

The «Scala Naturae» as norm in constructing «language»

Robert Ullrich

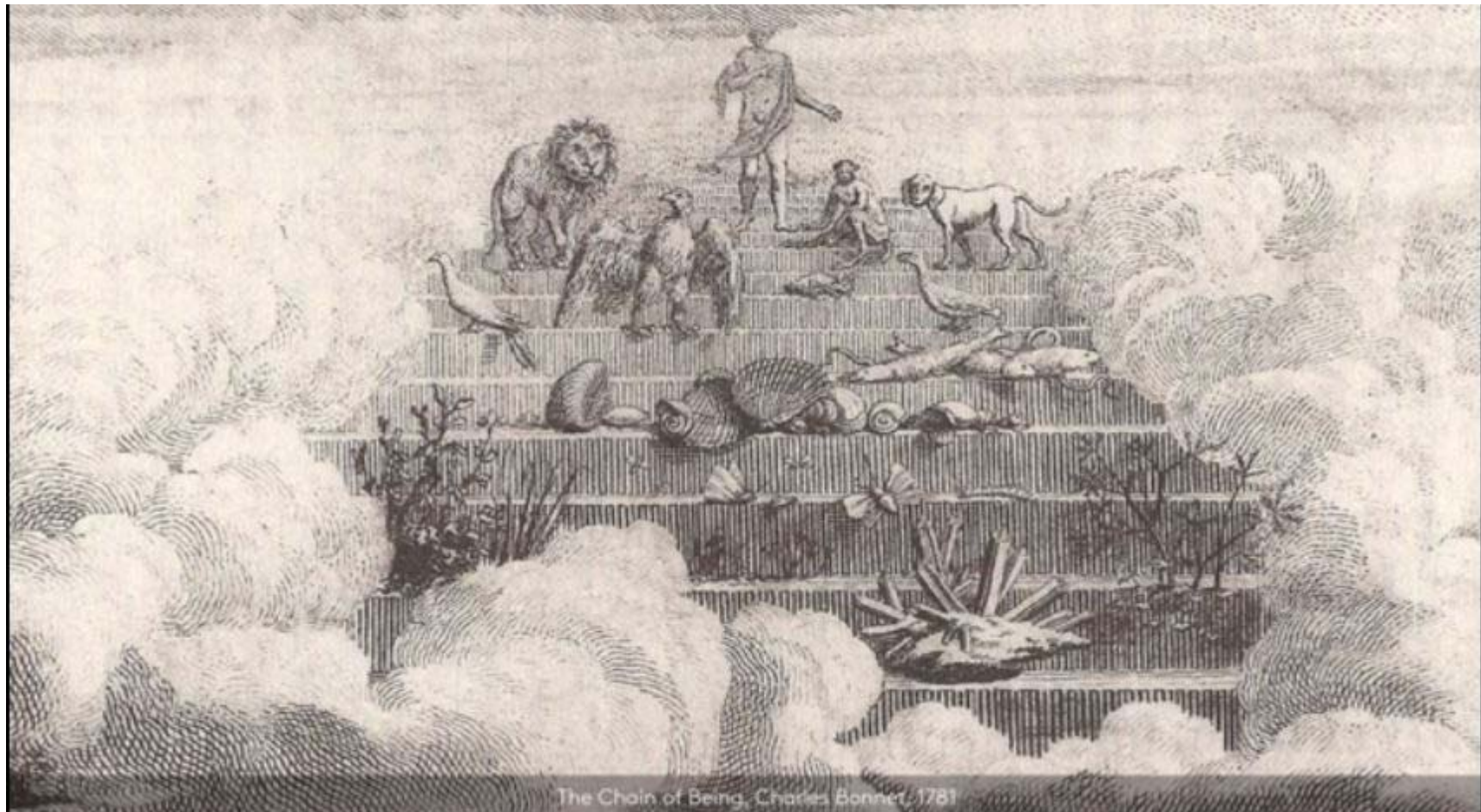
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“... evolution... is an ascending development in a particular order.”

(Jackson, 1884, p. 591)



“Language is the most human of all behaviors” (Meir et al, 2010, p. 267)

“It is language, more than anything else, that makes our minds different.” (Burling, 1993, p. 36)

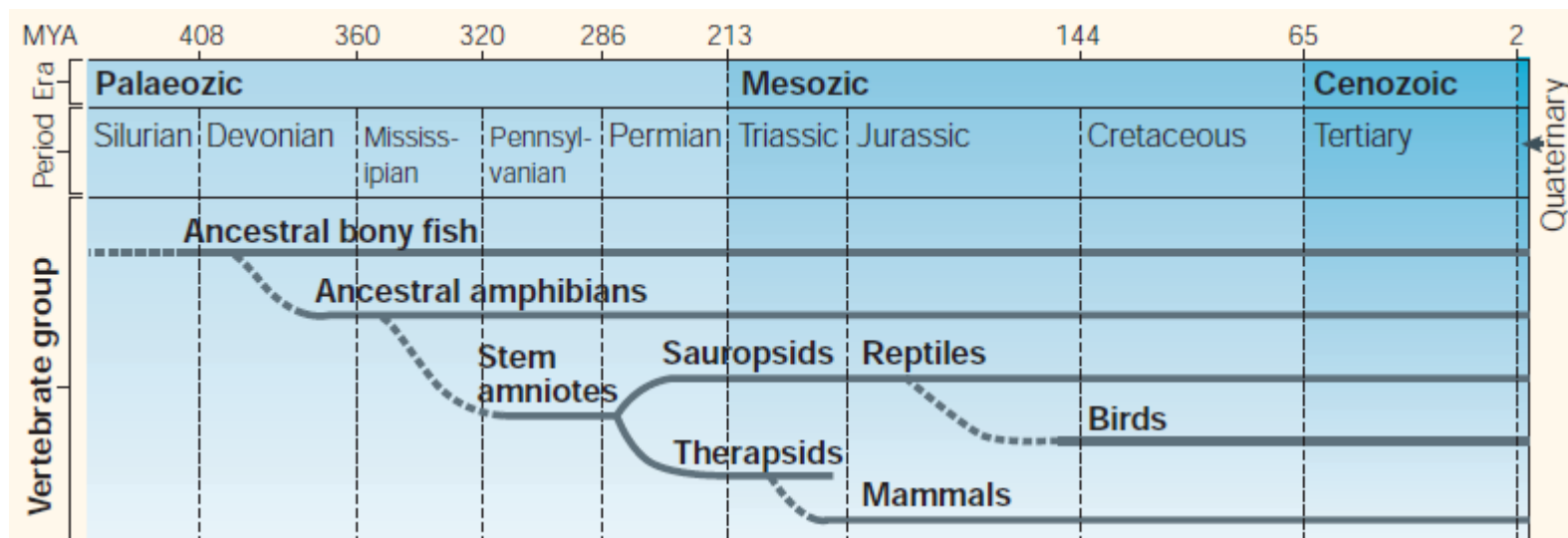
“Language is the crucial difference between humans and other animals.”
(Maynard & Harper, 2003, p. 130)

The norm of progress.

“What is language? The ape, when properly trained, emerges as the unclear middle case: Neither wholly comparable to man (the clear positive case) nor to parrot (the *clear negative case*)...”

Premack, 1971

“...we believe with even better reason that man is a further development of tendencies found also in the lower orders.” (Hartshorne, 1958, p. 421)



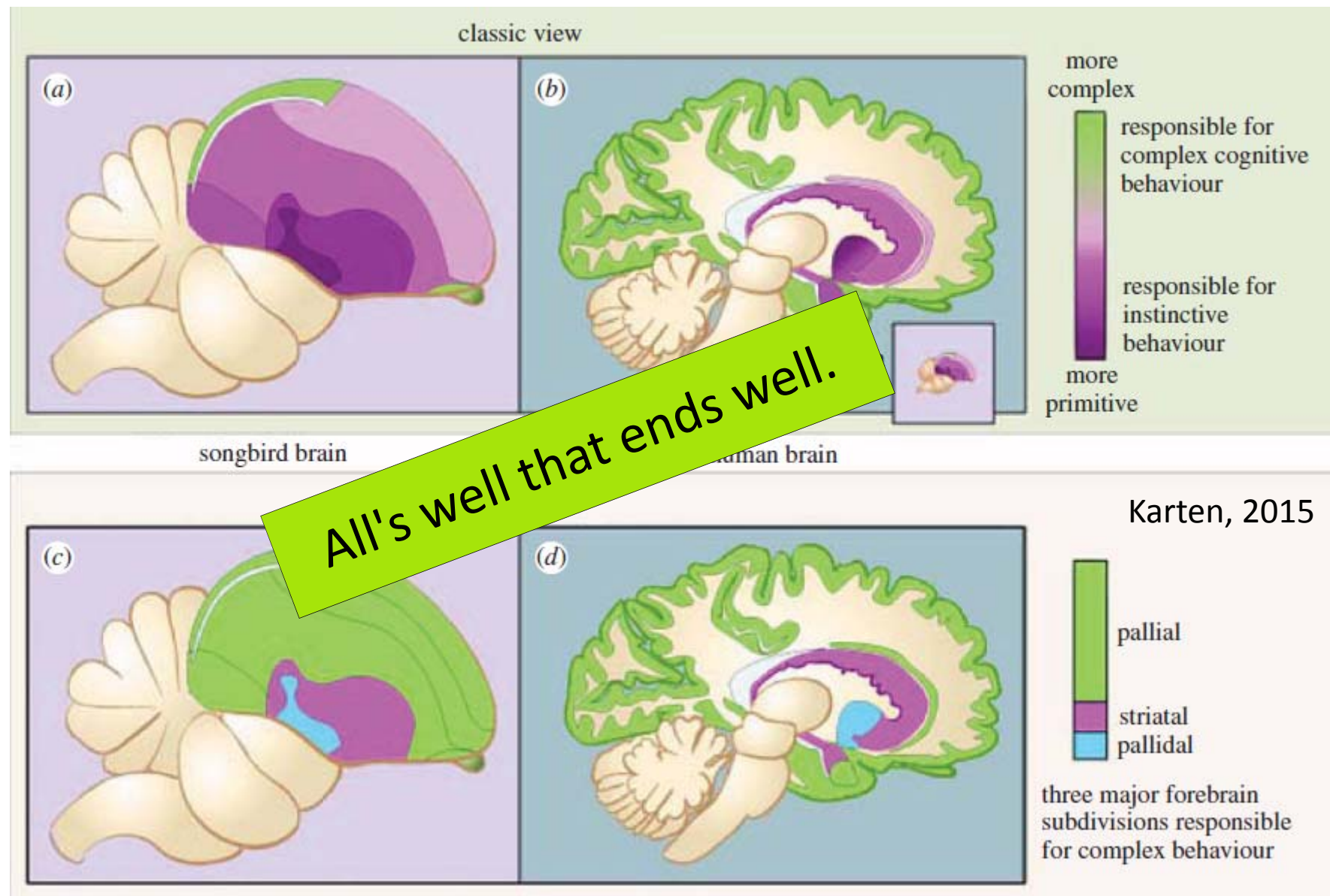
Paul D. MacLean (1971)

Human language
=> neocortex (problem solving, intelligence)

(MacLean, 1977, p. 140)



2005: *The Avian Brain Nomenclature Consortium*



All's well that ends well?

Direct complaints

(also: Fitch et al, 2010, p. 796; Ruse, 1996; Chittka et al, 2012, p.2678; Northcutt, 2001)

“There is a powerful perennial tendency [...] in terms of a ‘**Great Chain of Being**’ [...]”

(Sereno, 2014, p. 5)

Indirect Complaints

(also: Ravignani et al, 2014; Emery, 2006; Shimizu, 2009; Jarvis et al, 2005; Reiner et al, 2004; Vaesen, 2014; Shettleworth, 2010; Güntürkün & Bugnyar, 2016)

“extrapolations [...] along a **linear progression** from ‘lower’ to ‘higher’ forms.” (Waal, 1999, p. 257)

Rigato & Minelli (2013): Quantitative Text Analysis

Rigato and Minelli *Evolution: Education and Outreach* 2013, **6**:18
<http://www.evolution-outreach.com/content/6/1/18>

 **Evolution: Education and Outreach**
a SpringerOpen Journal

RESEARCH ARTICLE

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The great chain of being is still here

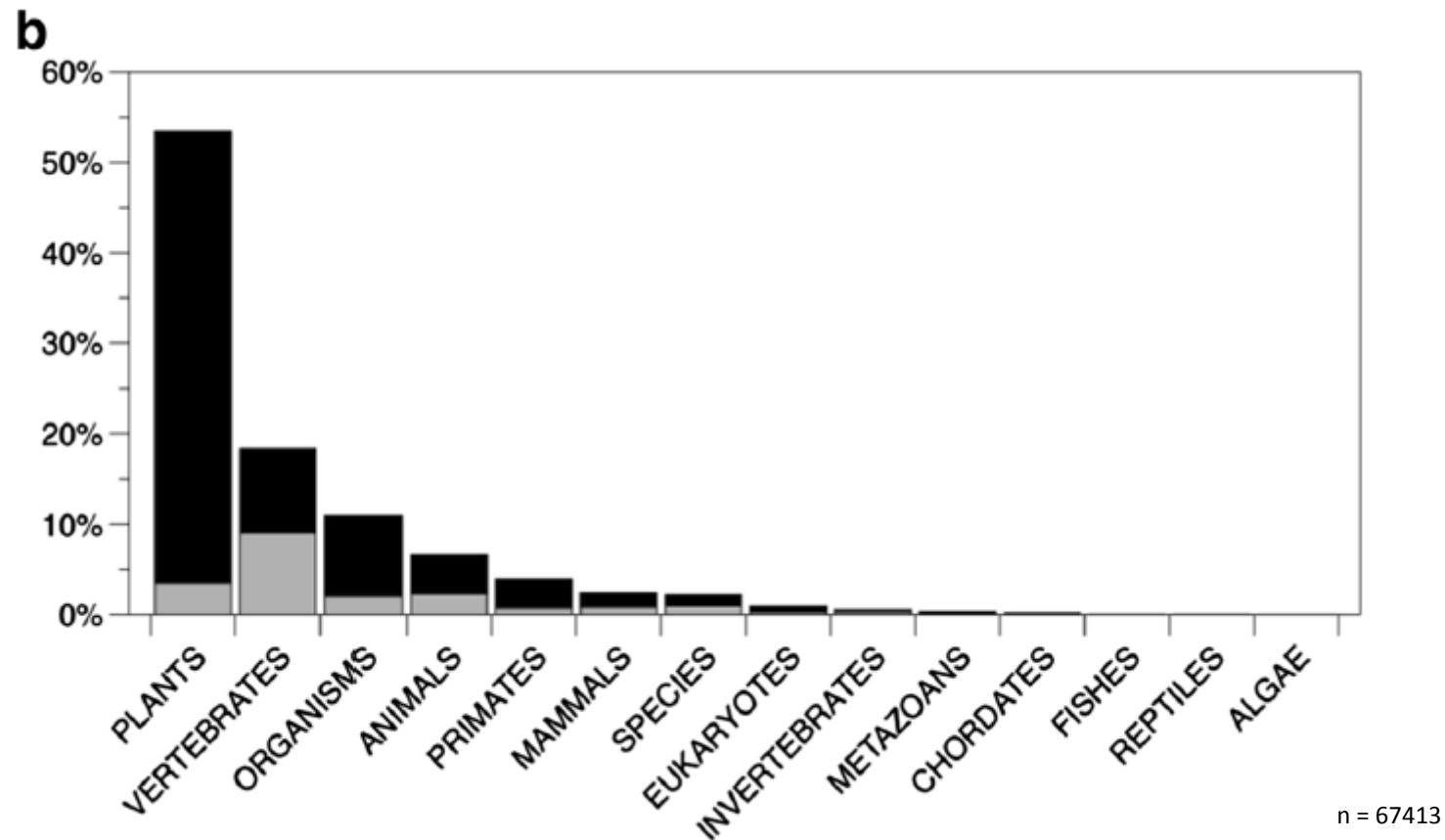
Emanuele Rigato^{*†} and Alessandro Minelli[†]

Rigato & Minelli study

Title & Abstract: “low X” | “high X”

X = {species, organism, eukaryotes, algae, plant, animal, metazoan,
invertebrate, chordate, vertebrate, fish, reptile, mammals, primate}

Rigato & Minelli (2013): Quantitative Text Analysis



- 1,287 (1.91%) positive hits
- > 55% of all hits = plants

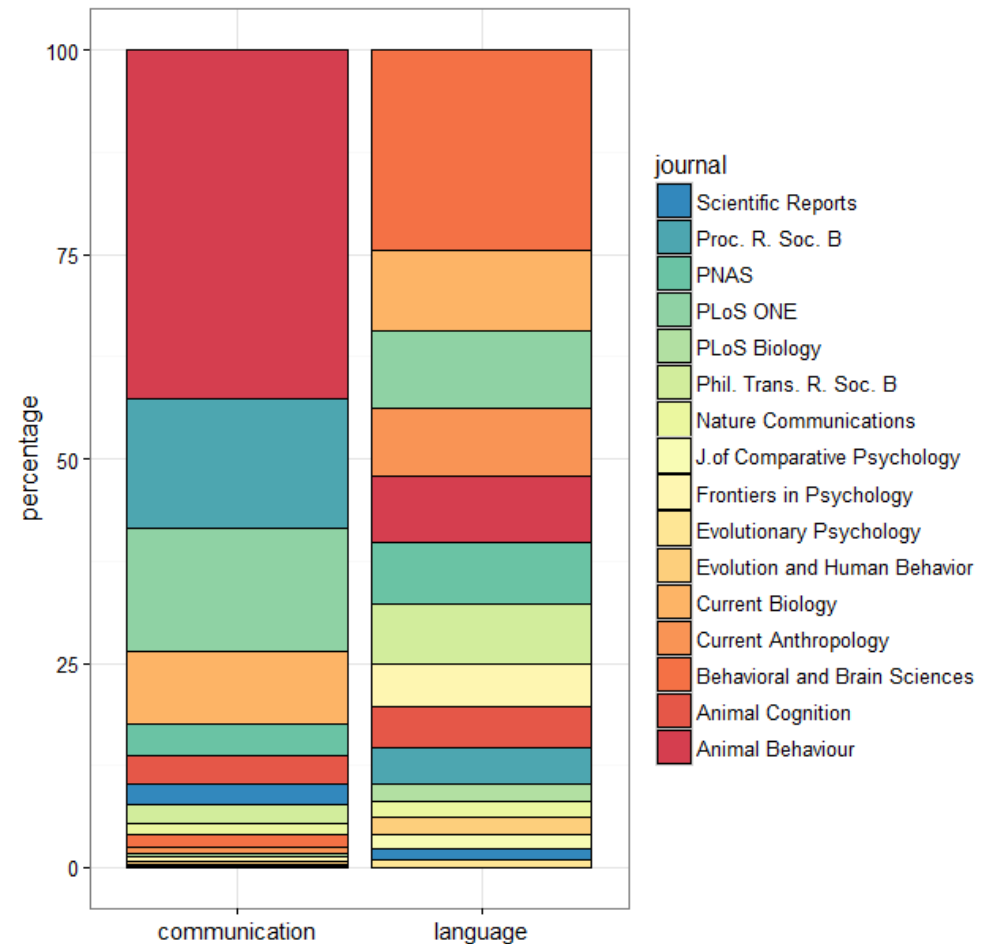
Replicate Rigato & Minelli study

Fulltext: “X_{<-10-low*}_{-10->} X” | “X_{<-10-high*}_{-10->} X”

X = {specie*, organism*, eukaryot*, algae*, plant*, animal*, metazoan*,
invertebrate*, chordate*, vertebrate*, fish*, reptil*, mammal*, primat*}

Quantitative text analysis: Language discourse

- 16 Journals
- Yrs: 2005 – 2015
- Two data-sets:
 - I. language
 - II. communication
- Articles: 1,997/923
 - I. language: 890/441
 - II. communication: 1107/480



Check for relevance:

- must be comparative
- focus on language/communication (not general cognition)
- focus on biological evolution (i.e. exclude machines)
- multicellular organisms only; but no plants, fungi, or intracellular communication.

Tab.1 Rigato Minelly Replication: Positive hits? Minor.

	positive hits
Lan. (n=441)	4 (0.91%)
Com. (n=480)	4 (0.84%)
Rigato & Minelli (n = 64413)	1287 (1.91%)

Essay

What does the cerebellum really do?

Mitch Glickstein

hemispheres. The hemispheres are large in the **higher primates** and they are very large in the human brain. Because the cerebellar hemispheres are particularly large in humans and the **higher primates**, from time to time claims have been made that in addition to its role in motor control, the cerebellum is important for cognitive functions, such as learning, attention, and language. Here I review some of

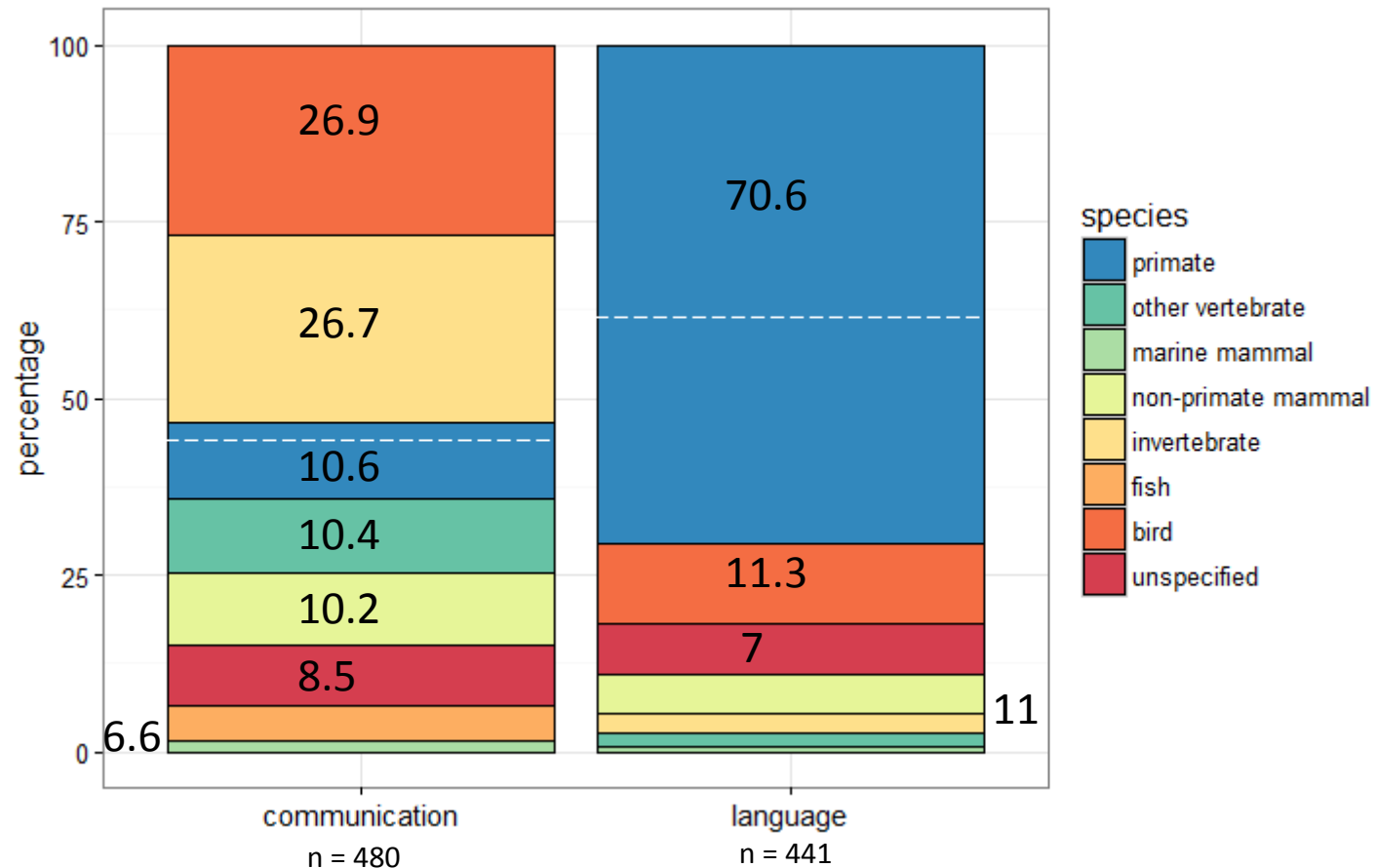
Tab.1 Rigato Minelly Replication: Positive hits? Minor.

	positive hits	tendentious
Lan. (n=441)	4 (0.91%)	18 (4.01%)
Com. (n=480)	4 (0.84%)	9 (1.89%)
Rigato & Minelli (n = 64413)	1287 (1.91%)	NA

One can try to make broad taxonomic comparisons to argue that group-living primates, for example, have significantly more elaborate systems of communication relative to claw-waving territorial crabs because primates form complex societies, whereas crabs do not (by comparison). Yet there are many other non-primate groups that do exhibit extraordinary

(Ord, Garcia-Porta, 2012)

Tendentious: Range of study species



Adjective

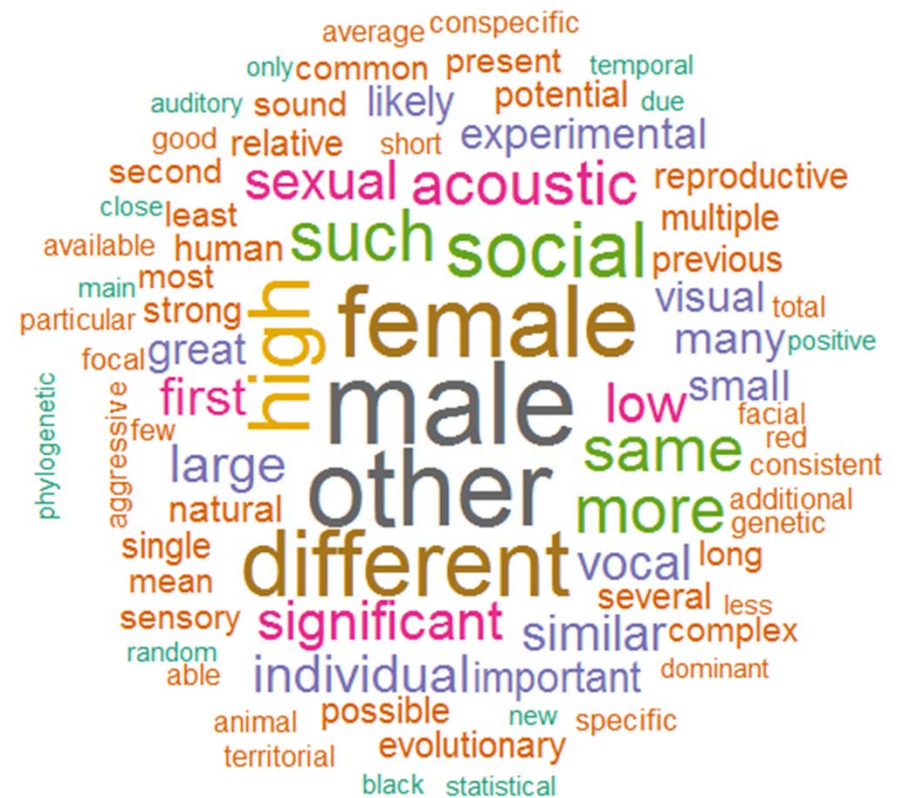
... a word that describes or clarifies a noun

80 most common adjectives

'language'



'communication'



The appearance of 'unique'

language

	group	factor	occurrence	articles.detected	articles.total	articles.rel
1	human	3.83695652173913	353	92	178	51.685393258427
2	primate	2.8	224	80	143	55.9440559440559
3	bird	2.88	72	25	50	50
4	unspecified	3.66666666666667	44	12	21	57.1428571428571
5	non-primate mammal	2.15384615384615	28	13	25	52
6	invertebrate	1.83333333333333	11	6	12	50
7	marine mammal	4	8	2	3	66.6666666666667
8	other vertebrate	2.33333333333333	7	3	9	33.3333333333333
9	total	3.20600858369099	747	233	441	52.8344671201814

communication

	group	factor	occurrence	articles.detected	articles.total	articles.rel
1	bird	1.90740740740741	103	54	129	41.8604651162791
2	invertebrate	1.92307692307692	75	39	128	30.46875
3	primate	2.17391304347826	50	23	40	57.5
4	non-primate mammal	2.52631578947368	48	19	49	38.7755102040816
5	other vertebrate	1.33333333333333	24	18	50	36
6	unspecified	1.84615384615385	24	13	41	31.7073170731707
7	fish	1.28571428571429	9	7	25	28
8	human	2.33333333333333	7	3	11	27.2727272727273
9	marine mammal	1.33333333333333	4	3	7	42.8571428571429
10	total	1.92178770949721	344	179	480	37.2916666666667

40% increase of “uniqueness-factor” in language articles

Thanks!

Moritz Mittelbach &

Department of Education and Psychology /

COMPARATIVE DEVELOPMENTAL PSYCHOLOGY



Norm of Progress?

Historically	=>	clear evidence	
Rigato & Minelli Replication	=>	minor evidence	
Range of Species	=>	tendentious	} aftermaths!?
Adjectives	=>	tendentious	
Appearance of 'unique'	=>	tendentious	

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