

1.2 MANIPULATION OF NUMBERS

1.2.1 ORDINAL NUMBER

There are no special terms for ordinal number in Anindilyakwa. The distinction between cardinal and ordinal number is not focused upon in the same way as in Western society. The same terms are used for both cardinal and ordinal number. The meaning is clear from the context in which the numeral is used.³² Note the adverbial expression using the prefix *arngk-* 'times' in the last two examples.

1.2.2 SORTING

A great deal of sorting occurs in a traditional Aboriginal community. Although the categories into which a child has learnt to sort things may differ from those categories the school emphasizes, the actual skill of sorting is not new to the beginning school child.

One aspect of sorting involves like and unlike attributes. When a mother teaches her child which berries are edible and which are not, she points out an example and tells her child to pick some berries like it.³³ During the process of picking berries, sorting takes place as a person chooses the biggest berries on a bush. Further sorting automatically takes place after collecting is finished. Anyone eating a handful of berries chooses the best and discards the least ripe, the over-ripe, the stunted and diseased that were unnoticed at first. In this way a more precise sorting follows the initial rough sorting.³⁴

When someone is making string, the strips of fibre that have been collected must be sorted into the right lengths. While the strips are being gradually inserted into the string, any unsuitable strips are discarded. Thick and thin pieces are selected from the pile of strips according to the thickness of the partially made string. In this way the complete string should be the same thickness throughout, although it is composed of strands of varying thickness. It may be noticed that this type of sorting entails choosing complementary attributes instead of like attributes, to achieve uniformity in the finished product.

- 35 *eningaba-wiya ~ eninginingaba-wiya* the good ones
akwalya ayukwayuwa-wiya the small fish
mulbulirra miyarrmiyarrma-wiya the thin strips of fibre
- 36 *nalikena wurruwurrakawura* they went together
nilikena nakwukawura he went alone, by himself
nalikena wurrayabijaba they went separately
wakuma eka ayabijaba put the sticks down separately
- 37 *kirrambambilyuma-wiya* all of you, two by two
kirruwilyuwilyaba-wiya all of you, one at a time
wurringuwilyuwilyaba-wiya two girls, one by one
awilyuwilyaba-wiya one each, e.g. fish, one by one
na-likarna wurr-ambambilyuma-wiya
they-went plur-two.two-plur
'They went two by two.'
- 38 *arngk-ambarrngarna ningki-likarnuma Darwin-langwa*
times-how.many you-went Darwin-from
'How many times have you been to Darwin?'
- Typical answers are:
- arngk-abiyakarbiya* three times
arngk-ababurna many times

The suffix *-wiya* (see section 1.1.8) is used when sorting.³⁵

1.2.3 GROUPING

There are various ways of expressing the concepts of togetherness and separateness. The basic terms are *awurrakawura* 'together', *akwukawura* 'alone' and *ayabijaba* 'separate'.³⁶ (See also the suffixes *-ay-* and *-iyi-* in section 1.1.8.)

a) Addition and multiplication

Before Western education was introduced it is probable that sharing, and therefore the process of division, was more common than the processes of addition and multiplication.

Adding took place with small numbers in concrete situations. It was closely connected with counting, which in fact makes use of the process of addition in most numbers over five (see section 1.1.3). For instance, several men might count their spears before fighting to ascertain the total. Each man would presumably have a different number, so it would not be possible to take the short cut of multiplication to obtain the total number.

When several canoes set sail, the number of people accommodated by each canoe depended on the size of the canoe and the proportion of adults to children. The possibility of four canoes setting sail each containing the same number of people with their possessions sounds more like a hypothetical, abstract proposition than a real life situation. Such hypothetical examples are just as unlikely today, and this should be taken into account when devising mathematics curricula.

The possibility of accounting for people and things in small groups of equal numbers, especially pairs, is not precluded. When partial reduplication, indicated by underlining in the examples, occurs in the numeral adjective *ambilyuma* 'two' and the plural suffix *-wiya* is added, the new word means 'two by two, two at a time, two each or by twos'. Other numeral adjectives can be handled in the same way, e.g. 'by ones'.³⁷ The processes of addition and multiplication are not likely to be involved. However the prefix *arngk-* 'times' is directly associated with multiplication.³⁸

b) Division and subtraction

Sharing is one of the first lessons an Aboriginal child learns. The process of division is common for the purpose of sharing. It concerns concrete objects, particularly food, and is not considered in the abstract.

- 39 *yukwa ekwarra arinja* give me half the orange
mikwarra yukwa nganja give me half of them, e.g. *mangkarrkba*
 'wild plums'
ekwarra akungwa half the water
- 40 *ngay-embirra nguwurdiya*
 I-in.turn let.me.climb
 'It's my turn to climb.'
- 41 *nawarrukwayinama* they take turns, e.g. doing shift work
kirringu-warrukwayinuma diriya
 you.two.fem-changed. reciprocal dress
 'You two (girls) have swapped dresses.'

Sharing means dividing countable objects, such as shellfish and berries, which are often too small to be worth counting, and which can be divided into heaps or handfuls. Larger countable objects, such as fish, turtle eggs and wild apples are either counted or shared in heaps. Sharing also means dividing by cutting, as in the case of a big fish, a turtle or a wallaby (see example 161). As sharing is usually done within a group of people of different ages and sexes, the division is not usually exact, nor is it precisely calculated in advance.

There are no Anindilyakwa words for the abstract terms 'half' and 'apart'. When objects are divided into two parts, the adjective *ekwarra* 'one part' is used with the appropriate noun meaning one out of two parts. This word is usually used to translate the English word 'half', although in practice it may be only an approximation.³⁹ It is probably connected with the adjective *akwarrirra* ~ *akwarra* 'torn' although it can also be used for uncountable nouns (see section 2.9).

Another aspect of sharing is taking turns. The suffix *-embirra* or *-ambulangwa* ~ *-abulangwa* ~ *-ababulangwa* is added to the basic pronoun form, producing a series of words such as *ngay-embirra* 'in my turn'.⁴⁰ The verb stem *-warru kwayina* has several meanings, including 'taking turns, swapping and sharing'.⁴¹

The process of subtraction focuses on precise numbers, but when children have sneaked off with some turtle eggs, the abstract exercise of subtraction to discover how many are taken and how many remain is quite irrelevant. When a few fish escape the hunter's spear, he does not contemplate what might have been. Again, when a fish has gone bad it is not 'subtracted' — it is forgotten.

42 *yingalyubarina dakina awank-iyukwujiya aninga umba diyabadikba*
 she.ate she rather-little food but her.sister
yingalyubarina ayukwujiya angbilyuwu-baba
 she.ate little sickness-because

'She only ate a little but her sister ate even less because she is sick.'

wulkwa mambawura mamamuwa memu-manja beka, umba mangabu-manja
 only few marbles this-in bag, but that-in

beka muwank-ambawura makina
 bag rather-few it

'There are fewer marbles in this bag than in that one over there.'

mambawura mamamuwa miyukwujiyu-manja beka, umba muwank-ababurna
 few marbles little-in bag but rather-many

mangabu-manja
 that-in

'There are a few marbles in the little bag, but there are more (quite a lot) in the one over there.'

muwank-ababurna mamamuwa memu-manja beka umba mababurna
 rather-many marbles this-in bag but many

angwurra mangabu-manja
 more that-in

'There are quite a lot of marbles in this bag, but there are a lot more in the one over there.'

43 *aduwaba nuwardanga ababurna angwala umba yarrungkwa ababurna*
 today he.killed many crabs but yesterday many

angwurra nuwardanga nakina
 more he.killed he

'He caught a lot of crabs today but yesterday he found even more.'

aruma akungwa enu-manja awurukwa umba aruma angwurra angabu-manja
 big water this-in billabong but big more that-in

'There is plenty of water in this billabong, but there is more in that one over there.'

1.2.4 INEQUALITY AND EQUALITY

a) Inequality

The terms 'more than', 'less than' and 'fewer than' are expressed differently in Anindilyakwa and English, as is shown in the examples using the adjectival prefix *awank-* 'rather'. Note the use of *wulkwa* 'only'.⁴² 'More than' can also be expressed by the intensifier *angwurra*.^{42,43} The most common way of expressing the concept of inequality is from the point of view of the greater quantity.

⁴⁴ *yaruma yalyukwa nilarrina aduwaba wuburra yarrungkwa*
big rain it.y.fell today like yesterday

'There was as much rain today as yesterday.'

ayukwujiya akungwa enu-manja bajikala wuburra mangabu-manja cup
little water this-in tin that-in cup

'There's only a little water in the tin, the same as in that cup.'

mambawura mema marndekirriyerra enu-manja angalya wuburra angakuba
few this yam this-in place like over.there

'There are as few yams in this place as there are over there.'

⁴⁵ *alakina-kiya akwalya ayukwujiya-kiya neyenama akina wuburra aruma*
those-two fish little-two they.do that like big

awilyaba-ma akwalyi-da
one-emph fish-emph

'Those two little fish are equal to one big one.'

⁴⁶ *ebinu-manja angalya* in that place, i.e. the same place already
described

nibina nenungkwarba
same man

'that man, i.e. the same man already described'

dibina!
that.same

'That's the one!' (they're talking now about that bird I was
telling you about before)

⁴⁷ *akinu-manja angalya ebinu-manja yingumakburrangarnu-manja*
that-at place same-at she.it.m.found-at

yingumadakama marndekirriyerra
she.it.m.cooked yam

'She cooked the yams at the place where she found them.'

b) Equality

The concepts 'as much', 'as many as', 'as little as' and 'as few as' are translated using *wuburra* 'like'.⁴⁴ *wuburra* 'like' can also be used to describe items with attributes that are equivalent but not the same, e.g. two small fish that are equal to one large one,⁴⁵ but this would not normally be stated so precisely.

c) Identity

ebina 'same'

The English demonstrative 'that' refers to a particular person or thing already mentioned, to avoid ambiguity and to preserve continuity. The adjective *ebina* 'same' has this function in Anindilyakwa.⁴⁶

In sentences containing a main clause and a relative clause, *ebina* 'same' occurs in the relative clause as distinct from *akina* 'that' in the main clause.⁴⁷

48 *alakina bajikala adidirrbura ngawu-da*
those.two tin same still-emph
'Those two tins are just the same.'

49 *wunembirrki-didirrbura-kiya* two men equally stocky
wunilingaki-didirrbura-kiya two men equally tall
yakakwuruma yi-didirrbura-kiya
we.two.incl.know we.two.incl-same-two
'You and I both know (the same).'

mababurna manyungwunya nungkwulangwa wuburra ngalilangwa,
many figs your like her
kirringi-didirrbura
you.two.women-same

'You two women both have the same number of figs.'

nenilikena wuni-didirrbura makinu-manja diraka
they.two.men.went two.masc-same that-in truck

'They both went together in the same truck.'

50 *yirriyar.danga yirru-wurrakidirrbura*
we.arrived we.all-same

'We all arrived together (at the same time).'

adidirrbura and *awurrakidirrbura* 'same'

The adjective *adidirrbura* 'same' is formed from the adjective *adirrbura* 'straight' by repeating one part (see section 1.1.8 Reduplication). It is used in two ways:

- to describe two or three items which are identical in all respects. 'Just' and 'exactly' reinforce such statements in English, and *ngawa* 'still' and *ngawu-da* 'still' + the emphatic suffix *-da* reinforce similar statements in Anindilyakwa.⁴⁸
- to describe two or three items sharing one or more characteristics. It describes people and things being likened as to size, height, shape, age, colour and so on. People are also likened as to their possessions and to characteristics such as nationality, left- and right- handedness, various abilities and moral qualities.⁴⁹ The following phrase may refer to any such comparison according to the context:

wunalakina-kiya
dual.masc.those-two

wuni-didirrbura-kiya
dual.masc-same-two

'Those two men are the same.'

In the context of a competition, two contestants or two teams running neck-and-neck or having the same score are described as 'equal' in English and *adidirrbura* in Anindilyakwa.

The plural *awurrakidirrbura*⁵⁰ has the same function as *adidirrbura*.

ebinu-murrada ~ *ebinu-murradungwa* 'self-same'

In Anindilyakwa, when one person or thing appear in different circumstances, identity is kept constant by the use of *ebinu-murrada* or *ebinu-murradungwa*. These words occur in a restricted context, such as in the following circumstances:

In one bark painting several scenes may be depicted to illustrate various parts of one story. One particular man may be represented in each scene together with other figures. To understand the story, it is necessary to ascertain whether the figure in each scene represents that same person or someone different. Having established the identity of the first figure, the rest of the figures are pointed to in turn. The main character whose identity

was first established is referred to in each successive scene as *nibinu-murrada* 'the same man'. Any other figures are *wurruningka* 'different'. Similarly, in the consecutive illustrations of a book, people, places and things are identified in this way.

The English word 'same' is very frequently used in the classroom. Typical examples include a teacher asking a child to point to several occurrences of the 'same' word; a child complaining that he has been given the 'same' book that he was reading from on an earlier occasion because he recognises a dirty mark on the page; a child complaining that he is required to re-read the 'same' paragraph that he has already read; a child repeating the 'same' mistake that he has made before. In each case the English word 'same' is translated by *ebinu-murrada* ~ *ebinu-murradungwa* 'self-same'.

Comparing *adidirrbura* with *ebinu-murrada*

Anindilyakwa differentiates between *adidirrbura*, *awurrakidirrbura* 'same, identical (dual, plural)' and *ebinu-murrada* 'self-same (singular)'. This can be illustrated by the following classroom situation:

When books of the one title are handed around a class in school, the children are all said to be reading from the same book (*awurrakidirrbura*). The teacher tells them to find the same story, the same page, paragraph, sentence or word (*awurrakidirrbura*). The books are all open at the same place, they are *awurrakidirrbura*.

However, when referring to the page studied the previous day, the Anindilyakwa speaker must use *ebinu-murrada* 'self same'. The English speaker can use the one word 'same' in both contexts.

In such situations the Groote Eylandters' concept of 'same' is more carefully defined than the English.

Judith Stokes, 1982

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“A description of the mathematical concepts of Groote Eylandt Aborigines”

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