

Towards a typology of quantification in Australian languages

Margit Bowler (UCLA) and Vanya Kapitonov (University of Melbourne)

Australian Languages Workshop
4 March 2018
Practice talk: UCLA, 21 February 2018

I Introduction¹

- In this talk, we give the preliminary results of our typological survey of quantifier terms in Australian languages.
- Australian languages are frequently described as having “simple” or “impoverished” quantifier systems.
- We show that Australian languages have a variety of quantificational expressions, contrary to this stereotype.
- Of particular interest is the variety of morphosyntactic strategies that Australian languages use for expressing quantificational concepts.

I.1 Scope of our survey

- Our typology is based on data from 96 published grammars or grammatical sketches on 85 Australian languages.
- We aim to have a sample that is genetically and areally balanced.
 - Our survey currently includes languages from all Australian states/territories except Tasmania and the Australian Capital Territory (6/8).²
 - The **Pama-Nyungan** family contains 90% of the languages in Australia.
 - * There are ~25-30 accepted subgroups in Pama-Nyungan (Bowern and Atkinson 2012; O’Grady et al. 1966).
 - * Our study includes 50 Pama-Nyungan languages from 23 subgroups.

¹We thank Ed Keenan and Pam Munro for their feedback on this project. We also thank our UCLA research assistants, Nick Curleo and Ryan Smick, for their help collecting data!

²The Australian Capital Territory is very small (think Washington DC) and we were unable to locate relevant data on the languages that are spoken there. Linguists generally do not have very much information on Tasmanian languages. The last speaker of a Tasmanian language passed away in 1905.

- **Non-Pama-Nyungan** families contain the remaining 10% of languages in Australia; non-Pama-Nyungan languages are spoken only in northern Australia (NT and WA).
 - * There are ~15-20 accepted families in non-Pama-Nyungan (Koch and Nordlinger 2014, xv).
 - * Our study includes 31 non-Pama-Nyungan languages from 16 families.

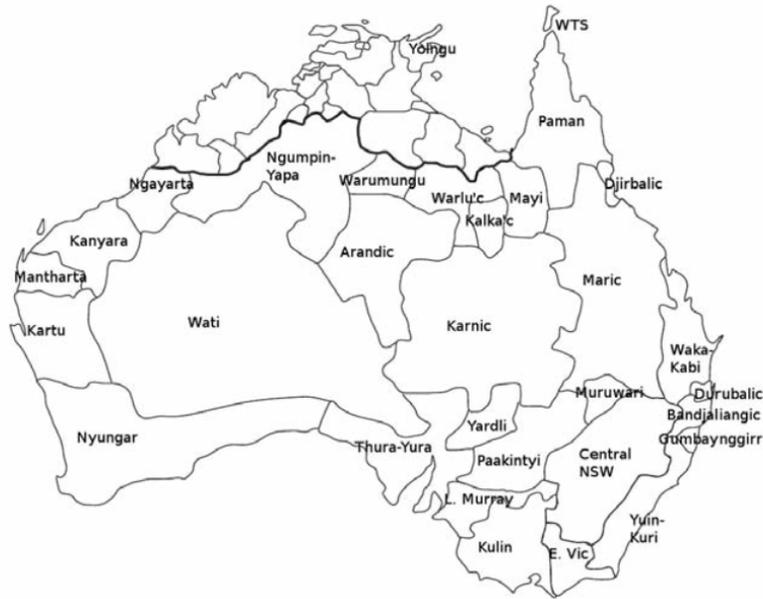


Figure 1: Map of major current subgroups of Pama-Nyungan (Bown and Atkinson 2012, 820).

- * We also include 8 language isolates (sometimes classified as isolates within either Pama-Nyungan or non-Pama-Nyungan, e.g. Muruwari, Wardaman) and 2 creoles.
- When we report that a language “has” a quantifier, we mean that the source(s) that we consulted on the language describe this quantifier.
- We restrain from making strong claims about languages lacking certain quantificational expressions, since there may be gaps in the collected data.
- We instead present proportions.
 - For each expression we discuss, we show **how many languages in our sample have it / the total number of languages for which we have quantifier data.**
 - We surveyed a total of 109 sources; of these, only 96 had quantifier data.
- We generally present data as it is given in the source: We standardize some interlinear glosses, and generally use the author’s chosen orthography.

1.2 How we define quantifiers

- For the purpose of this study, we do not assume a theoretical definition of quantifiers (i.e., Heim and Kratzer 1998).
- **We define quantifiers as lexical items that refer to quantities, typically of individuals.** This includes:
 - Terms referring to vague quantities (*many, few, several, ...*)
 - Terms referring to properties of sets (*all, some, no, ...*)
 - Terms referring to cardinalities (*one, two, three, ...*)
 - Wh-words referring to quantities (*how many, how much*)
 - Indefinite pronouns (*someone, something, somewhere, ...*)
 - Terms referring to “quantities” of times (*always, often, sometimes...*)
- Our study does **not** include:
 - Number marking in agreement systems, e.g. singular, dual, or paucal agreement
 - Non-pronominal (in)definiteness
 - Expressions that have been theoretically argued to include quantifiers in their semantic denotations, e.g. modals (Heim and Kratzer 1998)

2 Morphosyntactic findings

2.1 Lexical categories of quantifier terms

- The vast majority of languages in our survey encode quantifier terms as nouns.³
- Like other nouns, they can host case marking and trigger agreement marking.

(1) BARDI (NPN: NYULNYULAN) (Bower 2012, 272)
Nyalaboo i-ng-arr-ala-n **boonyja-nim.**
there 3-PST-AUG-see-REM.PST all-ERG
'Everyone saw him.'

(2) WARLPURI (PN: NGUMPIN-YAPA) (Bowler 2017, 6)
Panu-ngku = lu karlaja yunkaranyi-ki.
many-ERG=3SUBJ.PL dig.PST honey.ant-DAT
'Many (people) dug for honey ants.'

- As nominals, quantifiers are frequently documented in discontinuous NPs (cf. Louagie and Verstraete 2016, 51–52, who observe that in Australian languages, quantifiers are the most frequent type of modifier to occur discontinuously). However, most sources do not comment on this property.

³Australian languages are often described as lacking adjectives, which pattern like nouns in e.g. hosting case marking and triggering agreement marking. Verbs and nouns tend to be the two major lexical categories.

- (3) MATNGELE (NPN: EASTERN DALY) (Zandvoort 1999, 54)

Nembiyu ardiminek **binya jawk**.

one IMS.do.P fish black.nailfish

‘I got one black nailfish.’

- Nominal quantifiers can also typically stand alone as arguments, without any other associated noun.

- (4) KUUKU YA’U (PN: PAMAN) (Thompson 1988, 15)

Ngulu kuu’ala-ngka **kulima**-ku.

3SG.NOM speak-PRES.CONT many-DAT

‘He is speaking to many people.’

- A standalone quantifier may be able to have arguments/adjuncts of its own.

- (5) GARRWA (NPN: GARRWAN) (Mushin 2012, 53)

miku ngayi = yi **yingamali** Garrwa-yudi

NEG ISG=NEG.ABIL one Garrwa-WITH

‘I’m not the only one with Garrwa.’

- A much smaller number of languages (at least 5/85) encode quantifier terms as adverbial expressions. These occur in addition to nominal quantifiers; as far as we know, no Australian language only uses adverbial quantifiers.

- (6) KAYARDILD (NPN: TANGKIC) (Round 2009, 464)

Dangka-wala-da kurri-n-da **bakii**-n-da wirrkan-inj.

person-PL-Ø watch-PROG-Ø all.do-PROG-Ø corroborree-CONT

‘The people are all watching the corroborree.’

- (7) GARADJARI (PN: MARRNGU) (Sands 1989, 54)

wiridjardu nga-njari-djinja.

completely eat-CONT-3PL.O

‘He ate them all up.’

2.2 Syntactic patterns of modification

- In a small number of languages, quantifiers are restricted to modifying absolutive arguments (i.e. they associate with S and P/O arguments, but not A).

- (8) WARLPIRI (PN: NGUMPIN-YAPA) (Bowler 2017, 15)

Wati-ngki **muku** rdilyki-pungu kurlarda-wati.

man-ERG all/completely break.PST spear-several

‘The man broke all the spears.’

- (9) MAYALI (NPN: GUNWINYGUAN) (Evans 1995, 233)

Aban-**djangged**-bukka-ng.

I/3PL-bunch-show-PP

‘I showed them **the whole lot**.’

- To the best of our knowledge, this property is primarily described of adverbial quantifiers.

- However, [Harvey \(1992\)](#) describes one nominal quantifier in Gaagudju, *geegirr*, that is preferred (but not required) in combination with absolutive arguments.

- (10) GAAGUDJU (NPN: ISOLATE) ([Harvey 1992](#), 307)
 ba-'rree-ng-ga = mba **geegirr** ma'rree-ya = mba **geegirr**.
 2A-IE-FU-take=AUG all I+2A-go.FU=AUG all
 'I will take all of you. We will all go.'

3 Semantic findings

3.1 Expressing 'many'

- The majority (72/85) of languages in our survey have a lexical item that contributes a meaning like English 'many'.⁴
- We find that languages frequently have more than one lexical item for 'many,' in opposition to the widely popularized view that Australian languages have "simple" or "impoverished" quantifier systems.

- (11) YUGAMBEH (PN: NGUMPIN-YAPA) ([Sharpe 1998](#))
 a. *kamaybu* 'lots of,' 'plenty,' 'beyond four'
 b. *karal* 'more,' 'many,' 'a lot,' 'all,' 'plenty'
 c. *walal* 'many'
- (12) BARDI (NPN: NYULNYULAN) ([Bowern 2012](#))
 a. *niimana* 'plenty,' 'many'
 b. *ngarri* 'a lot,' 'much'
 c. *alboorr(oo)* 'plenty,' 'many'
- (13) GUGADA (PN: THURA-YURA) ([Platt 1972](#), 32, 57)
 a. Badu **bulga** inma njagunj-djagu.
 man many corroboree see-PURP
 'A lot of men went to see a corroboree.'
 b. Badu njurbara **muḡa** djiṅḍu galaḷa njina:djinj.
 man strange many midday sit.down
 'A lot of strangers sat down at midday.'

3.1.1 Use of 'big' to express 'many'/'much'

- Several (~6/85) languages in our survey use a term for 'big' to express 'many'/'much'.⁵

⁴Only one language in our survey, the Gooniyandi mother-in-law language, is explicitly described as lacking a word for 'many' ([McGregor 1989](#), 636).

⁵[Louagie and Verstraete \(2016, 37\)](#) assert that in Gooniyandi, prenominal 'big' functions as a quantifier, whereas postnominal 'big' has an adjectival meaning:

- (1) GOONIYANDI (NPN: BUNUBAN) ([McGregor 1990](#), 260,265)
 a. **nyamani** gamba
 big water
 'a lot of water'

- This term typically occurs in combination with mass nouns and is glossed into English as ‘much’/‘a lot.’

(14) GARRWA (NPN: GARRWAN) (Furby and Furby 1977)

- a. **walguřa** wadjili
big wild.honey
‘a lot of wild honey,’ ‘much wild honey’
- b. **walguřa-nanji** duřala-nanji
big-ABL hill-ABL
‘from the big hill’

(15) WAGIMAN (NPN: ISOLATE) (Wilson 2006, 67)

- wahan **buluman** ga-di-n ginkin-na.
water big 3SG-come-PRES roar-ASP
‘A lot of rain came roaring here.’

- (At least) two languages in our survey, Kalaw Kawaw Ya and Garrwa, permit ‘big’ to be used with count nouns. This results in a gloss of ‘many.’

(16) KALAW KAWAW YA (PN: WESTERN TORRES STRAIT) (Ford and Ober 1991, 141)

- Yan burumiya lumiz + war moebaygan nanga burum **koeyma** mathan.
in.vain pig.COM hunt.PR.PF other person.ERG when pig.ABS big.ADV kill.PR.PF
‘He hunted in vain for a pig while the others bagged many.’

3.1.2 Other strategies for expressing ‘many’/‘much’

- One language, Mangarayi, primarily expresses “positive” meanings like ‘many’ and ‘much’ using negative expressions of the form ‘not a few’ or ‘not a little bit.’

(17) MANGARAYI (NPN: ISOLATE?) (Merlan 1989, 37-38)

- řiřnjag **guyban** ga-řa-nidba.
PROHIB little.bit 3-1SG/3SG-have
‘I have not a little bit,’ i.e., ‘I have a lot.’

3.2 Expressing ‘all’/‘every’

- Approximately half (44/85) of the languages in our survey have a strategy for expressing ‘all’/‘every.’
- Of interest to us is the fact that the languages in our survey use a number of different strategies to express ‘all’/‘every.’
 - 31/44 of these languages have at least one unique lexical item that means ‘all’/‘every.’
 - The remaining languages (13/44) use other strategies as their primary means of expressing universal quantification.

b. yoowooloo **nyamani**
man big
‘a big man’

- The most common of these strategies are using a single lexical item to express both ‘many’ and ‘all’/‘every,’ and morphologically deriving ‘all’/‘every’ from ‘many.’

3.2.1 Unique lexical item for ‘all’/‘every’

- Of the 44 languages that have a strategy for expressing universal quantification, 31 of them have at least one unique lexical item that expresses ‘all’/‘every.’
 - So far, we have not found languages with universal quantifiers that are restricted to plural nouns (English *all*) or singular nouns (English *every*).
- (18) ARRERNTE (PN: ARANDIC) (Wilkins 1989, 132)
 Alertekwenhe pmere **ingkirreke** artwe-kenhe, artwe-kenhe pmere.
 there place all man-POSS man-POSS place
 ‘That there (pointing to a particular site) was a place for all men, a men’s site.’
- (19) GARADJARI (PN: MARRNGU) (Sands 1989, 48)
djarin-dja barda-ngka yilba-gu-djinja.
 every-LOC sun-LOC throw-FUT-3.PL
 ‘Every day he threw them [the people].’
- Languages also do not lexically distinguish between quantification over sets of individuals (20a) versus over subparts of a single individual (20b).

- (20) BARDI (NPN: NYULNYULAN) (Bower 2012, 272)
- a. Nyalaboo i-ng-arr-ala-n **boonyja-nim**.
 there 3-PST-AUG-see-REM.PST all-ERG
 ‘Everyone saw him.’
- b. Ginyinggo = min o-rr-o-n = bal = irr, a-rr-a-rli-n = jamb = al = irr
 one = THEN I-AUG-spear-CONT = INDEF = 3A.DO I-AUG-TR-eat-CONT = THUS = INDEF = 3A.DO
boonyja irr barnamb.
 all 3AUG stingray
 ‘When we spear them, we eat the whole stingray.’
- (21) GAAGUDJU (NPN: ISOLATE) (Harvey 1992, 307)
- a. djirriingi njinggooduwa yaa-bu = mba **geegirr**.
 man woman 3I-went = AUG all
 ‘The men and women have all gone.’
- b. walaalu ∅-naana **geegirr**.
 country IV-burn:PP all
 ‘The country is all burnt.’

3.2.2 Universal quantifier is expressed by same lexical item as ‘many’

- A small number (~6/44) of these languages have a single quantifier that can be interpreted as having either existential or universal force.
- Its interpretation as expressing existential or universal force is determined by context.

- (22) GUGADA (PN: THURA-YURA) (Platt 1972, 56,65)
- a. badu ŋurbara **muŋga** djiŋɖu gala[a njina:djinj.
 man strange many/all midday sit.down
 ‘A lot of strangers sat down at midday’
- b. u[a ambuɖa **muŋga** ŋur-ŋga
 boy small many/all camp-LOC
 ‘All the boys are at camp.’
- (23) TIWI (NPN: ISOLATE) (Osborne 1974, 85,107)
taikuwa ‘many,’ ‘all’

3.2.3 Universal quantifier is morphologically derived from ‘many’

- A small number (~4/44) of these languages morphologically derive a universal quantifier from the lexical item for ‘many’ as their primary strategy for expressing universal quantification.
- This is typically accomplished by combining ‘many’ with an affix meaning ‘only’ or ‘still.’

- (24) GOONIYANDI (NPN: BUNANBAN) (McGregor 1990, 463-464)
- a. mooyoo-**nyali** bagiyi.
 sleep-NYALI he:lay
 ‘He still slept.’⁶
- b. **garndiwangooddoo-nyali** booldoogbiddani.
 many-NYALI they:broke
 ‘All (of the eggs) broke.’
- (25) MATNGELE (NPN: EASTERN DALY) (Zandvoort 1999)
- a. woerrens **mutjurr** lerr-ma-burrudak-awa
 mosquito many bite-IMP-3AS.standP-IMO
 ‘Lots of mosquitoes were biting me.’
- b. mi ngarru-ma-errerr **mutjurr-ayu-rnung**
 tucker IAUG-PRM-INCL many-only-PURP
 ‘This tucker belongs to all of us.’

- Burarra expresses universal quantification through a prefix added to the head noun in addition to the quantity noun ‘mob.’

- (26) BURARRA (NPN: BURARRAN) (Green 1987, 34)
mu-delipa yerrcha aburr-duwuji-nga.
 UNIV-child mob 3AUG-CRY-R
 ‘All the kids cried.’

- Other languages derive a universal quantifier by reduplicating the lexical item for ‘many.’

⁶McGregor (1990) gives a wide variety of glosses for *-nyali*, including ‘again,’ ‘still,’ ‘always,’ ‘exactly,’ ‘only,’ and ‘also.’

(27) GARRWA (NPN: GARRWAN) (Mushin 2012, 54)

- a. *kaja* ‘many’
- b. *kajawaja* ‘all,’ ‘every’ [lit. *many*~RDP]

- Interestingly, we note that languages that morphologically derive their universal quantifiers from ‘many’ (as their primary strategy for universal quantification) tend to be non-Pama-Nyungan.
- We also have not found any languages that make a lexical distinction akin to English ‘all’ versus ‘every,’ i.e., we have not found any Australian universal quantifiers that are restricted to combining with singular nouns (*every child*) as opposed to plural nouns (*all the children*).

3.2.4 Other strategies for expressing universal quantification

- We have found evidence from one language (Murrinh-Patha) for the adjective ‘big’ being used as a universal quantifier. It is capable of mass and wholistic (28) quantification, i.e. when the head noun is either mass or denotes an entity with understood internal structure (whether collective (*herd*) or not (*the whole house*)).

(28) MURRINH-PATHA (NPN: SOUTHERN DALY) (John Mansfield, p.c.)

Me-Ngala mup-ka **ngala** kanam-ka-wat-nime.
foot-big people-TOP big be.3SG.NFUT-PAUC.SUBJ-frequent-PAUC.M
‘The whole Big Foot mob come here regularly.’

- Finally, ~3/44 languages in our survey can express universal quantification through what appears to be a suffix marking set closure, i.e., that the head noun should be interpreted exhaustively.

(29) MARTU WANGKA (PN: WATI) (Marsh 1992, 158)

Palu-lyu.
3SG-TERMINATIVE
(1) ‘That’s all.’
(2) ‘That’s the lot.’

(30) WAMBAYA (NPN: MIRNDI) (Nordlinger 1998, 80)

Yarru irr-aji alaji-rdarra.
go 3PL.S-HAB.PST boy.I-GROUP(NOM)
‘All the boys used to go.’

3.3 Expressing ‘several’/‘a small number’

- Less than half (37/85) of the languages in our survey have a lexical item for ‘several’/‘a small number.’

- (31) WARLPIRI (PN: NGUMPIN-YAPA) (Bowler 2017, 9)
 Napaljarri-rli karlaja **wirrkardu**.
 Napaljarri-ERG dig.PST few
 ‘Napaljarri dug few (honey ants).’⁷
- (32) BARDI (NPN: NYULNYULAN) (Bower 2012, 271)
Jalboorr a-n-a = ngay, joo a-n-ay-a = rr arang.
 a.little 2-TR-give=IM.DO 2MIN 2-TR-take-FUT=3A.DO others
 ‘Give me a little, and you take the rest.’⁸

- Of these languages, over a third (14/37) use numerals to express ‘several’/‘a small number.’
- These numerals range from ‘two’ to ‘four.’
- Some languages have one lexical item that can express either a cardinality or a small vague amount; other languages derive their vague amount quantifiers from their numerals (through e.g. reduplication, as in Djabugay).⁹

- (33) DJINANG (PN: YOLNGU) (Waters 1983, 9)
bilawili ‘two,’ ‘a few’
- (34) DJABUGAY (PN: PAMAN) (Patz 1991, 87)
 a. *mulu* ‘two’
 b. *mulumulu* ‘a few’ [lit. *two*~*RED*]
- (35) GOONIYANDI (NPN: BUNABAN) (McGregor 1990, 149)
ngarlloodoo ‘three,’ ‘a few’
- (36) KUUKU YA’U (PN: PAMAN) (Thompson 1988, 27,82)
mangku ‘four,’ ‘a few’

3.3.1 Use of ‘small’ to express ‘a little bit’/‘a small number’

- We noted in §3.1.1 that a number of languages in our survey use ‘big’ to mean ‘many.’
 - We also find the opposite pattern; that is, a small number of languages (~4/37) use the lexical item for ‘small’/‘little’ to express ‘a little bit’.
- (37) KUNBARLANG (NPN: GUNWINGUAN) (Kapitonov in prep.)
 Kadda-djarrang na-**wanjak** nayi kikakkin.
 3PL.NF-eat.PST I-small NM.I meat
 ‘They ate a little bit of the meat [but didn’t finish it all].’ [iki60802-000/52:15-26]

⁷Warlpiri *wirrkardu*, like English *few*, expresses a value judgment that the cardinality is lower than expected. For the purpose of this study, we include such value judgment quantifiers along with lexical items expressing ‘several’/‘a small number’ (absent any value judgments).

⁸Bower (2012) glosses *jalboorr* as ‘few’/‘a little’; however, we could not find any examples of it combining with count nouns.

⁹Alpher (1973, 51) asserts that in Yir Yoront (PN: Paman), *wapayər* ‘three’ is morphologically derived from *wap* ‘few,’ ‘some.’

(38) KUNWINJKU (NPN: GUNWINYGUAN) (Carroll 1976, 76,116)

- a. korroko bu ngaye nga-yahwurd-ni.
 long.ago when I 1SG-small-was
 ‘Long ago when I was small.’
- b. ku-bo-yahwurd
 NC?-water-small
 ‘a small quantity of water’

- To the best of our knowledge, we have not found any instances of ‘small’/‘little’ being used in combination with count nouns to express ‘several’/‘few’ (but see Mengerrdji *melebenb* ‘small,’ ‘few’ (Birch 2006, 70)).

3.4 Expressing ‘some’

- For the purpose of this study, we are interested in how Australian languages express partitive readings akin to English *some (of the) men*, not purely existential ‘some’ (e.g. *Some bananas are on the table*).
- We find that a quarter (22/85) of the languages in our survey have a strategy for expressing ‘some.’

(39) GARRWA (NPN: GARRWAN) (Furby and Furby 1977, 19,37)

- a. ...ŋala gudiya-∅ djařidjba-wa yalu-∅.
 while some-NOM are:away-CONT they:PL-SUBJ
 ‘...While they, some (of them) are still away.’
- b. miguyadji yalu-gi gudiya-ŋjŋga.
 nothing they:PL-REFR some-REFR
 ‘Some people didn’t come.’

(40) KUNBARLANG (NPN: GUNWINYGUAN) (Kapitonov in prep.)

- Ngurnda ki-kala ngob nayi barbung la na-yika ka-(rnak)-kalng.
 not 3SG.IRR.PST-get.IRR.PST all NM.CLI fish CONJ CLI-some 3SG.NF-LIM-get.PST
 ‘S/he didn’t get all the fish, but only got some.’

- In at least 6/22 languages, expressions that are glossed with English *some* are expressed using the lexical item ‘other’ or ‘others.’
- Donaldson (1980, 73) reports that in Ngiyambaa (PN: Central NSW) ‘different’ is also used to express something like partitive quantification.

(41) BARDI (NPN: NYULNYULAN) (Bowern 2012, 268)

- Aranga gala i-ng-arr-na-na ilogo manyarr-nim.
 others well 3-PST-AUG-sit-REM.PST on.side thirst-ERG
 ‘Some lay down because of their thirst.’

(42) BURARRA (NPN: BURARRAN) (Green 1987, 84)

- an-nerranga an-mola rrapa an-nerranga an-bachirra.
 3Man-other 3Man-good and 3Man-other 3Man-wild
 ‘Some are friendly and some are the angry kind.’

- Sources for 4/22 languages suggest that the expression for ‘some’ implies ‘some and not all,’ akin to the scalar implicature that obtains with English *some*.
- We presently hypothesize that in the languages where ‘some’ is expressed by ‘other’/‘others,’ this partitive meaning is part of the assertion rather than a scalar implicature. However, comparison of ‘some’ and ‘other’/‘others’ in these languages requires much further research.
- Finally, 4/85 sources explicitly deny that the respective language has an expression for ‘some.’

3.5 Expressing ‘no’

- Over half (52/85) of the languages in our study have a strategy for expressing constituent negation (i.e. *no dogs*).
- The main two strategies for expressing constituent negation are through privative suffixes and free, uninflected lexical items.

3.5.1 Privative suffixes

- Approximately half (24/52) of these languages can express constituent negation with a privative suffix.
- Privative suffixes typically express a lack of possession; however, we also find examples of languages using privative suffixes in negative existential expressions (43).
 - Some privative suffixes are related to free lexical items expressing ‘nothing,’ e.g. Nhirrpi (PN: Karnic) *-pani* ‘PRIV’ and *pani* ‘nothing’ (Bower and Wurm 2005).

(43) NHANDA (PN: KARTU?) (Blevins 2001, 64)

wilu-nggu apa-nyida.
river-LOC water-PRIV
‘There’s no water in the river.’

(44) ARABANA-WANGKANGURRU (PN: KARNIC) (Hercus 1994, 237)

Antha kadhnaardi-padni.
I money-PRIV
‘I haven’t got any money.’

(45) NGARLA (PN: NGAYARTA) (Westerlund 2007, 33)

Kupalya-yanya-ngku nga-ja yarni ma-rnu murtuka.
sleep-PRIV-INST ISG-ERG ? VBLISER-PST car
‘Without sleep I repaired the car.’ (i.e., I worked all night on it.)

- With the exception of Wagiman and Wardaman (nPN: Wagiman/Wardaman) (46), all of the languages in our survey that have privative suffixes are Pama-Nyungan.

(46) WAGIMAN (NPN: WAGIMAN/WARDAMAN) (Cook 1987, I33-I34)

laman-ne’en, gi-ya-ŋana lewaya’an laman-gu.
meat-PRIV IPL:IMPV-go-INCL look.for meat-DAT
‘We have no meat; we will go and look for some.’

3.5.2 Free lexical item expressing ‘no’

- Of the languages with a strategy for expressing constituent negation, 29/52 can use a free, uninflecting lexical item. (This may be in addition to having a privative suffix.)
- Over half of these 29 languages are non-Pama-Nyungan; however, Pama-Nyungan languages are also represented.
- We have examples of negative particles occurring both prenominally and postnominally.

- (47) GARRWA (NPN: GARRWAN) (Furby and Furby 1977, 37)
migu-yadji mama-nji walgura-∅ ηawamba bayagaɖa-∅
nothing food-REFR big-NOM only small-NOM
‘There are no big (watermelons) to eat — only small ones.’
- (48) MATNGELE (NPN: EASTERN DALY) (Zandvoort 1999, 102)
yim **dakayu** jawungu ngutjyende-ma.
fire NEG today morning-PRM
‘We had no fire this morning.’
- (49) WARRONGO (PN: MARIC) (Tsunoda 2011, 660)
banggorro-∅ **nyawa**.
freshwater.turtle-NOM NEG
‘There is no turtle (meat).’

3.5.3 Other strategies for expressing ‘no’

- A small number of languages can use morphosyntactically complex, bipartite expressions to indicate constituent negation.

- (50) WAMBAYA (NPN: MIRNDI) (Nordlinger 1998, 204)
Guyalinya ngawurniji manganymi-nka.
lacking.II(NOM) ISG.NOM tucker.III-DAT
‘I’ve got no tucker.’
- (51) MURUWARI (PN: ISOLATE) (Oates 1988, 74)
wala mathan-pira
NEG limb-having.
‘There are no sticks.’

3.6 Counting systems

- Bower and Zentz (2012) give a typology of counting systems in Australia. For now, we refer interested individuals to their paper.
- Most (139/189) of the languages in their sample have counting systems with upper limits of ‘three’ or ‘four’ unique (i.e., non-morphologically complex) numerals.
- 60/85 of our sources include information on counting systems. Of the languages described by these sources, at least half (30/60) have counting systems with an upper limit of ‘three’ or ‘four’ morphologically simple numerals.¹⁰

¹⁰At present, we do not distinguish between base 3/base 4 counting systems and counting systems that terminate at ‘three’ or ‘four,’ i.e., counting systems with no larger numerals.

- Larger numerals are typically morphologically derived through combinations of smaller numerals.

(52) UMBUGARLA (NPN: UMBUGARLIC) (Davies 1989, 47-48)

- rringgirr* ‘one’
- rrədidj* ‘two’
- rrədi-rringgir* ‘three’ [lit. ‘two-one’]
- rrədi-rrədidj* ‘four’ [lit. ‘two-two’]

(53) YUGAMBEH (PN: NGUMPIN-YAPA) (Sharpe 1998, 60)

- yabuhr* ‘one’
- bulah* ‘two’
- bulah yabur* ‘three’ [lit. ‘two one’]
- bulah bulah* ‘four,’ ‘middle’ [lit. ‘two two’]
- bulah bulah yabur* ‘five’ [lit. ‘two two one’]
- dajan* ‘five,’ ‘hand’

- We also note that a number of languages have borrowed numerals from English (e.g. Donaldson (1980, 73) on Ngiyambaa (PN: Central NSW): “(...) first attempts to elicit ‘three’ and ‘four’ were usually met with contact jargon forms like *threefellow* and *four-fellow*”).

(54) PINTUPI (PN: WATI) (Summer Institute of Linguistics 1977)¹¹

- payipala* ‘five’
- tjikitkipala* ‘six’
- tjapanpala* ‘seven’
- yitipala* ‘eight’
- nayinpala* ‘nine’
- tinpala* ‘ten’

3.6.1 Nominal suffix expressing ‘two’

- At least 15/85 languages in our survey have a nominal suffix expressing ‘two.’¹²
- This can, but need not be, related to the free numeral expression for ‘two.’

(55) PANYJIMA (PN: NGAYARTA) (Dench 1981, 121)

- kutharra* ‘two’
- Nyiya-**kutha**-∅ warlipi-**kutha**-∅ pinyarri-ku katama-yi-ku.
this-TWO-NOM boy-TWO-NOM fight-PRES hit-RECIP-PRES
‘These two boys are fighting, hitting each other.’

¹¹These Pintupi examples include the suffix *-pala* (< English ‘fellow’), which is a common cardinality suffix in Australia.

¹²Australian languages typically have singular, plural, and dual number agreement. As such, this nominal suffix could be treated as marking dual number. Nonetheless, we choose to include it in our current study due to the interesting variability in whether this suffix is related to the free numeral ‘two.’

- (56) WALUWARA (PN: WARLUWARIC) (Breen 1971, 140)
- a. *kutja* ‘two’
 - b. **tawa-wija**
man-two
‘two men’

3.7 Expressing ‘how many’

- Interestingly, nearly half (38/85) of the languages in our study have a Wh-term used to ask ‘how many’.
 - Of these 38 languages, 29/38 have a unique Wh-word that is used to ask ‘how many.’
 - 10/38 languages have a Wh-term for ‘how many’ that is morphologically derived from another Wh-word or has a broader meaning, including e.g. ‘how long’ (Bardi root *nganyji-*) (Bower 2012).
- This prevalence of lexicalization for ‘how many’ suggests that the concept of quantity may be more salient in Australian cultures than the received wisdom has it.

3.7.1 Unique lexical item for ‘how many’

- We find that the majority (29/38) of these languages have a unique Wh-word that is used to ask ‘how many.’

- (57) UMBUGARLA (NPN: UMBUGARLIC) (Davies 1989, 57)
walalg **djugamərr** ga-rar?
child how.many 2SG-got
‘How many kids have you got?’
- (58) MARTUTHUNIRA (PN: NGAYARTA) (Dench 1995, 190)
Nhamintha ngula? Kayarra jina, kayarra juwayu wirra-ngara wiyaa.
how.many IGNOR two foot two hand boomerang-PL maybe
‘How many were there? Maybe twenty boomerangs (lit. two hands and two feet of boomerangs).’
- (59) WALUWARA (PN: WARLUWARIC) (Breen 1971, 260)
Nangu-ka jipa junja pumata-ka mukama-na?
how.many-LOC you it.ACC day-LOC make-PST
‘How long did it take you?’

3.7.2 ‘How many’ morphologically derived from another Wh-word

- A smaller number of languages morphologically derive their Wh-term for ‘how many’ from another Wh-word.
- These source Wh-words include *what* (60), *where* (61), *when* (Malakmalak: nPN, Northern Daly) (Tryon 1974, 17), and *how* (Kuuku Ya’u: PN, Paman) (Thompson 1988, 91).

- (60) MURUWARI (PN: ISOLATE) (Oates 1988, 122)
minjan-karra maa-n-thara-ntu?
 what-number get-R-NECESS-2SG
 ‘How many did you get?’
- (61) MATNGELE (NPN: EASTERN DALY) (Zandvoort 1999, 51)
- a. **ngun an-yin** buy-burrayn
 there where-ALLAT go-3AS.go.IMPF
 ‘Where’s that lot going?’
 - b. **nida an-buwaja** wari-mi-anyang
 brother how.many have-IMPF-2MSgo.PR
 ‘How many brothers do you have?’

3.7.3 Lexical item for ‘how many’ has a broader meaning

- A small number of languages use a Wh-term to express ‘how many’ that has a broader Wh-meaning, e.g. Warlpiri *nyajangu* ‘how many,’ ‘which one(s).’

- (62) WARLPIRI (PN: NGUMPIN-YAPA)
- a. **Nyajangu** = npa karlaja yarla = ja?
 how.many=2SG.SUBJ dig.PST bush.yam=EMPH
 ‘How many bush yams did you dig?’
 - b. Pungu = ngku = pala jirrama-rlu. **Nyajangu-rlu** yirdi-jarra-rlu = ju?
 hit.PST=2SG.OBJ=3DU.SUBJ two-ERG which.one-ERG name-two-ERG=TOP
 ‘Two people hit you. Which ones, by name?’

3.8 Expressing indefinite pronouns, e.g. ‘someone,’ ‘something’

- 34/85 languages in our survey are described as having indefinite pronouns like *someone*, *nothing*, *anywhere*, *whoever* etc. and ignoratives (*whatchamacallit*).
 - The vast majority (30/34) of the indefinite pronouns are based on Wh-words.
 - * In the majority (~23/30) of these languages, Wh-words are ambiguous between indefinite and interrogative meanings.
 - * However, in 11/30 languages, indefinites (can) be morphologically derived from Wh-words.
 - In at least 5/34 languages, indefinite pronouns can be based on generic nominals or classifiers (e.g. ‘person’, ‘thing’).
 - At least 4/34 languages have dedicated expressions for indefinite pronouns or ignoratives (that are distinct from the Wh-words).

3.8.1 Indefinites are expressed by Wh-words

- ~23/30 languages that use Wh-words to express indefinite pronouns (can) do so without adding any additional morphology.
- Wh-expressions can therefore be ambiguous between interrogative and declarative readings.

- (63) GOONIYANDI (NPN: BUNABAN) (McGregor 1990, 147)
ngoonyi-yidda wardginggiri.
 which-ALL you.go
 (1) ‘Where are you going?’
 (2) ‘You’re going somewhere.’
- (64) BILINARRA (PN: NGUMPIN-YAPA) (Nordlinger 1990, 37)
ngantu-rlu-nga pa-ni.
 who-ERG-DUB hit-PST
 (1) ‘Who hit him?’
 (2) ‘Maybe someone hit him.’

3.8.2 Indefinites are morphologically derived from Wh-words

- In 11/30 languages, indefinite pronouns can be morphologically derived from Wh-words.
- Indefinite pronouns are typically derived by adding an indefinite, ignorative, or dubitative affix/particle.¹³
- In at least 2/30 languages, indefinite pronouns involve reduplication of Wh-words.

- (65) DJAMBARRPUYŊU (PN: YOLŊU) (Wilkinson 1991, 393)
 Ga djäma nhe dhu ga-a yindi nhe dhu ga djäma **ŋula nhämunha**
 and work 2sg FUT IMPV-1ST big 2sg FUT IMPV-1STE work INDEF2 how.many
 dhungarra ŋurraka+m
 year throw+1ST
 ‘And you are working, you are working (on something) big, lasting for an indefinite amount of time.’
- (66) NGIYAMBAA (PN: CENTRAL NSW) (Donaldson 1980, 271)
ŋa:ndi-ŋa:ndi-ga: manabi-nji.
 who~who+ABS-IGNOR hunt-PAST
 ‘Whoever went hunting, I don’t know.’
- (67) ARABANA-WANGKANGURRU (PN: KARNIC) (Hercus 1994, 129)
Thiyara~thiyara yuka-ka **minha~minha** mapi-rnda, partyarna ngawi-lhiku
 which.way~which.way go-P what~what do-PRES all hear-PUR
 waya-rnda.
 wish-PRES
 ‘Wherever he went and whatever he did, I want to hear it all.’

3.8.3 Indefinites are expressed by generic nouns and classifiers

- At least 5/30 languages can use generic nouns (‘person,’ ‘thing’) or classifiers (69) to express indefinite pronouns; we suspect the actual number is much higher.

¹³Interestingly, Bardi (nPN: Nyulnyulan) can express the indefinite pronoun ‘something’ using a compound of ‘who’ and ‘nose’: *angginimal* ‘something’ [lit. *anggaba* ‘who’ + *nimal* ‘nose’] (Bower 2012, 321).

- (68) MURRINH-PATHA (NPN: SOUTHERN DALY) (John Mansfield, p.c.)
Kardu karrim attjait.
 PERS stand.PRS outside
 (1) ‘Someone is outside.’
 (2) ‘He is outside.’
- (69) BURARRA (NPN: BURARRAN) (Green 1987, 9)
 an-gata **ana-nga** joborr gu-rrumu-rra abu-bu-na
 3Man-that 3ManHum-INDET law 3Mgun-break-PRECON 3AUG3Man-hit-PRECON
 aburr-workiya-na.
 3AUO-do:always-PRECON
 ‘Whoever broke the law they hit him all the time.’
 (Maybe lit. ‘When someone breaks/broke the law, they always hit him.’)

3.8.4 Indefinites are expressed by dedicated lexical items

- Finally, a small number of languages in our survey have dedicated lexical items that are used to express indefinite pronouns.

- (70) KALKATUNGU (PN: KALKATUNGIC) (Blake 1979, 104–5)
- a. *ṅani* ‘who’; *ṅaka* ‘what’
 - b. “The interrogatives are not used as indefinites... *ṅarpa* is the indefinite ‘some creature’... *miṅaṅara* is ‘something’”
- We have not yet systematically investigated the contexts of indefinites, their scopal properties and the different series they form.
 - Impressionistically, existential indefinites (‘someone,’ ‘something,’ etc.) are prevailing in the descriptions, and there is less information about e.g. free-choice indefinites (‘anyone’/‘whoever’).
 - The negative indefinites (‘nothing,’ ‘nowhere’) are often formed by combining a negative particle with an interrogative.
 - In Murrinh-Patha, for instance, indefinites formed by adding a suffix to a Wh-word are necessarily non-specific or unknown to the speaker, while the ones formed with the classifier (68) do not have this restriction.

3.9 Verb for ‘to count’

- Although it is not a quantifier itself, we are interested in the prevalence of the verb ‘to count’ in Australian languages. The presence of this verb suggests a familiarity with quantificational concepts like numeracy.
- A small number (7/85) languages in our survey have a verb that is glossed as ‘to count.’
- The actual number of languages with this verb is probably somewhat higher, since only a subset of our sources are dictionaries/include wordlists.
- Interestingly, several of the verbs for ‘to count’ explicitly describe physically manipulating objects or tallies for the purpose of counting.

- (71) PINTUPI (PN: WATI) (Summer Institute of Linguistics 1977, 179)
yiltijirripungu ‘to count’/‘to mark the ground’
 (used to describe the marking of the ground with parallel marks for the purpose of counting)
- (72) NUNGGUBUYU (NPN: GUNWINGUAN) (Heath 1984)
 a. *munduwa* ‘to examine closely and divide into piles’
 b. *ngunymaa* ‘to examine a pile of objects’/‘to count’

3.10 Quantifier borrowings from English

- Some authors cite instances of Australian languages borrowing quantifier terms from English (see §3.6 for examples of borrowed numeral terms).
- In Sandefur (1979)’s description of Ngukurr-Bamyili Creole, nearly all of the quantifier terms in the language are borrowed from English.
- We take this as possible instances of borrowings to fill lexical gaps.

- (73) WARLPURI (PN: NGUMPIN-YAPA)
pulapi ‘full’ < English ‘full up’
- (74) NGUKURR-BAMYILI CREOLE (Sandefur 1979, 100)
 a. *fyu* ‘few’
 b. *lilbit* ‘a little’
 c. *sam, sambala* ‘some’
 d. *holot, holbit* ‘all’/‘whole’
 e. *nomo lilbit* ‘a lot’
 f. *tumani, tumaj* ‘very many’/‘very much’
 g. *thadmaj, milyans* ‘an unbelievable quantity’

4 Conclusion and wishlist

- In this talk, we showed the variety of morphosyntactic strategies that Australian languages use to express quantificational concepts.
- We make the following tentative generalizations about quantificational expressions in Australian languages:
 - Vague quantifier terms (e.g. ‘many,’ ‘several’) can combine with both mass and count nouns, unlike e.g. English *many* versus *much*.
 - * However, the use of the adjectives ‘big’ and ‘small’ as quantificational expressions is typically limited to mass nouns.
 - The use of privative suffixes to express constituent (nominal) negation is restricted almost entirely to Pama-Nyungan languages.
 - Pama-Nyungan languages are more frequently described as having Wh-terms for ‘how many’ (whether unique or morphologically derived).

- Indefinite pronouns can almost always be based on Wh-words, either through a single lexical item expressing both indefinite and interrogative meanings, or by morphologically deriving indefinite pronouns from Wh-words.
- In conclusion, we provide the following **wishlist for future descriptions of quantifiers in Australian languages**:
 - Do quantifiers with existential force give rise to scalar implicatures (i.e., ‘some (and not all)’)?
 - What are the scope-taking ability of quantifiers; e.g., can they scope above or below negation? Can multiple quantifiers occur in a single utterance, and if so, do quantifier scope ambiguities occur, as in (75)?

(75) Some student loves every teacher.

 - a. *some* > *every* = There is one unique student such that that student loves every teacher.
 - b. *every* > *some* = Every teacher is such that some (potentially different) student loves them.
 - What are the historical sources of quantifier expressions? Is there evidence for speakers adapting existing lexical items to express quantificational concepts, e.g. possibly Pintupi *yiltjirripungu* ‘to count’/‘to mark the ground’?

References

- Alpher, B. (1973). *Son of Ergative: The Yir Yoront Language of Northeast Australia*. PhD thesis, Cornell University.
- Birch, B. (2006). *A First Dictionary of Erre, Mengerrdji and Urningangk*. Gundjeihmi Aboriginal Corporation.
- Blake, B. J. (1979). *A Kalkatungu Grammar*, volume 57 of *Pacific Linguistics, Series B*. Australian National University, Canberra.
- Blevins, J. (2001). *Nhanda: An Aboriginal Language of Western Australia*. Number 30 in *Oceanic Linguistics Special Publications*. University of Hawai'i Press.
- Bowern, C. (2012). *A Grammar of Bardi*. Mouton de Gruyter.
- Bowern, C. and Atkinson, Q. (2012). Computational phylogenetics and the internal structure of Pama-Nyungan. *Language*, 88:817–845.
- Bowern, C. and Wurm, S. (2005). *Nhirrpi*. Collection of text files.
- Bowern, C. and Zentz, J. (2012). Diversity in the numeral systems of Australian languages. *Anthropological Linguistics*, 54(2):133–160.
- Bowler, M. (2017). Quantification in Warlpiri. In Paperno, D. and Keenan, E., editors, *Handbook of Quantifiers in Natural Language: Volume II*, pages 963–994. Springer.
- Breen, J. (1971). *A Description of the Waluwara Language*. Master's thesis, Monash University.

- Carroll, P. (1976). *Kunwinjku: A Language of Arnhem Land*. Master's thesis, The Australian National University.
- Cook, A. (1987). *Wagiman Matyin: A Description of the Wagiman Language of the Northern Territory*. PhD thesis, La Trobe University.
- Davies, J. (1989). *Umbugarla: A Sketch Grammar*. BA Thesis.
- Dench, A. (1981). *Panyjima Phonology and Morphology*. Master's thesis, The Australian National University.
- Dench, A. C. (1995). *Martuthunira: A Language of the Pilbara Region of Western Australia*, volume 125 of *Pacific Linguistics, Series C*. Australian National University, Canberra.
- Donaldson, T. (1980). *Ngiyambaa: The Language of the Wangaaybuwan*. Cambridge University Press.
- Evans, N. (1995). A-Quantifiers and Scope in Mayali. In Bach, E., Jelinek, E., Kratzer, A., and Partee, B., editors, *Quantification in Natural Languages*, pages 207–270. Kluwer Academic Publishers.
- Ford, K. and Ober, D. (1991). A sketch of Kalaw Kawaw Ya. In Romaine, S., editor, *Language in Australia*, pages 118–142. Cambridge University Press.
- Furby, E. and Furby, C. (1977). A Preliminary Analysis of Garawa Phrases and Clauses.
- Green, R. (1987). *A Sketch Grammar of Burarra*. BA Thesis, the Australian National University.
- Harvey, M. (1992). *The Gaagudju People and Their Language*. PhD thesis, University of Sydney.
- Heath, J. (1984). *Functional Grammar of Nunggubuyu*. Australian Institute of Aboriginal Studies, Canberra.
- Heim, I. and Kratzer, A. (1998). *Semantics in Generative Grammar*. Blackwell Publishers.
- Hercus, L. (1994). *A Grammar of the Arabana-Wangkangurru Language, Lake Eyre Basin, South Australia*. The Australian National University.
- Kapitonov, I. *A Grammar of Kunbarlang*. PhD thesis, University of Melbourne.
- Koch, H. and Nordlinger, R., editors (2014). *The Languages and Linguistics of Australia: A Comprehensive Guide*, volume 3 of *The World of Linguistics*. Walter de Gruyter, Berlin/Boston.
- Louagie, D. and Verstraete, J.-C. (2016). Noun phrase constituency in Australian languages: A typological study. *Linguistic Typology*, 20(1):25–80.
- Marsh, J. (1992). *Martu Wangka-English Dictionary*. Summer Institute of Linguistics, Darwin.
- McGregor, W. (1989). Gooniyandi Mother-in-Law “Language”: Dialect, Register, and/or Code? In Ammon, U., editor, *Status and Function of Languages and Language Varieties*, pages 630–656. Walter de Gruyter.
- McGregor, W. (1990). *A Functional Grammar of Gooniyandi*, volume 22 of *Studies in Language Companion Series*. John Benjamins Publishing Company, Amsterdam/Philadelphia.
- Merlan, F. (1989). *Mangarayi*. Routledge, London, New York.
- Mushin, I. (2012). *A Grammar of (Western) Garrwa*. Number 637 in *Pacific Linguistics*. Walter de Gruyter.
- Nordlinger, R. (1990). A sketch grammar of Bilinarra.

- Nordlinger, R. (1998). *A Grammar of Wambaya, Northern Territory (Australia)*, volume 140 of *C. Pacific Linguistics*.
- Oates, L. F. (1988). *The Muruwari Language*, volume 108 of *Pacific Linguistics, Series C*. Australian National University, Canberra.
- O'Grady, G., Voegelin, C., and Voegelin, F. (1966). Languages of the World: Indo-Pacific Fascicle Six. *Anthropological Linguistics*, 8(2):1-197.
- Osborne, C. (1974). *The Tiwi Language*, volume 55 of *Australian Aboriginal Studies*. Australian Institute of Aboriginal Studies, Canberra.
- Patz, E. (1991). *Djabugay Grammar, Texts and Vocabulary*.
- Platt, J. (1972). *An Outline Grammar of the Gugada Dialect: South Australia*. Australian Institute of Aboriginal Studies.
- Round, E. (2009). *Kayardild Morphology, Phonology and Morphosyntax*. PhD thesis, Yale University.
- Sandefur, J. (1979). *An Australian Creole in the Northern Territory: A Description of Ngukurr-Bamyili Dialects*.
- Sands, A. (1989). *A Grammar of Garadjari, Western Australia*. BA Thesis, the Australian National University.
- Sharpe, M. (1998). *Dictionary of Yugambah*, volume 139. *Pacific Linguistics*.
- Summer Institute of Linguistics (1977). *Pintupi/Luritja Dictionary*. Institute for Aboriginal Development.
- Thompson, D. (1988). *Lockhart River "Sand Beach" Language: An Outline of Kuuku Ya'u and Umpila*.
- Tryon, D. (1974). *Daly Family Languages, Australia*, volume 32 of *C. Pacific Linguistics*, Canberra.
- Tsunoda, T. (2011). *A Grammar of Warrongo*. Mouton de Gruyter.
- Waters, B. (1983). *An Interim Djinang Dictionary*. Work Papers of SIL-AAB. Series B, 9.
- Westerlund, T. (2007). *A grammatical sketch of Ngarla: A language of Western Australia*. Master's thesis, Uppsala University.
- Wilkins, D. (1989). *Mparntwe Arnernte (Aranda): Studies in the Structure and Semantics of Grammar*. Australian National University.
- Wilkinson, M. P. (1991). *Djambarrpuynju: A Yolngu Variety of Northern Australia*. PhD thesis, University of Sydney.
- Wilson, A. (2006). *Negative Evidence in Linguistics: The Case of Wagiman Complex Predicates*. BA Thesis, University of Sydney.
- Zandvoort, F. (1999). *A Grammar of Matngele*. BA Thesis, University of New England.