Warlpiri people are warned that this talk contains pictures and names of persons who have passed away.

UNI FREIBURG

Australian National University

ARC CENTRE OF EXCELLENCE FOR THE DYNAMICS OF LANGUAGE

Language contact, language change and flexible word order in Warlpiri

Maria Vollmer (maria.vollmer@linguistik.uni-freiburg.de)

Twenty-Fifth International Conference on Historical Linguistics, Oxford, 1-5 August 2022

I gratefully acknowledge the Warlpiri people who provided the material used in this presentation. I acknowledge that the Warlpiri data was recorded on Warlpiri and Gurindji land and I pay my respects to their elders past and present.

Northern Territory, ©James Gray (james.gray@anu.edu.au)

Two starting points:

1. Flexible word order common in Australian languages, governing principles not understood in all detail

2. Increased contact to English ➡️ language change?

   Conflicting evidence;

   (e.g. Langlois 2004, Wilmoth et al. 2022 for Pitjantjatjara)

   problem of under-documentation and no long written tradition

The four Warlpiri communities

The solution: Warlpiri!

- One of the best-documented Australian languages
  (e.g. Hale 1983; Nash 1980; Simpson 1983; Swartz 1991; O'Shannessy 2006)

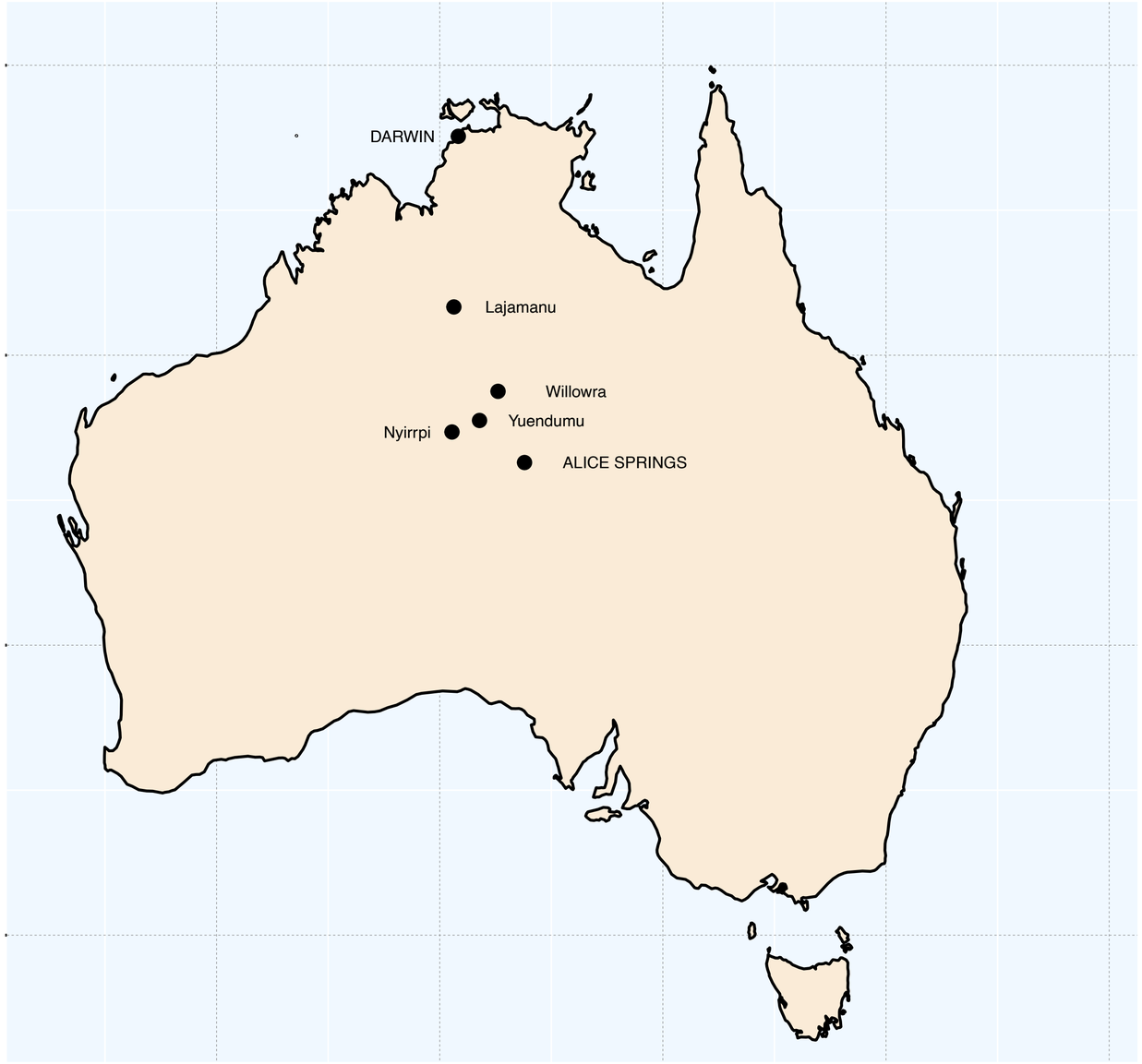
- First documentation with (available) audio recordings in the 1960s
  (Hale 1966-1967a, b)

- Previous studies point to language change, but no recent studies
  (Bavin & Shopen 1985, O'Shannessy 2006)

Warlpiri

- Spoken by about 2,592 speakers (2021 ABS Census) in Central Australia
- Four major communities: Lajamanu, Willowra, Nyirrpi, Yuendumu
- No community vernacular literacy until 1970s (Swartz 1991; Nash 1980; Simpson, p.c.)

The four Warlpiri communities



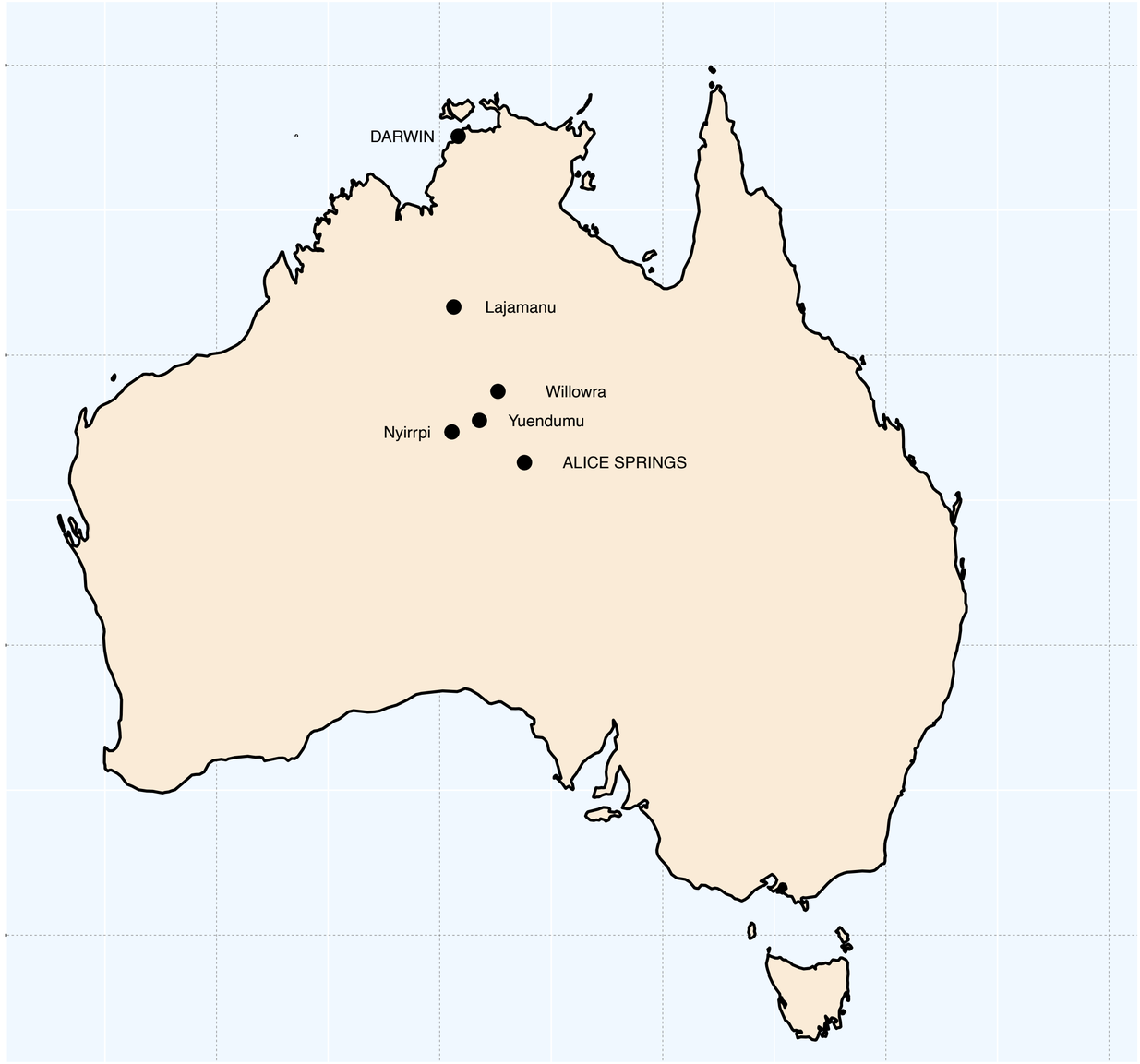
Warlpiri

Increasing contact to English:

- cattle stations and gold mines from 1880s
- reserves from 1940s
- (mission) schools from 1940s, bilingual programmes from 1970s

e.g. Meggitt 1962; O'Shannessy 2020; Simpson, p.c.

The four Warlpiri communities

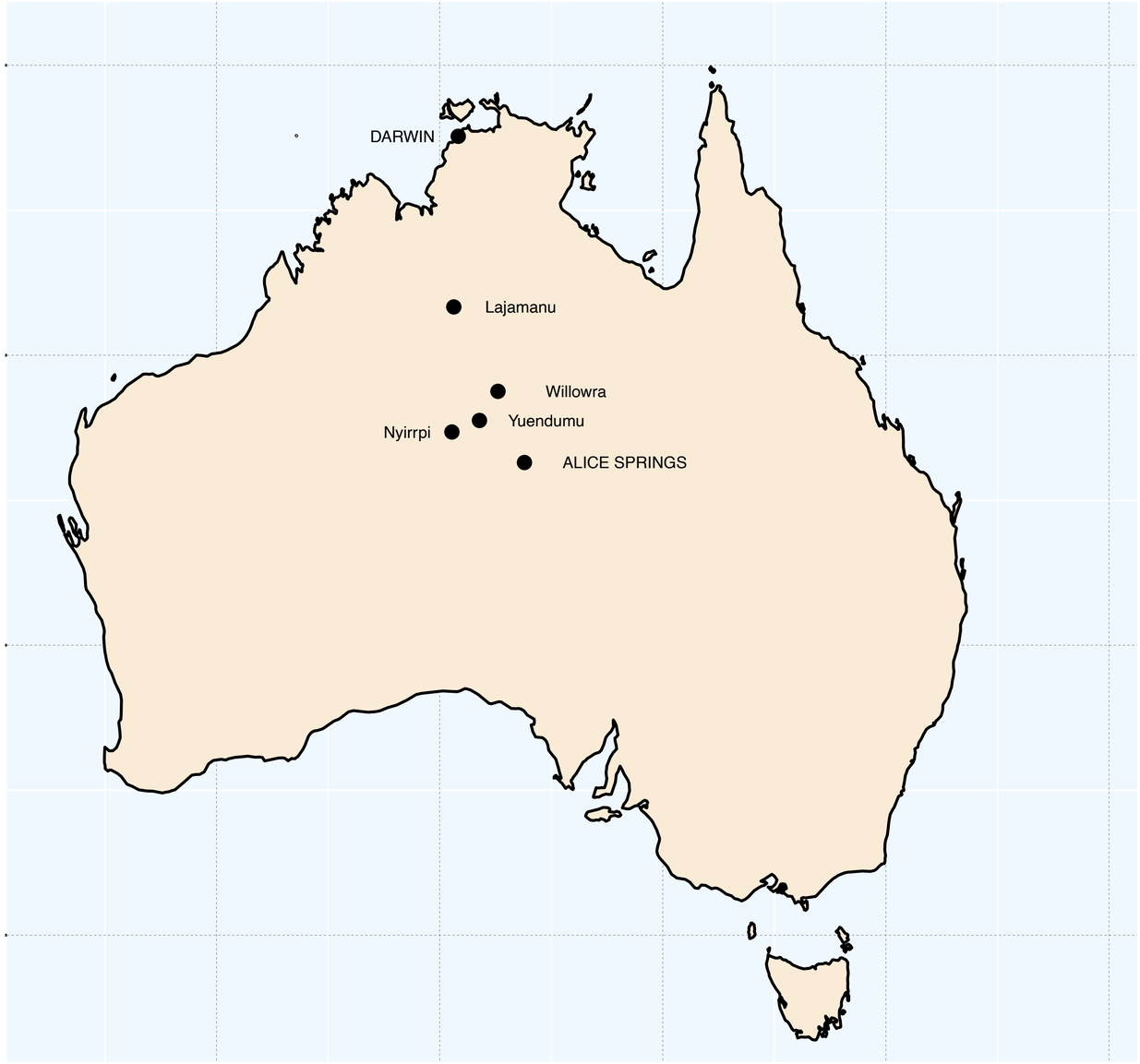


Warlpiri

- Emergence of mixed language Light Warlpiri in Lajamanu (O'Shannessy 2006)

- Multilingual: Warlpiri, Light Warlpiri, Kriol, Aboriginal Australian English, Standard Australian English, neighboring languages

The four Warlpiri communities



Background

Grammar

Northern Territory, ©James Gray (james.gray@anu.edu.au)

Flexible word order

Famously flexible word order: VS or SV

(1)	*jarnku*	*=pala*	*ya-nu*	*yapa*	*jirrama*
	separately	AUX.3DL.SBJ	go-PST	person	two

‘Two people went separately.’ (2.19-056; Hale 1966-1967a)

(2)	*ngarrkangkarla*	*=lpa*	*=lu*	*ya-nu*
	big.group.of.people	AUX.PST.IMPF	AUX.PRS	go-PST

‘The big group of people went.’ (2.19-113; Hale 1966-1967a)

Flexible word order

Famously flexible word order: VO or OV

(3)	*yinya*	*ka*	*=lu*	*karnta-ngku*	*karla*	*miyi-pardu*	*yarla*
	this	AUX.PRS	=AUX.3PL.SBJ	woman-ERG	dig.NPST	vegetable-little	yam

‘Over there, the women are digging up the yams.’ (2.19-066-7; Hale 1966-67a)

(4)	*kapi*	*miyi*	*yarla*	*warru*	*karla*
	AUX.FUT	vegetable	yam	around	dig.NPST

‘(We) will dig up yams all around.’ (2.19-014; Hale 1966-1967a)

Evidence for influence from information structure

(O'Shannessy 2006, 2016; Swartz 1991; Hale et al. 1995; Hale 1992, Simpson 2006)

But: "[w]e are a long way from a full understanding of information structure possibilities in Warlpiri, and much of what I have written here is tentative and requires serious investigation of the Warlpiri corpus" (Simpson 2006: 512)

Non-adjacent nominal expressions

Flexible order and non-adjacency in complex nominal expressions:

(5)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child.ABS	one.ABS	AUX.PRS	go-NPST-here	woman.ABS

‘One girl goes.’ (ywa02-034; O’Shannessy 2022)

Non-adjacent nominal expressions

Even more complex because of discontinuous nominal expressions:

(5)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child.ABS	one.ABS	AUX.PRS	go-NPST-here	woman.ABS

‘One girl goes.’ (ywa02-034; O’Shannessy 2022)

> Functional, but not syntactic unit

Non-adjacent nominal expressions

Even more complex because of discontinuous nominal expressions:

(5)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child.ABS	one.ABS	AUX.PRS	go-NPST-here	woman.ABS

‘One girl goes.’ (ywa02-034; O’Shannessy 2022)

> Functional, but not syntactic unit

> Subject-Verb-Subject order

Non-adjacent nominal expressions

Context, world knowledge and semantic properties determine function:
(Simpson 2005)

(6)	*murnma*	*=lu*	*youngfella*	*paka-rnu*	*ngaju-ku*	*father*
	before	AUX.3PL.SBJ	young.fella.ABS	kill-NPST	1SG-DAT	father.ABS

Before, (they) killed my father as a young fella.' (j17-011; Ross 2009)
(vs. 'Before, (they) killed my young father.')

In favor of language change:

- Evidence for changes in Yuendumu children's word order
  (Bavin & Shopen 1985, 1991)

- Changes in Lajamanu (children's) word order
  (O'Shannessy 2006)

But:

- No recent systematic (corpus) studies

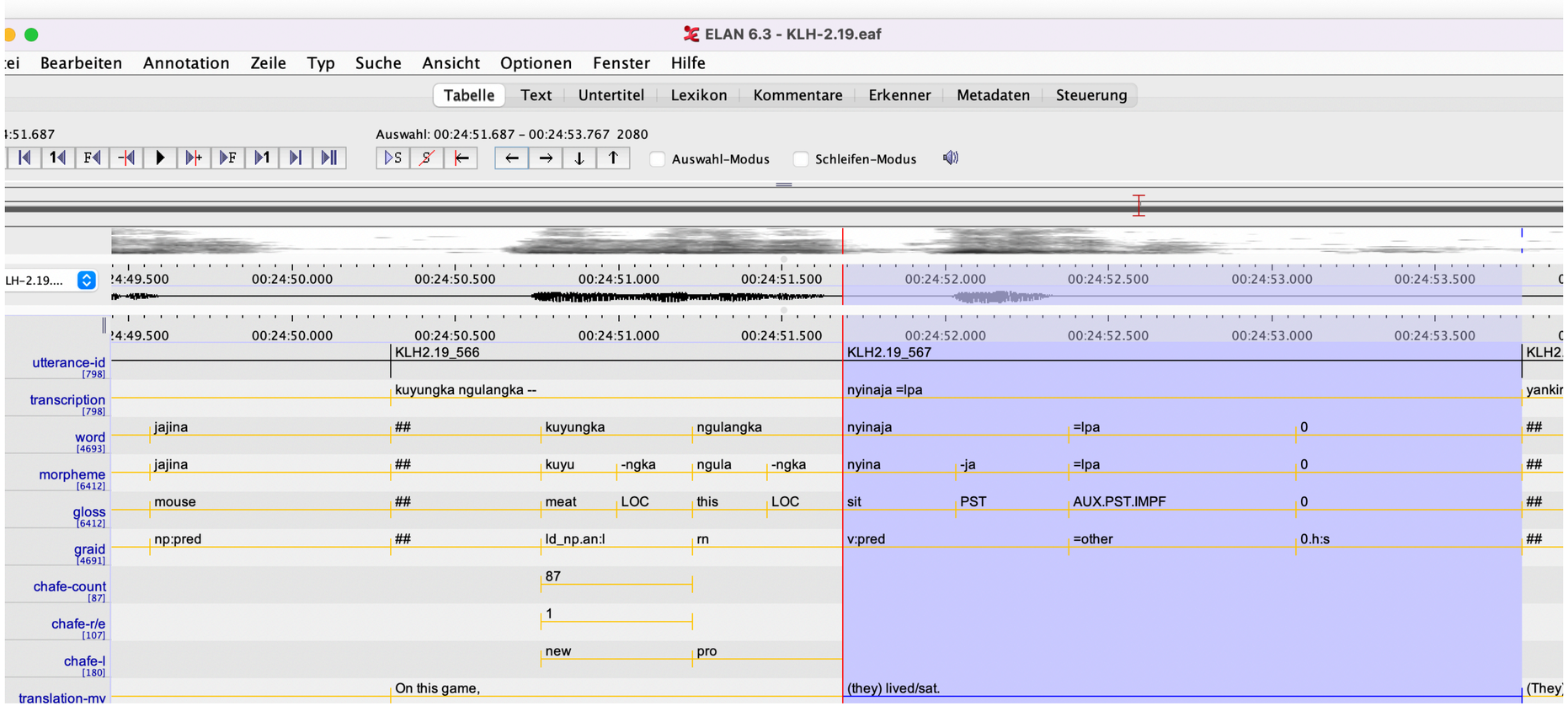
- Conflicting evidence (Wilmoth et al. 2022; Bavin & Shopen 1985, 1991)

1. Has word order changed in the last decades?
   = Towards a more stable word order and SVO

2. What variables influence word order (and have they changed)?

Background

Corpus



Many thanks to the speakers and researchers sharing their language and their data with me!

- Datasets: from 1960s and 2000s
- 1855 clauses
- Genre: spoken narratives
- No fieldwork possible due to COVID-19, use of existing data: Daniels 2009; Hale 1966-1967a, b; Morton 2009a-e; Nelson 2009; O'Shannessy 2004a-e, 2022; Presley 2009; Ross 2009

	1960s	2000s
Number of clauses	830	1025
Speaker age	66, 20s	40, 50s, 63, 64, 65, 71
Genre	Spoken narratives	Spoken narratives
Communities	Willowra	Willowra, Lajamanu, Yuendumu

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	aux	v:pred	cne_dc_rn_s

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	aux	v:pred	cne_dc_rn_s

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

np = nominal, h = human, s = intransitive subject

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	**rn_s**	aux	v:pred	cne_dc_rn_s

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	**aux**	v:pred	cne_dc_rn_s

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

aux = auxiliary

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	aux	**v:pred**	cne_dc_rn_s

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

v = verb, pred = predicate

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	aux	v:pred	**cne_dc_rn_s**

'One girl goes.' (Ywa02-034; O'Shannessy 2022)

cne = complex nominal expression,
dc_rn = non-adjacent element to the right side of nominal,
s = intransitive subject

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	aux	v:pred	**cne_dc_rn_s**

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

Includes option for ambiguity!

Annotated with GRAID (Haig & Schnell 2014) and other annotation schemes

(7)	*kurdu*	*jinta*	*ka*	*ya-ni-rni*	*karnta*
	child	one	AUX.PRS	go-NPST-here	woman
	np.h:s	rn_s	aux	v:pred	cne_dc_rn_s

‘One girl goes.’ (Ywa02-034; O’Shannessy 2022)

> Encompass detailed analysis
> Can capture complex picture
> Can be used in future studies for other research questions

Variables included in the analysis:

- Animacy
- Transitivity
- Referential givenness/newness incl. how many clauses/intonation units ago
- Heaviness of nominal expression (how many words/morphemes)
- Speaker age
- ‘Topicality’ (such as frequency of referent per narrative/in last clauses)
- English loanwords
- Existence of case marking
- Word(s)-/speaker-/community-/ genre-specific tendency for a word order
- Priming: word order of the previous clause

Variables included in the analysis:

- **Animacy**
- Transitivity
- Referential givenness/newness incl. how many clauses/intonation units ago
- Heaviness of nominal expression (how many words/morphemes)
- **Speaker age**
- 'Topicality' (such as frequency of referent per narrative/in last clauses)
- **English loanwords**
- Existence of case marking
- Word(s)-/speaker-**/community-/genre-specific** tendency for a word order
- Priming: word order of the previous clause

Results

Has word order changed in the last decades?

Picture of Warlpiri speaker Sam Japangardi, taken by David Nash.

Analysed word orders

Thesis

- Object and verb
- Subject and verb
- Auxiliary and verb
- Verb and obliques

- Subordinate clauses
- Main verbal clauses
- Nominal clauses

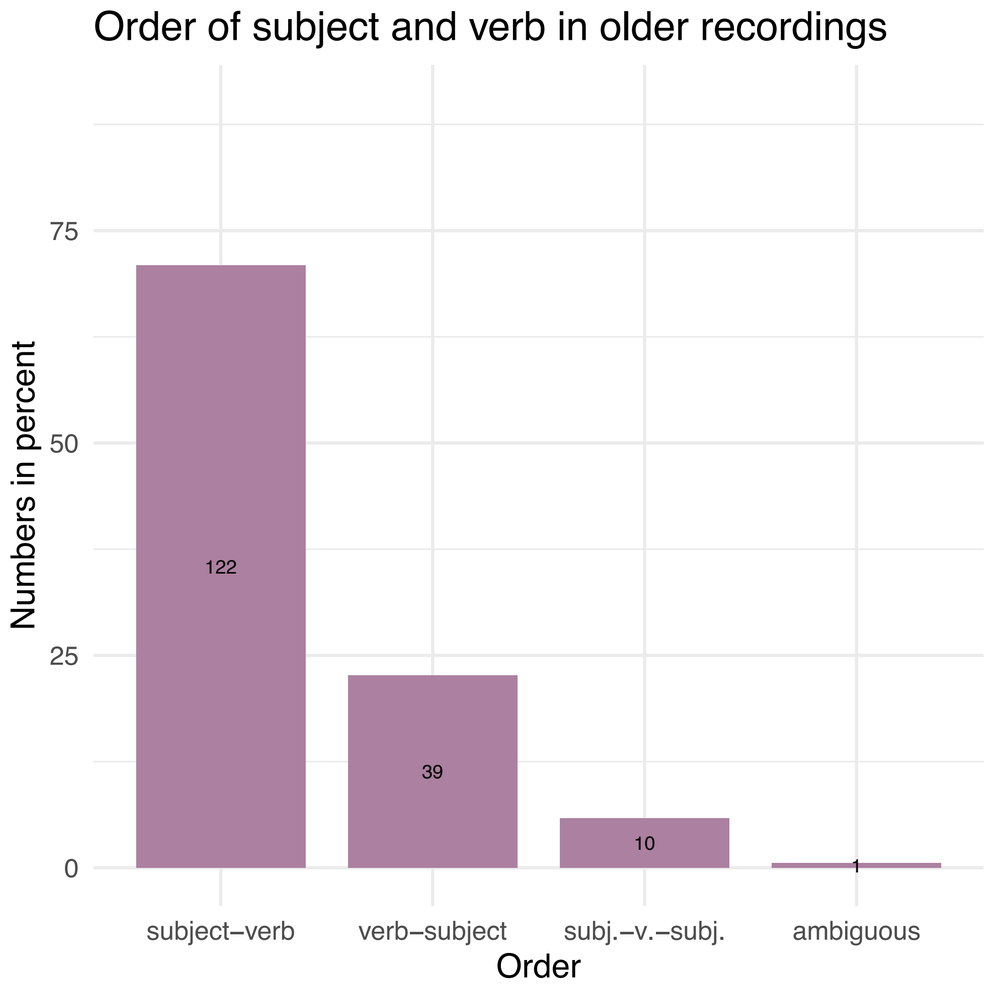
Analysed word orders

Talk

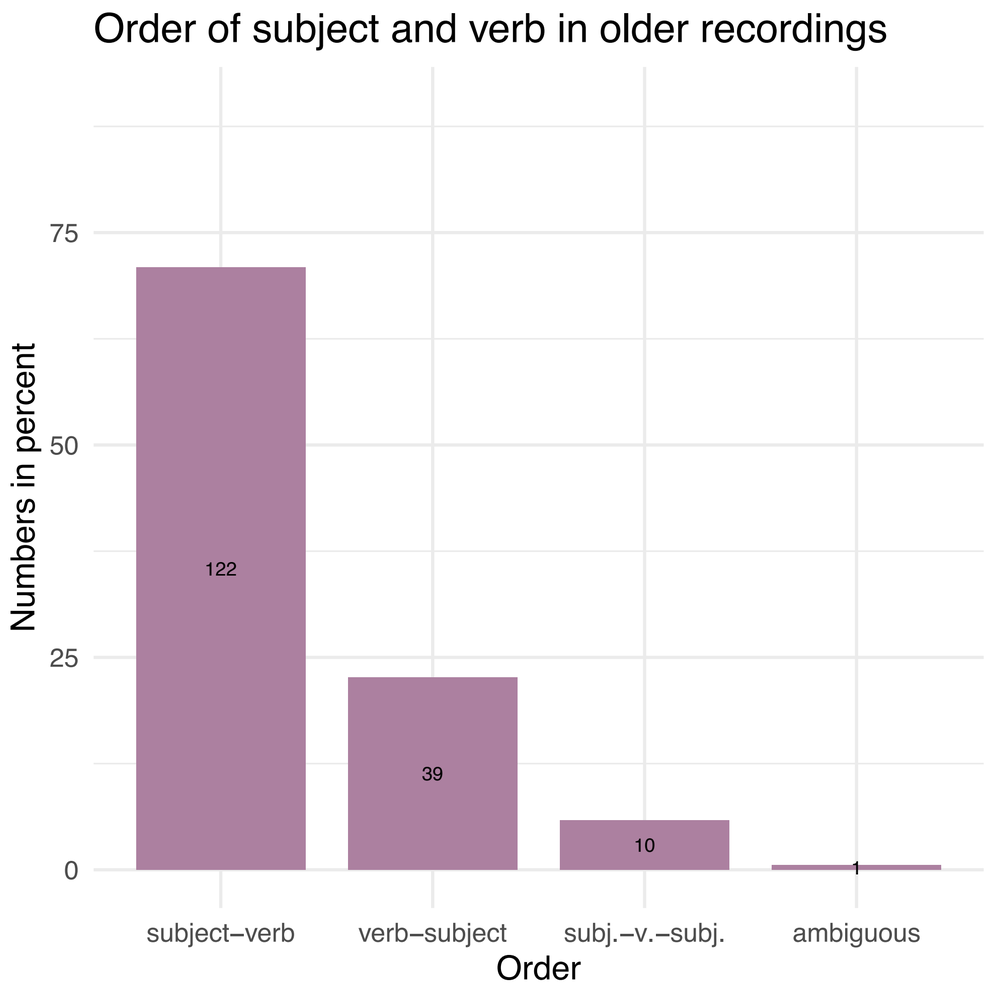
- **Object and verb**
- **Subject and verb**
- Auxiliary and verb
- Verb and obliques

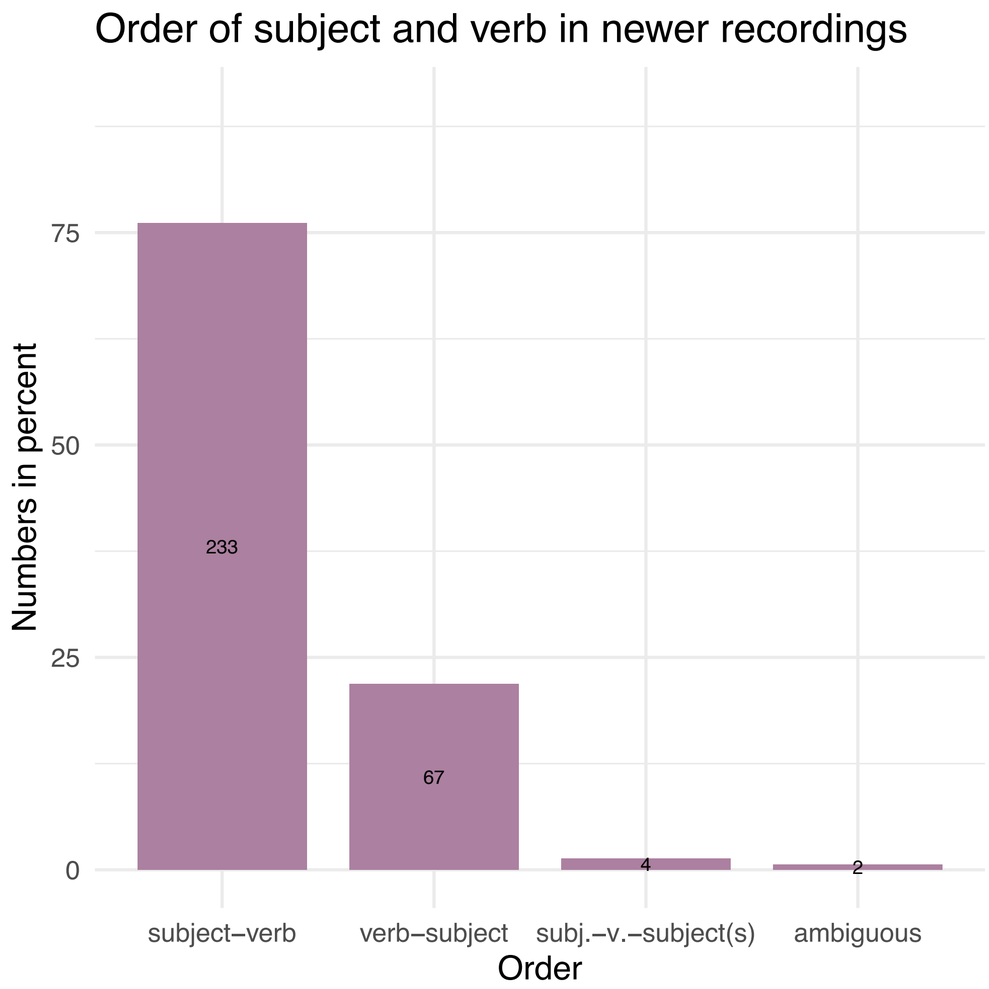
- Subordinate clauses
- Main verbal clauses
- Nominal clauses

Subject-verb order

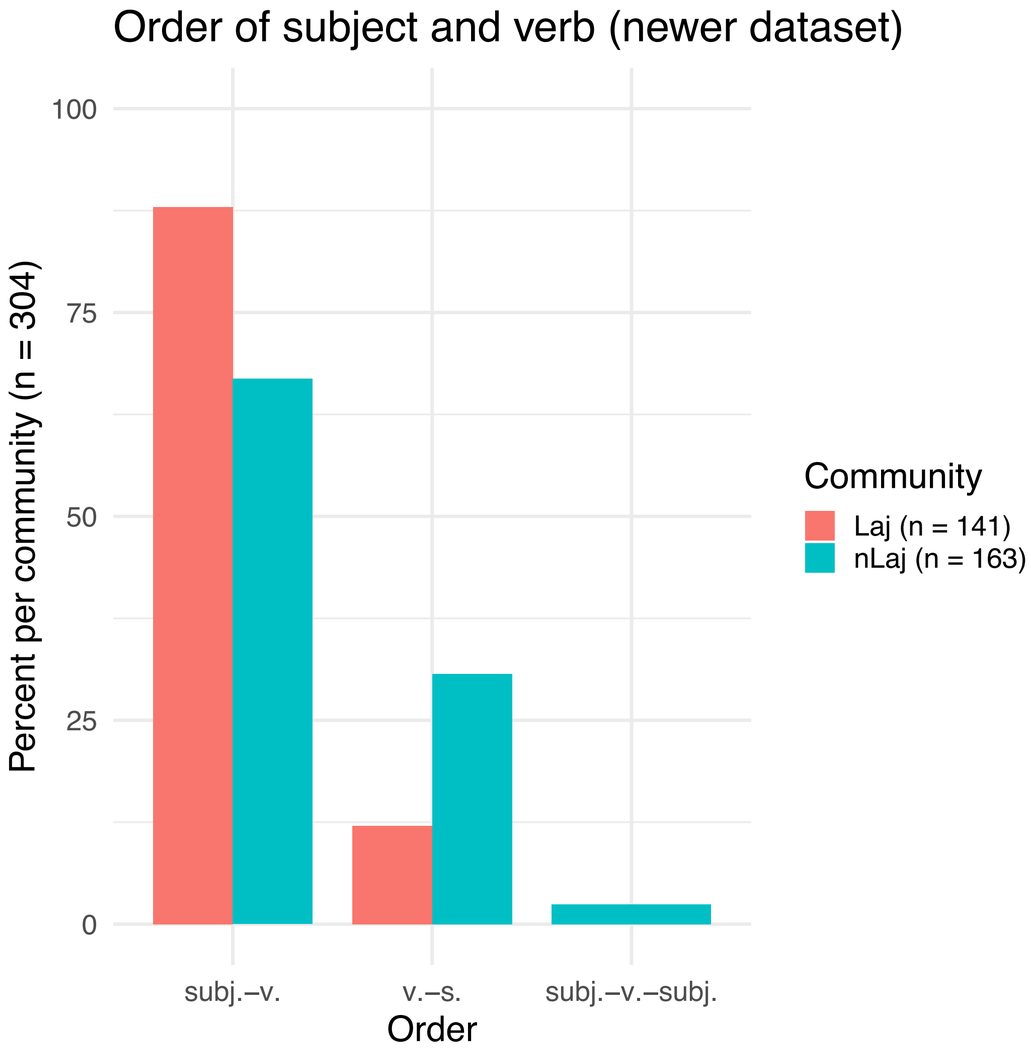


Order of subject and verb



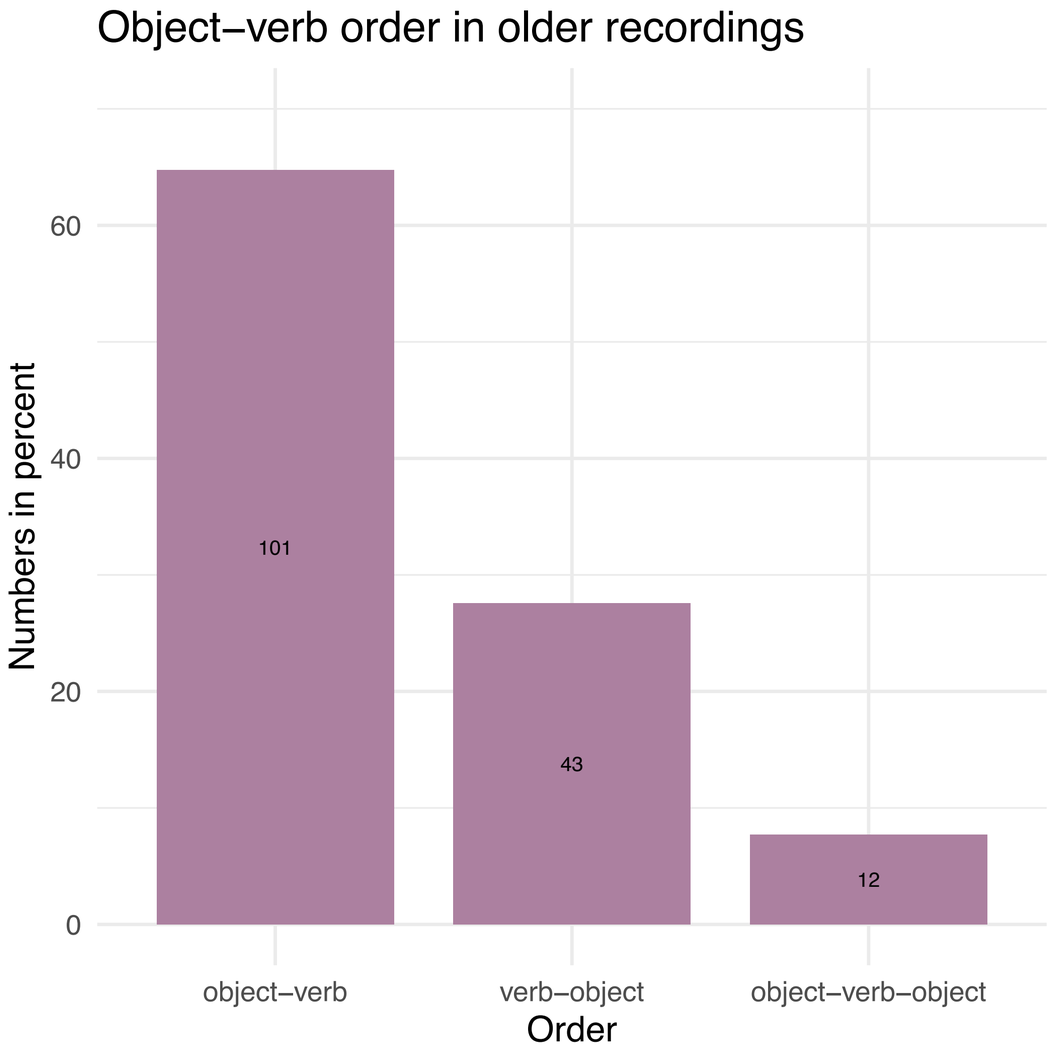


No statistically significant change in word order of subj. and v., but time is the strongest explanatory variable.

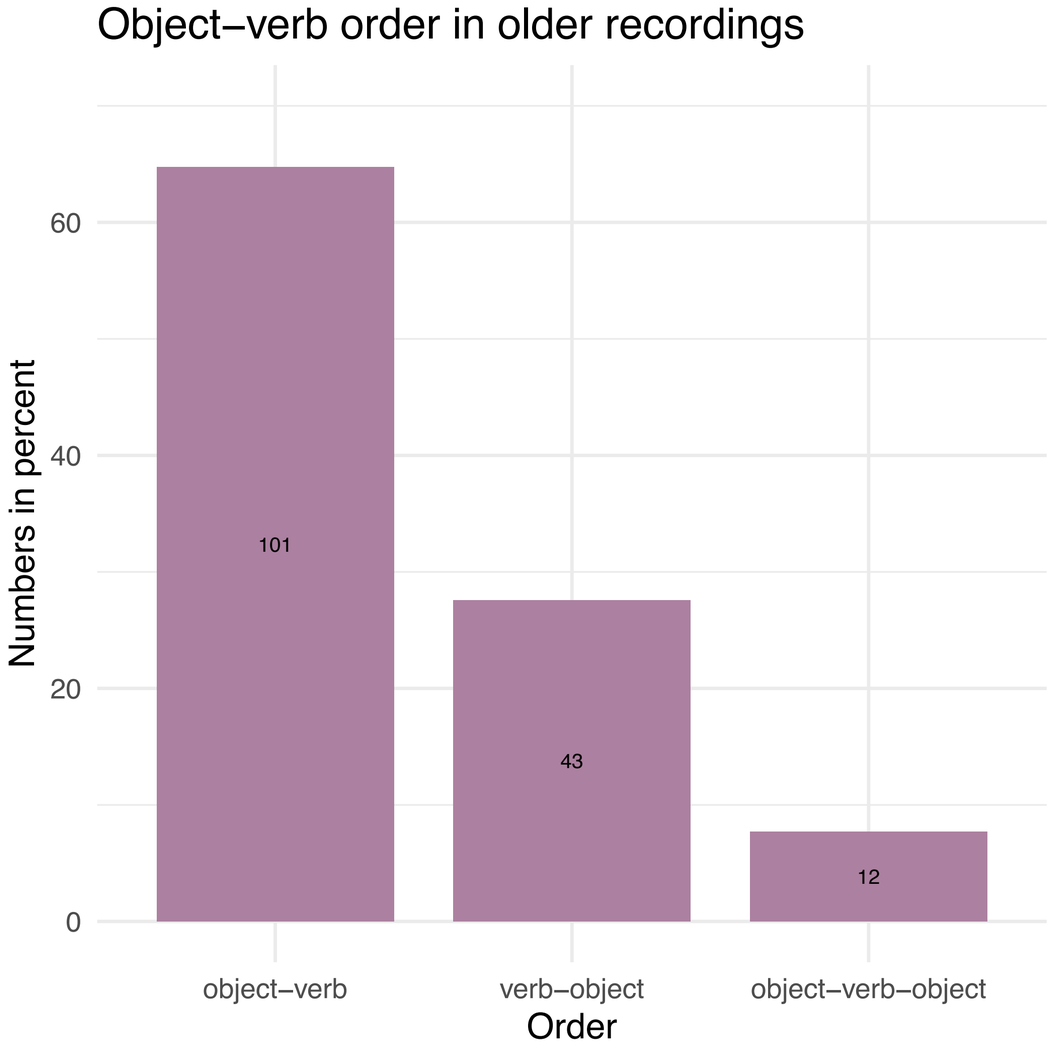


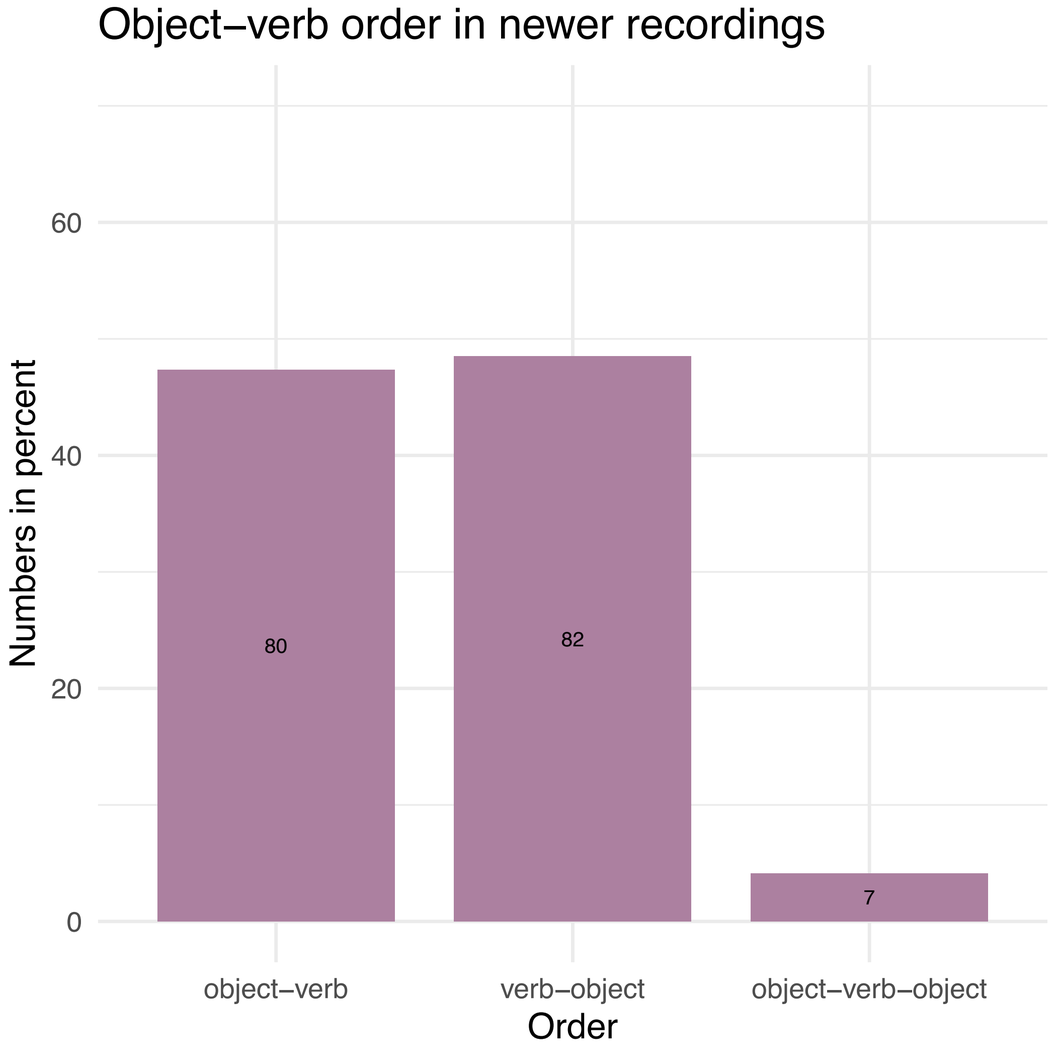
Community has a statistically significant effect on word order in the newer dataset.

Object-verb order



Object-verb order





Time has a statistically significant effect on word order.

Results

What affects word order (and has it changed)?

Northern Territory, ©James Gray (james.gray@anu.edu.au)

Variables included in the analysis:

- Animacy
- Transitivity
- Referential givenness/newness incl. how many clauses/intonation units ago
- Heaviness of nominal expression (how many words/morphemes)
- Speaker age
- ‘Topicality’ (such as frequency of referent per narrative/in last clauses)
- English loanwords
- Existence of case marking
- Word(s)-/speaker-/community-/ genre-specific tendency for a word order
- Priming: word order of the previous clause

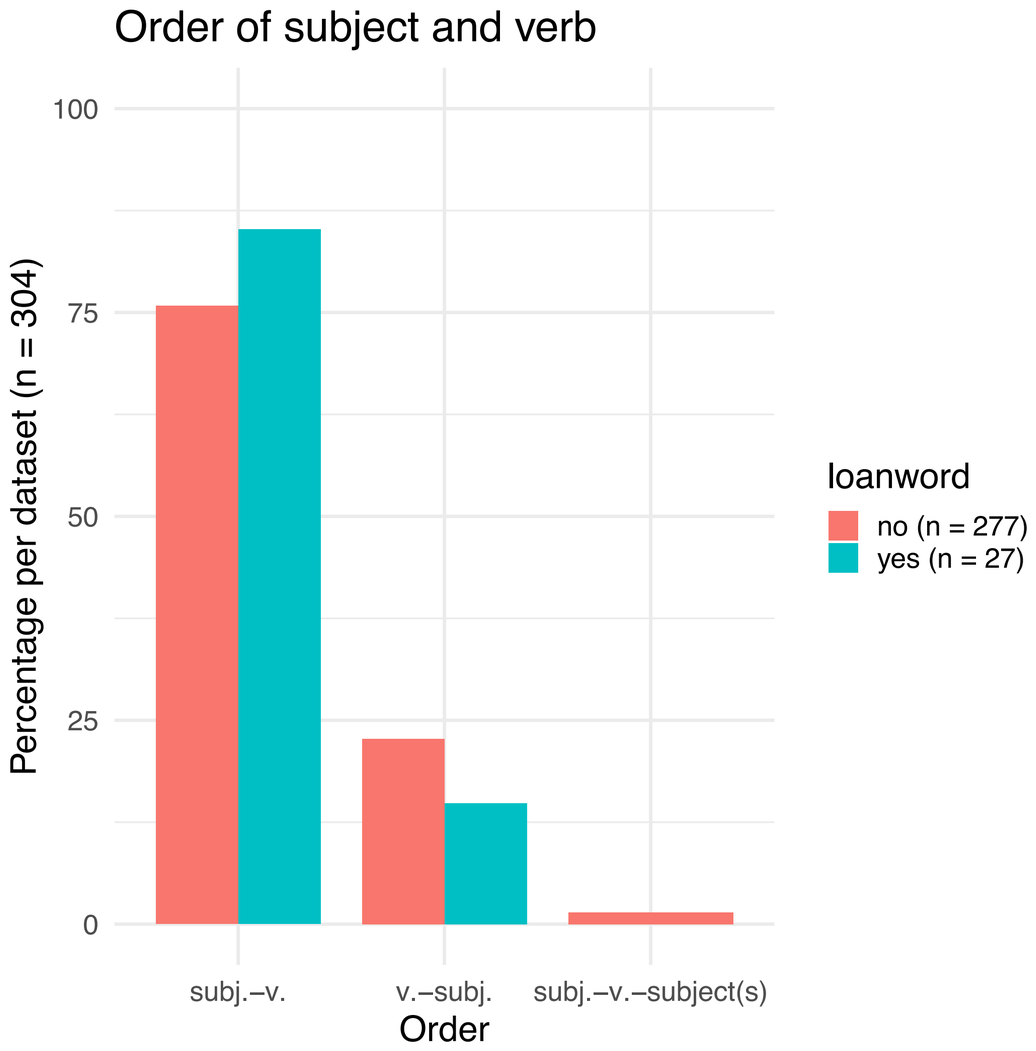
Variables included in the analysis:

- Animacy
- Transitivity
- Referential givenness/newness incl. how many clauses/intonation units ago
- Heaviness of nominal expression (how many words/morphemes)
- Speaker age
- ‘Topicality’ (such as frequency of referent per narrative/in last clauses)
- **English loanwords**
- Existence of case marking
- Word(s)-/speaker-/community-/ genre-specific tendency for a word order
- Priming: word order of the previous clause

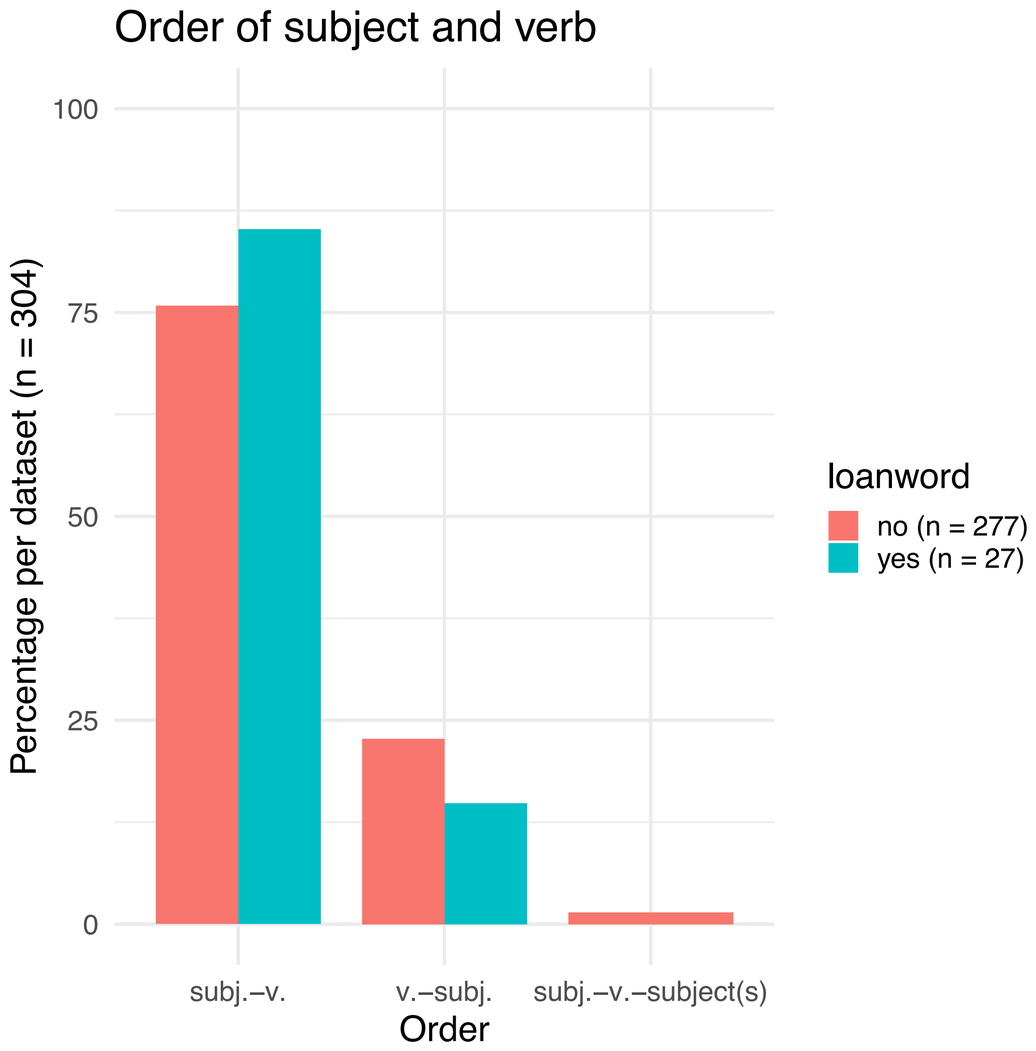
English loanwords

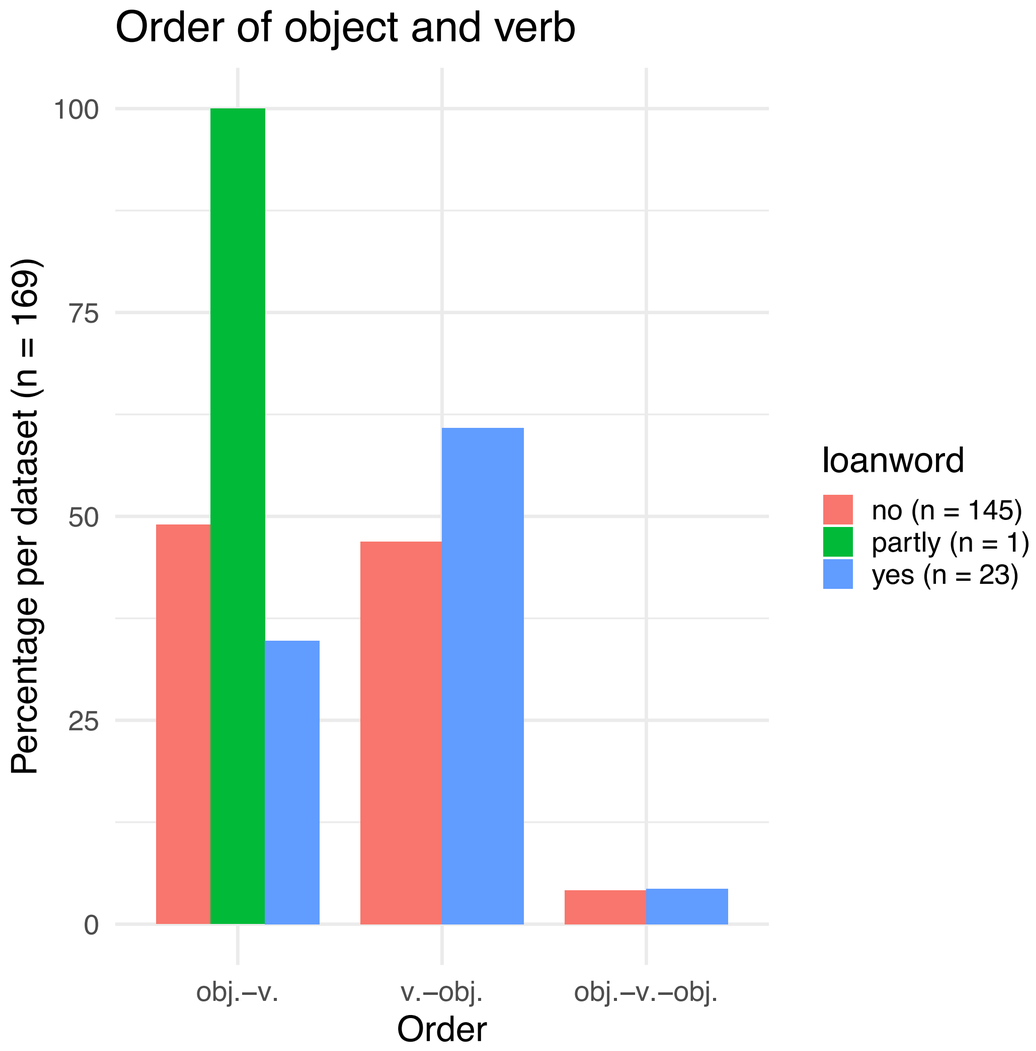
(7)	*wanti-ja*	*=rla*	*ladder*	*=ju*	*jarntu-ku*
	fall-PST	=AUX.3SG.DAT	ladder	=TOP	dog-DAT

‘The ladder falls on the dog.’ (wa293-019; O’Shannessy 2004e)



The effect of loanwords is **not** statistically significant.





The effect of loanwords is **not** statistically significant.

Conclusion: it’s complicated!

- No notable change in SV versus VS order
- Speakers in Lajamanu show more change towards SV
- VO order has become more common, but this has paradoxically led to **more variation**
- Lexical loans may influence syntactic structure (but small dataset, results not statistically significant)

Outlook

- Look at more word order constellations: auxiliary and verb, subordinate clauses, verb and oblique, nominal clauses, …
- Include qualitative analysis of how/if prosody interplays with information structure and word order
- Controlling/testing more variables (and their weight): referential givenness/ newness, priming, heaviness, ‘topicality’, ergative case marking, …
- Analysis of entropy (range of variation in word order) between older and newer dataset (as in Wilmoth et al. 2022)

Thank you!

Northern Territory, ©James Gray (james.gray@anu.edu.au)

Conclusion: it’s complicated!

- No notable change in SV versus VS order
- Speakers in Lajamanu show more change towards SV
- VO order has become more common, but this has paradoxically led to **more variation**
- Lexical loans may influence syntactic structure (but small dataset, results not statistically significant)

References

Australian Bureau of Statistics (2021). Northern Territory. *2021 Census All persons QuickStats*.

Bavin, Edith, and Tim Shopen. (1985). Warlpiri and English: languages in contact. In Clyne, Michael (ed.), *Australia, meeting place of languages,* 81-94.

Bavin, E., & Shopen, T. (1991). Warlpiri in the 80s: An overview of research into language variation and child language. In S. Romaine (Ed.), *Language in Australia* (pp. 104-117). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511620881.008

Daniels, D. N. (2009). Track 6 Yakajirri. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

ELAN (Version 6.3) [Computer software]. 2022. Nijmegen: Max Planck Institute for Psycholinguistics, The Language Archive. Retrieved from https://archive.mpi.nl/tla/elan.

Haig, G., & Schnell, S. (2014). Annotations using GRAID (Grammatical Relations and Animacy In Discourse). Manual Version 7.0. In G. Haig, & S. Schnell (Eds.), *Multi-CAST: Multilingual corpus of annotated spoken texts*. Retrieved 02 August 2019 from https://multicast.aspra.uni-bamberg.de.

Hale, K. L. (1966-1967a). *Warlpiri and Warlmanpa language elicitation*, Australian Institute of Aboriginal and Torres Strait Islander Studies, Call Number HALE_K01, Tape Number 2.13 Track 2. Recorded at Warrarbi, N.T., and Yuendumu, N.T., 1966-1967, by Ken Hale. Creator: Ken Hale, Performer: Stephen Simpson Tjapangardi, Sam Johnson Tjapangardi, Donald Spencer Tjupurrula. https://tinyurl.com/2p84u3ez

Hale, K. L. (1966-1967b). *Warlpiri language elicitation*, Australian Institute of Aboriginal and Torres Strait Islander Studies, Call Number HALE_K04, Tape number 2.19. Recorded at Lander River, N.T., and Yuendumu, N.T., 1966-1967, by Ken Hale. Creator: Ken Hale, Performer: Denny Japaljarri, Sam Johnson Japangardi, Paddy Stewart Jupurrula, Weddie Jangala. https://tinyurl.com/2xxwdpkb

Hale, K. L. (1981). *On the position of Walbiri in a typology of the base*. Indiana University Linguistics Club. (= Linguistics Club Bloomington; 203) https://tinyurl.com/45khrwnz

Hale, K. L. (1983). Warlpiri and the grammar of non-configurational languages. *Natural language and linguistic theory,* 1, 5-47. http://www.jstor.org/stable/4047512

Hale, Ken. 1992. Basic word order in two "free word order" languages. Payne, Doris L. (ed.), Pragmatics of word order flexibility, Amsterdam/Philadelphia: John Benjamins (= Typological studies in language; 22).

Hale, K. L. (1995). *An elementary Warlpiri dictionary*. IAD Press.

Hale, Kenneth; Mary Laughren; and Jane Simpson. 1995. 80. Warlpiri. Jacobs, Joachim, Arnim von Stechow, Wolfgang Sternefeld and Theo Vennemann (eds.), Syntax. Ein internationales Hand- buch zeitgenössischer Forschung. / An international handbook of contemporary research. Halbband 2. Handbücher zur Sprach- und Kommunikationswissenschaft. Berlin, New York: de Gruyter.

Himmelmann, N., Sandler, M., Strunk, J., & Unterladstetter, V. (2018). On the universality of intonational phrases: A cross-linguistic interrater study. *Phonology*, 35(2), 207-245. https://doi.org/ghmnqf

Langlois, Annie (2004). *Alive and kicking : Areyonga teenage Pitjantjatjara*. Canberra: Pacific Linguistics, Research School of Pacific and Asian Studies, Australian National University.

Meggitt, M. J. 1962. *Desert People*. London; Sydney; Singapore; Manila: Angus and Robertson.

Morton, L. N. (2009a). Track 1 Manja. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

Morton, L. N. (2009b). Track 2 Janjinngi. In Warlpiri-patu-kurlangu Jaru (Ed.), Jaru-kurlu. *Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

Morton, L. N. (2009c). Track 3 Yinapaka. Jaru-kurlu. Warlpiri-patu-kurlangu Jaru (Ed.), *Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

Morton, L. N. (2009d). Track 4 Jitirlpuru. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

References

Morton, L. N. (2009e). Track 5 Wapilingki. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

Nash, D. (1980). *Topics in Warlpiri grammar*. [Doctoral dissertation, MIT]. https://tinyurl.com/38rv5tn4

Nelson, L. N. (2009). Track 15 Jujuminyi-minyi. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

O'Shannessy, Carmel. (2004a). Item *"ERGstoryWA32_1"* in collection "C. O Shannessy". The Language Archive. https://hdl.handle.net/1839/00-0000-0000-0021-107F-8. (Accessed 2022-03-21)

O'Shannessy, Carmel. (2004b). Item "ERGstoryWA32_2" in collection "C. O Shannessy". The Language Archive. https://hdl.handle.net/1839/00-0000-0000-0021-109B-A. (Accessed 2022-03-21)

O'Shannessy, Carmel. (2004c). Item "ERGstoryWA32_3" in collection "C. O Shannessy". The Language Archive. https://hdl.handle.net/1839/00-0000-0000-0021-10A2-8. (Accessed 2022-03-21)

O'Shannessy, Carmel. (2004d). Item "ERGstoryWA29_1" in collection "C. O Shannessy". The Language Archive. https://hdl.handle.net/1839/00-0000-0000-0021-1092-4. (Accessed 2022-03-21)

O'Shannessy, Carmel. (2004e). Item "ERGstoryWA29_3" in collection "C. O Shannessy". The Language Archive. https://hdl.handle.net/1839/00-0000-0000-0021-1088-6. (Accessed 2022-03-21)

O'Shannessy, C. (2006). *Language contact and children's bilingual acquisition: Learning a mixed language and Warlpiri in northern Australia*. [Doctoral dissertation, University of Sydney]. http://hdl.handle.net/2123/1303

O'Shannessy, Carmel, (2020) 'Language Contact in Warlpiri and Light Warlpiri', in Anthony P. Grant (ed.), The Oxford Handbook of Language Contact

O'Shannessy, Carmel. (2016). Entrenchment of Light Warlpiri morphology. In Felicity Meakins & Carmel O'Shannessy (Eds.), Loss and Renewal: Australian Languages Since Contact (pp. 217-252). Berlin: Mouton de Gruyter.

O'Shannessy, Carmel. 2022. Warlpiri DoReCo dataset. In Seifart, Frank, Ludger Paschen and Matthew Stave (eds.). *Language Documentation Reference Corpus (DoReCo) 1.0*. Berlin & Lyon: Leibniz-Zentrum Allgemeine Sprachwissenschaft & laboratoire Dynamique Du Langage (UMR5596, CNRS & Université Lyon 2). (https://doi.org/10.34847/nkl.042dv614).

Presley, M N. (2009). Track 7 Yawakiyi. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

Reinöhl, U., Culhane, K., Fries, S., Peck, N., and Vollmer, M. (In prep.). *Annotating Chafe's one-new- idea constraint: Annotation Notes.*

Ross, M. N. (2009). Track 17 Ngapa-kurlu. In Warlpiri-patu-kurlangu Jaru (Ed.), *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://www.trafford.com/BookStore/BookDetails/168778-jaru-kurlu

Schiborr, N., Schnell, S., & Thiele, H. (2018). RefIND – Referent indexing in natural-language discourse. Annotation guidelines v1.1. In G. Haig, & S. Schnell (Eds.*), Multi-CAST: Multilingual corpus of annotated spoken texts.* Retrieved on 02 August 2019 from multicast.aspra.uni-bamberg.de.

Schultze-Berndt, E., & Himmelmann, N. (2004). Depictive secondary predicates in crosslinguistic perspective. *Linguistic Typology,* 8, 59-131. https://doi.org/10.1515/lity.2004.004

Simpson, J. (1983). *Aspects of Warlpiri morphology and syntax*. [Doctoral dissertation, MIT]. https://tinyurl.com/2p82pp4c

Simpson, J. (2005). Depictives in English and Warlpiri. In N. Himmelmann, & E. Schultze-Berndt (Eds.), *Secondary predication and adverbial modification: The typology of depictives* (pp. 69-106). OUP. https://doi.org/10.1093/acprof:oso/9780199272266.003.0002

Simpson, J. (2006). Expressing pragmatic constraints on word order in Warlpiri. In J. Grimshaw, J. Maling, C. Manning, J. Simpson and A. Zaenen (Eds.), *Architectures, rules, and preferences: A Festschrift for Joan Bresnan* (pp. 491-514). CSLI Publications. https://tinyurl.com/3u3bp8f5

Swartz, S. (1988). Pragmatic structures and word order in Warlpiri. *Papers in Australian Linguistics,* 17, 151-166.

Swartz, S. 1991. Constraints on zero anaphora and word order in Warlpiri narrative text. *SIL-AAIB Occasional Papers,* (1). Summer Institute of Linguistics, Australian Aborigines and Islanders Branch.

Warlpiri-patu-kurlangu Jaru (Ed.). (2009). *Jaru-kurlu. Traditional stories and songs by senior Warlpiri women from Wirliyajarrayi (Willowra), Yurntumu (Yuendumu), Lajamanu and Nyirrpi communities with accompanying audio CD.* Trafford Publishing. https://tinyurl.com/yvp3x473

Wilmoth, Sasha, Rachel Nordlinger, Gabriela Garrido & Evan Kidd. (2022) Word order flexibility in Pitjantjatjara, across genres and generations. Talk held at the *Symposium on Languages and Linguistics in honour of Jane Simpson.*

Acknowledgement

Many thanks to the Warlpiri speaking communities who provided the material used in this presentation. I acknowledge that the Warlpiri data was recorded on Warlpiri and Gurindji land and I pay my respects to their elders past, present and emerging.

Thanks to Uta Reinöhl and Jane Simpson for their invaluable and continuous feedback on this talk and my thesis. Thank you to David Nash for his help with the Warlpiri recordings and with their analysis.

Thanks to James Gray, Haoyi Li, Laura Becker, and Jenny Herzky for linguistic and non-linguistic cross-country discussions and support!

This project is supported by funding from the Deutsche Forschungsgemeinschaft project number 406074683, and the ARC Centre of Excellence for the Dynamics of Language project ID CE140100041.

Appendix: Raw numbers of order of subj. + v. in older/newer data

> frequency_old_inpercent

	Var1	Freq	Percentage
1	ambiguous	1	0.58
2	subj.-v.-subj.	10	5.81
3	subject-verb	122	70.93
4	verb-subject	39	22.67

> frequency_new_inpercent

	Var1	Freq	Percentage
1	ambiguous	2	0.65
2	subj.-v.-subject(s)	4	1.31
3	subject-verb	233	76.14
4	verb-subject	67	21.90

Appendix: Order of subject and verb across time

```
> summary(change_sv_glm)

Call:
glm(formula = word.order_binary ~ timeframe_binary, family = "binomial",
    data = sv_order_all)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.7315   0.7110   0.7110   0.7344   0.7344

Coefficients:
                 Estimate Std. Error z value Pr(>|z|)
(Intercept)       1.24635    0.13863   8.991   <2e-16 ***
timeframe_binary -0.07363    0.22977  -0.320    0.749
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 499.22  on 464  degrees of freedom
Residual deviance: 499.12  on 463  degrees of freedom
AIC: 503.12

Number of Fisher Scoring iterations: 4
```

```
> summary(change_sv_glm_withcontrol)

Call:
glm(formula = word.order_binary ~ timeframe_binary + animacy2 +
    loanwordwithverb + Lajornot + picbookornot, family = "binomial",
    data = sv_order_all)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.1457   0.4592   0.6811   0.7703   1.1040

Coefficients:
                   Estimate Std. Error z value Pr(>|z|)
(Intercept)          1.0286     0.4330   2.376  0.01752 *
timeframe_binary     0.8432     0.2979   2.831  0.00465 **
animacy2nhuman       0.2799     0.2408   1.162  0.24511
loanwordwithverbyes 11.3695   535.4113   0.021  0.98306
LajornotnLaj        -0.8535     0.3478  -2.454  0.01414 *
picbookornotpicbook  0.8881     0.3365   2.639  0.00830 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 499.22  on 464  degrees of freedom
Residual deviance: 474.69  on 459  degrees of freedom
AIC: 486.69

Number of Fisher Scoring iterations: 12

> drop1(change_sv_glm_withcontrol, test = "Chisq")
Single term deletions

Model:
word.order_binary ~ timeframe_binary + animacy2 + loanwordwithverb +
    Lajornot + picbookornot
                Df Deviance    AIC    LRT Pr(>Chi)
<none>               474.69 486.69
timeframe_binary  1   482.68 492.68 7.9932 0.004695 **
animacy2          1   476.04 486.04 1.3519 0.244942
loanwordwithverb  1   474.90 484.90 0.2100 0.646796
Lajornot          1   480.86 490.86 6.1694 0.012998 *
picbookornot      1   481.71 491.71 7.0192 0.008064 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
>
```

Appendix: Variables and their weight regarding word order of subject and verb

Appendix: Order of subj. and v. + community/age

> barplot_community

	word.order	Lajornot	n	percentage
1	subj.-v.	Laj	124	87.94
2	subj.-v.	nLaj	109	66.87
3	subj.-v.-subj.	nLaj	4	2.45
4	v.-s.	Laj	17	12.06
5	v.-s.	nLaj	50	30.67

> barplot_age

	word.order	recname_speakerage	n	percentage
1	subj.-v.	40	119	89.47
2	subj.-v.	50	72	67.29
3	subj.-v.	60	42	65.62
4	subj.-v.-subj.	50	3	2.80
5	subj.-v.-subj.	60	1	1.56
6	v.-s.	40	14	10.53
7	v.-s.	50	32	29.91
8	v.-s.	60	21	32.81

Appendix: Community and age influencing order of subject and verb in newer dataset

> summary(change_sv_new_glm_age)

Call:

glm(formula = word.order_binary ~ speakerage, family = "binomial",

    data = sv_order_onlynew)

Deviance Residuals:

    Min   1Q   Median   3Q   Max

-1.8108   0.6569   0.6569   0.6569   0.9005

Coefficients:

                  Estimate Std. Error z value Pr(>|z|)

(Intercept)   0.6931   0.2673   2.594   0.0095 **

speakerageunder60   0.7305   0.3137   2.329   0.0199 *

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 318.66 on 299 degrees of freedom

Residual deviance: 313.46 on 298 degrees of freedom

AIC: 317.46

Number of Fisher Scoring iterations: 4

> summary(change_sv_new_glm_Laj)

Call:

glm(formula = word.order_binary ~ Lajornot, family = "binomial",

    data = sv_order_onlynew)

Deviance Residuals:

    Min   1Q   Median   3Q   Max

-2.0570   0.5069   0.5069   0.8690   0.8690

Coefficients:

              Estimate Std. Error z value Pr(>|z|)

(Intercept)   1.9871   0.2586   7.683 1.55e-14 ***

LajornotnLaj -1.2077   0.3099 -3.897 9.75e-05 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 318.66 on 299 degrees of freedom

Residual deviance: 301.79 on 298 degrees of freedom

AIC: 305.79

Number of Fisher Scoring iterations: 4

Appendix: Community and age influencing order of subject and verb in newer dataset

> summary(change_sv_new_glm_all)

Call:

glm(formula = word.order_binary ~ Lajornot + speakerage, family = "binomial", data = sv_order_onlynew)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.0654	0.5022	0.5022	0.8290	0.9435

Coefficients:

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	1.6940	0.4046	4.187	2.82e-05	***
LajornotnLaj	-1.1153	0.3262	-3.419	0.000627	***
speakerageunder60	0.3129	0.3345	0.935	0.349623	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 318.66 on 299 degrees of freedom

Residual deviance: 300.92 on 297 degrees of freedom

AIC: 306.92, Number of Fisher Scoring iterations: 4

> drop1(change_sv_new_glm_all, test = "Chisq")

Single term deletions

Model:

word.order_binary ~ Lajornot + speakerage

	Df	Deviance	AIC	LRT	Pr(>Chi)	
<none>		300.92	306.92			
Lajornot	1	313.46	317.46	12.5347	0.0003995	***
speakerage	1	301.79	305.79	0.8635	0.3527708	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Appendix: Raw numbers of order of obj. + v. in older/newer data

> frequency_old_inpercent

	Var1	Freq	Percentage
1	object-verb	101	64.74
2	object-verb-object	12	7.69
3	verb-object	43	27.56

> frequency_new_inpercent

	Var1	Freq	Percentage
1	object-verb	80	47.34
2	object-verb-object	7	4.14
3	verb-object	82	48.52

Appendix: Significance of time variable on order of object and verb

> summary(change_ov_glm)

Call:

glm(formula = word.order_binary ~ timeframe_binary, family = "binomial",

data = ov_order_all)

Deviance Residuals:

Min 1Q Median 3Q Max

-1.5547 -1.1669 0.8423 1.1879 1.1879

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -0.02469 0.15715 -0.157 0.875142

timeframe_binary 0.87861 0.24052 3.653 0.000259 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 413.90 on 305 degrees of freedom

Residual deviance: 400.14 on 304 degrees of freedom

AIC: 404.14

Number of Fisher Scoring iterations: 4

Appendix: Control variables and influences on word order of object and verb

> summary(change_ov_glm_withcontrol)

Call: glm(formula = word.order_binary ~ timeframe_binary + animacy2 + loanword + Lajornot + picbookornot, family = "binomial", data = ov_order_all)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.5603	-0.9207	0.8379	0.9009	1.6848

Coefficients:

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	0.02086	0.71498	0.029	0.976726	
timeframe_binary	0.17428	0.29375	0.593	0.552979	
animacy2nhuman	0.16795	0.59335	0.283	0.777138	
loanword partly	13.87406	882.74341	0.016	0.987460	
loanword yes	-0.21597	0.49007	-0.441	0.659440	
LajornotnLaj	0.50320	0.41265	1.219	0.222675	
picbookornotpicbook	-1.33110	0.37798	-3.522	0.000429	***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 413.90 on 305 degrees of freedom

Residual deviance: 375.25 on 299 degrees of freedom

AIC: 389.25

Number of Fisher Scoring iterations: 13

Appendix: Control variables and influences on word order of object and verb

> drop1(change_ov_glm_withcontrol, test = "Chisq")

Single term deletions

Model: word.order_binary ~ timeframe_binary + animacy2 + loanword + Lajornot + picbookornot

	Df	Deviance	AIC	LRT	Pr(>Chi)
<none>		375.25	389.25		
timeframe_binary	1	375.60	387.60	0.3508	0.5536634
animacy2	1	375.33	387.33	0.0794	0.7780990
loanword	2	376.26	386.26	1.0145	0.6021470
Lajornot	1	376.73	388.73	1.4835	0.2232288
picbookornot	1	388.17	400.17	12.9258	0.0003241 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Appendix: Loanwords

> barplot_loanwords

	word.order	loanword	n	percentage
1	subj.-v.	no	210	75.81
2	subj.-v.	yes	23	85.19
3	subj.-v.-subject(s)	no	4	1.44
4	v.-subj.	no	63	22.74
5	v.-subj.	yes	4	14.81

> barplot_loanwords_ov_new

	word.order	loanword	n	percentage
1	obj.-v.	no	71	48.97
2	obj.-v.	partly	1	100.00
3	obj.-v.	yes	8	34.78
4	obj.-v.-obj.	no	6	4.14
5	obj.-v.-obj.	yes	1	4.35
6	v.-obj.	no	68	46.90
7	v.-obj.	yes	14	60.87

Appendix: The effect of loanwords is not significant

> summary(change_sv_new_glm_loanword)

Call:

glm(formula = word.order_binary ~ loanword, family = "binomial",

    data = sv_order_onlynew)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.9348	0.5780	0.7229	0.7229	0.7229

Coefficients:

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	1.2087	0.1436	8.419	<2e-16	***
loanword yes	0.4960	0.5622	0.882	0.378	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 318.66 on 299 degrees of freedom

Residual deviance: 317.80 on 298 degrees of freedom

AIC: 321.8

Number of Fisher Scoring iterations: 4