Diversity in the numeral systems of Australian hunter-gatherers

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85th Annual Meeting of the Linguistic Society of America
Pittsburgh, PA
January 9, 2011
Abstract

While the numeral systems of Australian languages are small, they are not uniform in all respects. In this paper we shed light on the extent of diversity in small numeral systems by systematically surveying 121 languages from Pama-Nyungan and non-Pama-Nyungan families.
Outline

1 Introduction

2 Features of Australian numeral systems
   - Extent of system
   - Internal structure
   - Secondary meanings of numerals
   - Etymologies of numerals

3 Conclusions
Stereotypes of Australian numeral systems

One, two, (three), many (Dixon 1980: 107–108)

Often excluded from discussion (e.g., Hanke 2010: 64)

Or claimed that they aren't numeral systems at all
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1. Survey of Australian numeral systems
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This is timely, given the current interest in cultural constraints on language (e.g., Evans & Levinson 2009).
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4. Whether numerals may denote inexact quantities
5. Etymologies of atomic numerals
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Data sources

Bowern's Pama-Nyungan comparative lexical database; supplemented by information from grammars and fieldnotes (where available); numerals and quantifiers extracted; partial data omitted, leaving:

121 doculects/varieties:
- Ten Pama-Nyungan subgroups
- Six non-Pama-Nyungan families
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- The forms for basic numerals; subsequent analysis provided data regarding:
  - The extent of the numeral system (that is, how high the numbers go);
  - How (and whether) numerals are combined to form higher numerals;
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  - Whether there is information about the use of numerals for vague counting.
  - (Whether there are ancillary counting systems.)
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3. Conclusions
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No systems in the survey extend above 20, so they are all “restricted” (Comrie 2005). But, upper limits vary:
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But, upper limits vary:
Combining numerals

General observation

75 of the 121 surveyed languages combine smaller numerals to create larger ones.

Common patterns

1, 2, 3, 2:2, 2:2:1

10 = 2:5 or 5:2 or 5:5
Combining numerals

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- 1, 2, 3, 2:2, 2:2:1
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- $10 = 2:5$ or $5:2$ or $5:5$
Do small number systems have bases?
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- Is 2:2:1 for ‘five’ formed through addition alone or through both multiplication and addition?
Variation in numeral composition
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Multiple ways of forming numerals

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- Gamilaraay: $6 = 2 \times 3 \text{ or } 1 + 5$
Are Australian numerals really numerals?

Evidence includes:

- Jaru: murrkun ‘three, few’
- Yan-nha: Nu (YolNu) wal¯ip ‘one’
- m¨ arrma ‘two’
- l¯urrkun ‘three, a few, a little, some, several’
- goku wal¯ip ‘five, a handful, a bunch’

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Australian languages don’t have numerals, they have quantifiers which can denote more or less specific quantities.

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- 29 languages allow vague readings
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- 29 languages allow vague readings
- 34 languages do not allow vague readings
Are Australian numerals really numerals?

Our survey

- 29 languages allow vague readings
- 34 languages do not allow vague readings
- 58 languages had no conclusive information
Languages with and without vague numerals
Are numerals and vague quantifiers related?

Some languages show an etymological (but not synchronic) relationship between numerals and vague quantifiers:

- Garrwa (Furby & Furby 1977)
  - 'three': kujarra yalku (2 + 1)
  - 'four': kujarra kujarra (2 + 2)
  - 'a few': kujajarra

Other languages have distinct numerals and quantifiers throughout (e.g. Bardi).
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General tendencies

Reconstructibility of numerals

Some families have reconstructible numerals: e.g., Nyulnyulan

one *warinyji

two *kujarra (Loan into Proto-Nyulnyulan)

three *yirrjara

four *kujarrakujarra

(five) (*nimarla)
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Reconstructibility of numerals

- Numerals in Pama-Nyungan are difficult to reconstruct beyond the lower subgroups.
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  - ‘one’ as *collective* (i.e. ‘together’) vs ‘one’ as *individuative* (i.e. ‘alone’)

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Small numeral systems
What about other hunter-gatherer languages?

**Small numeral systems**

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**Etymological sources**
- Combination of numerals: found in all case study areas (though with differences in the details).
- Hand: found in all case study areas.
- Kinship/sibling terms: only Amazonia (Epps 2006).
Australian numeral systems are uniformly small, which makes it difficult to answer the traditional questions of numeral typology, but there are parameters along which they differ.

May numerals be combined, and if so, how?

May numerals be used for inexact quantities?

To what level are numerals reconstructible?

What are the etymological sources for numerals?

We would like to encourage numeral typologists not to lay aside data from small systems, and for linguists working on languages with such systems to explore them.

One, two, three, many is by no means the end of the story.
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Acknowledgments

This work was funded by NSF grants BCS-844550 and BCS-902114

Participants in the project “Dynamics of Hunter-Gatherer Language Change”: Patience Epps, Russell Gray, Jane Hill, Keith Hunley, Jack Ives, Patrick McConvell, Catherine Sheard
References


