SUMU-MAYANGNA MERONYMS: MAPPING VOLUMES AND PROJECTING FACETS

Alyson Eggleston, Elisa Salomón, Demetrio Antolín,
Susana Budier, Modesta Dolores, Gloria Fendly,
Tomasa Gomez, and Elena Benedicto

Meronymy Across Languages – UNAM
Mexico D.F., Mexico
September 27-28, 2013

PURDUE UNIVERSITY

Goals

- Sumu-Mayangna meronym productivity
- Structural profile
- Towards a meronymy mapping algorithm (MMA)

Sumu-Mayangna meronyms: Mapping volumes and projecting facets

1. Meronymy productivity in Sumu-Mayangna
2. Meronyms in structural context
   - Spatial expressions
   - Locations and projections
3. Toward an algorithm for domain-general meronyms
   - Algorithm
   - Duplicate assignment of meronyms
   - Structural independence
   - Interpretation and orientation preferences
4. Quantitative comparison
   - Meronymy usage in Sumu-Mayangna, Nicaraguan Spanish, and Barcelona Spanish
   - Frame of Reference (FoR) usage in Novel Objects II: 3 cohorts
5. Conclusions and Future Work

1. Meronymy productivity in Sumu-Mayangna

Drawings Task

How do we measure productivity?

1. Current measure: Cross-domain usage
2. Structural properties
   - Participation in syntagmatic and lexical compounds
3. Mapping to Novel Objects I (Bohnemeyer, 2008) (Levinson, 1994; MacLaury 1989)

Domain-general Sumu-Mayangna meronyms

- Out of 2,124 (non-unique entries)
  - Human, animal, plant, artifact domains
- limiting criterion:
  - ≥ ¾ domains: human, animal, and plant OR artifact

Meronym	Shape	Domain Productivity	Structural Productivity	Novel Objects I Usage
bâ	Volume	X	X	X
mak/makpa	Volume	X	X	X
tapan	Volume	X	X	X
tun	Volume	X	X	X
sapan	Volume	---	---	X
basan	Extension/Protuberance	X	X	?
dinluk	Extension/Protuberance	X	---	X
kal	Extension/Protuberance	X	X	X
nangtak	Extension/Protuberance	X	X	X
sut	Extension/Protuberance	X	X	X
ting	Extension/Protuberance	X	X	X
dang	Facet	X	X	X
tang	Facet	---	X (limited)	X
muh	Facet	X	X	X
pirin	Facet	X	X (limited)	X
sait	Facet	---	X (limited)	X
sar	Facet	X	X	X
tâ	Facet	---	---	X
pan	Column	X	X	X
an	Border/Edge	X	---	---
kung	Border/Edge	X	X	X
sipintang/lawani	Border/Edge	---	---	X
rahrah	Negative space: y-shaped	X	X	X
sulinh	Negative space: round	X	X	X
tinapas	Negative space	---	---	X

1. Meronymy productivity in Sumu-Mayangna

Conceptual algorithm summary

- volume
- extension/protuberance
- facet
- column
- border/edge
- negative space

Geometric continuum: 2D → 3D → Junctions → Cavities

Sumu-Mayangna meronyms: Mapping volumes and projecting facets

1. Meronymy productivity in Sumu-Mayangna
2. Meronyms in structural context
   - Spatial expressions
   - Locations and projections

2. Meronyms in structural context

Structural profile

- Head-final position within nominal phrase
  - (Hale, 1994; Benedicto, 2002)
- Consistently head-final throughout the grammar.
- Nominal inflection
  - Construct state and facet-based relational noun forms (small set)

Meaning	Nominal form (construct state)	Nominal meaning	Relational noun form (3rd Singular)	Relational noun meaning
'back'	dang-ni	'her back'	dang-ni-t	'behind her'
'face'	muh-ni	'her face'	muh-ni-t	'in front of her'

2. Meronyms in structural context

Compositional compounds

- Lexical and syntagmatic

Nominal	Construct State	Syntagmatic Compound	Lexical Compound
nangtak	nangnitak	nangtak pana / nangtak panan nangtak minit nangtak sibiln nangtak sut tân nangtak / tang nangtak	tângnantak

2. Meronyms in structural context

Nominal	Construct State	Syntagmatic Compound	Lexical Compound
sar	saran	dikwa saran	kuansar
		mahman sut saran	ûkalnisar
		anan saran	
		âm saran	
		panan saran	
		ulun saran / sausulun saran	
		wilu saran	

2. Meronyms in spatial context

Spatial expressions

- Locative (or contact reading)
  - (Meronym) + AUX CL
- Projective
  - (Meronym) + AUX CL + RN

Auxiliary Classifier	Argument
sak	non-moving, non-horizontal
lik	moving
pas	2-D horizontal
tus	3-D horizontal
wit	hanging

(Benedicto, 2002)

2. Meronyms in structural context

Non-BLC spatial expressions

- Locative (or contact reading)
  - (Meronym) + AUX CL

Locative or contact reading

saran **rahran** kau kiki lik ki
'The ant is moving on the y-shaped-cavity of the base-facet.'
(1_MBN_To_1)

kalni**bâ** yak bilap kasna sak ki
'At the round-volume-thing of the lower extension, the fly is there eating.'
(P7090071 / 1_HMBS)

2. Meronyms in structural context

Non-BLC spatial expressions

- Projective
  - (Meronym) + RN + PP+ AUX CL

Projective reading

sasah as sâkara muhnit yak wit ki
'the mosquito is toward the front of the chicken.'
P7090063 / 2_Ch

û kalni sut yaihnit yak baba as wit ki
'the fly is hanging there in front of the extensional tip of the lower extension of the hoe.'
P7090070 / 4_MaH

2. Meronyms in structural context

(Eggleston, 2012)

	Facets	Volumes – Simple	Volumes - Complex	
			Syntagmatic Compound	Lexical Compound
- Projection	(1) [[[Facet(N)]NP + P] PP + AUXC]	(3) [[[Vol(N)] NP + P] PP +AUXC]	(5) [[[[Vol(N2)]Mero(N1) + CS] NP+P] PP + AUXC]	(7) [[[[Vol(N2)]Mero(N1)+CS] NP+P]PP+AUXC]
+ Projection	(2) [Facet(N)>(RN) [PP [AUXC]]]	(4) [Vol(N)[Facet/(RN) [PP[AUXC]]]]	(6) [Vol(N2)[Mero(N1) + CS[Facet/(RN)[PP[AUXC]]]]]	(8) [Vol(N2)[Mero(N1) + CS [Facet/(RN) [PP[AUXC]]]]

Sumu-Mayangna meronyms: Mapping volumes and projecting facets

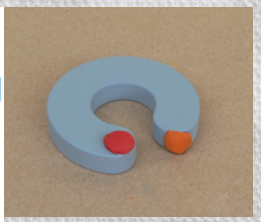
1. Meronymy productivity in Sumu-Mayangna
2. Meronyms in structural context
   - Spatial expressions
   - Locations and projections
3. Toward an algorithm for domain-general meronyms
   - Algorithm
   - Duplicate assignment of meronyms
   - Structural independence
   - Interpretation and orientation preferences

3. Toward an algorithm for domain-general meronyms

- duplicate assignment was not restricted

mâ	niking	yak	sak	ki	kun	**nangtak**	**bû**	pak	kidi,	mâ	niking
our	against.RN	PP	AUX.CL	PTC	DSJ	nose.N	two	AUX.CL	DET	our	against.RN
yak	sak	ki									
PP	AUX.CL	PTC									

‘it is in front of us, but there are two noses, it is in front of us’
(N-A 1Ch1 00:06:38)



waralaih	**tapan**	**bin**	**arauk**	**sak**	kidi	talnaman
now	ear.N.CS	small	four	AUX.CL	DET	see.V-PST.2SG

‘now, you saw four little ears’
(Gl-M 2Ch5 3:05-3:09)

kaln	binina	...talnam	ainingh	**bas**	**rau**	**ki**	dawakat	mâ	muk	kat
foot.N.CS	small	see.V-PST.2SG	FOC	three	AUX.CL	PTC	CONJ	our	front.RN	PTC
kidi										
DET										

‘the little feet you saw, in front of us, there are three of these’
(B-B 2Ch3 00:29-00:40)

3. Toward an algorithm for domain-general meronyms

- structural independence

tunun	mâ	saitni	yak	**kaln**	**bin**	**kidi**, aih	saitni	kau	kaln	bin
head.N.CS	sun	side.N.CS	PP	foot.N.CS	small	DET	FOC	side.N.CS	PP	foot.N.CS	small

kidi	mâ	kau
DET	sun	PP

‘the little feet of the head are pointing up, on the right the little feet are up’
(B-B 2Ch6 00:36-00:41)

kalni	**binina**	rau	kalaih,	**tunun**	utun	bin	tuyul	yak… […]
foot.N.CS	small	AUX.CL	FOC	head.N.CS	navel	small	round	PP

‘the little feet that are there, in the round little navel of the head’
(G-M 2Ch7 7:18-7:22)

3. Toward an algorithm for domain-general meronyms

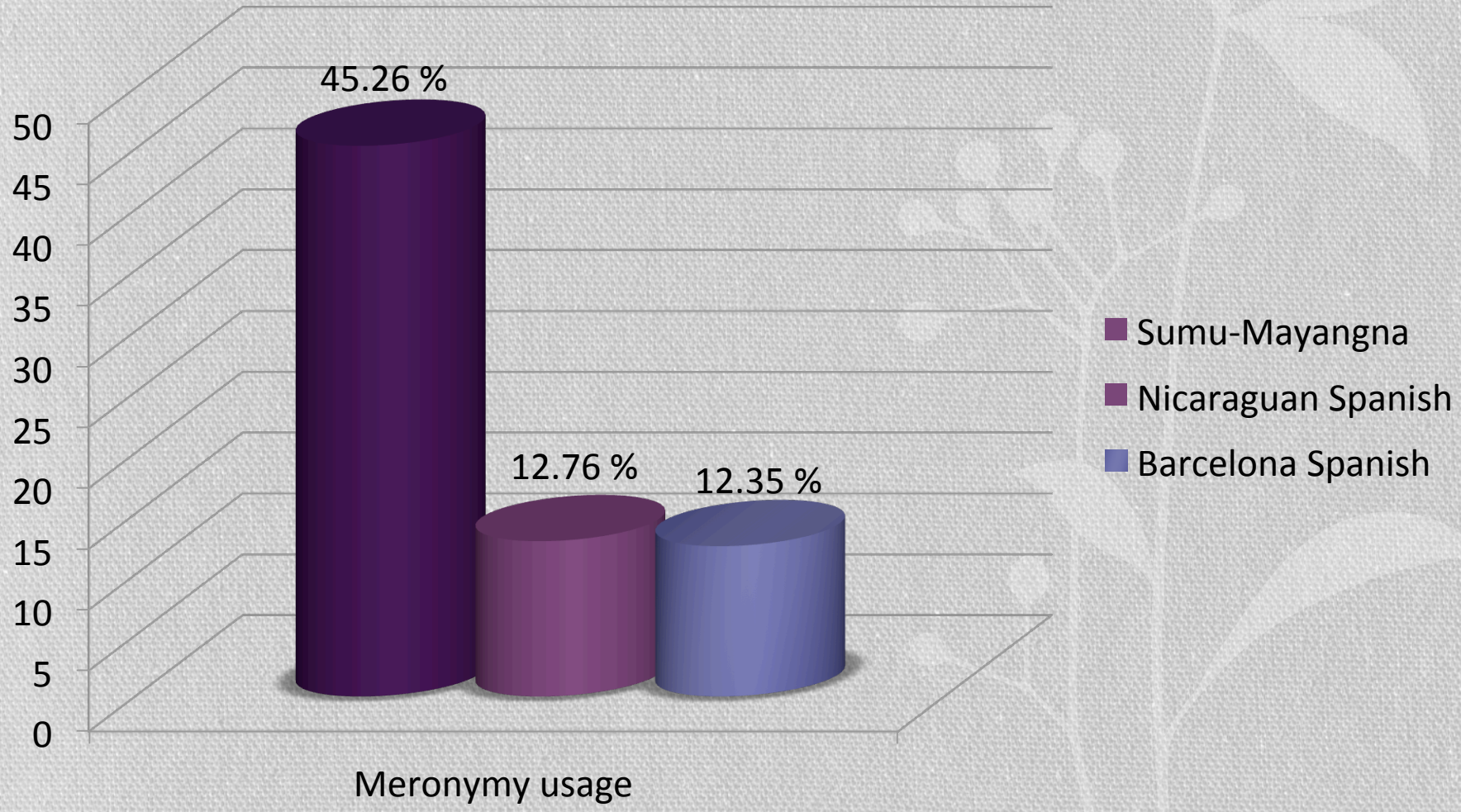
Algorithm

- Interpretation and orientation
  - Canonical orientation was not observed
  - Speakers interpret the object much of the time – 44%
    - But meronym generation does not flow from initial interpretation
  - Speakers orient the object a majority of the time – 78%
    - Unclear how orientation may function to identify meronyms!

Sumu-Mayangna meronyms: Mapping volumes and projecting facets

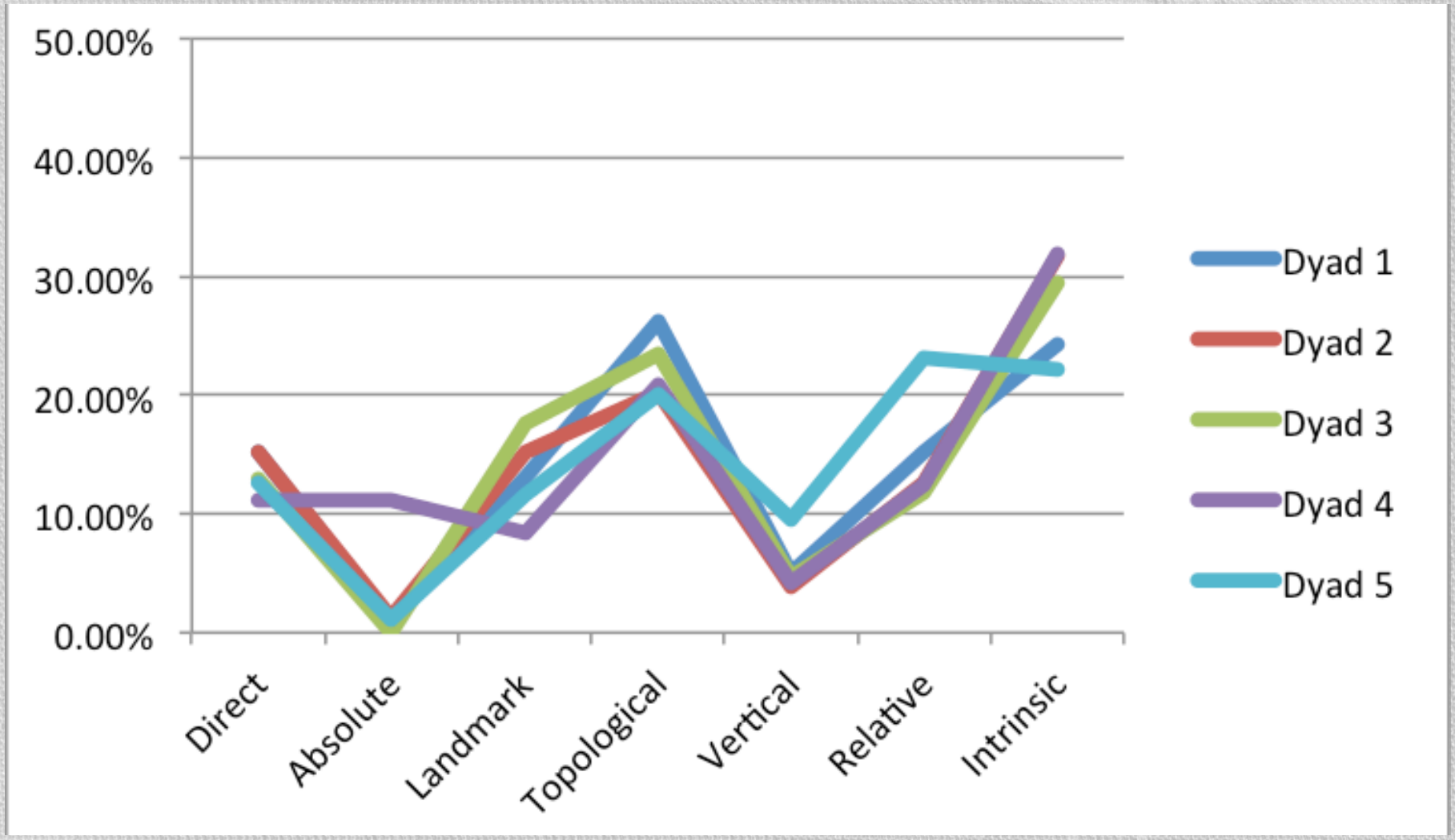
1. Meronymy productivity in Sumu-Mayangna
2. Meronyms in structural context
   - Spatial expressions
   - Locations and projections
3. Toward an algorithm for domain-general meronyms
   - Algorithm
   - Duplicate assignment of meronyms
   - Structural independence
   - Interpretation and orientation preferences
4. Quantitative comparison
   - Meronymy usage in Sumu-Mayangna, Nicaraguan Spanish, and Barcelona Spanish
   - Frame of Reference (FoR) usage in Novel Objects II: 3 cohorts

4. Quantitative comparison



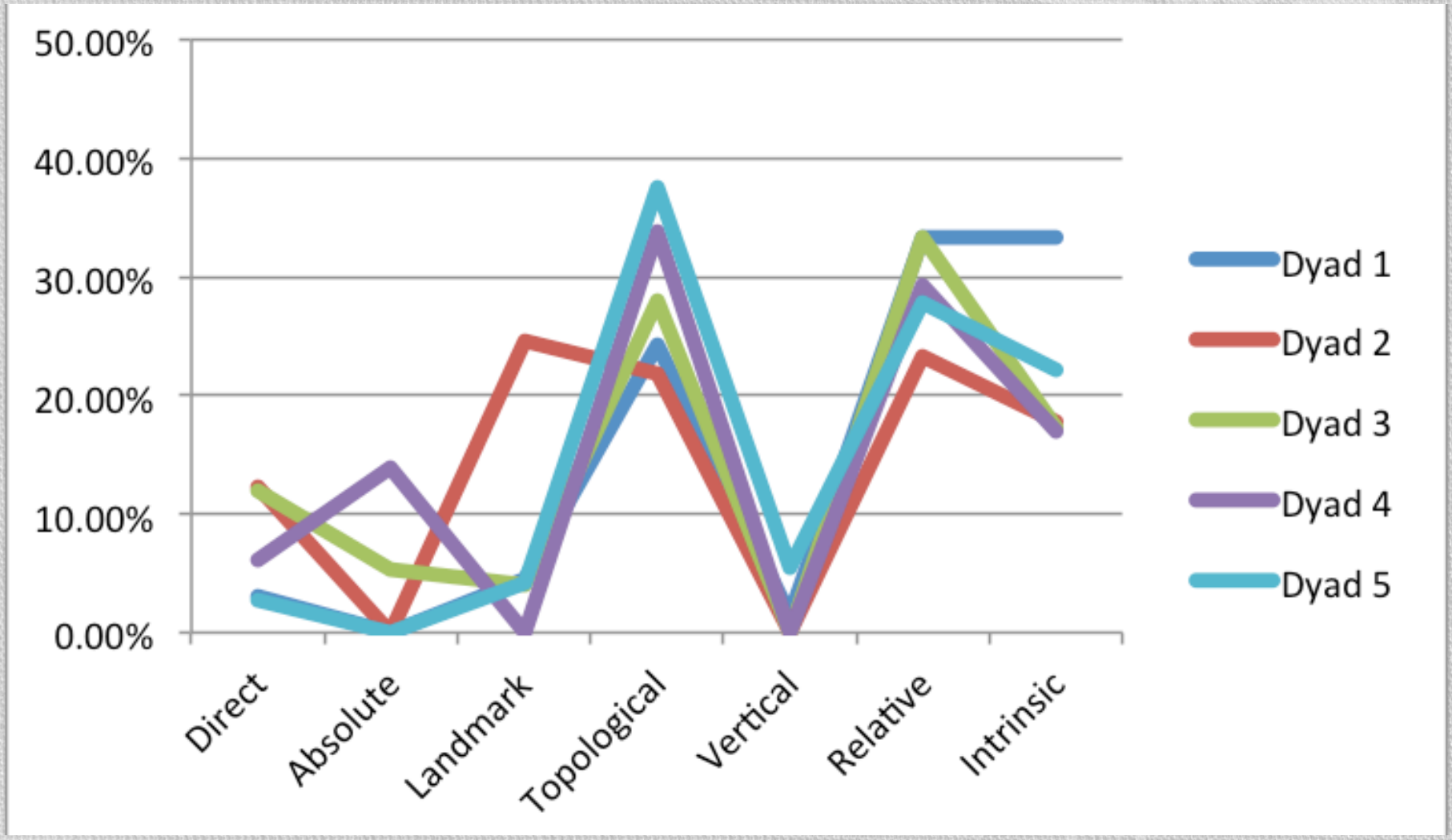
4. Quantitative comparison

(Eggleston, 2012)



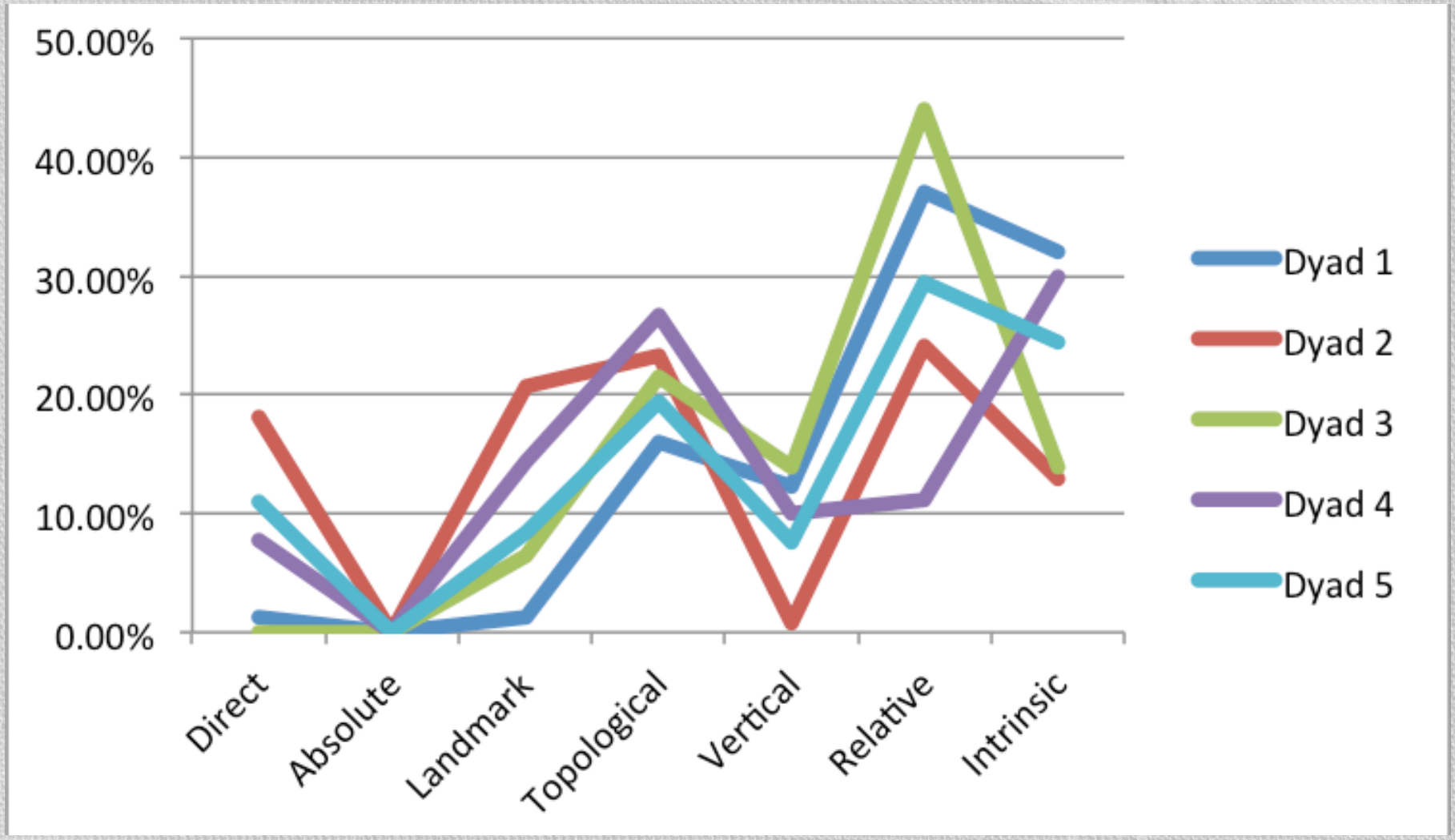
4. Quantitative comparison

(Eggleston, 2012)



4. Quantitative comparison

(Eggleston, 2012)



Sumu-Mayangna meronyms: Mapping volumes and projecting facets

1. Meronymy productivity in Sumu-Mayangna
2. Meronyms in structural context
   - Spatial expressions
   - Locations and projections
3. Toward an algorithm for domain-general meronyms
   - Algorithm
   - Duplicate assignment of meronyms
   - Structural independence
   - Interpretation and orientation preferences
4. Quantitative comparison
   - Meronymy usage in Sumu-Mayangna and Barcelona Spanish
   - Frame of Reference (FoR) usage in Novel Objects II: 3 cohorts
5. Conclusions and Future Work

5. Conclusions

Properties of Meronym Assignment	Presence?
Domain-general meronyms across 4 object classes	✓
Shape-based geometric algorithm	✓
Analogical body-mapping	✗
Reflection of meronym terms in other parts of the grammar	✓
Application to novel objects (Chunches I)	✓
Duplicate (or more!) assignment	✓
Structural independence	✓
Pervasive orientation of the object	✓
Pervasive interpretation of the object*	✓
Participation in spatial FoR expressions	✓

* Part-terms were not generated on the basis of this interpretation!

5. Future work

- Algorithm needs to go beyond the qualitative
  - Formal protocol developed that identifies causal triggers for lexical meronym usage (i.e., if this, then that)
  - Part term agreement among dyads
  - Further questions about Sumu-Mayangna
    - Preliminary evidence indicates Novel Objects II provided more instances (and more diversity) in meronym usage. Why?
    - Preliminary evidence shows that instances of non-unique naming, structural independence, etc., are more prevalent in Novel Objects II. Why?
  - Broad questions
    - Nature of meronymy criteria (Croft and Cruse, 2004; Cruse 1986)
      - Failures of proposed universals (Andersen, 1978; Enfield, et al., 2006)
      - Transitivity failures (Majid, 2006; Majid, et al., 2010)
      - What kinds of parameters would be included in a crosslinguistic typology of meronymies?

Andersen, E. S. (1978). Lexical universals of body-part terminology. In: Greenburg, J. H. (Ed.), *Universals of human language, Vol. 3: Word structure*. Stanford University Press Stanford: Stanford University Press.

Benedicto, E. (2002). Verbal classifier systems: The exceptional case of Mayangna auxiliaries. In Bar-El, L., Watt, L., Wilson, I. (Eds.), Proceedings of WSCLA 7th, *UBC Working Papers in Linguistics 10*, University of British Columbia, Vancouver, Canada, pp. 1-14.

Bohnemeyer, J. (2008). Elicitation task: frames of reference in discourse – the Ball and Chair pictures. In: Pérez Báez, G. (Ed.), *MesoSpace: Spatial language and cognition in Mesoamerica – 2008 Field Manual*. Manuscript, University at Buffalo – SUNY (http://www.acsu.buffalo.edu/~jb77/MesoSpaceManual2008.pdf).

Croft, W., Cruse, D. A. (2004). *Cognitive linguistics*. Cambridge: Cambridge University Press.

Cruse, D. A. (1986). *Lexical semantics*. Cambridge: Cambridge University Press.

Eggleston, A. G. (2012). Spatial reference in Sumu-Mayangna, Nicaraguan Spanish, and Barcelona Spanish. West Lafayette, Indiana: Purdue University Dissertation.

Enfield, N. J., Majid, A., & Van Staden, M. (2006). Cross-linguistic categorisation of the body: Introduction. *Language Sciences*, 28(2-3), 137-147.

Hale, K. (1994). Preliminary Observations on Lexical and Semantic Primitives in the Misumalpan Languages of Nicaragua. In Cliff Goddard & Anna Wierzbicka (eds.), *Semantic and lexical universals: Theory and empirical findings* (pp. 263-283). Amsterdam; Philadelphia: J. Benjamins.

Majid, A., (2006). Body part categorisation in Punjabi. *Language Sciences*, 28(2-3), 241-261.

----- (2010). Words for parts of the body. In B. C. Malt, & P. Wolff (Eds.), *Words and the Mind: How words capture human experience.* Oxford University Press, New York, pp. 58-71.

TINGKI PALNI!
¡GRACIAS!
THANK YOU!

Acknowledgements

- Many thanks to the speakers that participated in this project for generously sharing their language with us, as well as the members of the communities at large for accommodating this work.

- The research presented here was partially supported by the Bilsland Dissertation Fellowship of Purdue University, 2010-2011, and the National Science Foundation Award No. BCS-0723694 “Spatial language and cognition in Mesoamerica,” (PI J. Bohnemeyer). In addition, institutional resources were provided by the Indigenous and Endangered Languages Lab at Purdue University, (PI E. Benedicto).