Determiners and incorporation in Maori*

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The noun phrase in Maori has been analysed by Waite 1994 and Dooley Collberg 1994 using a DP structure of the type first introduced by Abney 1987. This article presents additional evidence in the form of incorporation data which supports the DP analysis and the classification of the singular determiner *te* as the head of DP.

Introduction

The singular definite determiner *te* is one of the most prolific words in the Maori language. Besides appearing in its base form in the determiner position of noun phrases, its presence can also be seen in the forms of demonstratives, indefinite articles, pronouns, and possessives. Even in forms where there is no visible trace of *te*, it has been assumed that there is an underlying *te* present. Bauer 1993 describes such *te*-forms as arising from a process of fusion of *te* with possessive prepositions or proximal particles. In a formal analysis, such fusion can readily be described as an instance of incorporation. Incorporation is the syntactic process by which two independent words become one through head movement (Baker 1988). However, an incorporation analysis is not possible if *te* is analysed as a determiner occupying the specifier position of NP. Waite 1994 argues that *te* should be classified instead as the head of its own DP phrase. He concentrates his discussion on *te*, however, and only briefly mentions in footnotes that the other *te*-forms can be treated as the output of phonological rules applying to s-structure sequences of [*te* + X]. The *te*-forms are such an integral part of the noun phrase and exhibit such complex

and productive syntactic alternations that they should be given a more detailed study. If a DP analysis is accepted, an incorporation analysis for the *te*-forms in Maori suggests itself immediately. I will assume a DP structure for Maori and discuss the derivation of the various *te*-forms in Maori as instances of *determiner incorporation*. This term is meant to reflect the fact that all the incorporations involve the determiner in some way, although it is not always the case that the determiner itself will be the incorporating element. Section 1 introduces the unincorporated determiner *te*, the basic DP analysis, and some principles of incorporation. Sections 2, 3, and 4 give analyses for each type of *te*-form which can be derived through determiner incorporation. It will be shown that the facts about determiner incorporation serve as further evidence in favor of adopting the DP analysis. The paper concludes with comments on other types of incorporation in Maori and some brief speculations about the syntactic status of the plural determiner *ngaa* and the personal article *a*, which do not participate in determiner incorporation.

1. Unincorporated *te*

All Maori noun phrases except those headed by pronouns, locative nouns, or proper names include an overt determiner. The singular determiner is *te*, the plural determiner *ngaa*. Examples (1) and (2) show simple Maori noun phrases.

(1)　te kaainga
　　　DEF.SG village
　　　the village

(2)　ngaa tikanga
　　　DEF.PL custom
　　　the customs

Number is marked only in the form of the determiners. The form of the noun is the same in singular or plural phrases. Given the type of DP analysis developed in Waite 1994, examples (1) and (2) are analysed as shown in Figure 1. This is the structure which will serve as the basis for the account of determiner incorporation which will be developed in the following sections. This analysis differs from that of Waite in one important aspect, however. His analysis includes optional raising of N (or V or A) heads to D to parallel the raising of the verb to Infl in the clause. I do not find this raising motivated, since these heads do not show any signs of
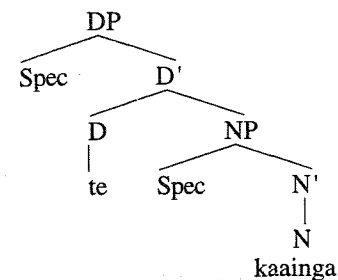
Figure 1. The Maori DP.

syntactic merger in the way that V+I sequences do in other languages.[1] D in Maori merges instead with other categories, as the rest of this paper will show.

The crucial feature of the analysis shown in Figure 1 is that *te* is analysed as a functional head and is therefore capable of taking part in incorporation, since only heads may incorporate. Other restrictions upon incorporation have been outlined in Baker 1988. Basically, incorporation is an instance of head-to-head movement. It is only possible under proper government, and the movement must obey all the same restrictions as any other instance of Move Alpha: the trace of the moved element must be properly governed, and no barrier may be crossed during the movement.[2] After incorporation, the incorporated forms continue to govern any categories which they governed before incorporation occurred.

2. Demonstratives: Incorporated proximal particles

Any simple noun phrase may be expanded in Maori with the addition of various modifiers including possessives, relative clauses, adjectives, and proximal particles. These normally appear in postnominal position, but some may optionally appear in prenominal position instead. This is true of the three proximal particles *nei, naa,* and *raa*. They encode the relative distance of an object with respect to the speaker and hearer, and correspond

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[1]This raising is actually problematic for the phonological account of *te*-forms which Waite assumes, since it blocks generation of the [*te* + X] surface structures which are required as input to the phonological rules.

[2]*A* properly governs *B* iff *A* theta-governs or antecedent governs *B* (Chomsky 1986). Theta-government requires that *A* assign a theta role to *B*. Antecedent government requires that *A* and *B* are coindexed. Barriers to movement are defined relatively with respect to the nature of the item being moved, following Rizzi's conceptions of Relativized Minimality (1990).

to the English demonstratives *this* and *that*. Example (3) illustrates the use of the postnominal proximal particles.[3] The number of the determiner does not affect their form. In prenominal position, the proximal particles are fused with the determiner *te* to form demonstratives, as shown in (4). This is the case even for plural noun phrases, as shown in the forms in (5). In other words, the plural determiner *ngaa* does not participate in determiner incorporation as *te* does. This is true for all forms of determiner incorporation which will be identified in this paper. I will therefore only be considering incorporation with *te* in any subsequent examples. For plural forms, number is marked by the absence of *t-*.

(3) a. **te**   kurii **nei**
         DEF.SG dog PROX1
         this dog (by me)

     b. **te**   kurii **naa**
         DEF.SG dog PROX2
         that dog (by you)

     c. **te**   kurii **raa**
         DEF.SG dog PROX.DIST
         that dog (over there)

     d. **ngaa**   kurii **nei** / **naa** / **raa**
         DEF.PL dog PROX1 / PROX2 / PROX.DIST
         these / those / those dogs

(4) **teenei** / **teenaa** / **teeraa** kurii
     this   / that   / that   dog

(5) **eenei** / **eenaa** / **eeraa** kurii
     these / those / those dogs

The demonstrative forms in (4) and (5) are the first type of determiner incorporation which we can identify for Maori. In this type, a proximal particle incorporates onto the D head. The simplest analysis for this type of incorporation is to allow the particles, which are best analyzed as adverbial adjuncts, to incorporate directly onto the D head. It must be said that this is not a typical case of incorporation. In the more familiar cases of incorporation described by Baker 1988, such as object incorporation, it is a sister constituent which incorporates onto a governing head. Also uncontroversial are instances in which the noun head incorporates onto D
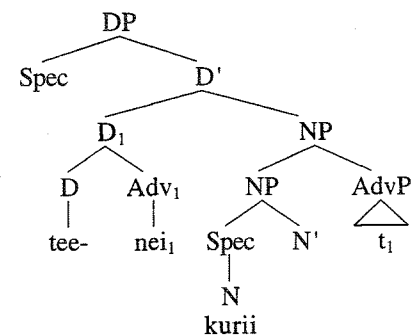

Figure 2. Incorporation of proximal particles.

through head movement paralleling V-to-I movement in full clauses. This second type of incorporation is attested in languages with suffixed articles, for example Swedish (Delsing 1993). According to Baker's theta-role-based definition of government, adjuncts and subjects should not be eligible for incorporation. However, this restrictive view of incorporation has been questioned. Uriagerika 1996 discusses incorporation from adjunct position and takes a more flexible view of the government relationship required for incorporation.[4] Similarly, Li 1990 gives examples of adjectival adjuncts which are incorporated into verbs in Chinese resultative compounds. Baker's work is primarily concerned with incorporation as a grammatical function-changing process, and as such it will affect only theta-governed arguments. But as these later studies suggest, there may also be types of incorporation which do not involve arguments and consequently do not entail any grammatical function-changing.

In the analysis being built here for the Maori demonstratives, it is the head of an adverbial modifier (the proximal particle) which incorporates onto a higher functional head (*te*). These examples therefore provide further evidence for the possibility of incorporation from adjuncts. Figure 2 shows the structure I assume for the determiner incorporation deriving prenominal demonstratives. The NP does not act as a barrier for the movement of the Adverb head, since the adjunct technically lies outside the barrier of the maximal projection. After incorporation to D, the Adverb is

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able to properly govern its trace by antecedent government. The complex head category created by incorporation is transparent for government purposes, according to Baker, so that an incorporated head is still able to c-command its trace. Or, another way of expressing this is to say that the index of the Adverb is percolated up to the complex D head, allowing the Adverb to c-command its trace via the coindexed D head (see Di Sciullo & Williams 1987 on feature percolation).

3. Possessive determiners: Incorporated KP

Another optional modifier within the noun phrase is a possessive. Possessives can be expressed postnominally as prepositional phrases headed by the prepositions *a* and *o*, or as prenominal possessive pronouns whose forms also reflect an *a/o* distinction. Collectively all the forms are therefore often discussed under the heading of A and O Possession (Bauer 1993). The factors governing the choice between the *a* and *o* forms are not completely understood, but it is clear that the expression of the distinction is based upon relations between the possessor and possessee rather than upon a property of either. Most often the relationship is described in terms of dominance or subordination between the possessor and the possessee. It is also clear that the expression of this distinction is extremely important in Maori. Possession is one of the most complex and closely studied areas of Maori syntax (Biggs 1955, Bauer 1993, Head 1989, Foster 1987).

Aside from the question of the A/O distinction, the most interesting aspect of the Maori possessives is the regular alternations in the prenominal and postnominal equivalents. Examples (6) and (7) show part of the singular and plural paradigms. The examples in (6) give one pair of singular postnominal and prenominal equivalent forms, while (7) shows a pair of plural forms. The additional forms given in (8) show that these are not isolated examples but part of a productive pattern for the generation of possessives of all numbers and persons, including pronominal possessors. The A and O particles are simply glossed as genitive particles.

(6) a. **te**   whare **o**   Hone
         DEF.SG house OGEN John
         John's house

     b. **too**   Hone whare
         DEF.SG.OGEN John house
         John's house

(7) a. **ngaa** kii **a**   Hone
         DEF.PL key AGEN John
         John's keys

     b. **aa**   Hone kii
         DEF.PL.AGEN John key
         John's keys

(8) a. **too**   **taaua**   hoa
         DEF.SG.OGEN 1DUAL.INCL friend
         our (yours and mine) friend

     b. **aa**   **maatou** ngeru
         DEF.PL.AGEN 1PL.EXCL cat
         our (theirs and mine) cats

The pattern is basically the same one identified for the prenominal proximal forms: the *t-* is visible in the singular, but deleted in the plural forms. The determiner is fused with the genitive preposition. The presence of the determiner *te* is more obvious in the demonstrative forms *eenei* etc., where the vowel *e* still surfaces. Here, the only sign of *te* in the plural may be the lengthening of the vowel of the AGEN or OGEN particles. This is plausible as a later phonological change in PF: a kind of assimilation, if you will. All this suggests that these possessive forms are also the result of incorporation.[5] It is not unknown for possessive pronouns to be incorporated with a prenominal determiner. This pattern can be found, for example in Bulgarian (Zimmermann 1991):

(9) **moi-te** chubavi knigi
     my-the   beautiful books

The Maori prenominal possessives are unusual, however, because the determiner is incorporated with the possessive preposition rather than the possessive pronoun itself.

While they show the same morphological pattern as the incorporated proximals, the prenominal possessives cannot be given exactly the same analysis as the one shown in Figure 2. First, the postnominal position of the possessor KP before the proposed incorporation is not clear. Waite 1994 allows AGEN possessors to be generated in Spec-NP position and OGEN possessors to be generated as complements to N, encoding the A/O

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[5]The idea that prenominal possessives could be derived transformationally from post-nominal ones was first suggested in Sharples 1968 for the possessives in Sikaiana, a Polynesian language with possessives closely resembling those found in Maori.
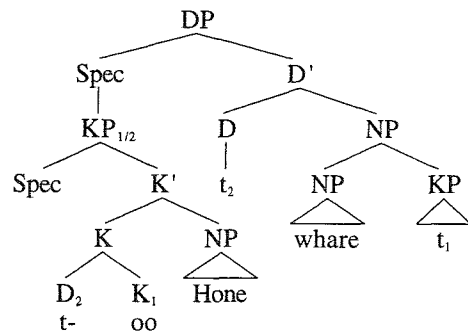
Figure 3. Incorporated possessives.

distinction structurally in this way. This poses a problem for an incorporation analysis of the possessives, however, because there should be inherent differences in the incorporation possibilities of complements and specifiers (Baker 1988). This is not reflected in any differences in the distribution of prenominal (i.e. incorporated) AGEN as opposed to OGEN: either type seems to be able to incorporate freely. I will therefore assume instead that there is no structural difference between AGEN and OGEN, but that either type may be generated as NP adjuncts. This brings them into the same position as the proximals, which we have already established as a possible position from which incorporation may originate.

Second, we must account not only for the incorporation of the preposition head onto the determiner, but also for the fronting of the entire prepositional phrase to a prenominal position. In effect, there must be some A-bar position available for leftward scrambling of the possessor phrase. If we assume that *te* is a determiner heading its own phrase and projecting its own specifier, then there is an available A-bar position for this move: Spec-DP. From this position, the incorporation now becomes a matter of the determiner incorporating onto the preposition rather than the opposite. Figure 3 illustrates the proposed analysis. The determiner is able to govern its trace properly after incorporation because the K head is transparent and the KP bears both indexes from the two elements contained in its head.

There is one important syntactic restriction upon the use of the prenominal (i.e. incorporated) and postnominal (unincorporated) possessive equivalents. If the possessor is pronominal, it is not normally possible to use the unincorporated form. There are therefore no unincorporated

equivalents such as those shown in (10) which are analogous to the examples given in (8):

(10) a. *te   hoa   o   taaua
        DEF.SG friend OGEN 1DUAL.INCL
        our (yours and mine) friend

     b. *ngaa ngeru a   maatou
        DEF.PL cat   AGEN 1PL.EXCL
        our (theirs and mine) cats

Why is incorporation obligatory for personal pronouns? A partial answer is readily available at least in the case of the singular pronouns, which are affixes and therefore cannot appear as free morphemes in the surface structure. Example (11) shows that the morphemes marking person and A/O distinction are required to appear attached to a host head, in this case the determiner *te*.

(11) a. **tooku**   whare
        DEF.SG.OGEN.1SG house
        my house

     b. **taau**   pukapuka
        DEF.SG.AGEN.2SG book
        your book

     c. **toona**   whare
        DEF.SG.OGEN.3SG house
        his / her house

This answer is only a partial one, because it does not explain why the pronominal affixes cannot attach to the AGEN or OGEN particles themselves and in this way appear in postnominal position as a kind of inflected preposition. But as (12) shows, this option is also ungrammatical.

(12) a. *te   whare **ooku**
        DEF.SG house OGEN.1SG
        my house

     b. *te   pukapuka **aau**
        DEF.SG book   AGEN.2SG
        your book

     c. *te   whare **oona**
        DEF.SG house OGEN.3SG
        his / her house

The hypothetical inflected prepositions in (12) are surface forms which do in fact occur in Maori. They are legitimate when used as prenominal incorporated plural possessives: because DEF.PL is marked with Ø, the forms are homophonous.

(13) a. Kei waho [**ooku** hoa]
LOC outside DEF.PL.OGEN.1SG friend
My friends are outside.

b. Tikina atu [**aau** pukapuka]
get away DEF.PL.AGEN.2SG book
Go and get your books!

c. Ko eenei [**oona** whare]
TOP these DEF.PL.OGEN.3SG house
These are his / her houses.

The same may be said for every one of the singular forms we can hypothetically build for inflected possessive prepositions: they will all be homophonous with incorporated plural possessives. Could it be that obligatory determiner incorporation for pronominal possessives might be a means of ensuring against the generation of ambiguous forms in the grammar? If the forms are allowed to surface only in prenominal position, then they will be unambiguously interpreted as plurals. Again, this is only partially satisfactory as as answer. Ambiguity is common enough in human language, and the necessary information regarding the number of the phrase is encoded clearly enough in the form of the determiner. There is no apparent reason why the forms in (12) should not be acceptable. For the moment it must be simply stipulated that incorporation with the determiner is obligatory for all pronominal possessors.

Examples in (12), then, are not normally grammatical as surface forms, but are possibly intermediate forms. The inflected preposition is the result of one incorporation, and it in turn will be incorporated into the determiner in the same manner as that described in Figure 3 to derive the surface forms in (11). This must be the case, since the A/O distinction is still encoded in the forms which have undergone determiner incorporation. Figure 4 shows the analysis for the proposed intermediate incorporated forms which underly surface forms such as *tooku, taau, and toona*. These intermediate incorporations may themselves constitute another type of determiner incorporation in Maori, that of a [K + D] combination, depending upon
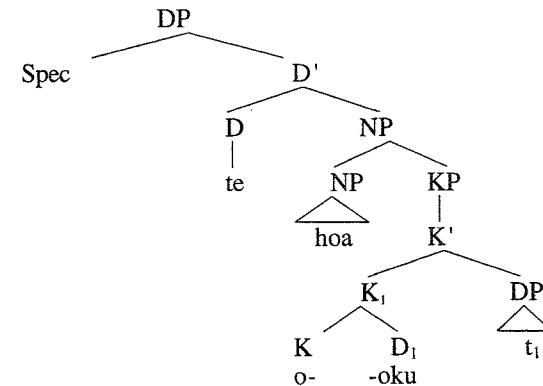
Figure 4. Incorporated pronominal possesives before incorporation with **te**.

whether we classify the personal pronouns as DP or NP.[6] I will speculate for the moment that they are DP and leave confirmation of this detail for further research. It does not significantly affect the incorporation analysis shown in Figure 3. The combination [preposition + pronoun] is found in other languages, for example Irish (*le* + *me* = *liom* 'with me') and French (*de* + *le* = *du* 'from it'), and it has been treated as incorporation by some syntacticians (for example Anderson 1982, Guilfoyle 1990).[7]

In fact, there is actually one instance in which this obligatory incorporation may be circumvented. It is an exception which serves to strengthen an incorporation analysis of these forms rather than weaken it. As Bauer 1993 points out, a plural pronominal possessive may occur in postnominal position, but only if the determiner of the possessed noun is a determiner other than *te*. For example (Bauer #1696):

(14) I tuutaki ahau ki [teetahi hoa **o raaua**].
PF meet 1SG to DEF.SG.one friend OGEN 3DUAL
I met a friend of theirs.

This is exactly what we expect given the determiner incorporation analysis being developed in this paper: personal pronoun possessors appear postnominally exactly in those instances in which they *cannot* move to

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[6]Both analyses have been suggested for pronouns: Abney 1987 assumes that they are DP in English, while traditionally they are classed as NP. Still a third view may be found in Rouveret 1991, where they are treated as NumP in Welsh.
[7]But see Stump 1984, Hendrick 1988, and McCloskey & Hale 1984 for accounts of Celtic inflection as a form of agreement.

incorporate with D, because the element there is not able to undergo incorporation. As noted earlier, only the determiner *te* is able to participate in incorporation.[8] When the D position is filled by another determiner such as *teetahi*, or by a demonstrative such as *teenei* which has itself been created by incorporation, the grammar cannot enforce obligatory incorporation, and seeming exceptions like (14) will surface. The only option available to the grammar under these circumstances is to allow an otherwise ungrammatical construction.

Similarly, the hypothetical postnominal inflected prepositions which were shown to be ungrammatical except as possible intermediate forms in examples (12a-c) can in fact surface in precisely the same circumstances. When the determiner is one other than *te*, these inflected prepositions are acceptable in postnominal position (Foster 1987):

(15) a. teenei   pukapuka **aana**
          DEF.SG.PROX1 book   AGEN.3SG
          this book of his

      b. teenaa   huu **ooku**
          DEF.SG.PROX2   shoe OGEN.1SG
          that shoe of mine

      c. eenaa   huu **ooku**
          DEF.PL.PROX2   shoe OGEN.1SG
          those shoes of mine

Notice that in (15b-c) the number feature for the phrase is encoded in the form of the determiner, while the form of the inflected preposition remains the same and encodes only the A/O distinction and the person of the possessor. There is really no reason why the examples in (12), which encode this information in precisely the same way, should be ungrammatical. The only difference is the one we have established dealing with the structure of the determiner: the determiners in (12) are simple, while those in (15) are 'complex' and are themselves the result of incorporation.

To summarize, then, the behaviour of the possessive *te*-forms examined in this section indicates that incorporation of KP possessors within the Maori noun phrase is dependent upon several factors. For the majority of

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[8]The plural determiner *ngaa* does not itself participate in incorporation, but it will not block incorporation to create such examples. Only 'complex' determiners such as those named in the text will block incorporation. It remains to be explained how a Ø allomorph of *te* can always surface even in plural noun phrases to support incorporation.

full noun phrase possessors, determiner incorporation is optional. For pronominal possessors, it is obligatory whenever possible. This requirement may only be relaxed when incorporation is blocked by a complex determiner filling the D position. This blocking effect in itself shows that the determiner is not capable of undergoing multiple incorporations.[9]

4. Deriving other determiners

4.1 Indefinite determiners: An incorporated numeral?

The analysis in Fig. 2 might seem applicable to the singular and plural indefinite determiners *teetahi* and *eetahi*. These have been analysed morphologically as a combination of the determiner *te* and the numeral *tahi* 'one' (Bauer 1993). These determiners are not simply indefinite, however, but appear to be specific as well and contrast with the non-specific indefinite determiner *he*, whose syntactic distribution is heavily restricted. Also, while they express number, *he* does not. Emphasis is usually conveyed by using *teetahi/eetahi*, as shown in this example from Bauer 1993 (#2243):

(16) E tika ana koe kia   moohio ki **eetahi** kupu Maaori
     T/A right PROG 2SG SUBJ know   to some-PL word Maori
     You must know *some* Maori words.

The form of the indefinite determiners clearly follows the same pattern as the incorporated proximal determiners discussed in section 2. However, the facts do not totally support an incorporation analysis of *teetahi/eetahi*. First, the numeral *tahi* is the only one which combines morphologically with *te*, so we are dealing with two isolated forms rather than with a general phenomenon affecting a whole class of words. Second, unlike the postnominal proximals in example (5), there is no possibility of an analogous postnominal unincorporated indefinite form such as the ones which have been constructed here:

(17) a. te   kupu Maaori kotahi
         DEF.SG word Maori one
         *one Maori word
         But: the one Maori word

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[9]Unfortunately, it also begs the question of why the preposition is capable of undergoing multiple incorporations. According to the analysis built in this section, the K is assumed to undergo incorporation at least twice in the derivation of examples such as those in (11): once with the possessive pronoun in postnominal position, and consequently with the determiner in prenominal position. A similar multiple incorporation pattern appears in N-class possessives, which are discussed in section 5.3.

b. *ngaa   kupu Maaori kotahi
    DEF.PL word Maori   one
    some (specific) Maori words

Notice that the only possible interpretation of (17a) is one which involves enumeration and definite reference rather than the indefinite interpretation. An indefinite interpretation is likewise impossible with (17b): the numeral functions in its capacity as a numeral. The incorporated proximals, in contrast, receive precisely the same interpretations as their unincorporated postnominal variants. Note also that the numeral *tahi* can only appear postnominally in the form *kotahi*, and that other numerals must be preceded by the particle *e*. Finally, numerals other than *tahi* may appear either prenominally or postnominally, and in prenominal position they are never accompanied by any overt determiner:

(18) [Ngaa   haaora e   **rua** / **E**   **rua** haaora] i   tatari ai   ahau.
     DEF.PL hour   NUM two / NUM two hour   T/A wait PART 1SG
     I waited for two hours.   (Bauer 1993, # 2216)

These facts all seem to indicate that the indefinite determiners *teetahi/eetahi* are not derived by the process of incorporation in the syntax, but are inserted into the determiner position directly from the lexicon.

4.2. Neutral Possessives

Although the A/O possessive distinction is very important in the expression of possession in Maori, there is a set of singular possessive pronouns which do not encode it. These are also clearly *te*-based, and are known as the neutral possessive pronouns. They are listed below in (19).

(19) a. Singular possession:
        taku   'my'
        too   'your'
        tana   'his/her'

     b. Plural possession
        aku   'my'
        oo   'your'
        ana   'his/her'

Although these forms are *te*-based, they cannot be derived through incorporation, but must be derived in the lexicon before insertion into the determiner position of the syntax. Like the indefinite determiners discussed above, they are isolated forms which do not represent the output of a

general syntactic rule. Also, it is difficult to identify the elements which in this instance would be said to incorporate with the determiner. While the *t/Ø* element is visible as the determiner and number morpheme, the *-aku*, *-oo*, and *-ana* elements are not classifiable as any independent syntactic category. They are reminiscent of personal pronoun forms and especially of the affixes found in the A/O possessives, but equating them with these is unjustified. The fact that the possessive forms in (19) are neutral to the A/O distinction clearly indicates that they are not derived from any kind of underlying prepositional possessive, unlike the forms in (11). This is evidenced as well in the difference in vowel length between the neutral forms and those encoding the A/O distinction: the long vowels in the A/O forms arise from the incorporation of the A/O preposition with the pronominal affixes. Although some grammarians list the neutral possessives as pronouns, they must be considered true determiners and not pronouns, since they cannot stand alone as the subject of a sentence. Possessives which encode the A/O distinction and which I have analysed as involving incorporation may function as pronouns. The neutral possessives should therefore be distinguished from the A/O possessives. Like *teetahi/eetahi*, they are not the result of incorporation, but are probably inserted into the determiner position directly from the lexicon. They can be classified as D which are listed in the lexicon and which obligatorily select an overt NP complement.

5. Other incorporations in Maori

5.1 Object incorporation

Incorporation is not limited to the types we have identified here as determiner incorporation, but may also occur in other syntactic relations in Maori. Object incorporation has been identified for Maori by Bauer 1993. Object incorporation is of particular interest in Maori because incorporated direct objects may be accompanied by modifers, as the following example shows:

(20) E   [rukuruku   kooura   nunui]   ana   ia.
     T/A dive.REDUP crayfish big.REDUP PROG 3SG
     He is diving for big crayfish. (lit. big-crayfish-diving)

Such examples pose a challenge to the definition of incorporation as strict head movement and possibly to the accepted notion that there are no instances of X' movement. If we analyse the noun and adjective modifier in

Maori as an X' head, then incorporation may prove to be a much more versatile phenomenon than the one described in existing analyses.

5.2 Causatives
Baker 1988 has identified morphological causatives as arising through verb incorporation. Causatives in Maori may be formed morphologically for intransitive verbs by the addition of the prefix *whaka-*, while transitive or ditransitive verbs must be made causative using a periphrastic construction.

(21) a. Kua mutu   te   hui.
        PRF finished DEF.SG meeting
        The meeting has ended.   (Bauer #1802)

     b. Naa   Hone i   **whakamutu**   te   hui.
        ACTGEN John PRF CAUSE.finished DEF.SG meeting
        John has ended the meeting.   (Bauer #1803)

An incorporation analysis of these Maori causatives would involve postulating that *whaka-* is a lexical verb head which selects a CP complement. The verb of the complement clause would be moved up to incorporate into the main verb *whaka-*. Fully motivating such an analysis would require further study and a detailed examination of all possible *whaka-* forms. It should be mentioned, for example, that some *whaka-* forms seem to have become lexicalized with non-transparent meanings that do not necessarily include the concept of causation. One may therefore question the productivity of a syntactic *whaka-* causative derived by incorporation in Maori. Most linguists have for this reason treated *whaka-* as a derivational affix. Nevertheless, there may be a sufficient number of identifiable cases of syntactically derived *whaka-* causatives to make investigation of an incorporation analysis feasible.

5.3 N-class possessives
Besides the T-class possessives analysed in section 3, Maori also contains a system of N-class possessives which are used predicatively and in questions concerning ownership.

(22) a. **Noona**   eenei   tiipuna.
        NGEN.OGEN.3SG DEF.PL.PROX1 ancestor
        These ancestors are his/hers.

     b. **Noou**   teeraa   tungaane?
        NGEN.OGEN.2SG DEF.SG.PROX.DIST brother
        Is that your brother?
                                              Bauer #1692

     c. Ae, he   tungaane **nooku**.
        yes INDEF brother   NGEN.OGEN.1SG
        Yes, he's a brother of mine.   Bauer #1692

     d. **Maaku**   teenei.
        MGEN.AGEN.1SG DEF.SG.PROX1
        This one is for me / This one is to be mine.   Bauer #1690

These possessives encode the A/O distinction and the person of the possessor in the same manner as the T-class possessives. They also encode a difference between realized and intended possession in the *n-/m-* distinction, as shown in (22d).[10] As the glosses in these examples indicate, these forms involve the fusion of two genitive prepositions as well as personal pronoun affixes. They are therefore classified by Bauer 1993 as "compound prepositional possessive pronouns". Because of the systematic productivity of these forms and their virtual identity with the T-class possessives, they should also be treated as incorporations. They are particularly interesting because if this analysis is correct, they show that multiple incorporations are possible in Maori with prepositions, although not with the determiner *te*.

6. Conclusions and some speculations
This article has identified at least three types of incorporation involving the Maori determiner *te*. These have been discussed as a common phenomenon under the term determiner incorporation. The data presented here supports earlier claims (Waite 1994, Dooley Collberg 1994) that the determiner in Maori is not a simple specifier category to the head noun of an NP, but is the head of its own phrasal projection. As such, it is the primary participant in several complex and highly productive syntactic operations. The demonstratives and possessives identified here as the result of incorporation cannot be given a satisfactory analysis unless *te* is analysed in this way as the head of a full phrasal projection. The material presented here therefore provides additional support for the acceptance of the DP analysis for Maori. It also provides new data on incorporation and suggests that incorporation may not be restricted to categories which are in a strict theta-government relationship.

There are still several questions which remain to be answered, however. The chief of these deals with the status of the plural determiner, *ngaa*. It is not clear why *te* alone is able to participate in incorporation. For the moment, there are two possible answers. One is simply that *ngaa* is not

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[10]Bauer glosses the *m-* and *n-* forms as intgen (i.e. intended) and actgen (i.e. actual), respectively.

phonologically capable of undergoing incorporation, and that the absence of any *ngaa* incorporations is simply a gap in the system which is created by restrictions at the level of PF (Phonological Form). This is not a very satisfactory answer, however, because it leaves a very large gap and basically just dismisses the problem by making it the responsibility of another module of the grammar. A syntactic alternative could be that *ngaa* and *te* are not syntactically equivalent, and that there is in fact some categorial difference between the two words which underlies the difference in their incorporational capabilities. Further research into determiner incorporation in Maori should therefore focus upon the categorial status of the word *ngaa* (see Dooley Collberg, in preparation). Despite its traditional classification as a determiner, the behaviour of *ngaa* indicates that a syntactic classification as a D head may be too superficial. Just as the DP analysis has offered more detailed insight into the behaviour of *te*, research into the structure of functional categories within the noun phrase may provide a clearer understanding of the bahaviour of *ngaa*.

A similar treatment may be required for the word *a*, which is traditionally classified as the personal article, because it precedes names and in certain instances personal pronouns and local nouns. Like *ngaa*, however, it never participates in incorporation, and its appearance is dependent upon a combination of factors, including the grammatical function of the phrase. At first glance, a promising line of research would be to investigate *a* as a marker of argument status, given that this is the distinction it seems to encode with local nouns. As (23a-b) show, the *a* is required when a local noun functions as subject of the sentence, but not when it functions as a predicate. Unfortunately, this distinction does not hold for personal names and pronouns. When used predicatively, they require the *a* particle (23c). The peculiar distribution of *a* can be stated descriptively, but remains to be explained in formal terms.

(23) a. Kei **roto** i te   kapata   te   tioka.
        AT-PRS inside at DEF.SG cupboard DEF.SG chalk
        The chalk is in the cupboard.   Bauer #450

b. He   whero **a**   **roto**.
       CLS red   PERS inside
       The inside is red.   Bauer #451

c. Kei   **a**   **Aapirana** te   waka.
       at-PRS PERS   Apirana   DEF.SG car
       Apirana's got the car.   Head, p. 97

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LUKAS – a preliminary report on a new Swedish speech synthesis

Marcus Filipsson and Gösta Bruce

Introduction

Background

For several years we have used speech synthesis at the Department of Linguistics and Phonetics, both as a research and as a teaching tool. The primary system has been the Swedish rule-based synthesis from Telia Promotor (formerly Infovox) and its developer's interface Rulsys from KTH. We have also used different implementations of Klatt synthesis on VAX and Macintosh. In the last few years, some successful projects (Bruce et al. 1995, Horne & Filipsson 1996a) have also used resynthesis of speech as a test method. In these cases, the recorded speech has been prosodically altered, and then resynthesized with an implementation of the PSOLA algorithm (Möhler & Dogil 1995).

Several previous projects at the department have aimed at modelling intonation in speech. The results of this research can easily be applied to speech synthesis. Merle Horne has demonstrated the need for tracking New/Given information in the text input to a speech synthesis system (Horne et al. 1993) and has also worked extensively on parsing text input prosodically (Horne & Filipsson 1996b), based on a Swedish dictionary which also contains phonetic transcriptions (Hedelin et al. 1987). Furthermore, the ProZodiag project led by Gösta Bruce and Björn Granström has been successful in generating a natural sounding intonation contour based on a limited set of prosodic labels (Bruce et al. 1995, Bruce et al. 1997). With these models and tools, we have many of the basic building blocks of a speech synthesis system. In late 1996 we arrived at the idea of trying to combine these building blocks into a speech synthesis system. Based on our experience with the PSOLA resynthesis, and given the existence of a Swedish rule-based synthesis, we decided to explore the possiblity of concatenative synthesis.