Optional disagreement and the case for feature hierarchies[*]

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1. Introduction

Grammatical gender is not always discrete, as observed cross-linguistically by Corbett (1991), and more specifically for Australian languages by various authors in Harvey and Reid 1996. In Australian languages, membership of one gender may imply membership of another, superordinate, gender. Evans, Brown, and Corbett (1999) showed that in some instances in Mayali, disagreement (lack of expected agreement) is mandated by lexical properties of either head or modifier. For instance, a feminine head noun may be accompanied by a masculine modifier (but never vice versa). This suggests that feminine is a sub-class of masculine.

Jingulu (western Barkly Tablelands, Northern Territory, Australia (non-Pama-Nyungan)), the traditional language of the Jingili people, shows evidence for a hierarchical relationship between all four of its gender categories. Modifiers have separate forms for each of the four genders and usually appear in the same gender form as the head they modify. When disagreement occurs, masculine modifiers can found with heads of all four genders, while vegetable gender heads can be modified by neuter modifiers as well. While agreement is the norm, disagreement is always an available option, and appears never to be either mandated or ruled out in specific grammatical or semantic contexts.

This suggests a hierarchy of gender features wherein the traditional 'masculine' is actually unspecified or default gender, with neuter and feminine being specific subclasses of gender, and vegetable a further subclass of neuter.

Similar disagreement patterns can be found with the categories of number and animacy in Jingulu, and section 4 proposes similar hierarchies for these features. While it is possible that disagreement has entered the language only as a result of language loss, its organization suggests that it reveals an underlying system of organizing morphological features that may be a universal property of language.

The disagreement facts find a very straightforward analysis in models involving late (post-syntactic) insertion of lexical items, such as the Distributed Morphology (DM) model of Halle and Marantz (1993), once hierarchies are admitted as the organizing principle of morphogrammatical features.

All the Jingulu data in this article are drawn from Pensalfini 1997 and from my own field notes.

2. Gender and agreement in Jingulu

Jingulu has four genders: masculine (m), feminine (f), neuter (n), and vegetable (v). The names for these genders come from Chadwick (1975) and are named for much the same reason as gender in Romance languages: masculine is the class that includes words for male animates, feminine includes words for female animates, vegetable is a class which includes words for edible plants, while neuter is the class containing words for most other inanimate objects. However, there are many exceptions to the above simple characterization. For instance, names of some edible plants are found in the neuter gender, many words for objects which are clearly not vegetables (predominantly long, thin objects) are found in the vegetable gender, and some of the terms that show up in the masculine and feminine genders are surprising if we expect the gender classifications 'masculine' and 'feminine' to equate to the biological labels 'male' and 'female'. For instance, while words for

people and higher animates belong to different genders according to the biological sex of the referent (eg: *kunyarrba* (masculine) 'dog', *kunyirrbirni* (feminine) 'bitch'), words for lower animates have fixed genders irrespective of the sex of their referent (eg: *junma* (masculine) '"left-hand" wallaby'). The Jingulu gender system is therefore what Corbett (1991) calls 'predominantly semantic'. I choose to follow Chadwick's terminology, though semantically neutral class numbers as used for the Gun-Winkuan languages might be more appropriate.

In Jingulu, gender is marked morphologically by suffixes and characteristic endings. Nominals which are invariant in gender typically (but not always) end in a predictable phonemic string, the gender's characteristic ending:

(1) a. masculine: *bininja* *kirda*
                    'man' 'father'
                    yarrilinja *kiyinarra*
                    'sand' 'vagina, vulva'
                    jamankula *jabarrka*
                    'blanket lizard' 'liver'
     exceptions: *darndiyi* *wajirrku*
                  'rat' 'praying mantis'
     b. feminine: *lirrikbirni* *dardawurni*
                    'cockatoo' 'axe'
                    kirirni *kirninginjirni*
                    'catfish' 'emu'
                    jingirdi *kularnkurrurdi*
                    'heart' 'dove'
     exceptions: *(w)urdila* *yakakak*
                  'axe' 'sulphur-crested cockatoo'
     c. neuter: *yurrku* *karalu*
                  'flower, nectar' 'ground'
                  ngabarangkurru *kirangkuju*
                  'blood' 'type of melon'
     exceptions: *bikirra* *marnkurlukurlidi*
                  'grass' 'ear wax'
     d. vegetable: *wardbardbumi* *ngijinmi*
                     'bush passionfruit' 'tail'
                     kingmi *ukbi*
                     'rainbow' 'lump, swelling'
                     mankijbi *milakurrmi*
                     'back of neck' 'wild potato'
     exceptions: *ngurrmana* *wilyurdku*
                  'string, cotton' 'narrow path'

Other nominals inflect for gender by taking gender suffixes. Such variable nominals include terms for higher animates which can take either masculine or feminine forms (2a), genitive pronouns (which agree with the gender of the possessum) (2b), and adjectivals (2c). The gender suffixes resemble, but are not identical with, the corresponding characteristic endings.

(2) a. *warlaku*   *warlaku-rni*
    'dog(m)'   'dog-f'
    wawa   *wiwi-rni* [1]
    'boy'   'girl'

  b. *ngarrin-a wawa*   *ngarri-rnini wiwi-rni*
    1sgGEN-m child(m) 1sgGEN-f child-f
    'my boy'   'my girl'
    ngarrin-u ngawu *ngarri-rnimi babirdimi*
    1sgGEN-n home   1sgGEN-v yam
    'my home'   'my yam'

  c. *bininja bardakurr-a* *nayurni bardakurri-rni*
    man good-m   woman good-f
    darrangku bardakurr-u *babirdimi bardakurri-mi*
    tree   good-n   yam   good-v

I have argued elsewhere (Pensalfini 1997, to appear a, b, c) that the characteristic endings and gender suffixes are in fact the head of the nominal word. That is, they contain formal categorial information, including gender features and the category feature [+N], and they combine with a semantically rich root which lacks these features in order to form a noun or adjective.

3. Gender 'disagreement' and the gender feature hierarchy

This section examines a pattern of optional gender 'disagreement', a nominal appearing in a gender which is unexpected given either its reference or, in the case of nominal modifiers, the gender of the modified word. Disagreement occurs both in texts and elicited sentences, but it could not be checked, because speakers always 'corrected' my instances of disagreement, and identified their own instances as mistakes (or denied having said them).[2] Nevertheless, these 'errors' occur in a strict pattern. The examples in (3) are concocted to show the pattern, but those in (4) and (5) are from my corpus of sentences produced by native speakers of Jingulu. While agreement is certainly the norm, disagreement occurs in all grammatical and semantic contexts.

When disagreement occurs, as the NPs in (3) show, masculine modifiers can found with heads of all four genders, while vegetable gender heads can be modified by neuter modifiers as well.

(3) a. masculine head: *wawa bardakurra* **wawa bardakurrirni*
         boy good(m)   boy good(f)
         **wawa bardakurru* **wawa bardakurrimi*
         boy good(n)   boy good(v)

  b. feminine head: *nayurni bardakurra* *nayurni bardakurrirni*
         woman good(m)   woman good(f)
         **nayurni bardakurru* **nayurni bardakurrimi*
         woman good(n)   woman good(v)

  c. neuter head: *darrangku bardakurra* **darrangku bardakurrirni*
         stick   good(m)   stick   good(f)
         darrangku bardakurru **darrangku bardakurrimi*
         stick   good(n)   stick   good(v)

d. vegetable head: *babirdimi bardakurra*   *babirdimi bardakurrirni*
                             yam   good(m)   yam   good(f)
                             babirdimi bardakurru   *babirdimi bardakurrimi*
                             yam   good(n)   yam   good(v)

There are some instances in the corpus of a masculine noun used in place of the feminine, though this is highly unusual with singular kinship terms. In (4) the bold-faced kinship terms *babiyurri* and *bardarda* are the masculine forms.

(4)   a. *Ngarri-ni-bala*   **babi-yurri**-*mi*.
            1sgGEN-f-pl(anim) older_sibling(m)-pl-IRR
             'They're my sisters.'
     b. *Nyina ngaanku lilirni nyamina-na   ngarnu*
            that(f) 2sgGEN aunt   DEM(m)-DAT 3sgGEN
               ngaanki-ni-na-ni   *kirda-rna-ni*   **bardarda**.
               2sgGEN-m-DAT-FOC father-DAT-FOC y.sibling(m)
   'That lilirni of yours is your father's little sister.'

Such use of masculine nouns for feminine is most common with animal names.

Adjectives almost always appear overtly bearing the gender of their referent, but demonstratives often do not. In either case, when there is disagreement, the same strict hierarchy of default agreements is possible as indicated in (3). If the noun is feminine (5a-c) or neuter (5d-e), the modifier may optionally appear in the masculine form. If the noun is vegetable, the modifier may optionally be either masculine (5f) or neuter (5g-i). Neuter agreement is not possible with feminine (5j) or masculine (5k) referents, and vegetable agreement is only ever possible with vegetable referents (5l-m). The disagreeing elements in (5) are given in bold-face, and the ungrammatical (asterisked) examples in (5) are invented examples which represent disagreement patterns that were never found in the corpus.

(5)   a. **Nyama**-*bili-rna-ni*   *nayu-wurlu kuwirinji-yurlu*.
            DEM(m)-dl-ERG-FOC woman-dl   W.Mudburra(f)-dl
            'These are two Western Mudburra women.'
     b. *Ngamulirni* **jalyamungka**   *binjiya-ju,birnmirrini*.
            girl(f)   young(m)   grow-do   prepub_girl
            'That little girl is growing up into a big girl.'
     c. **Nginda-***rni wujuwujurni kurlukurli-ni,*
            that(m)-FOC parrot(f)   small-f
              kurlungkurli-ni ngina-rniki wujuwujurni-ni.
              small-f   this(f)   parrot(f)-FOC
            'The wujuwujurni parrot is small.'
     d. **Jama**-*rni*   *nyanyalu-ngkuju, darrangku kirdilyaku.*
            that(m)-FOC leaf-HAVING   tree(n)   bent(n)
            'That bent tree is leafy.'
     e. *Ngandirdi ngini-niki-rni* **biyijala**   *bikirra-rni.*
            grass_sp   this(n)-FOC   tall(m)   grass(n)-FOC
            'Ngandirdi is this tall grass.'

f. *Karrangayimi* **nyama-***niki langaningki-mindi-i,*
   yam_species(v) this(m)   dig-1dlInc-will_go
      dajbajalmi **nyama-***niki marrimarri-mi.*
      spicy(v)   this(m)   cheeky-v
   'The karrangayimi yam, which I'm going to dig up, will burn you.'

g. *Ngima-rniki bilirdbi,* **ngini-***rniki bilirdbi,*
   this(v)   white_paint(v) this(n)   white_paint
      ngarri-nu   *bilirdbi,*   *ngarri-nimi bilirdbi.*
      1sgGEN-n   white_paint(v) 1sgGEN-v   white_paint
   'This white paint, this white paint, my white paint, my white paint.'

h. **ngini**-*rniki barndumi* **or** *ngima-rniki barndumi*
   this(n)   lower_back(v)   this(v)   lower_back(v)

i. **Bilyingbiyaku**   **ngini-***rniki-rni ngurndungurndulbi-rni*
   red(n)   this(n)-FOC   throat(v)-FOC
      lilingbi-nga-ju.
      hurt-1sg-do
   'My throat's red and sore.'

j. **Bambawunjirni* *ngaja-nga-nu,* **ngarri-nu**.
   shadow(f)   see-1sg-did   1sgGEN-n
   'I saw a shadow, my shadow.'

k. *buliki*   *jamarniki* **not**   **buliki* **jimi**rniki*
   cow(m)   this(m)   cow(m) this(n)

l. **Dardu-mi***bininja ya-jiyimi.*
   many-v   man   3sg-come
   'Many men are coming.'

m. **Dardu-mi** *nayurni ya-jiyimi.*
   many-v   woman   3sg-come
   'Many women are coming.'

n. **Darrangku* **kirdilyiki-mi**.
   tree(n)   bent-v
   'The tree is bent.'

The facts in (3) through (5) suggest an organization of genders in Jingulu that is perhaps best represented as a diagram involving sets and subsets:

(6)
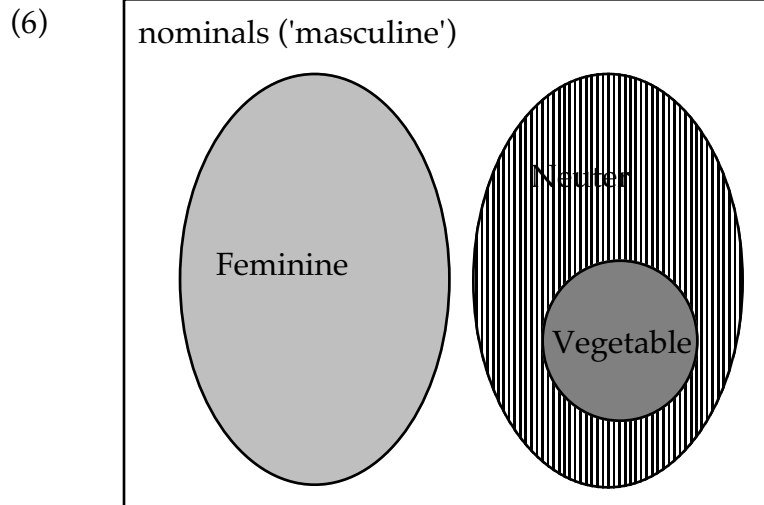
That is to say that all words fall into the 'masculine', more properly called 'gender-unspecified' group, and within this group there are two marked classes, the feminine and the neuter nouns. Within the neuter class there is a further marked class, the vegetable class. The N head therefore bears the gender feature of its most specific class and, automatically, of all the classes that its class is a subset of. If we imagine the features to be arranged into a tree, as in (7), we can say a nominal bears the feature of its class and of all the nodes which dominate it.

(7)

```
              [+N]
           /        \
      Neuter        Feminine
         |
      vegetable
```
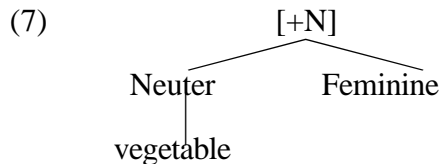
Disagreement involves erasure of one of the nodes in this hierarchy from the nominal head (the categorial feature [+N] can not be erased). The particular analysis of disagreement presented here assumes late insertion of vocabulary items, as presented in Halle and Marantz 1993. The general idea behind late insertion is that phonological features of vocabulary items are not present throughout the syntactic and morphological computation, but rather that the items manipulated by the syntax are bundles of formal features, with phonological features being inserted into the terminal nodes after syntactic and morphological processes which affect the specification of formal features have applied.
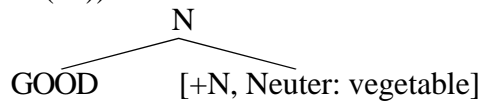
Lexical insertion takes place according to ordered lists of competing vocabulary items. The item inserted into a terminal node is that one whose features are the greatest subset of the features of the node into which it is to be inserted. In accordance with Panini's theorem, the most highly specified item is considered for insertion first. The vocabulary list for the [+N] node in Jingulu would be:

(8) [+N, Neuter: vegetable]   → [imi]

  [+N, Neuter]   → [u]

  [+N, Feminine]   → [irni]

  [+N]   → [a]   (the elsewhere case)

Disagreement is a morphological process of feature erasure. This analysis could probably be modified to suit lexicalist early-insertion theories, but I do not attempt this here.

To see how the analysis proposed here derives the disagreement patterns of Jingulu, consider the vegetable gender adjective /good-v/ (3d). The syntactic N head enters the morphological component with the features [+N, Neuter: vegetable]. If the [vegetable] node is erased, the word will appear in its neuter form. If the [Neuter] node is erased, the word will appear in the masculine form. There is no erasure which can cause the word to appear in the feminine form. On the other hand, feminine nominals are supplied with the gender features [+N, Feminine], and if the [Feminine] node is erased the word will appear in the masculine (default) form (3b). The derivations of the relevant forms are given in (9).

(9) a. /good-v/   (from (3d))
syntax: N
                    /\
              GOOD   [+N, Neuter: vegetable]
morphology:
  Option 1 - no erasure of features
      GOOD+[+N, Neuter: vegetable] → [bardakurr] + [imi]
                    → bardakurrimi
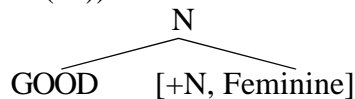 Option 2 - erase 'vegetable' node
      GOOD+[+N, Neuter: ~~vegetable~~] → [bardakurr] + [u]
                    → bardakurru
  Option 3 - erase 'Neuter' node
      GOOD+[+N, ~~Neuter: vegetable~~] → [bardakurr] + [a]
                    → bardakurra
    b. /good-f/   (from (3b))
syntax: N
                    /\
              GOOD   [+N, Feminine]
morphology:
  Option 1 - no erasure of features
      GOOD+[+N, Feminine]   → [bardakurr] + [irni]
                    → bardakurrirni
  Option 2 - erase 'Feminine' node
      GOOD+[+N, ~~Feminine~~]   → [bardakurr] + [a]
                    → bardakurra

In Jingulu, the erasure rules are optional (and not part of the prescriptive grammar presented by the speakers). The relatively rare occurrence of disagreement stems from the fact that additional steps in the derivation are required. That it is present in the grammar at all might be due to some force, operating in a situation of language loss, to reduce inflection (note that disagreement is not described by Chadwick in his 1975 grammar of Jingulu, and therefore may be a recent phenomenon). The language loss explanation would also explain why speakers do not recognize disagreement as a process in the language. In this context, it is important to note that even if disagreement is the result of morphological attrition, it proceeds strictly in accordance with feature hierarchies.

## 4. Extension of the analysis to number and animacy
Gender disagreement is the most striking, but not the only, form of hierarchical disagreement in Jingulu. Similar phenomena can be observed with both number and animacy.

Jingulu distinguishes singular, dual, and plural number morphologically in both nouns and verbal agreement paradigms. I will not demonstrate these in detail here in the interests of saving space; the full paradigms can be found in Pensalfini 1997. The NPs in (10) show number disagreement on nominals, while the sentences in (11) demonstrate number disagreement in verbal subject marking (all taken from texts and elicited sentences). The disagreeing elements appear in bold type, and the expected agreeing forms are given in parentheses.

(10) a. ***nyama-baji*** *imimikirni-bila*   *(nyama-bila)*
          DEM-pl(anim) old_woman-dl(anim)
          'the two old women'
       b. ***jama***   *bininja-yila*   *(jama-bila)*
          that   man-dl(anim)
          'those two men'
       c. ***nginda*** *juliji-darra*   *(nginda-ala)*
          that(m) bird-pl
          'those birds'
       d. *dardu* ***bilirna***   *(bilirna-darra)*
          many redgum
          'many red gum trees'

(11) a. *Kunyirrirni dij bila-**nya**-mi kandirri!*   *(dij bilikunyimi)*
          2dlERG   divide-2sg-IRR bread
          'You two cut up the bread.'
       b. *Dardu buliki **ya**-ju ngawu-mbili-rni.*   *(wurru-ju)*
          many cow   3sg-do camp-LOC-FOC
          'There are a lot of cows at the station.'
       c. *Kujarri-bila-rni   yurriy-**urru**-ju.*   *(yurriy-unyu-ju)*
          two-dl(anim)-FOC play-3pl-do
          'Those two boys are playing.'

We see from the above that singular forms are permitted with dual (10b, 11a) or plural (10c-d, 11b) reference, and plural forms are permitted with dual (10a, 11c), but not singular, reference, but dual forms may only ever occur with dual reference. This is reminiscent of the gender disagreement discussed in the previous section.

This suggests a hierarchy of number wherein 'singular' is more properly understood as default number, with plural a sub-case of this, and dual a further sub-case of plural:

(12)   [NUMBER]
              |
         [plural]
              |
          [dual]
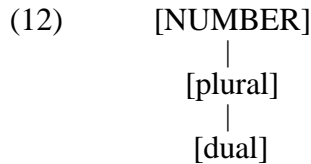
Here again, disagreement can be analyzed as erasure of one of the (non-root) nodes of the hierarchy in (12).

The dual and plural nominal morphemes make one further distinction. There are distinct dual and plural morphemes for animate and inanimate referents:

(13)   a. *ngarri-ni-bila*   *bardarda-yila*
            1sgGEN-m-dl(anim)   y_brother-dl(anim)
            'my two little brothers'
        b. *ngini-bulu*   *ngangarra-bulu*
            that(n)-dl(inan)   thing-dl(inan)
            'those two things'
        c. *murrku-nbala bayi-nbala*
            three-pl(anim) man-pl(anim)
            'three people'
        d. *nyiminika-la   kirangkuju-darra*
            this(v)-pl(inan)   melon_sp-pl(inan)
            'these melons'

Disagreement affects animacy as well. While nominals with inanimate reference are restricted to the morphemes in (13b) and (13d), nominals with animate reference can optionally take the forms in (13b,d) instead of those in (13a,c). Once again, the disagreeing elements are in bold type and the expected forms are in parentheses after the example.

(14)   a. ***Nyina-bulu***   *nayuurlu ngaba-wunyu-ju   amanjamanja.* [3]
            that(f)-dl(inan)   women   have-3dl-do   children
            'Those two women have kids.'   *(nyinabila)*
        b. *Dardu-wala*   ***bininja-darra Warumunga-darra***
            many_people   man-pl(inan)   Waramungu-pl(inan)
             wurri-jiyimi.   *(bininjabala Waramungubala)*
             3pl-come
                'A big mob of Waramungu men are coming this way.'

The analysis is straightforward if the feature [animate] is actually a subset of the feature ANIMACY, and that the default for ANIMACY is the 'inanimate' allomorph, as in (15). Animacy disagreement involves deletion of the [animate] node.

(15)   [ANIMACY]
             |
          [animate]

As with gender agreement, the prescriptive grammar offered by Jingulu speakers requires agreement in both number and animacy, but this is not adhered to in spontaneous or elicited utterances.

5. Conclusion - avenues of research

It is an enormous leap from the analysis of phenomena in a single language to the statement of linguistic universals, but the pervasiveness of evidence for hierarchical organization of morphosyntactic features in Jingulu demands that we inquire into the arrangement of these features cross-linguistically. The Jingulu facts suggest avenues of inquiry into similar systems in other languages that morphologically encode information such as grammatical gender, number and animacy. There is certainly evidence from Indo-European languages that there are default gender categories (consider, for instance, that plural or conjoined NPs in Romance languages take masculine agreement some when the individual referents would demand masculine and others feminine agreement).

It is important to note, also, that the evidence for Jingulu's hierarchisation of these features may only have arisen as a result of advanced language loss, where the strict morphological requirements of the language are being relaxed. This provides the scientific linguist with yet another reason for the urgent documentation of moribund languages, in addition to those outlined in Dixon 1997. This is not to say that urgent work is not also needed on those languages which are endangered but not yet moribund, as these languages have the greatest chance of being maintained and passed on to future generations with the appropriate support from linguists, educators and governments (see Bobaljik and Pensalfini 1996), and thus of helping to preserve the diverse linguistic heritage of humanity.

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[1] Feminine and vegetable gender suffixes induce height harmony in the roots to which they attach. A discussion of this harmony is well out of the scope of this article, but for extensive discussion on the issue see Pensalfini 1997 and to appear a and b.

[2] Demonstrating that grammatical prescriptiveness is alive and well among speakers of unwritten and/or endangered languages, and the descriptive linguist must take care not to immediately accept speakers' prescriptions as descriptive facts about the language.

[3] The terms *nayuwurlu* 'women' and *amanjamanja* 'children' are special irregular non-singular forms for these words.

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