The Austrills atlas & TAM typology in Australia 2nd FEMIDAL Workshop, 18. 09. 2023

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AUSTRILS IN A NUTTSHELL

- Atlas of Australian Indigenous Language Structures
- Coordinators: Patrick Caudal (LLF) & Achille Falaise (LLF)
- FEMIDAL & LLF (lab)-internal project
 - Investigators: students
 - Student internships (some L3, some M1/M2)
 - Annotation managers: Marie Legentil (LLF) & David-Felipe Guerrero-Beltran (LLF)





ROADMAP

- 1. AustrILS: rationale & context of project
- 2. Current state of the atlas
- 3. Theoretical discussion & expected benefits
- 4. Prospects







AUSTRILS: RATIONALE & CONTEXT OF PROJECT

• Existing atlases such as e.g. the WALS are essentially (1) bibliographic databases, plus (2) some 'shallow', relatively unstructured sets of binary datapoints (of the type – 'does language X possess property X', where X belongs to a list of morphosyntactic phenomena), with (3) little emphasis on form/meaning pairings





AUSTRILS: RATIONALE & CONTEXT OF PROJECT

- Existing atlases such as e.g. the WALS are essentially
 - (1) bibliographic databases, plus
 - (2) some 'shallow', relatively unstructured sets of attributes, with often binary values datapoints (of the type – 'does language X possess property X', where X belongs to a list of morpho-syntactic phenomena)
 - Shallow: at best, features are extremly limited trees, with one root node, and a small number of daughter nodes (e.g. 10A/10B:
 - (3) with little emphasis on form/meaning pairings



Formal/Experimental Methods and In-depth Description of Australian Indigenous Languages Home Features Chapters Languages References Authors



Features

A feature is a structural property of language that describes one aspect of cross-linguistic diversity. A WALS feature has between 2 and 28 different values, shown by different colours on the maps. Most features correspond straightforwardly to chapters, but some chapters are about multiple features.

RATIONALE	R ,	CONTEXT	ld
MATIUNALL	Ŭ	UUNILAI	Sea

https://wals.info/feature

ld 🔺	Name 🍦	Authors	Area 🍦	Languages 🍦	Details
Search	Search		any 🗸	Search	
1A	Consonant Inventories	lan Maddieson	Phonology	563	Values
2A	Vowel Quality Inventories	lan Maddieson	Phonology	564	Values
ЗA	Consonant-Vowel Ratio	lan Maddieson	Phonology	564	Values
4A	Voicing in Plosives and Fricatives	lan Maddieson	Phonology	567	Values
5A	Voicing and Gaps in Plosive Systems	lan Maddieson	Phonology	567	Values
6A	Uvular Consonants	lan Maddieson	Phonology	567	Values
7A	Glottalized Consonants	Ian Maddieson	Phonology	567	Values
8A	Lateral Consonants	Ian Maddieson	Phonology	567	Values
9A	The Velar Nasal	Gregory D.S. Anderson	Phonology	469	Values
10A	Vowel Nasalization	John Hajek	Phonology	244	Values
10B	Nasal Vowels in West Africa	John Hajek	Phonology	40	Values
11A	Front Rounded Vowels	Ian Maddieson	Phonology	562	Values
12A	Syllable Structure	Ian Maddieson	Phonology	486	Values
13A	Tone	lan Maddieson	Phonology	527	Values
14A	Fixed Stress Locations	Rob Goedemans and Harry van der Hulst	Phonology	502	Values
15A	Weight-Sensitive Stress	Rob Goedemans and Harry van der Hulst	Phonology	500	Values
16A	Weight Factors in Weight-Sensitive Stress Systems	Rob Goedemans and Harry van der Hulst	Phonology	500	Values
17A	Rhythm Types	Rob Goedemans and Harry van der Hulst	Phonology	323	Values
18A	Absence of Common Consonants	Ian Maddieson	Phonology	567	Values
19A	Presence of Uncommon Consonants	lan Maddieson	Phonology	567	Values
20A	Fusion of Selected Inflectional Formatives	Balthasar Bickel and Johanna Nichols	Morphology	165	Values
21A	Exponence of Selected Inflectional Formatives	Balthasar Bi Capture d'écran	Morphology	162	Values





AUSTRILS: RATIONALE & CONTEXT OF PROJECT

• APICS: database comprises actual examples, BUT... remains relatively shallow, structurally speaking

https://apics-online.info/parameters







AUSTRILS: RATIONALE & CONTEXT OF PROJECT Sources Authors

Home Languages Features WALS-APICS Surveys Examples

Features

o.	•	Feature information	Chapter	Feature type	Area	WALS- APICS	Cite	
Search		Search		primary ~	any ~	Search		
	1	Order of subject, object, and verb	Chapter 1 by Magnus Huber	primary	Word order	WALS 81A	cit	
	2	Order of possessor and possessum	Chapter 2 by Magnus Huber	primary	Word order	WALS 86A	cit	
	3	Order of adjective and noun	Chapter 3 by Magnus Huber	primary	Word order	WALS 87A	cit	
	4	Order of adposition and noun phrase	Chapter 4 by Magnus Huber	primary	Word order	WALS 85A	cit	
	5	Order of demonstrative and noun	Chapter 5 by Philippe Maurer	primary	Word order	WALS 88A	cit	
	6	Order of cardinal numeral and noun	Chapter 6 by Martin Haspelmath and Susanne Maria Michaelis	primary	Word order	WALS 89A	cit	
	7	Order of relative clause and noun	Chapter 7 by Martin Haspelmath and Susanne Maria Michaelis	primary	Word order	WALS 90A	ci	
	8	Order of degree word and adjective	Chapter 8 by Martin Haspelmath	primary	Word order	WALS 91A	ci	
	9	Position of definite article in the noun phrase	Chapter 9 by Martin Haspelmath	primary	Word order		ci	
1	0	Position of indefinite article in the noun phrase	Chapter 10 by Martin Haspelmath	primary	Word order		ci	
1	1	Order of frequency adverb, verb, and object	Chapter 11 by Martin Haspelmath	primary	Word order		ci	
1	2	Position of interrogative phrases in content questions	Chapter 12 by Martin Haspelmath	primary	Word order	WALS 93A	cit	
1	3	Gender distinctions in personal pronouns	Chapter 13 by Philippe Maurer	primary	Nominal categories	WALS 44A	cit	
1	4	Dual in independent personal pronouns	Chapter 14 by Martin Haspelmath	primary	Nominal categories		cit	
1	5	Inclusive/exclusive distinction in independent personal pronouns	Chapter 15 by Martin Haspelmath and Susanne Maria Michaelis	primary	Nominal categories	WALS 39A	cit	
1	6	Person syncretism in independent personal pronouns	Chapter 16 by Martin Haspelmath	primary	Nominal categories		cit	
1	7	Special dependent person forms for subject and object	Chapter 17 by Martin Haspelmath	primary	Nominal categories		ci	





- Atlas project really took off in 2023, with 12 languages, 14 references and about 3000 examples mined and annotated
 - 12 csv-format annotated corpus files
 - + phonological tables, + morphological tables, + phonographematic tables
- 8 internships so far, including one international internship
 - Elsa Pätzold, U. Freiburg, ERASMUS+FEMIDAL funding
- Enough data collected & annotated to complete a pilot atlas for first implementation at the end of 2023
 - Senior CNRS IT engineer: Achille Falaise
 - Form+meaning annotation must be thoroughly checked













• 12 documented languages so far:

Language	Family	Annotator	Date	Stage or contract	References
Iwaidja	nPN, Iwaidjan	Caudal	20/07/2022	-	Pym & Larrimore, dictionary
Mawng	nPN, Iwaidjan	Caudal	30/08/2021	-	Singer 2006
Ngarla	PN, Pilbara	Baptiste Loreau Unger	June-July 2022	stage	Westerlund 2012
Wubuy	nPN, Gunwinyguan	Luiz-Arthur Blamires	july 2021	M1 + stage	Heath grammar + texts
Ndjébbana	nPN, Maningrida	Elsa Pätzold	May 2023	stage	МсКау 2000
Gurr-Goni	nPN, Maningrida	Elsa Pätzold	April-May 2023	stage	Green 1995
Martuthunira	PN, Pilbara	Noah Loutchmia	May-June 2023	stage + M1 thesis	Dench 1995
Kayardild	Tangkic	Thomas Besse	June-July 2023	stage + M1 thesis	Evans 1995, Round 2013, Round et al. 2017
Worrorra	nPN, Wororan	Nour Benharrat	May-June 2023	stage L3	Clendon 2014
Yankutjatjarra	PN, Western Desert	Jocelyn Zaruma	12-06 to 25-06-2023	stage	Goddard 1983
Warlpiri	PN, Ngumpin-Yapa	Ludivine Huchin	05 June 2023	stage L3	Simpson 1991, Nash 1980
Mparntwe Arrernte	PN, Arandic	Abderahim Mazouz	12/06/2023	stage L3	Wilkins 1989





- Annotation guide 20 pages
- Comparative annotation, using a hierarchy of morphosyntactic and semantic categories
 - Hierarchy is tree-like (simple inheritance) so far, but can be enriched into a lattice structure (multiple inheritance)
 - Form: morphological & syntactic categories (clitics, affixes, infixes, discontinuous morphs, periphrastic tenses; clauses & types of clauses, dependencies...)
 - Meaning: comparative structure of meanings, ranging from broad TAM categories, to context-specific meanings





- Semantic annotations involve combinations of atomic semantic features, roughly ranging from the least specific, to the most specific
- A bit like a 'semantic path' across a tree, from root to leaf
 - Extension to lattice structure is unproblematic, as ordering of features between root (broad semantic domain) and leaf (context-specific meaning) is in fact, not necessarily deterministic
- Practical rather than theoretical function of the ordering





- Two main set of features (attributes): MORSYN and SEM
 - Aim at pairing instances of forms (as typed objects) and instances of meanings
- Each attribute receives a value within a deep, rich hierarchical structure
 - SEM: up to six mother/daughter node dominance relations
 - FORM





• FORM hierarchy

• To be refined!

INFL-SYN	synthetic inflections
INFL-PERI	analytic/periphrastic inflections
INFL-PERI-ANC	inflecting ancillary element ('auxiliary')
CLI	clitic
PART	particle
ADV	adverb/adverbial
RED	reduplication
СХ	constructions
CX-1	simple lexical construction (e.g., wiht a full aspectual/modal verb)
CX-2	complex construction, involving more than two lexical elements
CVC	coverb construction
CVC-LX	lexicalized coverb (discontinuous item)
SVC	serial verb construction
SVC-LX	fully lexical serial verb construction
SVC-LXGRM	semi-grammaticalized SVC
SVC-GRM	fully grammaticalized SVC (see e.g. the Murrinh-Patha PROG SVC)
V	verb
NADJ	noun-adjective
DET	determiner
IDEO	ideophone
PRO	pronoun
PRO.OBL	oblique pronoun
PRO.CT	contrastive pronoun







- Analysis of tense-aspect:
 - Imperfective vs. perfective readings
 - Non-culminating accomplishments









- Analysis of modality:
 - Temporal parameter (present vs. past vs. unspecified/context-dependent)
 - Modal flavour; Kratzer's (1991) concept of 'modal base'
 - E.g.: PURP as teleological modal flavour; EPI as epistemic, etc.
 - Modal force: e.g., existential vs. universal
 - Modals in Australian languages (cf. e.g. Caudal et al. 2019, Bednall 2020) have been hypothetized not to lexicalize modal force
 - Does this extend to so-called 'imperatives'?
 - ...which often turn out to have non-imperative uses
 - When bi-propositional structures are required, CONS and ANT can be seen as the nucleus vs. restrictor of a generalized quantifier (à la Kratzer)





- 'Special' modal categories
 - Apprehensivity
 - Evidentials
 - Various types of negative modals / or modals with negative dimensions (negative capacity, admonitives)
 - Postmodals
 - Avertivity
 - Mistaken thoughts







• Irrealis past categories

TAM-IRR-PST	past irrealis
TAM-IRR-PST-HYP	past irrealis matrix hypothetical (not in a two-clause conditional; possibly epistemic or doxastic)
TAM-IRR-PST-ANT-HYP	antecedent clause past irrealis (counterfactual) hypothetical/conditional subordinate (two-clause hypothetical conditional) – 'if' clause ('if we had reached the summit, we would have celebrated' or 'if he reached the summit' for past 'indicative' conditional)
TAM-IRR-PST-ANT-TEMP	antecedent clause past irrealis (counterfactual) hypothetical/conditional subordinate (two-clause hypothetical conditional) – 'when' clause ('when we reached the summit, we would celebrate')
TAM-IRR-PST-CONS-CF	consequent clause past irrealis counterfactual or past hypothetical conditional structure (two-clause conditional) – 'then' clause ("then we would have Yed')
TAM-IRR-PST-CONS-TEMP	consequent clause past irrealis with temporal/habitual value 'whenever X, we would Y')à
TAM-IRR-PST-PURP1	matrix past purposive / teleological
TAM-IRR-PST-PURP2	subordinate past purposive / teleological ('so as to')





TAM-IRR-PST-EPI	general past epistemic modal
TAM-IRR-PST-EPI-WK	weak past epistemic modal ('P could be/might have been
	true'/'il se pouvait que P soit vrai')
TAM-IRR-PST-EPI-ST	strong past epistemic modal ('P had to be true'/ 'it must be
	true that P')
TAM-IRR-PST-EPI-ID	indeterminate past epistemic modal
TAM-IRR-PST-PRIO	past priority modals
TAM-IRR-PST-PRIO-VOL	past volitional
TAM-IRR-PST-PRIO-VOL-WK	weak volitional
TAM-IRR-PST-PRIO-VOL-ST	strong volitional
TAM-IRR-PST-PRIO-VOL-ID	indeterminate volitional
TAM-IRR-PST-PRIO-VOL-NEG	negative volitional
TAM-IRR-PST-PRIO-VOL-WK-NEG	negative weak volitional
TAM-IRR-PST-PRIO-VOL-ST-NEG	negative strong volitional
TAM-IRR-PST-PRIO-VOL-ID-NEG	negative indeterminate volitional
TAM-IRR-PST-ADMO	admonitive ('should have P [but didn't]')
TAM-IRR-PST-ADMO-WK	weak admonitive ('ought to have P [but didn't]')
TAM-IRR-PST-ADMO-ST	strong admonitive ('why didn't you P???')





TAM-IRR-PST-PRIO-DEO	past deontic ('had to')
TAM-IRR-PST-PRIO-DEO-WK	weak past deontic ('maybe had to')
TAM-IRR-PST-PRIO-DEO-ST	strong past deontic ('necessarily had to')
TAM-IRR-PST-PRIO-DEO-ID	indeterminate past deontic
TAM-IRR-PST-PRIO-DEO-NEG	past synthetic (non-compositional) negative deontic ('didn't have to')
TAM-IRR-PST-PRIO-DEO-NEG-WK	weak past synthetic negative deontic
TAM-IRR-PST-PRIO-DEO-NEG-ST	strong past synthetic negative deontic
TAM-IRR-PST-PRIO-DEO-NEG-ID	indeterminate past synthetic negative deontic
TAM-IRR-PST-PRIO-DEO+NEG	compositional (with propositional negation particle) past negative deontic ('didn't have to')
TAM-IRR-PST-PRIO-DEO-WK+NEG	compositional weak past negative deontic
TAM-IRR-PST-PRIO-DEO-ST+NEG-	compositional strong past negative deontic (
TAM-IRR-PR-PRIO-DEO-ID+NEG	compositional indeterminate negative deontic
TAM-IRR-PST-ABI	past ability modal
TAM-IRR-PST-ABI-PERM	permission use of past ability modal
TAM-IRR-PST-ABI-CIRC	circumstancial use of past ability modal
TAM-IRR-PST-DOX	past doxastic (prediction, plan, belief in the past)
TAM-IRR-PST-DOX-WK	weak past deontic ('might/should' prediction)
TAM-IRR-PST-DOX-ST	strong past doxastic
TAM-IRR-PST-DOX-ID	indeterminate past doxastic





• Instance of grammar mining csv file thus constituted:

									
Template AustriLS	5						4		
Page in douce	Example number	Left context	Target lexeme	Right context	Gloss Left Context	Gloss Target Lexeme	Target category in gloss	MORSYN feature	SEM featur
226	8	0	0 angke-rr-inty.alpe-rle.ne-rre-pe-rre-me	C C	0 د	0 speak-RECIP-DO COMING BACK-CONT-dl.S/A-FREQ.rdp-npp	, npp	INFL-SYN	TAM-REA-I
13/	36 a	unte pmere nthenhe-le	ne-ke	c	0 2sgS place where-LOC	stay-pc	рс	INFL-SYN	TAM-REA-I
130	36b	Ampe ngwenhe-ke re key re-nhe	nthe-ke	c	0 child who-DAT 3sgA key 3sg-ACC	give-pc	рс	INFL-SYN	TAM-REA-I
130	36c	arne iwenhe-le relhe Mpetyane re	ke-lhe-ke	c	0 thing what-INST woman Mpetyane 3sgS	cut-refl-pc	рс	INFL-SYN	TAM-REA-I
125	19 33a	artwe itne	no	ahel-irre-ke artwe mperlkere ikwere	man 3plS	no	PART	PART	NOT-NEG
125	19 33b	Gavan re Margaret	ine-rle.lhe-ke	c	0 Gavan 3sgA Margaret	get-DO&GO-pc	рс	INFL-SYN	TAM-REA-I
125	19 33a	artwe itne no	ahel-irre-ke	artwe mperlkere ikwere	man 3plS no	angry-INCH-pc	рс	INFL-SYN	TAM-REA-I
129	a 34	arite arrpanhenhe re-therre re-nhe	mpawre-tyerte	c	0 day every 3dl(S) 3sg-ACC	do-rem.p.hab	rem.p.hab	INFL-SYN	TAM-IRR-F
123	3 32	2 Alakenhe re-hne itne	mpawre-tyerte	c	0 thus 3sg-ACC 3pIA	do-rem.p.hab	rem.p.hab	INFL-SYN	TAM-IRR-F
122	2 29	arplhe kngerre therre anterne ikwerge-nge nhenge	arrat-intye-ke	c	0 wing big two now 3sgDAT-ABL REMEMB	appear-DO COMING-pc	рс	INFL-SYN	ASSMO T/
122	2 30	0 the nhenge nge-nhe	are-ke	meeting-ke	1sgA REMEMB 2sg-ACC	see-pc	рс	INFL-SYN	TAM-REA-I
12	2 31a	re ayenge	twe-me	kwetethe,nhenge unte atyenge-werne petye-rlenge	3sgA 1sgO	hit-npp	npp	INFL-SYN	TAM-REA-I
12	2 31b	?					PST	INFL-SYN	TAM-REA-I
12*	28a	Inspector nhenge mape-le school nhenhe-rike	inspect-em.ile-ke	c	0 Inspector REMEMB pl(grp)-ERGschool this(O)-TOO	inspect-E.tr.CAUS-pc	рс	INFL-SYN	TAM-REA-I
12*	28b	kem-irre-ke thipe kngerrepenhe anteme.	Kem-irre-me-le	ante nhenge-Ø alkere-k-irre-ke	get up-INCH-pc bird big-one now.	get up-INCH-npp-SS,	npp	INFL-SYN	TAM-REA-I
120	ک 26	Artte arrpenhe-le anteme, artwe nhenhe	lhe-ke	anterne prnere kngerre-werne.	day other-LOC now, man this	go-pc	рс	INFL-SYN	TAM-IRR-F
121	27a 27a	Nhenhe anteme kweke arntnerre-ntye ikwere-kerte ayeye nhenhe re	ne-ke	c	0 this now little crawl-NMZR 3sgDAT-PROP story this 3sgS	be-pc	рс	INFL-SYN	TAM-REA-I
12	27b	Kele angke-tye ware-rle	ile-rne	yanh-aye	OK speak-NMZR DISM-FOC	tell-p.immed	p.immed	INFL-SYN	TAM-REA-I
120) 25	5 Kele re-nhe anterne itne	twe-ke,	yanhe antime re uyerre-ke, kunye.	OK 3sg-ACC now 3plA	kill-pc	рс	INFL-SYN	TAM-REA-I
120	25 ک	5 Kele re-nhe anteme itne twe-ke,yanhe antime re	uyerre-ke	kunye.	OK 3sg-ACC now 3plA kill-pc,there(mid) exactly 3sgS	disappear-pc	рс	INFL-SYN	TAM-REA-I
120	ک 24	Arne yanhe (pointing) kngerre nthurre kwete Yanhe-nge-ntyele intelyape-lyape	/ arrate-ke	c	0 tree that(mid) [pointing] big INTENS still hat(mid)-ABL-onwards butterflies	s appear-pc.	рс	INFL-SYN	TAM-REA-I
117	7 20) re	Ar-Ø-aye!	Artwe yalange-le re-nhe twe-me. Nhengekenhe-le arrpenhe mape twe-ke.	0	0 see-IMP-EMPH!	IMP	INFL-SYN	TAM-IMP
108	8 7	7 re	petyalpe-ke	ngkwarle urit-ampe-kerte	3sgS	come back-pc	рс	INFL-SYN	TAM-REA-I
108	8 7	7 re nyent-irre-tyeke alhe-ke, ngkwarle	impe-nhe-me-le.	c	0 3sgS one-INCH-PURP go-pc sweet-stuff	leave-DO PAST-npp-SS	npp	INFL-SYN	TAM-REA-I
11/	0 11a	Kngwelye mape re artwe alethenge artange-le	uthne-ke	c	0 dog pl(grp) 3sgA man stranger(O) co-operatively-ADV	bite-pc	рс	INFL-SYN	TAM-REA-I
11/	0 11b	. Ingwe-le Ayeperenye mape itne	irramp-irre-re-ke	c	0 night-LOC [sacred caterpillar] pl(grp) 3plS	scatter-INCH-pIS/A-pc	рс	INFL-SYN	TAM-REA-I
			· · · · · · · · · · · · · · · · · · ·			1	T	1	





• More examples...





THEORETICAL DISCUSSION & EXPECTED BENEFITS

- Some expected benefits of the annotation:
 - Allow the automatic identification semantic analogies across apparently unrelated morphological labels
 - Achieve rigorous comparison, without sacrificing language-specific semantic properties
 - Construing 'semantic maps' for various semantic domains/semantic supercategories, per language
 - E.g.: what does 'PAST.IRR' cover? What are the relevant forms in each language?
- Following steps for AustrILS:
 - Annotation verification
 - Production of pilot atlas ('proof of concept')
 - 2024 and beyond: extending annotations to other grammatical or lexical domains





THEORETICAL DISCUSSION & EXPECTED BENEFITS

- Some important issues lie ahead of us:
 - Annotations need to be checked, and enriched where necessary
 - Interface & implementation need to be developped







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- Pilot implementation to be produced by Spring 2024
 - CSV > XML
 - XML database for encoding tree-like data structures
- Two layers:
 - XML database
 - XPath interface for requests + web interface
 - Direct requests in XPath also available
- Not a large database at this stage (probably no more than 100,000 examples)
 - Future issue: switching to lattice structures?
- Classic HTML / javascript implementation





- Long-term aspect of the project: external contributions
 - Creative Commons license
 - Diffusing documentation & tools
 - Quality control over time
 - Recruiting managers for special sub-databases
 - Slow, controlled growth of database over time
- CDU (S. Bird): possible collaborations on e.g.:
 - Language documentation android+iOS apps/web applications





- AustrILS: applying for a well-funded project
 - In Europe: ANR ORA scheme (upcoming deadline for draft/1st round proposals: November 2023)

https://anr.fr/en/call-for-proposals-details/call/pre-call-announcement-8thedition-of-open-research-area-for-the-social-sciences/

- At least 3 elements in {Canada; France; Germany; United Kingdom}
- Australian institutional partners possible, as external participants
 - Some sort of attempt at providing matching funding would considerably strengthen the application





- Also: possible ethnolinguistic ramifications
 - Project with French anthropologists on a world atlas of myths
 - Language documentation in general
 - Geolocated collection of oral material







- Preparing for another round of internships & short to mid-term additions to the AustrILS atlas
 - TAM morphology again (at least at UPC); other types of verbal morphology (pronominal morphology, valency, conjugation classes...)
 - Opening the pilot to other grammatical domains? (phonectics+phonology was initially among the key domains identified for which the atlas could be enriched with high benefits potentially achieved) => Erich Round
 - Identifying other potential contributors + potential partners in Australia and Europe





CONCLUSION

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