non-modifier-like possessive, either.

Paiwan
(62) a. kun [ni   kai] [a   va'uan]
         skirt Gen Kai   A   new
         'Kai's new skirt'
     b. *kun [a va'uan] [ni   kai]
         skirt A new   Gen Kai

To capture this precedence requirement of the non-modifier-like possessive in Paiwan and Squliq Atayal, we assume with Chung (1998) that like Chamorro Paiwan and Squliq Atayal may also require their modifiers to be adjoined only to maximal projections.[28] Thus, in (60) the right-adjunction structure of N', F' and D' may not generate modifiers.

An account along this line of thought may explain the fact that in Paiwan modifiers may, by contrast, be allowed to appear between the modifier-like possessive and the noun. Compare, for instance, (63a-b) with (62a-b).

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[28] In Chamorro modifiers may appear to the left or right of the noun and they are analyzed in Chung (1998) as adjoined to either side of NP. Note however that, as stated in Chung, modifiers in Chamorro may not precede pre-nominal demonstratives, a fact that is also found in Paiwan (i), but not in Mandarin (ii).

Paiwan
(i) a. icu a va'uan a kun
       this A new   A skirt
       'this new skirt'
    b. *va'uan a icu a kun
        new   A this A skirt
Mandarin
(ii) a. na   yi   jian xin-de   qunzi
        that one CL   new-DE   skirt
        'that new skirt'
     b. xin-de   na   yi   jian qunzi
        new-DE   that one CL   skirt
        'that new skirt'

The grammaticality contrast between Paiwan (ib) and Mandarin (iib) is again problematic for the postulation of universal hierarchies of functional categories as in Alexiadou (1997) and Cinque (1999).

Paiwan

(63) a. [va'uan] a [ni kai] a kun[29]
          new   A NI Kai   A skirt
          'Kai's new skirt'

     b. [ni kai] a [va'uan] a kun
         NI Kai   A   new   A skirt
         'Kai's new skirt'

This is because maximal projections are available in a DP structure like (60) for multi-adjunction of modifiers.[30]

It may also explain the observation that modifiers may be found between the non-modifier-like demonstrative and the noun.

Squliq Atayal (Taoshan) (Yayut Isaw, personal communication, 2004)

(64) m-in-baziy   lukus   giqas qasa quw sayun.
      AV-Perf-buy   clothes new   that Nom Sayun
      'Sayun bought that new clothes.'

Squliq Atayal (Wulai) (Huang 1993)

(65) sic-on-maku? balay nbuw abaw [b-in-azi-   hira?]   qasa.
      like-UN-1S.G very   drink tea   =past=buy-2S.G. yesterday   that
      'I like the tea you bought yesterday very much.'

This is also because in (60) there appears a maximal projection between N and the specifier position of FP to the right of which modifiers may be adjoined.

By contrast, for a traditional view of noun phrase structure like (66) below, the word order variation under consideration may not be captured in a principled way.

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[29] These two phrases however may differ in the interpretation of the scope of the modifiers involved. Note also that, as discussed in Sproat & Shih (1988), Alexiadou (1997) and Cinque (1999), among others, certain semantic and/or syntactic constraints may hold for the scope interpretation or generation of the multiple modifiers involved. Further research will be done concerning the ordering requirement of modifiers in Formosan languages like Paiwan.

[30] For the derivation of cases like (63a) and (63b), we assume with Tang (1990, 2001) and Chomsky (1995) that they are not transformationally related.
    Note that, as discussed in Tang's (2001) analysis of Chinese and Formosan adverbials in clauses, examples of this kind are problematic for Alexiadou's (1997) and Cinque's (1999) specifier analyses of modifiers. This is because they both impose restrictive and universal hierarchies of distribution on all kinds of modifiers.

(66)

```
            NP
          /    \
       N'      D
      /  \
    N
```
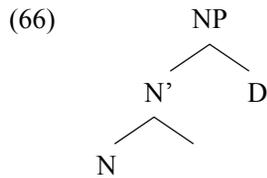
This is because in (66) both the demonstrative and the possessive need to be located in the D position of NP.

In fact, under our proposal of the generation of the possessive in the specifier position of NP for Formosan languages like Paiwan and Squliq Atayal, a distribution contrast between Chamorro and Paiwan/Squliq Atayal may also be accounted for. According to Chung (1998), in Chamorro the post-nominal possessive may precede or follow the adjective, a fact that is however not permitted in Paiwan and Squliq Atayal.

Chamorro (Chung 1998)
(67) i   kareta-na   agaga si Carmen
      the   car-agr   red   Carmen
      'Carmen's red car'
(68) i   kareta-n   Carmen   agaga
      the   car-L   Carmen   red
      'Carmen's red car'

While Chung also claims that in Chamorro only maximal projections may generate the modifier, the possessive is analyzed as surfacing as the specifier of D, not N,[31] hence

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[31] Cross-linguistically parametrization should be allowed for the surface realization of the possessive. It seems that for Chamorro-type languages the possessive receives its case in the specifier position of D, whereas in Paiwan-type languages the possessive gets case-assigned in the specifier position of NP.

In addition to the considered word order variation between the possessive and the modifier of Paiwan-type and Chamorro-type languages, it should be pointed out that in languages like Hungarian the possessive may also exhibit case variation and word order variation.

Hungarian (Szabolcsi 1983-84)
(i) a. az   en-f   vendeg-e-m
         the I-nom   guest-poss-1sg
         'my guest'
    b. en-nek-em   a   vendeg-e-m
         I-dat-1sg   the   guest-poss-1sg
         'my guest'

the grammaticality contrast between Paiwan (62b) and Chamorro (67a).[32]

Under Kayne's D-CP analysis of modifiers, by comparison, Paiwan cases like *kun ni kai* 'kai's skirt' will be derived in a manner similar to (21b), by which Squliq Atayal *laqi' qasa* 'that kid' is derived. And those like [*ni kai*] *a kun* 'kai's skirt' will be derived in a manner similar to (19b-d), by which Paiwan *icu a kun* 'this skirt' is derived. In addition to the problems already raised in the previous discussion, it remains unclear how the above-mentioned co-occurrence and precedence contrasts about cases like (58a-b), (59b), (62a), (63a-b) and (64)-(65) may be accounted for in a principled way.[33]

4. Modifier-like numerals vs. non-modifier-like numerals

In addition to the syntactic behavior of demonstratives and possessives, that of quantifiers is also relevant for the discussion of the Paiwan noun phrase structure in question. To begin with, as shown in Paiwan (27), repeated as (69), quantifiers like numerals are marked with *a* and may appear in either side of the noun, a fact that also holds for other kinds of modifiers in Paiwan (28)-(29), repeated as (70)-(71).

Paiwan (Tang et al. 1998)
(69) a. telu a kun
          three A skirt
          'three skirts'
      b. kun a telu
          skirt A three
          'three skirts'

---

[32] There are two more differences between Chung's (1998) analysis of Chamorro and our analysis of Paiwan. For one thing, Chung treats determiners, demonstratives and numerals as D. For another, the so-called linker is treated merely as an inflectional feature on N that serves to indicate the presence of a modifier. According to Chung, the linker does not constitute a syntactic category in its own right. For a discussion of different approach, see Dikken (2003), and Kahnemuyipour & Massam (2004), among others.

[33] In Bruge's (2002) analysis of the possessive it may occupy a position lower than the one occupied by the demonstrative and it may undergo the same restrictions that characterize the demonstrative. On the other hand, Kahnemuyipour & Massam (2004) claim that the possessive may be projected as the specifier of a projection higher than that of the demonstrative and the marker associated with the possessive may be realized as the head of this projection. As discussed so far, similar problems to those of demonstratives will be raised with respect to both approaches. Among others, see also Ihsane (2003) for the typology of possessive modifiers.

(70) a. va'uan a kun
     new   A skirt
     'new skirts'

   b. kun a va'uan
     skirt A new
     'new skirts'

(71) a. [k-in-asengseng ni   kai] a kun
     PV-make   Gen Kai A skirt
     'the skirt that is made by Kai'

   b. kun a [k-in-asengseng ni   kai]
     skirt A PV-make   Gen Kai
     'the skirt that is made by Kai'

Assuming that the head of NumP marks the feature [+/-α plural] of the noun phrase (cf. Alexiadou 1997, Cinque 1999, and Li 1999), Paiwan noun phrase structures like (61) may be revised as (72) below, in which NumP is posited between FP and NP (cf. Kahnemuyipour & Massam 2004).

Paiwan
(72)
```
                    DP
                    /\
                   D'
                  /\
                 D    FP
                      /\
                     F'
                    /\
                   F    NumP
                        /\
                      Num'
                      /\
                   Num    NP
                          /\
                         N'
                        /\
                       N
```
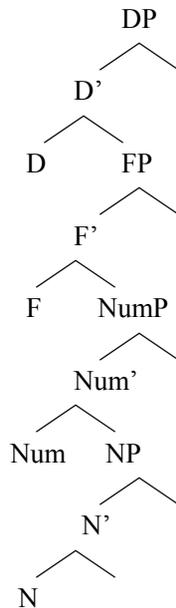
In (72) above the modifier-like Paiwan numeral may be licensed by Num and may

appear in either side of the adjunction structure of NumP.[34]

Unlike this freedom in the directionality of generation, there appears some sort of agreement requirement between the numeral and the [+/- human] noun.[35]

Paiwan (Tang et al. 1998, Tang 2004)

(73) a. *(ma-)telu   a   kakeDian
            MA-three A kid
        'three kids'

    b. (*ma-)telu   a   kun
            MA-three A skirt
        'three skirts'

In view of cases like (73), with agreement markers like *ma-*/ϕ- and modification markers like *a*, two questions may arise.[36] First, are numerals in Paiwan nominal or verbal in

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[34] We assume with Li (1999) that numerals may be projected as QP and need not be projected as the head of NumP (cf. Kahnemuyipour & Massam 2004). One piece of evidence for this postulation is that in Paiwan and other Formosan languages many numerals are not primitives but composites with internal structures.

[35] See Tang (2004) for a detailed typological study of the syntactic and semantic variation between non-classifier languages like English and classifier languages like Chinese, Formosan and Tibetan-Burman. See also the discussion there for problems these classifier languages may raise for the analyses of the cross-linguistic distinction in the occurrence of plural morpheme as in Cheng and Sybesma (1998), Li (1999), and Chierchia (1998).

[36] As discussed in Tang (2002a), *ma-* and ϕ- are two possible voice markers of stative verbs in Paiwan. *ma-* and ϕ- in (73a-b) however should be treated as classifiers rather than voice markers. For one thing, cross-linguistically while human and non-human nouns may be marked with distinct case markers, it seems rather unlikely that they need to be distinguished by different voice markers only in cases with numerals and quantifiers, interrogative or non-interrogative. Compare, for instance, (73), with numeral classifiers, and (i) below, with voice markers.

    Paiwan
    (i) a. *(ma-)tani a   zua a alak.
             AV-fall   Nom   that A kid
           'That kid fell.'
        b. *(ma-)tani a   zua a vatu.
             AV-fall   Nom   that A dog
           'That dog fell.'

For another, as discussed in Tang (2004), in Paiwan *ma-* needs to be changed into *mane-* when numerals are larger than 4, the latter of which is not found with the system of voice markers in Paiwan. Tang also points out that for some Formosan languages this kind of markers may be formed by the so-called C*a*-reduplication; they may be lexicalized with certain numerals; they may appear only with certain numerals; they may be optional for all or certain numerals, etc.

nature? Second, are modifier-like numerals in Paiwan relative clauses or non-relative clauses?

To answer these two questions, first note that in Paiwan and other Formosan languages certain aspectual elements may be attached to the predicate, as shown in (74) below.

Paiwan
(74) a. na-vaik ti   kai.
         Perf-go Nom Kai
         'Kai already went.'
     b. na-ti-kai   timadu.   (Tang 2002)
         Perf-TI-Kai she
         'She used to be called Kai.'

In (74a) aspectual elements like *na-* are attached to the verbal predicate *vaik*, and in (74b) the same marker *na-* to the nominal predicate *ti kai*. The same observation may also be found with other aspectual elements like *-anga*, *uri-*, etc. In other words, Paiwan markers like *na-*, *-anga*, *uri-*, etc. may be clitics rather than affixes, which may be attached to verbal predicates, as in (74a), or nominal predicates, as in (74b).[37]

None of these properties is however found with the characteristics of voice markers, which mark the thematic relation, not the [+/- human] relation, between subjects and predicates.

[37] In addition to proper names, pronouns and demonstratives, in Paiwan and other Formosan languages aspectual clitics may also be attached to common nouns and numerals in predicate position.
     Paiwan
     (i) a. na-Lutuk   a   ku-v-in-eLi, luwang-anga tucu.
             Perf-rabbit A   my-PV-buy   cow-ANGA   now
             'It is rabbits that I used to buy, now cows.'
         b. na-supat   a   ku-luwang,   dusa-anga   tucu.
             Perf-four   A   my-cow   two-ANGA   now
             'My cows used to be four, now two.'
In fact elements like *-anga* may be attached to the non-predicative nominal, as shown in (ii) below.
     Paiwan
     (ii) k-em-aleng ti   kui tai   kai-anga.
          know-AF   Nom Kui Obl Kai-ANGA
          'Kui knows the dead Kai.'
Thus, it seems that the possibility of co-occurrence with aspectual clitics itself is not sufficient evidence for the verbal property of predicates.
Similarly, in Formosan languages bound pronouns are clitics rather than affixes and thus predicates that may co-occur with bound pronouns need not be verbs.

Given the observation about (74) and the fact that Paiwan and many other Formosan languages do not exhibit copular verbs, one however might claim that *ti kai* in the so-called equational construction like (74b) may act as a verbal predicate rather than a nominal predicate. In fact one might claim further that nominals like (75b, d) may involve relative clauses, in which proper names like *ni kai* and pronouns like *nimadu* 'his/her' also need to be treated as verbs.

Paiwan

(75) a. kun ni   kai
          skirt Gen Kai
          'Kai's skirt'

      b. [ni   kai] a   kun
           NI   Kai   A   skirt
          'Kai's skirt'

      c. kakeDian   nimadu
          kid   his
          'his kid'

      d. nimadu a   kakeDian
          his   A   kid
          'his kid'

A postulation that in Paiwan and other Formosan languages predicates need to be all verbs however seems to be problematic. Consider, for example, languages like Mandarin Chinese, in which copular verbs like *shi* 'be' may not be always present, as (76b) illustrates, to be compared with (76a).

Mandarin

(76) a. zhe yi ben shi wo-de. na yi   ben shi ni-de.
          this one CL be I-DE   that one CL be you-DE
          'This is mine; that is yours.'

      b. zhe yi ben wo-de. na yi   ben ni-de.
          this one CL I-DE   that one CL you-DE
          '(lit) This mine; that yours.'

The absence of a copular verb in (76b) nevertheless does not turn expressions like *wo-de* and *ni-de* into verbs.

Also, as pointed out in footnote 8, Paiwan noun phrases like (77a) and equational constructions like (77b) exhibit several syntactic differences.

Paiwan

(77) a. icu   a   kun
         this A   skirt
         'this skirt'

   b. *(a) icu   a   kun.
         A   this Nom   skirt
         'This is a skirt.'

That is, in (77b), not (77a), replacement of *a icu* by *icu* will result in the ill-formedness of the sentence and the marker *a* between *a icu* and *kun* marks nominative case, not modification relation.[38] And for expressions like *sa*, they cannot act as predicates of equational sentences.

Paiwan

(78) a. na-v-en-eLi   ti   kai tu   sa   a   kun.
         Perf-AV-buy   Nom   Kai Obl SA   A   skirt
         'Kai bought a skirt.'

   b. *sa   a   kun
         SA   Nom   skirt

Thus, it seems that noun phrases as in (77a) and (78a) need not be derived from a underlying structure involving equational constructions like (77b) and (78b), either (cf. Kayne 1994).

Note further that like nouns in Paiwan, common or non-common, numerals themselves may be case-markerd.

Paiwan (Tang et al. 1998)

(79) na-v-en-eLi   ti   kai tua kun   tu   telu.[39]
     Perf-AV-buy   Nom   Kai Obl skirt Obl   three
     'Kai bought three skirts.'

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[38] See Tang et al. (1998) for a discussion of the (im)possibility of the presence of the internally headed relative clause in Paiwan.

[39] Based on the distributional and case-marking conditions on the numerals in examples like (79), Tang et al. (1998) analyze such non-adnominal numerals in Paiwan as base-generated secondary predicates.

Recall also that for Formosan languages like Puyuma and Amis adnominal free demonstratives may be case-inflected and appear with association markers. All these observations thus seem to indicate that numerals and certain other modifier-like elements may still be nominal in nature. That is, they cannot be categorized as verbs only.

Another piece of evidence for the claim that Paiwan predicative and adnominal numerals need not be analyzed as verbs may come from the grammaticality and inter-pretation contrasts between sentences like (80), with non-frequency/duration expressions, and those like (81)-(82), with frequency/duration expressions.

Paiwan
(80) a. ma-telu   *(a) caucau [a (na-)vaik a v-en-eLi tua luwang].
          MA-three A person A Perf-go A AV-buy Obl cow
          'It is three people that went to buy cows.'
      b. ma-telu   *(a) [(na-)vaik a v-en-eLi tua luwang a   caucau].
          MA-three A   Perf-go A AV-buy Obl cow   Nom person
          'The number of people that went to buy cows is three.'
(81) kin-telul   (*a) ti   kai [a (*na-)'-em-aung].
      KIN-three A Nom Kai A   Perf-AV-cry
      'Kai cried three times.'
(82) maka-telul   (*a) ti   kai [a (*na-)'-em-aung].
      MAKA-three A Nom Kai A   Perf-AV-cry
      'Kai cried for three days.'

As discussed in Tang et al. (1998) and Tang (1999), (80) are equational sentences with *ma-telu* (*a caucau*) acting as nominal predicates and (81)-(82) are complex sentences with *kin-telul* and *maka-telul* serving as matrix verbs.[40] Consequently, among other things, in (80a-b) the verbal predicates of the relative clauses are finite and may appear with aspectual clitics and various types of voice markers that agree with the subject, whereas in (81)-(82) the embedded verbal predicates are non-finite that cannot take aspectual clitics and must occur with AV markers.

Such an analysis may be further supported by the fact that in Paiwan while frequency and duration verbs may take imperative voice markers like *-i*, nominals like demonstratives, proper nouns, pronouns, common nouns, numerals, etc. cannot.

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[40] Unlike nominal numerals in (79), Paiwan verbal frequency and duration expressions cannot be marked with *tu*. In languages like Japanese and Korean, by comparison, nominal frequency and duration expressions may be marked with objective case.

Paiwan

(83) a. kin-telul-i.
          KIN-three-I
          'Do it three times.'
      b. maka-telul-i.
          MAKA-three-I
          'Do it for three days.'

(84) a. *(a) icu-i.
              A   this-I
      b. *ti   kai-i.
          TI   Kai-I
      c. *timadu-i.
          (s)he-I
      d. *luwang-i.
          cow-I
      e. *telu-i.
          three-I

By contrast, when some of these nominals are prefixed with elements like *pa-ka-* (or *ka-*), imperative markers like *-i* or *-u* may be present.

Paiwan

(85) a. pa-ka-zua-i.
          PA-KA-there-I
          'Go through there.'
      b. pa-ka-tikai-i.
          PA-KA-TIKAI-I
          'Name him Kai.'
      c. pa-ka-basu-i.
          PA-KA-bus-I
          'Take the bus.'
      d. pa-ka-luwang-i.
          PA-KA-cow-I
          'Make the cow carry it.'
      e. pa-ka-telu-i.
          PA-KA-three-I
          'Give him three.'

In view of cases like (83)-(85), a question arises with respect to the derivation of verbs from nouns. According to J.-M. Wu (2004), among others, in Paiwan denominal verbs may be formed in two ways. Cases like (86a-b) are of this sort, in which (86a) exhibits attachment of overt voice markers, and (86b) that of overt non-voice markers.

Paiwan (J.-M. Wu 2004)
(86) a. zaljum 'water' → z-em-aljum 'to flood'
      b. vava 'wine' → san-vava 'to make wine'
      c. vatu 'dog' → *v-en-atu/*v-in-atu
      d. suimun 'location name' → *s-em-uimun/*s-in-uimun
      e. kama 'father' → *k-em-ama/*k-in-ama

J.-M. Wu claims further that in (86a), not (86b), nouns need to be first turned into verbs via attachment of a zero nominal morpheme before the insertion of overt voice markers. By contrast, (86c-d) illustrate that common nouns like *vatu*, proper nouns like *suimun* and relational nouns like *kava* cannot undergo denominaliztion. Along his line of thought, in examples like (85) no overt voice markers are found, which thus seems to indicate that Paiwan expressions like demonstratives, proper nouns, common nouns, numerals, etc. may be nominal in nature before the attachment of *pa-ka-*.

Note that, as pointed out in footnote 36, agreement markers like *ma-* and *ϕ-* in Paiwan numerals (73a-b) should not be treated as voice markers. Similar facts may be observed in Formosan languages like Kavalan (cf. Li 2005, in which *ay* may be present or absent).

Kavalan (Chang 2000)
(87) a. kin-turu   ay   razat
          KIN-three AY person
          'three people'
      b. (u)-turu ay   wasu
          U-three   AY   dog
          'three dogs'

Like Paiwan (73a-b), Kavalan (87a-b) also exhibit [+/- human] classifiers like *kin-* and *u-* in cases with adnominal numerals, which need to appear pre-nominally with the marker *ay*. These markers however are not identical with Kavalan voice markers. For quantifiers that may act as verbs in Kavalan, on the other hand, they appear with overt voice markers like *m-* and *-an* but not classifiers like *kin-* and *u-*.

Kavalan (Chang 2000)

(88) a. m-eniz m-Rasa tu   sulal ya   razat.[41]
          AV-all AV-buy Obl book Nom person
          'All the people bought the books.'

      b. niz-an-na   m-Rasa   ya   sulal.
          All-PV-his AV-buy Nom book
          'He bought all the books.'

Note also that in Formosan languages voice markers may also be in the form of zero morpheme, a variant that J.-M. Wu does not discuss in his rules of formation of Paiwan denominal verbs. If the zero nominal morpheme and the zero voice marker are indeed relevant for the derivation of verbs from nouns, it almost amounts to say that all the nouns in Paiwan and other Formosan languages may have their verbal counterparts (cf. J.-M. Wu 2004). Our discussion so far seems to suggest that Paiwan nominal predicates including numerals need not be analyzed as verbs; the issue of the relation between the zero voice marker and the denominal verb will be left for further research.[42]

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[41] Note that, as opposed to Kavalan (88), Paiwan [+/- human] numerals cannot appear with overt AV markers like -em-. Note also that according to Chang (2000), Kavalan sentences like (i)-(ii) below are equational sentences, in which the predicative quantifiers appear with [+/- human] markers rather than voice markers (cf. Li 2005, in which ma- in (ia) and m- in (ib) are treated as voice markers).

Kavalan (Chang 2000)

(i) a. mazmun ya   m-Rasa ay   tu   sulal.
         many   Nom AV-buy AY Obl book
         'The number of the people that bought the book is a lot.'

     b. mwaza   ya   ni-Rasa-an-na   tu   sulal.
         many   Nom Asp-buy-PV-his Obl book
         'The amount of the books that people bought is a lot.'

(ii) kin-turu   a   sunis.
     KIN-three Nom kid
     'The number of the kids is three.'

In addition, like Paiwan Kavalan also uses markers of the same form to mark numeral modification and relative clauses. All these similarities and differences between Paiwan and Kavalan seem to indicate that Kavalan numerals in question may exhibit two uses: a nominal predicate in the equational construction and numeral modification and a verbal predicate in the control construction. By comparison, their Paiwan counterparts seem to be used nominally only.

[42] As stated in Tang (2002b), in Paiwan negators like ini-ka may be used to negate nouns and verbs, hence the impossibility of using ini-ka to examine the [+/- N] property of numerals.

Among others, Aikhenvald (2000) claims that numeral and verbal classifiers are two types of classifier languages, the difference being that the numeral acts as non-verbs in the case of numeral classifiers, and as verbs in the case of verbal classifiers. And, as posited in Tang

With the discussion of the [+/- N] property of demonstratives, possessives and numerals in Paiwan, a relevant question is whether in Paiwan and other Formosan languages nominal modification expressed by these elements must be analyzed as relative clauses. If our analysis so far is on the right track, that is, they need not be verbs, the modification under consideration need not involve relativization. Note further that, as pointed out in footnote 37, the presence of clitics like *na-*, *-anga*, etc. with these elements does not necessarily mean that they are in predicate position or act as verbs. In examples like (89b, c)-(91b, c) below, to be compared with (89a)-(91a), such clitics may not be always allowed in nominal modification.

Paiwan

(89) a. a zua-anga   ti   kai.
          A that-ANGA   Nom Kai
          'Kai already came.'

      b. *na-v-en-eLi   ti   kai   tua   na-zua   a   kun.
          Perf-AV-buy Nom Kai   Obl Perf-that A skirt

      c. *na-v-en-eLi   ti   kai   tua   zua-anga   a   kun.
          Perf-AV-buy Nom Kai   Obl that-ANGA   A skirt

(90) a. na-[ni   kai]   a   icu   a   vatu.
          Perf-NI Kai   Nom this A dog
          'This dog used to be Kai's.'

      b. na-pacun ti   kai   tua   na-[ni   kui] a   vatu.[43]
          Perf-see Nom Kai   Obl Perf-NI Kui A dog
          'Kai saw the dog that used to belong to Kui.'

(2004), the affixation of classifiers to numerals in Formosan languages is done in lexicon not at syntax. Therefore, for a noun phrase structure like (72) there may appear a projection of ClassifierP between NumP and NP, the head of which needs to check features like [+/- human] and [+/- sortal] with Num and N in LF.

[43] Post-nominal possessives however cannot take markers like *na-*, *-anga*, etc.

Paiwan

(i) a. *kun   na-ni   kai
            skirt Perf-NI Kai

     b. *kun   ni   kai-anga
            skirt NI Kai-ANGA

Thus, it seems that unlike modifier-like demonstratives and numerals in Paiwan modifier-like possessives, though not verbs, may function as nominal predicates of relative clauses. We shall leave this issue to future research.

    c.   na-pacun ti   kai tua [ni kui]-anga   a   vatu.
       Perf-see   Nom Kai Obl NI Kui-ANGA A dog
       'Kai saw the dog that belongs to the dead Kui.'

(91) a.   na-supat a   ku-kun.
       Perf-four Nom my-skirt
       'My skirts used to be four.'

    b. *na-pacun ti   kai tu na-telu   a ku-kun.
       Perf-see   Nom Kai Obl Perf-three A my-skirt

    c. *na-pacun ti   kai tu telu-anga   a   ku-kun.
       Perf-see   Nom Kai Obl three-ANGA A my-skirt

In relative clauses, by contrast, no such asymmetry is observed.

Paiwan

(92) a.   na-'udidil a   ku-kun.
       Perf-red   Nom my-skirt
       'My skirt used to be red.'

    b.   na-pacun ti   kai tua na-'udidil a ku-kun.
       Perf-see   Nom Kai Obl Perf-red   A my-skirt
       'Kai saw my skirt that used to be red.'

(93) a.   k-in-asengseng ni   kai a   kun.
       PV-make   Gen Kai Nom skirt
       'Kai made the skirt.'

    b.   na-v-en-eLi ti   kui tua [k-in-asengseng ni   kai a   kun].
       Perf-AV-buy Nom Kui Obl PV-make   Gen Kai Nom skirt
       'Kui bought the skirt that Kai made.'

The above-mentioned contrast in grammaticality between relative clauses and nominal modification of demonstratives and numerals is also found with negators like *ini-ka* and temporal expressions like *kaicavil* 'last year'.

In other Austronesian languages like Niuean, as stated in Kahnemuyipour & Massam (2004), demonstratives, possessives, and numerals may be also distinct in form and distribution.

Niuean (Kahnemuyipour & Massam 2004)

(94) e   tau manu kula fulufuluola e:
      AbsC Pl bird   red beautiful   Dem
      'those beautiful red birds'

(95) a. e   ha   Sione a leo
       AbsC GenP Sione a voice
       'Sione's voice'
    b. e   leo   ha   Sione
       AbsC voice GenP Sione
       'Sione's voice/voice of Sione'

(96) a. toko-lima e   tagata loloa
       Pers-five Lig person tall
       'five tall people'
    b. Maori toko ua
       Maori Pers three
       'three Maoris'

(97) motu ikiii moe tokolalo ne   fa:
     island small and sandy   Comp four
     'four small and sandy islets'

Of (94)-(97), according to Kahnemuyipour & Massam (2004), only (97) involves relative clauses.

Similarly, as already pointed out in footnote 32, one difference between Chung's (1998) analysis of Chamorro and our analysis of Formosan languages is concerned with the treatment of the so-called linkers that are associated with the demonstrative, possessive, and numeral. Such markers are all treated in Chung merely as an inflectional feature on N that serves to indicate the presence of a modifier and to signal whether it occurs to the left or right of the head (cf. Kahnemuyipour & Massam 2004). According to Chung, these linkers do not constitute a syntactic category in their own right and only those associated with relative clauses are analyzed as complementizers.

It should be pointed out here that in Niuean (94)-(97) the so-called ligatures and complementizers are not of the same form, a fact that is distinct from Paiwan, in which only the marker *a* is used. It is well-known that in Formosan languages markers of the same form may in fact exhibit various syntactic functions and thus the presence of *a* in Paiwan nominal modification should not be regarded at all as an indication of the existence of relative clauses.

Recall that, as shown in the previous discussion of Puyuma and Thao in Huang (2000a & b), the markers of modifier-like demonstratives/possessives as well as numerals may be distinct from that of real relative clauses.

Puyuma (Huang 2000a)

(98) a. sagar=ku   kanDini   na   buLabuLayan.
          AF-like=1sg.Nom   this-Obl NA   girl
          'I like this girl.'

      b. ba-li   na   babayan
          sister-my   NA   female
          'my elder sister'

      c. miaDua a   maLewadi
          two   A   brother
          'two brothers'

      d. me-nau=ku   Da   Tau [penu-a-kpuk Da   walak].
          AF-see-I.Nom   Obl man hit-Red   Obl kid
          'I saw a man that was hitting my son.'

Thao (Huang 2000b)

(99) a. haya wa   'azazak mi-La-liLi'.
          that WA   kid   AF-Red-stand
          'That kid is standing.'

      b. mihu wa   ranaw
          your WA   chicken
          'your chicken'

      c. larima wa   atu
          five   WA   dog
          'five dogs'

      d. yaku' myaran m-ang-qtu-qtu nak a   'azazak
          I   often   AF-miss-Red   my A   kid
          [i   tuLi   m-acupiS   pataSan].
           Loc Gaoxiong   AF-study   book
          'I often miss my son that studies in Gaoxiong.'

Similar observations are also found in Squliq Atayal and Saisiyat.

Squliq Atayal (Taoshan) (Yayut Isaw, personal communication, 2004)

(100) a. mtalah (na)/*ka   lukus
          red   NA KA   clothes
          'red clothes'

      b. giqas (na)/*ka   lukus
          new   NA KA   clothes
          'new clothes'

   c.   cyugal (*na/*ka) lukus
         three   NA KA clothes
         'three clothes'

   d.   s-m-awya [b-n-aziy-an na   tali'] *na/ (ka) ucya' quw sayun.
         AV-like   Perf-buy-PV Gen Tali' NA KA tea   Nom Sayun.
         'Sayun likes the tea that Tali' bought.'

Saisiyat (Yeh 2000)

(101) a.   hini' korkoring
         this   kid
         'this kid'

   b.   sia sarara' ka   'amana'a taw'an.
         he like   Acc my   house
         'He likes my house.'

   c.   hiza' 'an   'iban a tatpo'.
         that   Gen 'iban A hat
         'That is 'iban's hat.'

   d.   hiza' 'aehae' 'alaw
         that   one   fish
         'that fish'

   e.   'ima sekela' hi   'obay ka   ma'i:aeh m-wa:i'   ila.
         'IMA know   Acc 'obay Nom man   AV-come ILA
         'The man that knew 'obay came.'

   f.   tatini'   sarara' ka   kama   ra'oe: kapinobae:aeh kapinna:o.
         old-man like   Acc KAMA drink wine   lady
         'The old man likes the lady that drinks wine.'

In fact, according to Yeh, Saisiyat relative clauses like (101e-f) may be classified in accordance with the type of predicate in the relative clauses.

    Another important fact about Niuean numerals in (96a-b), with non-relative clauses, and (97), with relative clauses, has to do with the directionality of projection. In the case of the former, the complex numeral appears pre-nominally and the bare numeral post-nominally, a situation similar to the distribution of Paiwan possessives. In the case of the latter, however, the relative clause follows the noun. In examples like Paiwan (69a-b), by contrast, the complex numeral may precede or follow the noun. Word order variation of this sort may be problematic for restrictive antisymmetric approaches as in Kayne (1994), Alexiadou (1997), Cinque (1999), Bruge (2002), and Kahnemuyipour & Massam (2004).

To summarize, it is shown in this section that in Paiwan demonstratives, possessives and numerals need not be treated as (denominal) verbs and not all types of nominal modification involve relative clauses. Among others, Bolinger (1967) already illustrated the problems of deriving attributive adjectives from predicative adjectives in English, both on syntactic and semantic grounds (cf. Kayne 1994).

5. *z(u)a/icu* vs. *sa*

So far our focus has been on the syntax of the demonstratives in Paiwan; in the following the semantics of these demonstratives will be briefly touched upon. To begin with sentences like (102a-b), (102b) may be used only when both the speaker and the hearer know who the kid is.

Paiwan
(102) a.   na-pacun-aken tua zua/ icu a kakeDian.
            Perf-see-I   Obl that this A kid
            'I saw that/this kid.'
       b.   na-pacun-aken tu   sa a kakeDian.
            Perf-see-I   Obl SA A kid
            'I saw a kid.'

This difference in interpretation is also grammatically marked for replacement of *tua* by *tu* in (102a) and that of *tu* by *tua* in (102b) will result in the ill-formedness of both sentences. The same may be said about the subject position.[44]

Paiwan
(103) a.   v-in-eLi ni   kai *(a)   zua/ icu a kun.
            PF-buy Gen Kai Nom that this A skirt
            'Kai bought that/this skirt.'
       b.   v-in-eLi ni   kai (*a)   sa a kun.
            PF-buy Gen Kai Nom SA A skirt
            'Kai bought a skirt.'

They may also take different lexical items.

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[44] For a discussion of the referential properties of case markers in Paiwan, see Tang et al. (1998) and Tang (2002b, to appear).

Paiwan

(104) a. tengelay ti   kui tua zua/ icu a timadu/*tiza.
         like   Nom Kui Obl that this A man   man
         'Kui likes that/this man.'

      b. tengelay ti   kui tu   sa   a   *timadu/tiza.
         like   Nom Kui Obl SA A   man   man
         'Kui likes a man.'

Note however that, as stated in Tang et al. (1998), like *sa*, Paiwan demonstratives like *zua* and *icu* may also be non-deictic or indefinite specific in interpretation since they may appear with restrictive relative clauses (cf. Bernstein 1997).[45]

Paiwan (Tang et al. 1998)

(105) a. na-pacun ti   kui tua/*tai zua a ti kai a pu-'ulu.
         Perf-see Nom Kui Obl Obl that A TI Kai A smart
         'Kui saw that Kai who is smart.'

      b. na-pacun ti   kui *tua/ tai (*zua a) ti kai a pu-'ulu.
         Perf-see Nom Kui Obl Obl that A TI Kai A smart
         'Kui saw Kai, who is smart.'

      c. na-pacun ti   kui *tua/*tai/ tu   sa a ti kai a pu-'ulu.
         Perf-see Nom Kui Obl Obl Obl SA A TI Kai A smart
         'Kui saw a Kai who is smart.'

(106) a. na-pacun ti   kui tua/*tai zua a pu-'ulu a ti kai.
         Perf-see Nom Kui Obl Obl that A smart   A TI Kai
         'Kui saw that Kai who is smart.'

      b. *na-pacun ti   kui tai pu-'ulu a ti kai.
         Perf-see Nom Kui Obl smart   A TI Kai

      c. na-pacun ti   kui *tua/*tai/ tu   sa a pu-'ulu a ti kai.
         Perf-see Nom Kui Obl Obl Obl SA A smart   A TI Kai
         'Kui saw a Kai who is smart.'

6. Conclusion

By examining in detail the syntactic behavior of demonstratives, possessives, and numerals in Paiwan and other Formosan languages, it is first found in this paper that the

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[45] Tang et al. (1998) point out that pre-nominal relative clauses in Paiwan are restrictive in meaning, whereas post-nominal relative clauses can be interpreted as restrictive or non-restrictive.

form and distribution of these three types of elements may not always agree with one another. In addition, it is also noted that not all types of nominal modification may involve relative clauses, given the fact that attributive modification and predicative modification may be syntactically distinguished among modifiers. Thus, an analysis along the lines of the antisymmetry condition in Kayne (1994) may not necessarily capture in a principled way the word order variation in nominals within and across Formosan languages.

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指示詞和台灣南島語的限定詞組結構

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　　本文的主旨是研究台灣南島語中的指示詞、屬格名詞和數詞的語言類型，進而分析排灣語的指示詞組的名詞組結構。所探討的主要議題有四：台灣南島語中 (A) 名詞組中的詞序變化是否都能爲 Kayne (1994) 的「抗對稱性」條件所詮釋，(B) 指示詞、屬格名詞和數詞是否都得分析爲由名詞轉變而來的動詞，(C) 名詞組中的修飾語是否都得分析爲關係子句，以及 (D) 指示詞的語意屬性是否都是定指。有鑑於排灣語中的四種語言事實，這上述四個議題的答案似乎都是否定的：(A) 指示詞、屬格名詞和數詞的形式和分布並沒有一致，(B) 述語成分仍具有名詞性，(C)「屬性修飾」和「述語修飾」有句法上的區分，以及 (D) 指涉屬性有格位上的區分。

關鍵詞：指示詞，屬格名詞，數詞，抗對稱性，台灣南島語