

Supplementary materials:

‘Systematic quantitative analyses reveal the folk-zoological knowledge embedded in folktales’
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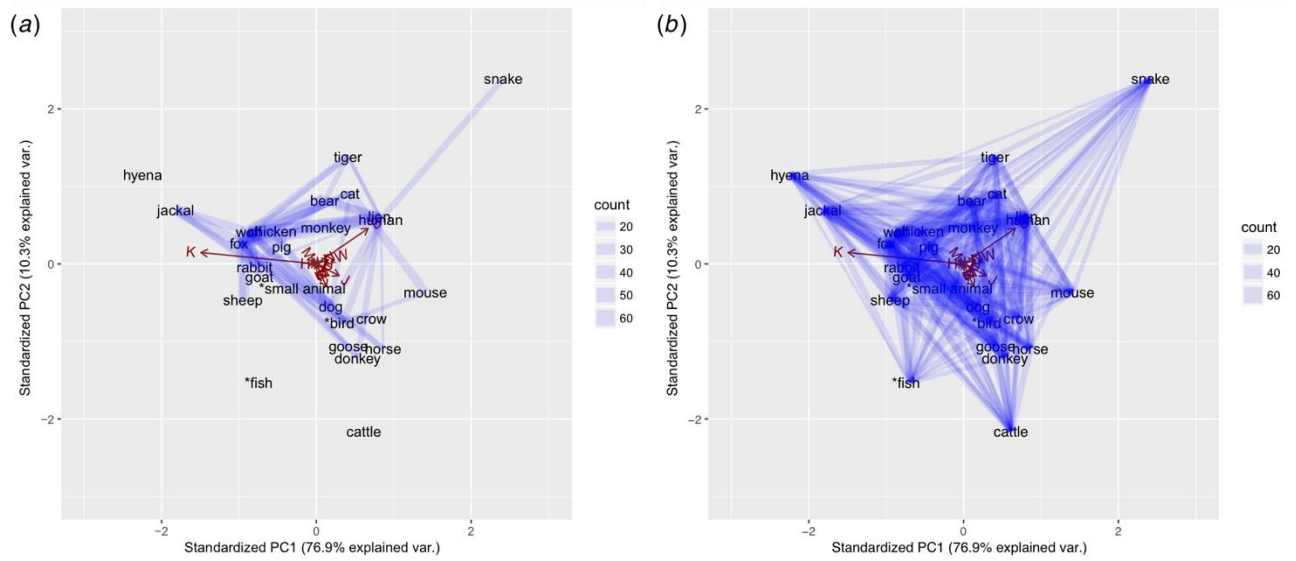
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Supplementary Fig. S1

Supplementary Table S1 – S7

References



Supplementary Fig. S1. Co-occurrence Network over Biplot of Frequency of Animals and Motifs

(a) Co-occurrent network with frequency more than 10. (b) The entire co-occurrent network (i.e. $n > 0$). The figures show the three hubs for co-occurrence network. The first hub is around fox, wolf, pig, jackal and sheep, which seems to show domesticated animals and its predators. The second hub is mainly around domestic animals, goose, horse, donkey, dog. The third hub is not as clear as other two clusters but it seems to be centered around human.

Supplementary Table S1. Frequency of the top 30 animals in each category of ‘animal tales’

Wild		Wild and Human		Wild and Domestic		Domestic		Others	
fox	87	human	49	wolf	37	donkey	16	*bird	55
wolf	54	bear	20	fox	23	dog	15	human	23
bear	37	wolf	18	cat	21	human	11	*bug	17
rabbit	32	fox	11	sheep	20	chicken	8	crow	17
jackal	28	lion	10	pig	15	mouse	6	frog	16
*bird	27	horse	8	goat	13	horse	6	fox	12
chicken	22	snake	7	mouse	13	cat	5	*vermin	12
lion	21	rabbit	6	dog	12	goat	5	*fish	9
human	21	tiger	6	bear	9	duck	5	snake	9
dog	21	sheep	5	human	9	wolf	3	mouse	9
*small animal	17	monkey	5	donkey	8	sheep	3	eagle	9
monkey	14	cattle	5	horse	7	*bird	3	*small animal	8
cat	13	dog	5	tiger	7	pig	3	turtle	8
tiger	13	goose	4	cattle	6	rabbit	3	*raptores	6
sheep	11	*supernatural	3	chicken	6	goose	3	wolf	6
donkey	10	crow	3	lion	6	lion	3	dove	6
hyena	10	*bird	3	rabbit	4	fox	3	chicken	6
crow	9	jackal	2	*fish	4	*bug	2	fly	6
goat	8	*fish	2	*small animal	3	cattle	2	bee	5
goose	7	*large animal	2	*bird	3	frog	2	wren	5
horse	7	donkey	2	jackal	2	crayfish	2	bear	5
deer	7	deer	2	hyena	2	crow	2	owl	5
mouse	7	cat	2	*supernatural	2	*small animal	2	ant	5
*fish	7	pig	2	turtle	2	eagle	1	rabbit	4
*big cat	6	*raptores	1	crab	1	bear	1	jackal	4
crocodile	6	crab	1	*bug	1	camel	1	cattle	4
pig	6	mouse	1	crocodile	1	snake	1	sparrow	4
cattle	5	*small animal	1	goose	1	ant	1	crab	3
coyote	5	sparrow	1	monkey	1	bee	1	horse	3
magpie	5	chicken	1	*large animal	1	*large animal	1	*large animal	3

Supplementary Table S2. Examples of folktales with inanimate objects, in the category ‘others’.

ATU index	Title
293	The Debate of the Belly and the Members
293B*	The Mushroom Reviles the Young Oak for clinging to it
293D*	The Hops and the Turnips Quarrel
293E*	The Grains Talk with One Another
294	The Months and the Seasons
295	The Bean (Mouse), the Straw, and the Coal
296	The Clay Pot and the Brass Pot in the River
297B	The War of the Mushrooms
298	The Contest of Wind and Sun
298A	The Frostgod and His Son
298A*	The Man Greet the Wind
298C*	The Reeds Bend before Wind (Flood)
299	The Mountain Gives Birth to a Mouse

Supplementary Table S3. List of group names which are labelled to unified animals. In the analyses, for each animal name that appeared less than 5 times, they were unified into one group category based on the similarity (see the *Occurrence of animals* in *Methods*). This grouping is for operational purposes: we did not employ any external criteria. Thus, grouping method is imperfect; there may be other possible ways of grouping these animals using data published by the authors.

group name	names
big cat	jaguar, leopard, lynx, panther
bird	bird, bittern, blackbird, cuckoo, diver, flamingo, goldfinch, grouse, hoopoe, hoopoo, jay, nightingale, oriole, parrot, partridge, peacock, snipe, swan, thrush, titmouse, turkey, woodpecker
bug	beetle, blindworm, butterfly, cricket, grasshopper, insect, scorpion, silkworm, spider, worm
fish	fish, flounder, herring, mussel, perch, salmon, shell, shrimp
large animal	beast, boar, buffalo, hippopotamus, whale
raptores	falcon, hawk
small animal	badger, bat, chameleon, gopher, hedgehog, lizard, mole, polecat, possum, snail, squirrel, weasel
supernatural	devil, dragon, dwarf, giant, god, ogre, pan, siren, zeus
vermin	bedbug, flea, gnat, louse, tick

Supplementary Table S4. Regional distribution of folktales in the ATU (ATU1-ATU299).

(a). The frequency of tale types listed in each world area (i.e. larger categories that included countries and ethnic groups). We counted a tale more than once if the same tale type appeared in two countries (or ethnic group) in the same area (e.g. If ‘Finnish’ and ‘Swedish’ appeared in ATU1, we counted these twice for Northern Europe). The frequency was counted based on bibliographical information in ATU (see *Structure of the Corpus* in *Methods*).

(b). The proportion that each world area covered for 382 folktale types. The number in the bracket shows frequency.

Note that countries were classified into their particular world area following United Nations (1999). If the name was not on the list, the item was manually checked and classified.

(a)

Region	frequency
Northern Europe	1227
Southern Europe	992
Eastern Europe	863
Western Europe	699
Western Asia	453
Central Asia	369
Northern Africa	327
Eastern Asia	254
Southern Asia	253
Northern America	209
South America	167
Others	146
Central America	145
South-eastern Asia	133
Eastern Africa	122
Latin America and the Caribbean	115
Southern Africa	113
Middle Africa	59
Western Africa	56
Australia and New Zealand	7
Polynesia	6
Melanesia	1
Micronesia	1

(b)

Region	CoverRate
Northern Europe	76.7% (293)
Southern Europe	72.8% (278)
Eastern Europe	69.1% (264)
Western Europe	65.4% (250)
Western Asia	45.3% (173)
Southern Asia	40.8% (156)
Central Asia	38.5% (147)
Eastern Asia	38.0% (145)
Northern Africa	36.4% (139)
Northern America	32.2% (123)
Others	31.4% (120)
Eastern Africa	23.0% (88)
South-eastern Asia	22.0% (84)
Southern Africa	20.9% (80)
Central America	20.9% (80)
South America	20.2% (77)
Latin America and the Caribbean	19.6% (75)
Western Africa	11.8% (45)
Middle Africa	11.3% (43)
Australia and New Zealand	1.8% (7)
Polynesia	1.6% (6)
Micronesia	0.3% (1)
Melanesia	0.3% (1)

Supplementary Table S5. The list of deceptive motifs in each major index of TMI. To investigate semantically overlapping motifs with ‘deception K’, we searched deceptive motifs with a search engine of TMI (MOMFER; Karsdorp, Van der Meulen, Meder and Van den Bosch, 2015). In the table, each column signifies as following—total items: the frequency of the potentially overlapping items found in MOMFER; presence: frequency of motifs found in our corpus (we listed these items in Supplementary Table S6); example: examples of deceptive motifs. As the table showed, only few deceptive motifs appeared in our corpus, except K.

index	total items	presence	example
A	104	2	A2426.2.10: Why duck quacks.; A2525: Why animals are deceptive.;
B	38	2	B210.2: Talking animal or object refuses to talk on demand.; B296.1: Animal journeys to Rome.;
C	39	0	C45: Tabu: offending devil.; C94.1: Tabu: uncivil answer to holy (or supernatural) being.;
D	151	0	D1819.2: Deception revealed in dream.; D835: Magic object acquired through trickery: child forced to cry till object is given.;
E	66	0	E780.2: Animal bodily members transferred to person or other animal retains animal powers and habits.; E781.1: Substituted eyes.;
F	124	0	F402.1.4: Demons assume human forms in order to deceive.; F709.3: Country of thieves and impostors.; F821.1.3: Dress of raw fur.
G	53	0	G303.16.19: Miscellaneous ways in which the devil may be escaped or his power destroyed.; G303.9.9.10: Exchanging things with the devil.;
H	106	1	H507.6: Literary contest won by deception: he who will be first silenced is the loser.; H573: Answer to riddle found by trickery.;
J	153	1	J1556: Lender repays borrower for deceptive loan.; J1577: Deceptive invitation to feast.;
K	396	19	K11: Race won by deception.; K171: Deceptive division of profits.
L	12	1	L315.6: Insects worry large animal to despair or death.; L62: Youngest daughter suspects impostor.
M	36	0	M205: Breaking of bargains or promises.; M291: Trickster undertakes impossible bargains and collects his part.
N	44	0	N465.1: Secret of person’s sleeplessness discovered by trickery.; N617: Impostor accidentally gives king talking bed which reveals his identity.
P	12	0	P15.3: King loses his kingdom to impostor.;
Q	34	0	Q262: Impostor punished.; Q267.1: Devil comes for hypocrite.; Q267: Hypocrisy punished.;
R	7	0	R13.2.2: Bull carries off devil after he has tried to deceive God.; R131: Exposed or abandoned child rescued.;
S	13	0	S112.1: Boiling to death.; S252.2: Vain attempt to save promised child by evasions.;
T	39	0	T331.3: Woman masks as man to deceive anchorite.; T332: Man tempted by fiend in woman’s shape.;
U	6	0	U119: Other ways in which appearances deceive.; U129.2: Prostitute will deceive new lover as always.;
V	14	0	V416.1: Man convicted of cheating at his bookkeeping is excused when it is learned that he has given the money to the poor.; V461.2: Truthful monk refuses to cheat even for his order.
W	4	0	W154.21: Workers (builder) killed when secret building or grave is finished.
X	301	0	X905.4.1: Boy to deceive his uncle: induces uncle to climb tree before deception begins: this is the deception.
Z	9	0	Z32.1: The funeral procession of the hen.; Z41.5: Lending and repaying: progressively worse (or better) bargain.;

Supplementary Table S6. The list of deceptive motifs overlapping with motif K (‘deception’).

motif	frequency	description
A2241	1	Animal characteristics: borrowing and not returning.
A2251.1	1	Ant carries load as heavy as himself.
B271.3	1	Animals ring bell and demand justice.
B296.1	1	Animal journeys to Rome.
H1541.1	1	Contest in enduring cold: frost and the hare.
J815.1	1	Liar rewarded by the apes.
L315.6	1	Insects worry large animal to despair or death.

References

Karsdorp, F, Van der Meulen, M, Meder, T, and Van den Bosch, A (2015). MOMFER: A Search Engine of Thompson's Motif-Index of Folk Literature. *Folklore*, 126(1), pp. 37-52.

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