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A DESCRIPTION OF THE MATHEMATICAL CONCEPTS
OF GROOTE EYLANDT ABORIGINES

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0. INTRODUCTION

This paper is the result of a number of years experience in education and linguistics on Groote Eylandt. During my teaching years, from 1952 to 1966, I became aware of the tremendous problems facing Aboriginal pupils as they struggled with concepts foreign to their culture, particularly in areas such as mathematics. From 1967 on, while engaged in linguistic studies, I have found many of those problems highlighted or explained.

In this paper I have attempted to outline some of the concepts relating to Aboriginal world view in order to help overcome the difficulties in teaching mathematics and related subjects. Much more detail could be included which would be relevant to those actually involved in teaching Groote Eylandt children; however it is hoped that this paper will also be useful to teachers in other Aboriginal schools.

The Anindilyakwa examples are set out on the left hand pages to enable people to read this material quickly. References to these numbered examples are given by raised numbers in the text on the right hand pages. The examples themselves have been simplified in terms of morpheme analysis to make them more readable to non-linguists, and technical terms have been reduced to a minimum. In many examples, the pronouns in their free form which would normally occur but which are not needed to make sense have not been included for the sake of brevity. For instance in example 32 *kilawurradinama* actually means both 'I will return' and 'you will return'. It

should also be noted that the suffix *-ma* ~ *-murra* (statement of fact) normally occurs when sentences are removed from context and this has not always been added — again, for brevity's sake. This means that examples in this paper may need to be expanded for use in conversation. (For more information on Anindilyakwa phonology see Stokes 1981.)

Groote Eylandt is situated in the west of the Gulf of Carpentaria. There are about 900 Groote Eylandters living in two communities: at Angurugu and at Umbakumba. Anindilyakwa is the language spoken in both places. I have had a close association with Aborigines in various situations ranging from the more formal teaching and learning situations to the less formal day to day contact in the settled community of Angurugu and camping out in traditional Aboriginal life-style. Many of the examples in this paper have come directly from conversations heard and observations made during these experiences.

It must be realised that the way Aborigines see things is often very different from the way non-Aborigines see them. Two groups of people, with very different backgrounds, life-styles and needs, focus on different aspects of the same phenomenon. All groups of people have basic concepts on which to build. Their ideas develop differently along different lines, having different patterns according to those things they recognise as important. When a technological society, which depends heavily on literacy and numeracy skills, intrudes on a non-literate society, adaptation must take place, together with adoption of new ideas. The Western-educated person is inclined to focus attention on those areas of the school for which the Aboriginal language seems inadequate. This is often because the Aboriginal and Western cultures are so different that it is neither appropriate nor possible to take the Western syllabus as it is and seek to translate it from English into the Aboriginal language. When the Westerner discards his own world view and looks through Aboriginal eyes he learns to appreciate the fact that there is indeed a considerable basis of knowledge on which to build. However, the traditional order in which concept development takes place in Aboriginal society does not follow the traditional Western order.

This paper attempts to highlight and explain many of the more important differences between Aboriginal and Western thought with particular reference to those concepts most frequently encountered in school. It is hoped that it will assist curriculum developers in drawing from realistic situations for mathematical and related examples.

1 *wurr-abiyakarbiya war-nungkwarba nabuki-likenuma angerriba*
 plural-three plural-man they.three-went over.there
 'Three men went over there.'

ningi-lirraki-rringka alakina-k-ya jurra ambilyuma-kiya
 I-two-saw those.two-two book two-two
 'I saw those two books.'

2 <i>nenungkwarba</i>	man (masculine singular)
{ <i>didarringka</i>	{ woman (feminine singular) plus
{ <i>duwalya</i>	{ curlew ~ curlews
	(non-human it <i>d</i> sing ~ plur)
<i>wunenungkwarba</i>	two men (masculine dual)
<i>wurringidarringka</i>	two women (feminine dual)
{ <i>wurrubukenungkwarba</i>	{ three men (masculine trial)
{ <i>wurrubukidarringka</i>	{ three women (feminine trial)
{ <i>warningkwarba</i>	{ men (masculine plural)
{ <i>wurridarringka</i>	{ women (feminine plural)
{ <i>wurruwarda</i>	{ dog ~ dogs
	(non-human it <i>w</i> sing ~ plur)
<i>yiburada</i>	wallaby ~ wallabies
	(non-human it <i>y</i> sing ~ plur)
<i>malamukwa</i>	canoe ~ canoes
	(non-human it <i>m</i> sing ~ plur)
<i>akwalya</i>	fish (non-human it <i>a</i> sing ~ plur)

N.B. 1. Brackets enclose members of the same noun class; italicised letters indicate particular Anindilyakwa noun classes, e.g. the *d* noun class.

2. The noun class form *wurrubuk-* 'trial human nouns' is not used as commonly as the dual and plural forms. It is more common to include trial nouns in the sixth noun class with masculine ~ feminine plural nouns.

1. PURE NUMBER

Groote Eylandters distinguish carefully between small numbers, especially with reference to people. The consciousness of differences between small numbers is reflected in the language by being firmly embedded in the grammar. There was no need to distinguish between large numbers before the advent of modern technology.

In English we think of either one thing (singular) or more than one thing (plural), i.e. there are two categories. In Anindilyakwa the classification is more complex. There are four possible categories:

singular	-	one
dual	-	two
trial	-	three
plural	-	more than three

In practice the trial form can include four.

Ambiguity is avoided by reference to number in the verb, the subject, the object, the adjective and the demonstrative, where these occur in any given sentence.¹

There are nine noun classes, each normally distinguished by its initial letter or syllable, e.g. *n-* and *wun-*.² Number is not indicated in the noun for non-humans, but where necessary it can be shown in various ways which are different from English. For humans, number is indicated in the nouns as well as by numeral adjectives (see section 1.1.2. Numerals).

³ Anindilyakwa Number Names

<i>nara ebina</i>	none
<i>awilyaba</i>	one
<i>ambilyuma ~ ambambuwa</i>	two
<i>abiyakarbiya</i>	three
<i>abiyarbuwa</i>	four
<i>amangbala</i>	five
<i>ememberrkwa</i>	ten
<i>amaburrkwakbala</i>	fifteen
<i>wurrakiriyabulangwa</i>	twenty (invariable - i.e. does not change its form in different grammatical contexts)

N.B. 1. The word *ambambuwa* 'two' which is cited as an alternative by Worsley (1954:36) is still used, in the restricted sense of 'two only'.

2. Worsley found that there was confusion in the usage of the number names for fifteen and twenty; he concluded that *wurrakiriyabulangwa* is the term for fifteen. Without denying that some people are confused in using the terms, I believe my data clearly indicates that the invariable form *wurrakiriyabulangwa* is 'twenty'. As recently as May 1982 a 74 year old woman was still able to count in fives without hesitation; she counted with the tips of her fingers as indicated in section 1.1.3 and used the number names as outlined above.

⁴ Macassan Number Names

<i>si ~ sibe're ~ se're</i>	one
<i>ruwa</i>	two
<i>tallu</i>	three
<i>appa'</i>	four
<i>lima</i>	five
<i>sampulo</i>	ten
<i>sampulo allima</i>	fifteen
<i>ruwampulo</i>	twenty

(Macassarese numbers 6-9 are different morphemes and not compounds as in Anindilyakwa.)

1.1 CARDINAL NUMBER

A technical economy requires a complicated number system in abstract terms. In Western society many people are fascinated with rote counting from early childhood. When mothers teach their children to count, they very soon pass from the counting of concrete objects to abstract counting far beyond the child's experience.

In traditional Aboriginal society nothing used to be counted that was outside normal everyday experience. When asked for what purpose counting was used in the old days, the old women who know the number names say that counting was used for turtle eggs. There is a story on Groote Eylandt about a mythical dog that could count. The story tells how the dog went hunting and returned to his family with the turtle eggs he had found. He began counting them in order to share them (though the story reveals that the dog cheated by hiding some eggs, causing a fight to develop!).

The number system in Anindilyakwa³ is more developed than in most other Aboriginal languages. Dr Peter Worsley, an anthropologist who was on Groote Eylandt, suggested that contact with the Macassans accounted for the development of number names beyond five, as it is normal in Aboriginal languages to count either to three or to five (Worsley 1954:368, Harris 1980:13). However, in conversations with Old Charlie, while he agreed with me that various names of introduced objects have Macassan origin, he did not consider that the number names originated in the Macassan language.* Macassan number names supplied by Dr C. Macknight (pers. comm.) are listed opposite.⁴

Since the introduction of English, English words have been used almost exclusively for numbers above five, while both the Anindilyakwa and English words have been used for the numbers up to five and also for ten. Today few young people know of the existence of the old Anindilyakwa words for fifteen and twenty. It is probably some time since these words were in use, but they are still remembered by middle-aged and old people, even though they do not always remember which word comes first. The old woman who told me the story of the mythical dog and the turtle eggs used the old words for fifteen and twenty as she described the dog counting.

* Charlie Galiyawa Wurramarrba, born about 1890, died in 1978. He remembered the days of the Macassan traders from the Celebes who came in search of trepang and pearl shell until about 1906, after the White Australia Policy was enforced. Old Charlie's father went away with the Macassans on their boat for about two years. His reminiscences are recorded on tape and are published in Cole 1972:31-2.

5	<i>nuwilyaba nenungkwarba</i>	one man
	<i>wunambilyuma wunenungkwarba</i>	two men
	<i>wurrabiyakarbiya wurrubukenungkwarba</i>	three men
	<i>wurrabiyarbuwa warnungkwarba</i>	four men
	<i>wurrumangbala warnungkwarba</i>	five men
	<i>wurrumemberrkwa warnungkwarba</i>	ten men
	<i>wurramaburrkwakbala warnungkwarba ~ wurrumemberrkwa wurrumangbala warnungkwarba</i>	fifteen men
	<i>duwilyaba didarringka</i>	one woman
	<i>wurringambilyuma wurringidarringka</i>	two women
	<i>wurrabiyakarbiya wurrubukidarringka</i>	three women
	<i>wurrabiyarbuwa wurridarringka</i>	four women
	<i>wurrumangbala wurridarringka</i>	five women
	<i>wurrumemberrkwa wurridarringka</i>	ten women
	<i>wurramaburrkwakbala wurridarringka ~ wurrememberrkwa wurrumangbala wurridarringka</i>	fifteen women
	<i>yaraja</i>	goanna ~ goannas
	<i>yuwilyaba yaraja</i>	one goanna
	<i>yambilyuma yaraja</i>	two goannas
	<i>yabiyakarbiya yaraja</i>	three goannas
	<i>yabiyarbuwa yaraja</i>	four goannas
	<i>yimangbala yaraja</i>	five goannas
	<i>yimemberrkwa yaraja</i>	ten goannas
	<i>yamaburrkwakbala yaraja ~ yimemberrkwa yimangbala yaraja</i>	fifteen goannas
6	<i>amangbala awilyaba</i>	6
	<i>amangbala ambilyuma</i>	7
	<i>amangbala abiyakarbiya</i>	8
	<i>amangbala abiyarbuwa</i>	9
	<i>ememberrkwa awilyaba</i>	11
	<i>amaburrkwakbala awilyaba</i>	16
	<i>wurrakiriyabulangwa awilyaba</i>	21
	<i>wurrakiriyabulangwa amangbala awilyaba</i>	26

1.1.2 NUMERALS

Numerals in Anindilyakwa are adjectival. They are complicated by the number of noun classes, because all adjectives must agree with the nouns they qualify. Taking nouns of three of the classes: *akwalya* 'fish', *malamukwa* 'canoe', *yaraja* 'goanna', and qualifying them with the numeral *awilyaba* 'one', gives *awilyaba akwalya*; *muwilyaba malamukwa*; *yuwilyaba yaraja*.

The numeral adjective *awilyaba* 'one' is used in Anindilyakwa more often than in English, sometimes being used in contexts where an English speaker would use the indefinite article 'a'. The numeral adjective *ambilyuma* 'two' is used for dual, *abiyakarbiya* 'three' for trial and *abiyarbuwa* for 'four', and so on for plural nouns. These adjectives occur with both human and non-human nouns and agree with the nouns they qualify.⁵ Some young people today use the compounds *ememberrkwa amangbala* 'ten five' and *ememberrkwa ememberrkwa* 'ten ten' as alternatives for fifteen and twenty.

1.1.3 COUNTING

The number names are basically 1, 2, 3, 4, 5, 10, 15 and 20. Counting after five continues 5+1, 5+2 etc. to ten. Counting after ten continues 10+1, 10+2 etc. to fifteen and counting after fifteen continues 15+1, 15+2 etc. to twenty. By using 20+1 for twenty-one and 20+5+1 for twenty-six and so on, it was possible to progress to twenty-nine, but this has not been common practice.⁶

An old woman counting pebbles for me on the beach clearly demonstrated the method of counting in fives. First she counted 1, 2, 3, 4, 5. Then instead of the cumbersome 5+1, 5+2 etc. for 6, 7, etc., she counted again 1, 2, 3, 4, and jumped to 10, then again 1, 2, 3, 4, and jumped to 15, and finally 1, 2, 3, 4, and jumped to 20, as she pushed aside the separate heaps of pebbles already counted. This was in effect the beginning of abstract counting, as she held in her head the number of heaps of pebbles.

Another example of counting by a non-literate woman threw further light on the procedure. Before counting the pebbles she gathered them up into one heap. This immediately brought to mind an indefinite number of turtle eggs ready to be distributed. Counting was probably used for sharing things more often than for adding them together.

7	<i>awilyaba amamuwa ayarrka</i>	one finger
	<i>awilyaba amamuwa alika</i>	one toe
8	<i>nara nibina nenungkwarba</i>	no man
	<i>nara dibina didarringka</i>	no woman
	<i>nara dibina duwalya</i>	no curlew
	<i>nara wunibina wunenungkwarba</i>	no two men
	<i>nara wurringibina wurringidarringka</i>	no two women
	<i>nara wurribina warnungkwarba</i>	no men
	<i>nara yibina yiburada</i>	no wallabies
	<i>nara mibina malamukwa</i>	no canoes
	<i>nara ebina akwalya</i>	no fish

These Anindilyakwa phrases mean that no man etc. is (was ~ will be) here (there) according to the context.

I have observed old people using fingers and toes for counting in recent times. The Anindilyakwa words for fingers and toes are in the a noun class.⁷ The procedure for counting on fingers and toes is as follows:

The hand is held loosely with the palm facing the person counting. The fingers are placed together one by one; index finger to thumb, middle finger to thumb, ring finger to thumb and little finger to thumb, until all fingers are bunched together. If the number is more than five the fingers are held together while counting continues with the other hand. After ten, the toes are touched one by one, first on one foot and then on the other.

1.1.4 ZERO AND INFINITY

'Nothing' is expressed by *nara ebina* 'not any'. This construction is made from *nara* 'not' and the demonstrative adjective *ebina* 'that (same)'.⁸ There is no concept of 'zero' as a place marker within the Anindilyakwa number system because there are no number symbols in Anindilyakwa.

There is no term for 'infinity' as such, but the concept 'innumerable' can be expressed by a verb in Anindilyakwa: *yinguwurramur.dinama dakwulyingarrijanga* 'there are too many stars to count'.

9	<i>yukwala yaraja</i>	some goannas
	<i>yambawura yaraja</i>	few goannas
	<i>yababurna ~ yangkwulyumuda yaraja</i>	many goannas
	<i>yababurni-langwa ~ yangkwulyumudi- langwa yaraja</i>	all the goannas
	<i>nara engkarrnguma akwala eka</i> not cut some tree	
	'Don't cut any more trees.'	
10	<i>ayukwujiya akungwa</i>	a little water
11	<i>aruma aninga</i>	plenty of food, or a big amount of one kind, e.g. sugar
	<i>ababurna aninga</i>	many kinds of food, or many packets of one kind
	<i>aruma akungwa</i>	a lot of water
	<i>ababurna akungwa</i>	many pools of water
	<i>aruma angwarra</i>	a lot of smoke
	<i>ababurna angwarra</i>	smoke from a number of fires
	<i>aruma angwura</i>	a big fire; a big load of pieces of firewood
	<i>ababurna angwura</i>	many fires
	<i>yaruma yalyukwa</i>	a lot of rain
	<i>yababurna yalyukwa</i>	many rain clouds
12	<i>ambarrngarna akwalya?</i>	how many fish?
	<i>ambarrngarna awarnda?</i>	how many stones? ~ how much money?
	<i>ambarrngarna amalyirra?</i>	how much petrol? i.e. how many litres?
	<i>dambarrngarna dumamawura?</i>	what is the time? (literally 'how many clock?')

When the English question 'How many brothers and sisters have you?' is translated into Anindilyakwa, 'how many?' takes a plural prefix, but *nawena* 'your brother' and *diyabena* 'your sister' do not take a plural prefix, although they take a plural suffix.

1.1.5 COUNTABLE AND UNCOUNTABLE NOUNS

In Anindilyakwa, as in English, there is a distinction between countable and uncountable nouns, although the distinction is organised differently in Anindilyakwa. Quantitative adjectives 'few' and 'many', 'much' and 'little' agree with the nouns they qualify and occur with human and non-human nouns. The adjectives *akwala* 'some', *ambawura* 'few', *ababurna ~ angkwulyumuda* 'many' and *ababurni-langwa ~ angkwulyumudi-langwa* 'all' are generally used with countable nouns,⁹ while *ayukwujiya* 'little'¹⁰ and *aruma ~ adirrungwarna* 'much' are generally used with uncountable nouns.

It is possible for both *ababurna ~ angkwulyumuda* 'many' and *aruma ~ adirrungwarna* 'much' to be used with certain nouns giving them a slightly different meaning.¹¹ The choice of word depends on where the focus lies, in either a countable or uncountable context, e.g. *maruma mamudangkwa* 'much sand' and *mababurna mamudangkwa* 'many sand-hills'. However these distinctions are not always made.

The adjective *ambarrngarna* 'how many?' refers to countable nouns and can only occur with uncountable nouns in certain situations, as in the examples.¹² When a person buys petrol the question *ambarrngarna amalyirra?* is quite acceptable, because the cost of petrol is standardised and the intended meaning is 'how many litres?' (The English alternative for 'how much?' with reference to something being poured into a container is often 'Tell me when to stop'. The Anindilyakwa translation for this request is *yikungwanjajiya* 'You will make me stop'.)

In some situations the adjective *amiyembena?* 'what kind?' can be used to ask 'how much?'. In this case a further question 'a little or a lot?' makes it clear that quantity is under discussion. When material is being discussed *dambarrngarna dumbala?* can only mean 'How many pieces of material?' but the question *dumiyembena dumbala, daruma yinda diyukwujiya?* 'What kind of material, big or small?' is the way to ask 'how much?'. The approximate amount can be indicated by hand gestures. At the Angurugu shop the women usually choose a ready cut length of material for a child's dress and a standard three metres for an adult's dress. Men buying material for ceremonial purposes usually take the roll of material they have chosen and ask for ten or twenty dollars worth, or else demonstrate the required amount. One old man pointed to a garbage bin outside the shop to indicate the length of the material he wanted to buy.

wurr-ambarrngarna n-aw-enu-murriya
 plur-how.many masc.sing-older.brother-your.sing-plur
 'How many brothers have you?'

Answers may include:

wun-ambilyuma n-aw-arrka-kiya
 masc.dual-two masc.sing-older.brother-my-two
 'I have two older brothers.'

wurr-abiyakarbiya n-enikumarnj-arrku-murriya
 plur-three masc.sing-younger.brother-my-plur
 'I have three younger brothers.'

13 *arngkambarrngarna bungaja?* how many times did they hit you?

14 *yinuwa* we (dual masculine exclusive)
yirringuwa we (dual feminine exclusive)
yirrubukwurruwa we (trial exclusive)
yirruwa we (plural exclusive)

nungkuwa you (singular)
nungkwunuwa ~ nungkwurnuwa you (dual masculine)
nungkwurringuwa you (dual feminine)
nungkwurrubukwurruwa you (trial)
nungkwurruwa you (plural)

When the prefix *arngk-* 'times' is added to *ambarrngarna* 'how many?', it makes an adverb 'how many times?'.¹³

Frequently questions such as 'How much rain was there?' and 'How much money have you?' are asked differently in Anindilyakwa, being the equivalent of 'Was there a lot of rain?' and 'Have you a lot of money?'. In such cases question intonation can be added to the examples in 11.

1.1.6 PRONOMINAL PREFIXES

The need to be specific with regard to small numbers has resulted in a complex pronominal system which includes a total of twenty-three pronouns. Dual masculine, dual feminine, and trial number are specified in the pronouns denoting 'we (inclusive)', 'we (exclusive)',¹⁴ 'you'¹⁴ and 'they', and are underlined in the examples.

- 15 *yin-aruma* we (dual masculine exclusive) are big
yirring-aruma we (dual feminine exclusive) are big
yirrubuk-aruma we (trial exclusive) are big
yirr-aruma we (plural exclusive) are big

ningk-aruma you (singular) are big
kin-aruma you (dual masculine) are big
kirring-aruma you (dual feminine) are big
kirrubuk-aruma you (trial) are big
kirr-aruma you (plural) are big
- 16 *yin-ambilyuma* we (dual masculine exclusive) two
yirring-ambilyuma we (dual feminine exclusive) two
yirr-abiyakarbiya we (plural exclusive) three

kin-ambilyuma you (dual masculine) two
kirring-ambilyuma you (dual feminine) two
kirr-abiyakarbiya you (plural) three
- 17 *yini-likajama* we (dual masculine exclusive) are going
yirringi-likajama we (dual feminine exclusive) are going
yirrubuki-likajama we (trial) are going
yirri-likajama we (plural) are going

ningki-likajama you (singular) are going
kini-likajama you (dual masculine) are going
kirringi-likajama you (dual feminine) are going
kirrubuki-likajama you (trial) are going
kirri-likajama you (plural) are going

Pronominal prefixes derived from the pronouns are added to all descriptive¹⁵ and numeral¹⁶ adjectives. The distinction between small numbers is more important to Anindilyakwa speakers for human beings than for non-humans. However the distinction between the sexes is equally important. Therefore in the prefixation for human beings both number and sex are in focus. For non-human nouns the distinction between small numbers is not indicated in the prefixation of descriptive and numeral adjectives, but can be shown in demonstrative adjectives (see section 1.1.7). Although it is beyond the scope of this paper, it should be noted that dogs are to some extent aligned with human beings rather than with animals in the system of prefixation.

The same attention to small numbers is evident in the pronominal prefixes added to verb stems. For intransitive verbs in the present and past tenses,¹⁷ many prefixes are identical to those used in prefixing adjectives. In the subject prefixes of transitive verbs, the distinction between small numbers does not extend throughout the whole system.

- 18 *akina (akwalya)* that (fish) ... it
alakina (akwalya) those (two fish) ... they
abukalakina (akwalya) those (three fish) ... they
awurrakakina ~ amurndakakina (akwalya) those (fish) ... they
nakina (nenungkwarba) that (man) ... he
wunalakina (wunenungkwarba) those (two men) ... they
wurrubukalakina (wurrubukeningkwarba) those (three men) ... they
wurrakina ~ wurrumurndakakina those (men) ... they
(warnungkwarba)
- dakina (didarringka)* that (woman) ... she
wurringalakina (wurringidarringka) those (two women) ... they
wurrubukalakina (wurrubukidarringka) those (three women) ... they
wurrakina ~ wurrumurndakakina those (women) ... they
(wurridarringka)
- 19 *yakina yimuwarraka ngarningma yakina nilikajama mukumuku-wa*
that green.turtle we.know that it.goes deep.sea-to
'We know the green turtle. It goes to the deep sea.'
nalikenuma wurrakina mijiyelyu-wa
they.went they beach-to
'They went to the beach.'
- 20 *ningkakina* you (singular that)
kinalakina you (dual masculine those)
kirringalakina you (dual feminine those)
kirrubukalakina you (trial those)
kirrakina you (plural those)
- 21 *yaruma yaraja* a big goanna
yarumuruma yaraja big goannas
wurrarumuruma warniniyarringka the important old men

1.1.7 DEMONSTRATIVES

Demonstrative adjectives occur with human and non-human nouns, agreeing with the nouns they qualify. Distinction is made between singular, dual, trial and plural number in all noun classes.¹⁸

The basic demonstratives are *enena* 'this', *akina* 'that', *angaba* 'that (over there — Old English yon ~ yonder)' and *ebina* 'that (same)'. *Akina* 'that' occurs more frequently in Anindilyakwa discourse than in English. It is often used where the definite article 'the' is used in English and also as a demonstrative pronoun.¹⁹ Demonstrative pronouns are also used extensively in conversation.²⁰

1.1.8 OTHER NUMBER DEVICES

a) Reduplication

Partial reduplication, indicated by underlining in the examples, occurs to show plurality in all adjectives qualifying human and non-human nouns.²¹ When a noun is qualified by two or more descriptive adjectives, reduplication does not necessarily occur on each one if this would prove cumbersome. Reduplication occurs in certain nouns, e.g. *wurrangaringariya* 'babies'. Such words are semantically nominal but grammatically adjectival.

- 22 *kini-lirraiki-likarna* you (dual masculine) went
kirringi-lirraiki-likarna you (dual feminine) went
- 23 Intransitive verb indicating duality of subject:
wun-ambilyuma wun-enungkwarba neni-lirraiki-likenuma angerriba
two.masc-two two.masc-man they.dual.masc-two-went over.there
'The two men went over there.'
- yambilyuma yaraja ni-lirraiki-likenuma angerriba*
two goanna it.y-two-went over.there
'The two goannas went over there.'
- 24 Transitive verb indicating duality of object:
nenuma-lirraiki-rringka wurrakina mambilyuma mijiyanga
they.dual.masc.it.m-two-saw they two boat
'They saw two boats.'
- 25 Intransitive verb indicating plurality of subject:
(*warnumamalya*) *na-murndaki-likarna ~*
na-wurraki-likarna they all went (people)
(*yaraja*) *nu-murndaki-likarna* they all went (goannas)
(*duwalya*) *yingu-murndaki-likarna* they all went (curls)
- 26 Transitive verb indicating plurality of object:
wunalakina-kiya narra-murndaki-rringka wurrababurna wurruwarda
those.two.masc-two they.them-all-saw many dog
'Those two men saw a lot of dogs.'
- 27 *wunambilyuma wunenungkwarba-kiya ~* two men
wunambilyuma-kiya wunenungkwarba-kiya
ambilyuma alakba-kiya two legs
maruma-kiya malamukwa two big canoes
wurriyukwujiya-kiya two little children

b) Prefixes

Dual prefix *-lirrak-*

An optional dual prefix *-lirrak-* may be added between the obligatory dual pronoun prefix and the verb stem.²² When this prefix occurs in an intransitive verb it indicates duality of the subject.²³ When it occurs in a transitive verb it refers to the object.²⁴

Plural prefix *-murndak-* ~ *-wurrak-*

An optional plural prefix *-murndak-* ~ *-wurrak-* may be added between the obligatory plural pronoun prefix and the verb stem.^{25,26} This prefix acts in the same way as the dual prefix.

Although the dual and plural object prefixes can co-occur with the dual subject prefixes,²⁴ they cannot co-occur with the trial subject prefix.

The following examples show some further uses of the plural prefixes. The prefix *-murndak-* occurs in the idiomatic expression *numurndakayuwaya* 'he is (all) weak'. It also occurs in the noun *amurndakijika* 'things, thing'. The introduction of a multitude of material things bearing English names, and the frequent use of 'thing' in English may be reasons for the use of *amurndakijika* in the singular today.

The prefix *-wurra(k)-* occurs in the adjective *awurra-kawura* 'together' (see section 1.2.3).

Although the quantitative adjectives already show plurality, a plural prefix may be added to some of them, e.g. *awurrak-ababurna* ~ *awurra-kwulyumuda* 'very many'.

c) Suffixes

Dual suffix *-kiya* 'two'

The dual suffix *-kiya* 'two' occurs on nouns and descriptive adjectives. It can also be added to the numeral adjective 'two'²⁷ but not to the free forms of dual pronouns.

Plural suffix *-wiya*

The plural suffix *-wiya* added to nouns and descriptive adjectives expresses an indefinite number larger than two. This suffix often has the meaning of 'all' or 'only' in English. *Warnungkwarba-wiya* 'men' indicates that the people referred to are males, to the exclusion of females, i.e. only males. *Duwalyu-wiya* 'curlews' means that the birds are all curlews. *Akwalya arumuruma-wiya* 'big fish'

28	<i>angubina-wiya</i>	cloudy
	<i>amarda-wiya</i>	grassy
	<i>amilyumilyinju-wiya</i>	muddy
29	<i>akangkirrayina angwurra</i>	we will run fast
	<i>nalyalyimbukwayinuma</i>	they conversed
	<i>namungkwulijayinuma</i>	they all slept together
30	<i>nenirringkayinama</i>	they (the two men) are looking at each other
	<i>nenuwardiyinama</i>	they (the two men) are fighting each other
31	<i>awilyaba akwalya ayukwujiya</i>	one little fish
	<i>ambilyuma akwalya ayukwujiya</i>	two little fishes
	<i>abiyakarbiya akwalya ayukwayuwa</i>	three little fishes
	<i>abiyarbuwa akwalya ayukwayuwa etc.</i>	four little fishes

infers that all the fish are big. If there are small ones as well, then *arumuruma-wiya* translates 'the big ones'. When we say that *mangkarrkba* 'wild plums' are *muruku-wiya* it may mean that they are all unripe or it may just refer to the unripe ones amongst others.

The suffix *-wiya* may be added to uncountable nouns.²⁸ In this case it is usually translated in English by a noun and 'y', e.g. *arrirru-wiya* 'windy'. However it must not be presumed that an Anindilyakwa noun + *wiya* necessarily has the same meaning as an equivalent English noun + y. Thus 'dirt' can be translated as *ajiringka*, but 'dirty' is not always *ajiringka-wiya*. In this case Anindilyakwa is more specific than English. A dirty plate may be *aninga-wiya* 'having food on it' or *amalyirra-wiya* 'sticky (having juice on it)'. The plate is only *ajiringka-wiya* if it has been on the ground and literally has earth and dust on it.

First order suffixes *-ay-* and *-iy-*

A suffix of the first order, i.e. a suffix immediately following the verb root, viz. *-ay-* or *-iy-*, occurs on certain verbs marking various aspects of plurality. It is underlined in the examples opposite. In intransitive verbs the suffix expresses togetherness of the action.²⁹ In verbs which normally require transitive prefixation the suffix expresses reciprocity. In this case it should be noted that the intransitive set of prefixes is used.³⁰

Past tense suffixes

In certain common verbs there are two past tense suffixes, one for the singular and one for the plural subject, e.g. *yingangkarra* 'she ran away' but *nuwangkirraja* 'they ran away'.

d) The adjective *ayukwujiya* 'little'

The singular ~ dual adjective *ayukwujiya* 'one ~ two little' has a plural form *ayukwayuwa*. The plural form is used for any number bigger than two.³¹

32 *likaja dirrbura ememberrku-wa alikira*
go straight ten-to house

'Go straight to the tenth house.'

yabiyakarbiyu-manja yimawura
three-in month

'In three months time' or 'in the third month'

naru-wiya ambilyuma durdurla arduma kilawurradinama ngayuwa
not-while two bell not.call I.will.return I

'I'll come back before the second bell.'

kengkirraju-manja ambilyuma durdurla kamba kilawurradinama
I.will.hear-when two bell then I.will.return

'When I hear the second bell I'll come back.'

kengkirraja-mu-langwa ngayuwa ambilyuma durdurla kamba
I.will.hear-statement.of.fact-after I two bell then

kilawurradinama
I.will.return

'I'll come back after the second bell.'

arngk-umangbala ningiridanguma eka kamba bangkilya nengkarnga
times-five I.chopped tree then tomahawk it.broke

'I chopped the tree five times and then (the sixth time) the tomahawk broke.'

mabiyakarbiyu-manja marringa (arngk-abiyakarbiya-ma) ningilikarnuma
three-on night times-three-emphasis I.went

awuruku-wa kembirra ningingarringka dingarrbiya
billabong-to then I.saw.it.d crocodile

'On the third night (the third time) that I went to the billabong I saw a crocodile.'

33 *andiya ngarningka akwiyadenu-wa ~ amukwiyadenu-wa*
look.for again this.kind-to

'Look for more of this kind.'

34 *akwiyadena eningaba umba akwiyadakina ~ akwiyadangaba awurrariya*
this.kind good but that.kind ~ that(over there).kind bad

'This kind is good, but that kind is not.'

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