

# FoR in Australian languages: An Overview of Absolute systems

*Dorothea Hoffmann*  
University of Chicago  
dorohoffmann@uchicago.edu

March 30, 2016

Table 1: Compass/Sun-based systems (horizontal): Pama-Nyungan languages

Language	References	Notes
Guugu Yimithirr (PN <sup>1</sup> )	(Haviland, 1993) (Haviland, 1998, 29) (Levinson, 2003)	“GY terms assume quadrants rather than idealized points on the horizon. Thus, if something is <i>guwa</i> ‘westward’, it lies in the western quadrant of the space in which one is centered, rather than, say, on a vector running “due” west. The morphology of the GY terms suggests that the four-direction system results from superimposing two separate oppositions, <i>gunnga-ljiba</i> -‘north/south’ and <i>naga-lguwa</i> -‘east/west’” (Haviland, 1993, 5)
Warlpiri (PN)	(Laughren, 1978) (Swartz, 2012)	<i>kurlarra</i> ‘south’, <i>yatijarra/yatujumparra</i> ‘north/northern side’ <i>yatujumpayi</i> ‘distant north’, <i>kakarrara</i> ‘east’, <i>karlarra</i> ‘west’ <i>karlumpayi</i> ‘distant west’
Bardi (PN)	(Bowern, 2012, 567f.)	<i>alang</i> ‘south’, <i>baanarr</i> ‘east’ and <i>goolarr</i> ‘west’ fairly similar to English counterparts, but <i>ardi</i> ‘north(east)’ is skewed to the east, terms based on wind directions with consistently changing endings depending on the time of year (Bowern, pc)
Arerrnte (PN)	(Wilkins, 2006)	<i>ayerrere</i> ‘north’, <i>ikengerre</i> ‘east’, <i>anteckerre</i> ‘south’, <i>aturle</i> ‘west’ (Wilkins, 2006, 54)
Djarru/Jaru (PN)	(Tsunoda, 1995)	<i>kajirra</i> <sup>2</sup> ‘north’ (Evans and Wilkins, 1992)
Kugu Nganhcara (PN)	(Smith and Johnson, 2000)	
Kuuk Thaayorre (PN)	(Gaby, 2006)	
Burarra/Djinang (PN)	(Glasgow and Glasgow, 2011)	based on wind-directions <i>lunggurra</i> ‘northern wind/north’, <i>walnggat</i> ‘south/southeast / south wind’, <i>burrbenga</i> ‘east/come.out.from’ (used in context as ‘east’)
Djinang (PN)	(Waters, 2011)	<i>jimurru</i> ‘east/east wind’, <i>bulunu</i> ‘east wind’, <i>rawirrang</i> ‘east direction/sunrise’, <i>bir jalachangn-giri</i> ‘facing north’ <i>bir jalachangili</i> ‘facing south’ <i>biri ngungili</i> ‘facing that way’
Walmajarri (PN)	(Richards and Hudson, 2011)	<i>kakarra</i> ‘east’, <i>karla</i> ‘west’, <i>kurlala/kurlirra</i> ‘south’, <i>kayili/kayirra</i> ‘north’
Wik Mungkan (PN)	(Kilham et al., 2011)	<i>kuuw</i> ‘west’, <i>kaaw</i> ‘east’, <i>kungk</i> ‘north’
Pintupi (PN)	(Lewis, 1976, 255)	<i>kayili</i> ‘north’, <i>yulparira</i> ‘south’, <i>kakarra</i> ‘east’, <i>wilurarra</i> ‘west’
Alyawarre (PN)	(Evans and Wilkins, 1992)	<i>ayerrer</i> ‘north’, <i>akngerrakw</i> ‘east’, <i>ante Kerr</i> ‘south’, <i>alturl</i> ‘west’
Kaytetye (PN)	(Evans and Wilkins, 1992)	<i>ayerrer</i> ‘north’, <i>akngerrak</i> ‘east’, <i>ante Kerr</i> ‘south’, <i>altmarle</i> ‘west’
Antekerpenhe (PN)	(Evans and Wilkins, 1992)	<i>arrayn</i> ‘north’, <i>ayerrer</i> ‘east’, <i>akngerrakw</i> ‘south’, <i>ante Kerr</i> ‘west’
Eora/Dharruk (PN)	(Nash, 2013, 65)	<i>buwan</i> ‘northwest’, <i>buruwi</i> ‘northeast’, <i>banyinari</i> ‘southwest’, ( <i>gunayima</i> ) ‘southeast’ possibly, or a clear ‘N-E-W-S’ system (Nash, pc)
Western Desert (PN)	(Nash, 1996)	( <i>y</i> ) <i>alinytjarra/kayili</i> ‘north’, ( <i>y</i> ) <i>ulparirra</i> ‘south’, <i>kakarra(ra)</i> ‘east’, <i>wilurarra/yapurra</i> ‘west’
Warnman (PN)	(Nash, 1996)	<i>kayili</i> ‘north’, <i>ngaparti</i> ‘south’, <i>kakarra</i> ‘east’, <i>kararra</i> ‘west’
Ngadjumaya	(Von Brandenstein, 1980) in (Nash, 1996)	<i>mernu</i> ‘north’, <i>kagarra</i> ‘east’, <i>currga/yulbairra</i> ‘south’, <i>ngardii/yalinjarra</i> ‘west’

<sup>1</sup>PN’: Pama-Nyungan language; ‘nPN’: ‘non-Pama-Nyungan language.

<sup>2</sup>Same as Gurindji.

<sup>3</sup>sociolect of Burarra

Table 2: Compass/Sun-based systems (horizontal) continued: non-Pama-Nyungan languages

Language	References	Notes
Kayardild (nPN)	(Evans, 1995, 206-227)	<i>ri-ya</i> ‘east’, <i>jirrkara/jirrkara-ya</i> ‘north’, <i>bath-i/bad-a</i> ‘west’, <i>ra-a/rar-a/ra-ga/rar-i</i> ‘south’
Garrwa (nPN)	(Mushin, 2013, 130-136) (Furby and Furby, 1976)	<i>langki</i> ‘north’, <i>bayungu</i> ‘west’, and <i>karr-i</i> ‘east’, <i>kula</i> ‘south’
Warrwa (nPN)	(McGregor, 2006)	<i>yaday/yawan</i> ‘north’, <i>yalmban</i> ‘south’, <i>banu</i> ‘east’, <i>kularr/wardiya</i> ‘west’
Iwaidja (nPN)	(Pym and Larrimore, 2011; Edmonds-Wathen, 2012)	<i>abalkban manyij</i> ‘sunrise/east/sun comes out’, <i>wurrying manyij</i> ‘west/sun goes into water’, <i>walim/makumbu</i> ‘south’, <i>anganybururtikiny/awalawal</i> ‘north’ (Edmonds-Wathen, 2012, 141-142) (Edmonds-Wathen, 2011, 4)
Tiwi (nPN)	(Lee, 2013)	<i>jiliyarti</i> ‘Darwin, place (in west) where dead thought to have gone, south’; <i>kapi pukwiyi ampi-ni-p-apurti</i> ‘east, Lit: where the sun comes up’
Nunggubuyu (nPN)	(Heath, 1984, 332-334)	<i>wunumbi</i> ‘north’, <i>wagay</i> ‘south’, <i>ramali</i> ‘east’ <i>argali</i> ‘west’
Gun-nartpa <sup>3</sup> (nPN)	(Carew, pc)	<i>miwach</i> ‘the east’ used as a directional, rarely the west though. This reflects a cultural orientation to the east among the Gunnartpa and their relatives (esp. the Djinang and Kune). While the Gunnartpa also link to the west and south, there are alignments with important eastern myths such as the Djangkawu story.

Table 3: River-based systems (horizontal)

Language	References	Notes
Dyirbal (PN)	(Dixon, 1972)	<i>-dawa</i> ‘upriver’ and <i>-balba</i> ‘downriver’
Jaminjung (nPN)	(Schultze-Berndt, 2006; Hoffmann, 2011)	<i>manamba</i> ‘upstream’ and <i>buwa</i> ‘downstream’ (Ng. <i>buyagu</i> )
Ngangityemerri (nPN)	(Reid, 2011, 371)	<i>ganggi</i> ‘upstream’, <i>warift</i> ‘downstream’ — terms are normally used in vertical descriptions, but can be extended to encode river-flow in directions
Wagiman (nPN)	(Harvey, pc)	<i>gangga</i> ‘upriver’ and <i>dubay</i> ‘downriver’
Warray (nPN)	(Harvey, pc)	<i>gibay</i> ‘upriver; vs <i>gijing</i> ‘downriver’
Mangarrayi(?) (nPN)	(Evans and Wilkins, 1992)	<i>kagarra</i> ‘west/upriver’

<sup>4</sup>including Martuthunira, Panyjima and Yindjibarndi<sup>5</sup>in (Evans and Wilkins, 1992) for Martuthunira.<sup>6</sup>of the Mitchell River, general trend is northwest.<sup>7</sup>up the Mitchell River, general trend is southeast’<sup>8</sup>*parn-kawrr*<sup>9</sup>but **not** ‘downriver’, this is *biya*.<sup>10</sup>For both MalakMalak and Matngele, there are also terms to encode ‘east’ *miri payika* and ‘west’ *miri tjalk*, however, they appear to be calques from English or Kriol or neighboring languages.<sup>11</sup>Nash (pc) comments: “The Lardil system is basically to do with the alignment of the island, with winds in a supporting role.”

Table 4: Compass- and River-based systems (horizontal)

Language	References	Notes
Pilbara lgs <sup>4</sup> (PN)	(Dench, 1995, 127f.)	<i>yawurru</i> ‘west/downriver’, <i>jinkayu</i> ‘east/upriver’ <sup>5</sup>
Yir Yoront (PN)	(Alpher, 1991, 64-67)	<i>kuw</i> ‘west, downstream <sup>6</sup> , coastal region as opposed to inland’, <i>kawrr</i> ‘east, upstream <sup>7</sup> , inland from coast <sup>8</sup> ’, (Evans and Wilkins, 1992)
Ngariinyman (PN)	(Jones, 1994)	
Gurindji (PN)	(McConvell, 1982; Meakins, 2011; Meakins et al., 2013)	<i>kaarrangkarra</i> ‘east and down’, <i>kurlarra</i> ‘west’, <i>kurlarra</i> ‘south’, <i>kayirra</i> ‘north’ / <i>kankapa</i> ‘upstream’, <i>kanimparra</i> ‘downstream’
Bilinearra (PN)	(Meakins and Nordlinger, 2014; Meakins, 2013, 196-202)	<i>gurlarra</i> ‘south’, <i>gayirra</i> ‘north’, <i>gaarnirra</i> ‘east’, <i>garlarra</i> ‘west’ / <i>ganimbarra</i> ‘downstream’, <i>gan-garra</i> ‘upstream’
Wardaman (nPN)	(Merlan, 1994, 150-153)	<i>jongon</i> ‘north’, <i>gorro</i> ‘south’, <i>yijanggu</i> ‘east’, <i>namanya</i> ‘west’, <i>gangga</i> ‘upstream’, <i>beye</i> ‘downstream’
Gooniyandi (nPN)	(McGregor, 1990, 156-162)	<i>biddi</i> ‘north’, <i>ngiji</i> ‘south’, <i>ngila</i> ‘east’, <i>liya</i> ‘west’
Bunuba (nPN)	(Rumsey, 2000)	
Ngandi (nPN)	(Heath, 1978, 66)	<i>nguri</i> ‘north’, <i>bakay</i> ‘south’, <i>rawara</i> ‘east’, <i>ngani</i> ‘west’ / <i>wala-</i> ‘upriver’, <i>gadi</i> ‘downriver’
Dalabon (nPN)	(Ponsonnet, pc, 2013)	<i>roHrrorrng</i> ‘RDP: east’, <i>karri</i> ‘west’
Mangarayi (nPN)	(Merlan, 1989, 117f.)	<i>gayara</i> ‘upriver/west’, <i>biya</i> ‘downriver’, <i>gajanya</i> ‘sunrise/east’ <sup>9</sup> , <i>ngariman</i> ‘south’, <i>bujba</i> ‘north’ — <i>dinjalin</i> ‘west/sunset, direction in which spirits are first sent with songs, associated with red ocher’; <i>mawur</i> ‘east/sunrise, direction in which spirits are sent away for good’
Kriol (N/A)	(Hoffmann, 2011; Lee, 2014)	<i>sangidap/sangidapwei/sanraisaid/sanraiswei</i> ‘east’, <i>sangodan/sangodanwei</i> ‘west’, <i>noth</i> ‘north’, <i>sauth/sauthsaid/sauthwei/ haidap</i> ‘upstream’, <i>lodan</i> ‘downstream’

<sup>12</sup> comment from (Nash, pc) “I’m not sure the Warlpiri vertical terminology fits in with the gradient system of Gurindji etc. (despite corresponding forms).”

<sup>13</sup> sociolect of Burarra

<sup>14</sup> Similar observations have been made for many other Australian languages including Warrwa (McGregor, 2006, 127) and Arrernte (Wilkins, 1989). Wilkins (1989, 314) argues that what links these notions might be ‘concealment’ or occlusion.

Table 5: Wind-based systems (horizontal)

Language	References	Notes
Kala Lagaw Ya (PN)	(Stirling, 2011; Bani, 2001, 182)	<i>pun</i> ‘pertaining to the direction the wind is blowing to at reference point (leeward, downwind)’; <i>pay</i> ‘pertaining to the direction the wind is blowing from at reference point (windward, upwind)’; <i>ngap(a)</i> ‘in between these directions, off to the side from the line made by the path of the wind at reference point’ — changing, depending on current wind conditions (historically), system becoming stagnant with younger generation
Adnayamathanha (PN)	(Nash, 2013, 64)	<i>uurru</i> ‘north-(west)’, <i>varpa</i> ‘south-(east)’ + composite terms for ‘east’ (sunrise), ‘west’ (sunset), ‘west-northwest’, and ‘southwest’
Djinang (PN)	(Waters, 2011)	<i>warti miman</i> ‘noun. wind direction.’, <i>wartinginyi gurppigi</i> ‘phrase. point into the wind, head in the direction of the oncoming wind.’
Iwaidja (nPN)	(Pym and Larrimore, 2011) (Edmonds-Wathen, 2012, 142-143)	<i>jinurru</i> ‘south-easterly trade wind’, <i>barra</i> ‘northwest wind’ - loan words from the Malay language spoken by the Macassans (Evans, 1992)
Maung (nPN)	(Hewett et al., 2013)	<i>jinurru</i> ‘south/south-east trade winds’
MalakMalak (nPN)	(Hoffmann, 2013)	<i>nul</i> ‘northwesterly’ <i>dangid</i> ‘southeasterly’ <sup>10</sup> — abstracted, aka unchanging system, regardless of the time of year and current wind conditions
Matngele (nPN)		<i>kurruwa</i> ‘northwesterly’ and <i>dangarr</i> ‘southeasterly’
Lardil (nPN)	(Nash, 2013, 64)	leewards and windward sides of Mornington Island <sup>11</sup>

Table 6: Tide-based systems (horizontal)

Language	References	Notes
Bardi (PN)	(Bower, 2012, 30)	change every 6 hours: <i>joodarrarr</i> ‘with the tide’ and <i>arrinarr</i> ‘against the tide’, mainly used by older speakers

Table 7: Ocean-based systems (horizontal)

Language	References	Notes
Kala Lagaw Ya (PN)	(Stirling, 2011; Bani, 2001, 182)	<i>pun</i> ‘pertaining to the direction the wind is blowing to at reference point (leeward, downwind)’; <i>pay</i> ‘pertaining to the direction the wind is blowing from at reference point (windward, upwind)’; <i>ngap(a)</i> ‘in between these directions, off to the side from the line made by the path of the wind at reference point’ — changing, depending on current wind conditions (historically), system becoming stagnant with younger generation
Maung(nPN)	(Hewett et al., 2013)	<i>wungijalk</i> ‘The sea, ocean is to the North of Goulburn Island and thus <i>wungijalk</i> is to the north’
Iwaidja (nPN)	(Edmonds-Wathen, 2011) (Edmonds-Wathen, 2012, 142-143)	<i>nimarrk</i> ‘deep ocean’ and <i>manandi</i> ‘mainland’ <i>warrin</i> ‘inland, bush’

Table 8: No attested systems (horizontal)

Language	References	Notes
Murrinh-Patha (nPN)	(Gaby and Singer, 2014)	

Table 9: Vertical systems: Pama-Nyungan languages

Language	References	Notes
Guugu Yimithirr (PN)	(Haviland, 1993) (Haviland, 1998, 29) (Levinson, 2003)	<i>wanggaar</i> ‘up’, <i>bada</i> ‘down’
Warlpiri (PN)	(Laughren, 1978) (Swartz, 2012)	<i>kankarlarra</i> ‘up’ <i>kankarlū</i> ‘up, upward direction, high’ <i>kankarlarra-kari</i> ‘upwards orientation or motion’; <i>kanunju</i> ‘down’ <i>kaninjara-kari</i> ‘downwards direction’ <sup>12</sup>
Bardi (PN)	(Bowers, 2012, 567f.)	no elevation terminology, but the overall difference in elevation across the area is about 30ft (Bowers, pc)
Arerrnte (PN)	(Wilkins, 2006)	<i>akertne</i> ‘top/above/over/up/upwards’ <i>kwene</i> ‘bot-tom/below/under/down/downwards’ (Wilkins, 2006, 35)
Djinang (PN)	(Waters, 2011)	<i>ngurr jurrjirr</i> ‘downhill, point downwards’, <i>mami</i> ‘on top, high, loudly (of speech), sky, Heaven’
Walmajarri (PN)	(Richards and Hudson, 2011)	<i>kaniny</i> ‘down’, <i>kankarra</i> ‘up’
Wik Mungkan (PN)	(Kilham et al., 2011)	<i>ninthan-ngaanh</i> ‘high places e.g. high ridge, high bank’
Gurindji (PN)	(McConvell, 1982; Meakins, 2011; Meakins et al., 2013)	<i>kankarra</i> ‘towards higher country, (going) upstream, ‘high up’ (in Kriol)’, <i>kanjjarra</i> ‘down, below. This term is also used to refer to Kalkaringi when you are traveling from Daguragu’
Bilinarra (PN)	(Meakins and Nordlinger, 2014; Meakins, 2013, 196-202)	<i>gan.gula</i> ‘up/above’, <i>ganyjarra</i> ‘down’ <i>ganyjal</i> ‘down/bottom’
Kala Lagaw Ya (PN)	(Stirling, 2011; Bani, 2001, 182)	<i>ka</i> ‘landwards/land up’; <i>gu(y)</i> ‘seawards/sea down’
Dyirbal (PN)	(Dixon, 1972)	<i>-daya</i> ‘uphill/upwards’ and <i>-bayga</i> ‘downhill/downwards’
Western Desert	(Nash, 1996)	<i>katu</i> ‘up’, <i>kaninytjarra</i> ‘down’
Warnman	(Nash, 1996)	<i>kankarra/kankarni</i> ‘up’, <i>kaninytjarra/kaninykurti</i> ‘down’
Ngadjumaya	(Von Brandenstein, 1980) in (Nash, 1996)	<i>yaburru</i> ‘down, below’, <i>maadu</i> ‘up, above’

Table 10: Vertical systems continued: non-Pama-Nyungan languages

Language	References	Notes
Nunggubuyu (nPN)	(Heath, 1984, 332-334)	<i>aruar</i> ‘up’ <i>lhiribala</i> ‘down/inside’
Kayardild (nPN)	(Evans, 1995, 206-227)	<i>walmu</i> ‘up/on top of/high’, <i>walmathi</i> ‘high’, <i>kirnkiirn-da</i> ‘overhead’, <i>nal-nya</i> ‘on top/top’, <i>yark-a</i> ‘bottom/underneath’, <i>dalkida</i> ‘low off the ground’
Iwaidja (nPN)	(Pym and Larrimore, 2011; Edmonds-Wathen, 2012)	<i>yurngud</i> ‘up high, the top’ (Used as a positional - follows noun); <i>warnidi</i> ‘be on top’
Tiwi (nPN)	(Lee, 2013)	<i>kuluwuni</i> ‘low/down’; <i>yarti</i> ‘ground, earth, place, low, down’; <i>kuriyuuu</i> ‘above, up, high, on top’
Jaminjung (nPN)	(Schultze-Berndt, 2006; Hoffmann, 2011)	<i>thangga</i> (Ng. <i>janggagu</i> ) ‘up’ and <i>thamirri</i> (Ng. <i>jamurrugu</i> ) ‘down’
Ngangityemerri (nPN)	(Reid, 2011, 371)	<i>ganggih</i> ‘high/up/on top’, <i>warriffi</i> ‘low/beneath’
Wagaman (nPN)	(Harvey, pc)	<i>wolok</i> ‘high, top’ vs <i>munya</i> ‘below’
Warray (nPN)	(Harvey, pc)	<i>waykkan</i> ‘top, open, exposed, high’ vs <i>ngunung</i> ‘low country’
Goonyandi (nPN)	(McGregor, 1990, 156-162)	<i>laandi</i> ‘above/up’, <i>naadiddi</i> ‘below/down’
Ngandi (nPN)	(Heath, 1978, 66)	<i>garkala</i> ‘above’, <i>garakadi</i> ‘below’
Garrwa (nPN)	(Mushin, 2013, 130-136) (Furby and Furby, 1976)	<i>kingkarri</i> ‘up’ and <i>wayka</i> ‘down’: used also for indicating direction towards and away from lower land masses (e.g., <i>wayka</i> indicates ‘towards a riverbank’ and <i>kingkarri</i> indicates ‘away from the river’). These forms are mostly used to express direction with geographic terrain sloping up (e.g., away from watercourses and up hills) or sloping down (towards or at a watercourse and down hills) — <i>yundu</i> ‘top’, <i>kala</i> ‘under’ may also be used to refer to general landscape features such as a road
Warrwa (nPN)	(McGregor, 2006)	<i>jimbini</i> ‘down/inside’, <i>kalbu</i> ‘up/above’
Burarra (nPN)	(Glasgow and Glasgow, 2011)	<i>jorrinyjorra</i> ‘higher ground; shore (in contrast to in/on the water); inland from the coast (used to refer to secret ceremony site, which is always further inland from the camp)’
Gun-naartpa <sup>13</sup> (nPN)	(Carew, pc)	<i>gochalawa</i> ‘low ground’ and <i>jorrinyjorra</i> ‘high ground’: This corresponds in part to differentiations in sociality and ritual between coastal and freshwater habitats and people. Also: body part terms that are metaphorically extended to landscape. E.g. <i>mernda a-jirra</i> ‘his arm’ > <i>mernda gu-jirra</i> ‘creek’; <i>jonama a-jirra</i> ‘his back’ > <i>jonama gu-jirra</i> ‘high ground’ (i.e. ‘land between waterways’). / “ <i>waykin</i> and <i>wupa</i> , corresponding to ‘high’ and ‘low’ respectively, <i>wupa</i> also used for inside, underneath etc.”
Wardaman (nPN)	(Merlan, 1994, 150-153)	<i>galul</i> ‘up/above’, <i>barrwa</i> ‘down/below’
Dalabon (nPN)	(Ponsonnet, pc, 2013)	there are terms for up and down, and like in English, up and down are also used for upstream and downstream — comment: “inside” and “under water” are the same word while “outside” and “out of water” are the same - I see it as modeling inside and outside on the basis of the river bed <sup>14</sup> (Ponsonnet, pc)
Mangarayi (nPN)	(Merlan, 1989, 117f.)	<i>gawar</i> ‘high up/on top, upriver’
MalakMalak (nPN)	(Hoffmann, 2013)	<i>kantyak</i> ‘up/on top’, <i>menyiken</i> ‘upstream’; <i>matya(nen)</i> ‘bottom/downstream’
Matngele (nPN)		<i>merrinyj</i> ‘downstream/bottom’ and <i>menginy</i> ‘upstream/up/on top’

Table 11: Spatial Reference Frame used

Language	Intrinsic FoR	Relative FoR	Absolute FoR	Reference
Iwaidja	x	(x)	x	(Edmonds-Wathen, 2011, 4)
MalakMalak	x	(x)	x	
Kriol	x	x	x	
Jaminjung	x	(x)	(x)	(Majid et al., 2004, 112) (Schultze-Berndt, 2006)
Warrwa	x		x	(Majid et al., 2004, 112)
Arrente	x		x	(Majid et al., 2004, 112)
Guugu Yimithirr	x		x	(Majid et al., 2004, 108)



## References

- Alpher, B. (1991). *Yir-Yoront lexicon: Sketch and Dictionary of an Australian language*, volume 6. Walter de Gruyter.
- Bani, E. (2001). The morphodirectional sphere. In *Forty Years on: Ken Hale and Australian Languages*, pages 477–480. Pacific Linguistics, Canberra.
- Bowern, C. (2012). *A grammar of Bardi*, volume 57. Walter de Gruyter.
- Bowern, C. (p.c.). personal communication.
- Carew, M. (p.c.). personal communication.
- Dench, A. (1995). *Martuthunira, a language of the Pilbara region of Western Australia*. *Pacific Linguistics*, volume C-125. The Australian National University, Canberra.
- Dixon, R. M. (1972). *The Dyirbal language of north Queensland*, volume 9. CUP Archive.
- Edmonds-Wathen, C. (2011). What comes before?: Understanding spatial reference in Iwaidja. In *ICMI Study 21 Conference: Mathematics and language diversity*, pages 89–97. ICMI.
- Edmonds-Wathen, C. (2012). *Frame of reference in Iwaidja: Towards a culturally responsive early years mathematics program*. PhD thesis, RMIT University.
- Evans, N. and Wilkins, D. (1992). From polysemy to semantic change in Australian Languages: Session 3. changes within the system.
- Evans, N. D. (1995). *A grammar of Kayardild: with historical-comparative notes on Tangkic*, volume 15. Walter de Gruyter.
- Furby, C. E. and Furby, E. S. (1976). *Garawa compass directions*. Summer Institute of Linguistics.
- Gaby, A. and Singer, R. (2014). Semantics of Australian Languages. In *The Languages and Linguistics of Australia: A Comprehensive Guide*, volume 3 of *Languages of the World*, pages 295–336. Walter de Gruyter.
- Gaby, A. R. (2006). *A Grammar of Kuuk Thaayorre*. PhD thesis, University of Melbourne.
- Glasgow, K. and Glasgow, D. (2011). Burarra-English Interactive Dictionary. <http://ausil.org/Dictionary/Burarra/lexicon/mainintro.htm>. Accessed: 2016-03-08.
- Harvey, M. (p.c.). personal communication.
- Haviland, J. B. (1993). Anchoring, iconicity, and orientation in Guugu Yimithirr pointing gestures. *Journal of Linguistic Anthropology*, 3(1):3–45.
- Haviland, J. B. (1998). Guugu Yimithirr cardinal directions. *Ethos*, 26(1):25–47.
- Heath, J. (1978). *Ngandi grammar, texts, and dictionary*. Australian Institute of Aboriginal Studies, Canberra.
- Heath, J. (1984). *Functional grammar of Nunggubuyu*. Australian Institute of Aboriginal Studies, Darwin.
- Hewett, H., Dineen, A., Stainsby, D., and Field, R. (2013). Maung-English Interactive Dictionary. <http://ausil.org/Dictionary/Maung/preindex.htm>. Accessed: 2016-03-08.
- Hoffmann, D. (2011). *Descriptions of Motion and Travel in Jaminjung and Kriol*. Ph.d., University of Manchester, Manchester.
- Hoffmann, D. (2013). Mapping worlds: Frames of Reference in MalakMalak. In *Proceedings to the 39th Meeting of the Berkeley Linguistic Society*, Berkeley. University of California at Berkeley.

- Jones, C. (1994). *Draft Sketch Grammar of Ngarinyman*. Diwurruwurru-Jaru Aboriginal Corporation, Katherine.
- Kilham, C., Pamulkan, M., Pootchemunka, J., and Wolmby, T. (2011). Wik Mungkan-English Interactive Dictionary. <http://ausil.org/Dictionary/Wik-Mungkan/lexicon/mainintro.htm>. Accessed: 2016-03-08.
- Laughren, M. N. (1978). Directional Terminology in Warlpiri (a Central Australian Language). *Working Papers in Language and Linguistics*, 8:1–16.
- Lee, J. (2013). Tiwi-English Interactive Dictionary. <http://ausil.org/Dictionary/Tiwi/intro.htm>. Accessed: 2016-03-08.
- Lee, J. (2014). Kriol-English Interactive Dictionary. <http://ausil.org/Dictionary/Kriol/index-en.htm>. Accessed: 2016-03-08.
- Levinson, S. C. (2003). *Space in language and cognition: Explorations in cognitive diversity*, volume 5. Cambridge University Press, Cambridge.
- Lewis, D. (1976). Observations on route finding and spatial orientation among the Aboriginal peoples of the Western Desert region of central Australia. *Oceania*, 46(4):249–282.
- Majid, A., Bowerman, M., Kita, S., Haun, D. B., and Levinson, S. C. (2004). Can language restructure cognition? the case for space. *Trends in cognitive sciences*, 8(3):108–114.
- McConvell, P. (1982). Neutralisation and degrees of respect in Gurindji. In *The languages of kinship in Aboriginal Australia*, Oceania Linguistic Monographs, pages 86–106. University of Sydney, Sydney.
- McGregor, W. (2006). Prolegomenon to a Warrwa grammar of space. In *Grammars of Space: Explorations in cognitive diversity*, pages 339–379. Cambridge University Press.
- McGregor, W. B. (1990). *A functional grammar of Gooniyandi*. John Benjamins Publishing, Amsterdam.
- Meakins, F. (2011). Spaced out: Intergenerational changes in the expression of spatial relations by Gurindji people. *Australian Journal of Linguistics*, 31(1):43–77.
- Meakins, F. (2013). Bilinarra multimedia database. <http://ausil.org/Lexicons/Bilinarra/index.htm>. Accessed: 2016-03-08.
- Meakins, F., McConvell, P., Charola, E., McNair, N., McNair, H., and Campbell, L. (2013). Gurindji Multimedia Database. [www.ausil.org/Lexicons/Gurindji/index.html](http://www.ausil.org/Lexicons/Gurindji/index.html). Accessed: 2016-03-08.
- Meakins, F. and Nordlinger, R. (2014). *A Grammar of Bilinarra: An Australian Aboriginal Language of the Northern Territory*, volume 640. Walter de Gruyter.
- Merlan, F. (1989). *Mangarayi*. Routledge, London.
- Merlan, F. C. (1994). *A grammar of Wardaman: A language of the Northern Territory of Australia*, volume 11. Walter de Gruyter.
- Mushin, I. (2013). *A Grammar of (Western) Garrwa*, volume 637. Walter de Gruyter.
- Nash, D. (1996). Cardinal direction terminology in western desert (wati) languages.
- Nash, D. (2013). Wind direction words in the Sydney language: A case study in semantic reconstitution. *Australian Journal of Linguistics*, 33(1):51–75.
- Nash, D. (p.c.). personal communication.

- Ponsonnet, M. (2013). *The language of emotions in Dalabon (Northern Australia)*. PhD thesis, Australian National University, Canberra.
- Ponsonnet, M. (p.c.). personal communication.
- Pym, N. and Larrimore, B. (2011). Iwaidja-English Interactive Dictionary. <http://ausil.org/Dictionary/Iwaidja/lexicon/mainintro.htm>. Accessed: 2016-03-08.
- Reid, N. J. (2011). *Ngan'gityemerri: A language of the Daly River region, Northern Territory of Australia*. Lincom Europa, Munich.
- Richards, E. and Hudson, J. (2011). Walmajarri-English Interactive Dictionary. <http://ausil.org/Dictionary/Tiwi/intro.htm>. Accessed: 2016-03-08.
- Rumsey, A. (2000). Bunuba. In Dixon, R. and Blake, B. J., editors, *Handbook of Australian languages*, pages 34–152. Oxford University Press, Oxford.
- Schultze-Berndt, E. (2006). Sketch of a Jaminjung Grammar of Space. In Levinson, S. C. and Wilkins, D. P., editors, *Grammars of Space: Explorations in cognitive diversity*, volume 6 of *Language, Culture and Cognition*, pages 63–113. Cambridge University Press, Cambridge.
- Smith, A. and Johnson, S. (2000). Kugu Nganhcara. In *Handbook of Australian Languages*, volume 5, pages 357–489. Oxford University Press, Melbourne.
- Stirling, L. (2011). Space, time and environment in Kala Lagaw Ya. In *Indigenous language and social identity: Papers in honour of Michael Walsh*, pages 179–203. Pacific Linguistics, Canberra.
- Swartz, S. M. (2012). Warlpiri-English Interactive Dictionary. <http://ausil.org/Dictionary/Warlpiri/aboutwarlpiri.htm>. Accessed: 2016-03-08.
- Tsunoda, T. (1995). *The Djaru language of Kimberley, Western Australia*. Pacific Linguistics, Canberra.
- Von Brandenstein, C. G. (1980). *Ngadjumaja: an Aboriginal language of south-east Western Australia*. Number 48. AMCE.
- Waters, B. E. (2011). Djinang-English Interactive Dictionary. <http://ausil.org/Dictionary/Djinang/index-en.htm>. Accessed: 2016-03-08.
- Wilkins, D. (2006). Towards an Arrernte Grammar of Space. In *Grammars of Space: Explorations in cognitive diversity*, pages 24–62. Cambridge University Press, Cambridge.
- Wilkins, D. P. (1989). *Mparntwe Arrernte (Aranda): Studies in the structure and semantics of grammar*. Ph.d, The Australian National University, Canberra.