

What's the Story?

Complex Networks | @networksvox
 CSYS/MATH 303, Spring, 2016

Prof. Peter Dodds | @peterdodds

Dept. of Mathematics & Statistics | Vermont Complex Systems Center
 Vermont Advanced Computing Core | University of Vermont



Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



Licensed under the *Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License*.



These slides are brought to you by:

COcoNuTS

Sealie & Lambie
Productions



Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



Outline

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

COcoNuTS

Narrativium

Power

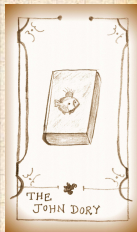
Shapes

Taxonomy

Essence

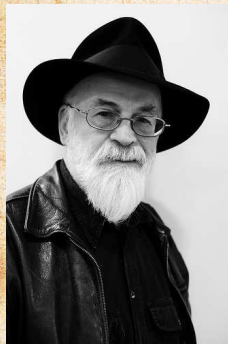
Coda


References





(Sir Terry) Pratchett's Narrativium

COcoNuTS



 "The most common element on the disc, although not included in the list of the standard five: earth, fire, air, water and surprise. It ensures that everything runs properly as a story."

 "A little narrativium goes a long way: the simpler the story, the better you understand it. Storytelling is the opposite of reductionism: 26 letters and some rules of grammar are no story at all."

 "Heroes only win when outnumbered, and things which have a one-in-a-million chance of succeeding often do so."

Narrativium

Power

Shapes

Taxonomy

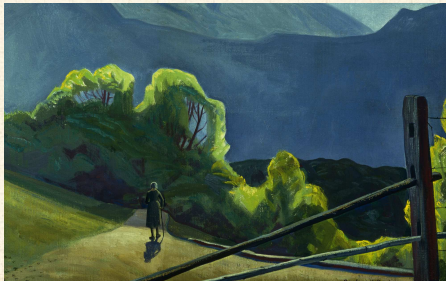
Essence



Coda

References



The story trap by Philip Ball, 2015-11-12



-  "We use neat stories to explain everything from sports matches to symphonies. Is it time to leave the nursery of the mind?"
-  "...we might wonder if the ultimate intelligibility of the universe will be determined not so much by the capacity of our minds to formulate the appropriate concepts and equations, but by whether we can find a meaningful story to tell about it."

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda


References



Competing storytelling organizations:

-  News.
-  Art.
-  Music industry.
-  Books, magazines.
-  Movie studios, Netflix, HBO, Disney.
-  Video Games.
-  Social media: Facebook, Medium, Tumblr, blogs.

Cultural products from Pantheon

-  Writers, artists, movie directors, video game directors.

Narrativium

Power

Shapes

Taxonomy

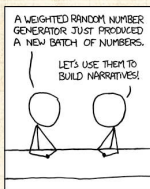
Essence

Coda

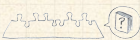
References



Understanding the Sociotechnocene—Stories:



xkcd.com/904/



Perhaps: A true science of stories.



Claim: Homo narrativus —we run on stories.



Claim: The narrative hierarchy and the Scalability of stories.



Research: Extraction of metaphors, frames, narratives, and stories from large-scale text.



Research: The taxonomy of human stories.



Harness: Sociotechnical algorithms for measuring/predicting decisions, contagion, demographics, weather, ...

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References





Adjacent narratives —why mistruths and conspiracy theories exist and flourish:

COcoNuTS

Narrativium

Power

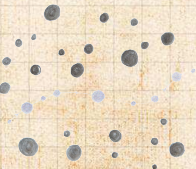
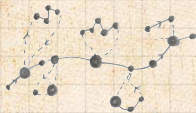
Shapes

Taxonomy


Essence


Coda

References



1999 Gallup poll: 

 6% of Americans said the lunar landings were fake.

 5% were undecided.

Video replay:

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

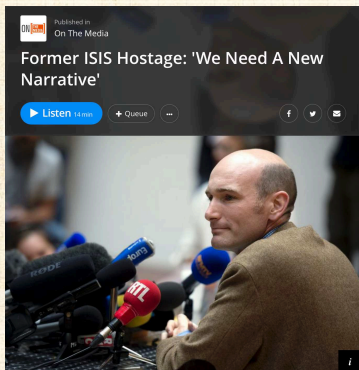
Essence

Coda

References



Story Wars:



Nicholas Hénin ↗,
 French Journalist,
 held captive for 10
 months ↗.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



From the end of the interview:

NICOLAS HENIN: No, it was just like in a movie. And, by the way, even the people going to Syria, joining ISIS in Syria to fight, even these people see himself as movie characters. They play their own movie. This is why I think that the most powerful way to fight ISIS are not bombs. It is to kill the narrative. We have to write another movie. We have to build other heroes. And this is why I believe that the French are making big mistakes in the ways they, they fight ISIS.

We created, for instance, accounts on the social media named "Stop Jihadism," and this is [BLEEP], like they did not understand anything. And I did understand why we are so bad. It's just because in France we don't know how to write TV series properly.

[BROOKE LAUGHS]

Just because we have no imagination, we cannot just tell beautiful stories, create beautiful characters, beautiful heroes.

And this is what we have to do because in our world, in our societies what do people want? They want to become heroes. They want to be famous. They want to be, to be recognized.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda


References



The American Dream = Rags to Riches

- ⊞ The story that anyone can become King or Queen.
- ⊞ Story of individual, not the collective.
- ⊞ But we know about fame and success:
The presence of outsized fame in a social system means social imitation is a driver of value.
- ⊞ Stories of societies can only hold if they have been and remain believable.



If not Trump, what? , David Brooks, New York Times:

"We'll probably need a new national story. Up until now, America's story has been some version of the rags-to-riches story, the lone individual who rises from the bottom through pluck and work. But that story isn't working for people anymore, especially for people who think the system is rigged."

"I don't know what the new national story will be, but maybe it will be less individualistic and more redemptive. Maybe it will be a story about communities that heal those who suffer from addiction, broken homes, trauma, prison and loss, a story of those who triumph over the isolation, social instability and dislocation so common today."

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



Claim: Stories must have real substance to endure

- 📦 Enormous disasters: Fabrications of real experiences.
 - 📦 Plain old making stuff up: [A million little pieces](#) ↗
... Oprah will get you.
 - 📦 Wikipedia's has a list of [famous fake memoirs](#) ↗.
 - 📦 Expansive plagiarism: [How Opal Mehta Got Kissed, Got Wild, and Got a Life](#) ↗.
#kudos
 - 📦 Self-plagiarism and more standard badness: [Jonah Lehrer](#) ↗.
Amazingly: Made up Bob Dylan quotes.
 - 📦 Lance Armstrong. Also got to meet Oprah.
- 📦 Enormous power: Fiction that speaks to real experiences.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



Kurt Vonnegut on the shapes of stories:

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



The Shapes of Stories

by Kurt Vonnegut

Kurt Vonnegut gained worldwide fame and adoration through the publication of his novels, including *Slaughterhouse-Five*, *Cat's Cradle*, *Breakfast of Champions*, and more.

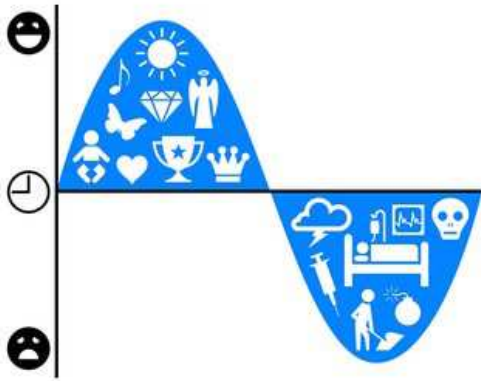
But it was his rejected master's thesis in anthropology that he called his prettiest contribution to his culture.

The basic idea of his thesis was that a story's main character has ups and downs that can be graphed to reveal the story's shape.

The shape of a society's stories, he said, is at least as interesting as the shape of its pots or spearheads. Let's have a look.

Designer: Maya Eilam, www.mayaeilam.com

Sources: *A Man without a Country* and *Palm Sunday* by Kurt Vonnegut





Kurt Vonnegut on the shapes of stories:

CoCoNuTS

Man in Hole





The main character gets into trouble then gets out of it again and ends up better off for the experience.

-  Arsenic and Old Lace
-  Harold & Kumar Go To White Castle

Boy Meets Girl





The main character comes across something wonderful, gets it, loses it, then gets it back forever.

-  Jane Eyre
-  Eternal Sunshine of the Spotless Mind

From Bad to Worse



The main character starts off poorly then gets continually worse with no hope for improvement.

-  The Metamorphosis
-  The Twilight Zone

Which Way Is Up?



The story has a lifelike ambiguity that keeps us from knowing if new developments are good or bad.

-  Hamlet
-  The Sopranos

Creation Story



In many cultures' creation stories, humankind receives incremental gifts from a deity. First major staples like the earth and sky, then smaller things like sparrows and cell phones. Not a common shape for Western stories, however.

Old Testament




Humankind receives incremental gifts from a deity, but is suddenly ousted from good standing in a fall of enormous proportions.

-  Great Expectations

New Testament



Humankind receives incremental gifts from a deity, is suddenly ousted from good standing, but then receives off-the-charts bliss.

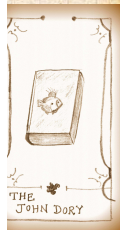
-  Great Expectations with Dickens' alternate ending

Cinderella



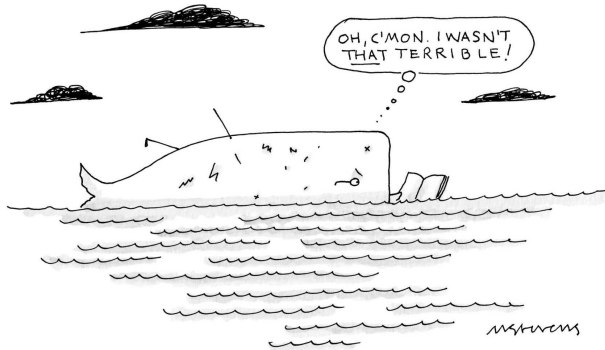
It was the similarity between the shapes of Cinderella and the New Testament that thrilled Vonnegut for the first time in 1947 and then over the course of his life as he continued to write essays and give lectures on the shapes of stories.

irrativium
wer
apes
onomy
sence
da
ferences



The UNIVERSITY of VERMONT

Done



< 8 OF 20 >

The New Yorker, December 16, 2013, p. 56.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



Ron Swanson:

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

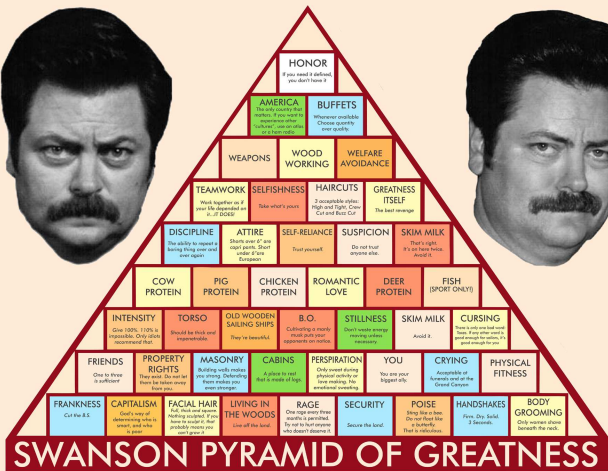
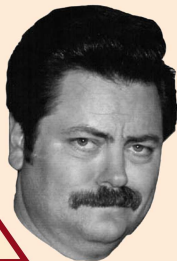
Essence

Coda

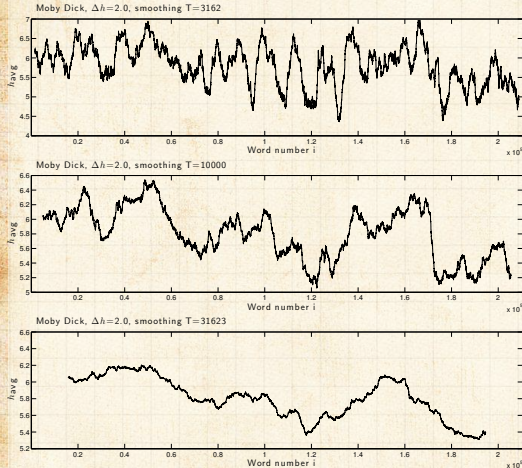
References

🧩 "I hate metaphors. That's why my favorite book is Moby Dick. No frou-frou symbolism. Just a good, simple tale about a man who hates an animal."





The emotional shapes of stories—Moby Dick:



Ⓒ $h_{avg}(\text{Last } 10\%)=5.69$
 $< h_{avg}(\text{First } 25\%)=6.20$



Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



Partly inspired by [Vonnegut's Shapes of Stories](#) ↗.

Online, interactive Emotional Shapes of Stories for 10,000+ books:

Frankenstein; Or the Modern Prometheus [\(wiki\)](#)

by Mary Shelley

Search Gutenberg Corpus

by Title ▾

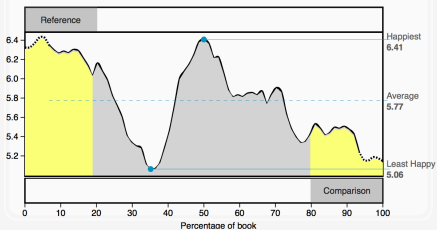
Classics ▾

Harry Potter ▾

Random

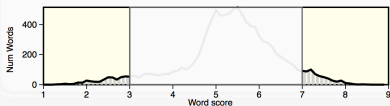
Book happiness time series:

Explore the work's emotional dynamics by sliding and resizing the reference and comparison sections.



Lens (for advanced users):

Slide and resize the stop-window to change the lens:

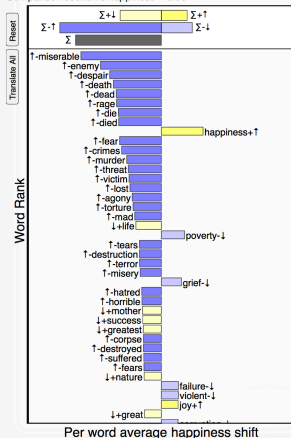


Word Shift:

Why comparison section is less happy than the reference one

Reference section's happiness = 6.31

Comparison section's happiness = 5.35



Online, interactive Emotional Shapes of Stories for 10,000+ books:

Harry Potter (all books together)

by J.K. Rowling

Search Gutenberg Corpus

by Title ▾

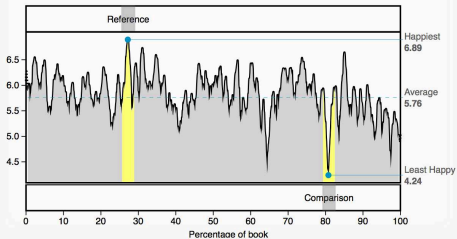
Classics ▾

Harry Potter ▾

Random

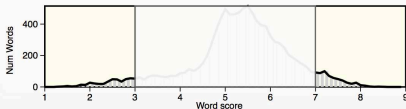
Book happiness time series:

Explore the work's emotional dynamics by sliding and resizing the reference and comparison sections.



Lens (for advanced users):

Slide and resize the stop-window to change the lens:

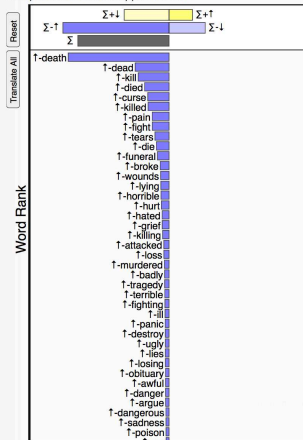


Word Shift:

Why comparison section is less happy than the reference one

Reference sections's happiness = 6.13

Comparison section's happiness = 5.14



Per word average happiness shift

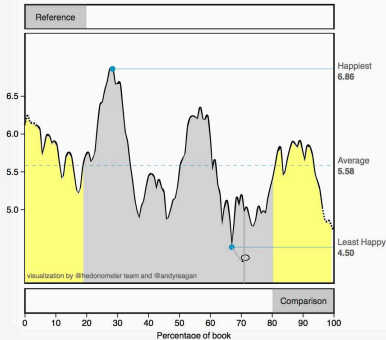
Online, interactive Emotional Shapes of Stories for 1,000+ movie scripts:

Pulp Fiction

directed by Quentin Tarantino

Movie happiness time series:

Explore the work's emotional dynamics by sliding and resizing the reference and comparison sections.



Movie script:

Portion of script scored for each point in timeseries.

Zed takes the chair, sits it in front of the two prisoners, then lowers into it. Maynard hands The Gimp's leash to Zed, then backs away.

MAYNARD
(to The Gimp)
Down!

The Gimp gets on its knees.

Maynard hangs back while Zed appraises the two men.

MAYNARD
Who's first?

ZED
I ain't fer sure yet.

Then with his little finger, Zed does a silent 'Benie, meany, miney, moe...' just his mouth mouthing the words and his finger going back and forth between the two.

Butch and Marsellus are terrified.

Maynard looks back and forth at the victims.

The Gimp's eyes go from one to the other inside the mask.



"The game story space of professional sports: Australian Rules Football" ↗

Kiley, Reagan, Mitchell, Danforth, and Dodds.
Physical Review E, , 2016. [5]

COCoNuTS

Narrativium

Power

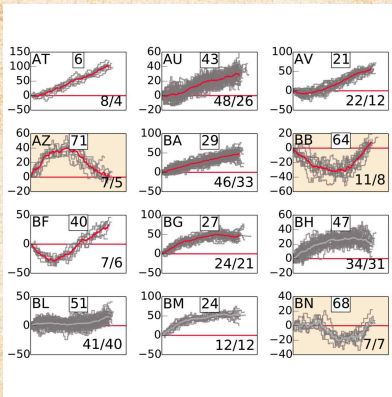
Shapes

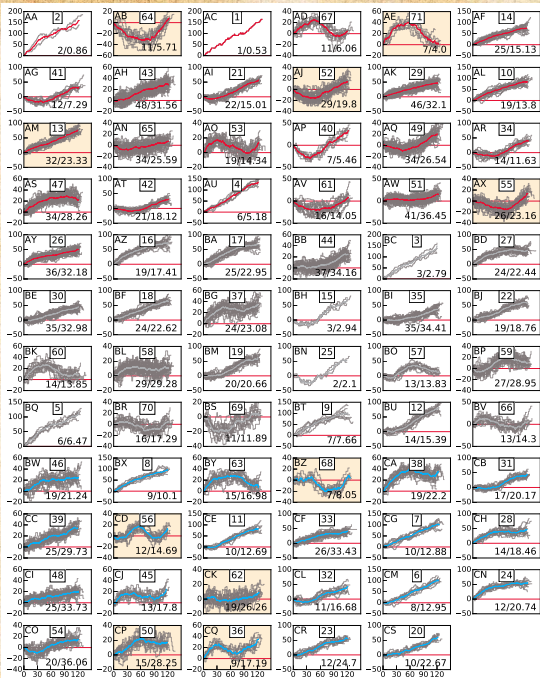
Taxonomy

Essence

Coda

References





CoCoNuTS

Narrativium

Power

Shapes

Taxonomy

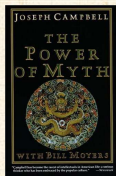
Essence

Coda

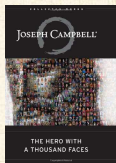
References



The very tiresome Great Man Theory:



"The Power of Myth" [a](#) [↗](#)
by Campbell and Moyers (1991). ^[4]



"The Hero with a Thousand Faces" [a](#) [↗](#)
by Joseph Campbell (2008). ^[3]

Highly influential but it's a trap! [↗](#)

Narrativium

Power

Shapes

Taxonomy

Essence



Coda






References



How to write a screenplay:



"Save the Cat!"  
by Blake Snyder (2005). [6]

-  9 acts.
-  Someone important to the main characters gets toasted in the second act, blah, blah.
-  Believes irony is key.
-  Logline = one or two sentence summary.
-  Logline fails to be a summary of logline.

Narrativium

Power

Shapes

Taxonomy

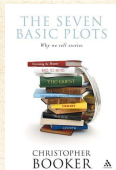
Essence

Coda

References



Seven "good" stories?:



"The Seven Basic Plots: Why We Tell Stories" [a](#) [↗](#)
by Christopher Booker (2005). [2]

- 🧱 Seven Gateways to the Underworld (?)
- 🧱 Overcoming the Monster ×2 and the Thrilling escape from Death (plot).
- 🧱 Rags to Riches (plot).
- 🧱 The Quest (plot).
- 🧱 Voyage and Return (plot).
- 🧱 Comedy ×2 (plot but really structure).
- 🧱 Tragedy ×3 (plot).
- 🧱 Rebirth (plot).
- 🧱 The Dark Power: From Shadow into Light (master structure).

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



The taxonomy of stories:


- **ANIMAL TALES** 1-299
 - Wild Animals 1-99
 - The Clever Fox (Other Animal) 1-69
 - Other Wild Animals 70-99
 - Wild Animals and Domestic Animals 100-149
 - Wild Animals and Humans 150-199
 - Domestic Animals 200-219
 - Other Animals and Objects 220-299
- **TALES OF MAGIC** 300-749
 - Supernatural Adversaries 300-399
 - Supernatural or Enchanted Wife (Husband) or Other Relative 400-459
 - Wife 400-424
 - Husband 425-449
 - Brother or Sister 450-459
 - Supernatural Tasks 460-499
 - Supernatural Helpers 500-559
 - Magic Objects 560-649
 - Supernatural Power or Knowledge 650-699
 - Other Tales of the Supernatural 700-749
- **RELIGIOUS TALES** 750-849
 - God Rewards and Punishes 750-779
 - The Truth Comes to Light 780-799
 - Heaven 800-809
 - The Devil 810-826
 - Other Religious Tales 827-849
- **REALISTIC TALES** 850-999
 - The Man Marries the Princess 850-869
 - The Woman Marries the Prince 870-879
 - Proofs of Fidelity and Innocence 880-899
 - The Obstinate Wife Learns to Obey 900-909
 - Good Precepts 910-919
 - Clever Acts and Words 920-929

Folkloristics:



Academic area formally started around 1900.




Aarne-Thompson classification systems 



Motif-based taxonomy.



Online classification database 

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda



References







"Computational folkloristics"

Abello, Broadwell, and Broadwell,
Communications of the ACM, **55**, 60–70, 2012. [1]


 Motivation: "As a simple, historical example from the Danish materials, no one has yet classified (according to the ATU index) the several thousand fairy tales in the collections of the Danish Folklore Archive (<http://www.dafos.dk> ) , nor does it seem anyone ever will."

 'Imagine a system in which the complexities of a folklore corpus can be explored at different levels of resolution, from the broad perspective of "distant reading" down to the narrow perspective of traditional "close reading." 



"The phylogeny of Little Red Riding Hood"

Jamshid J. Tehrani,

PLoS ONE, **8**, e78871, 2013. 

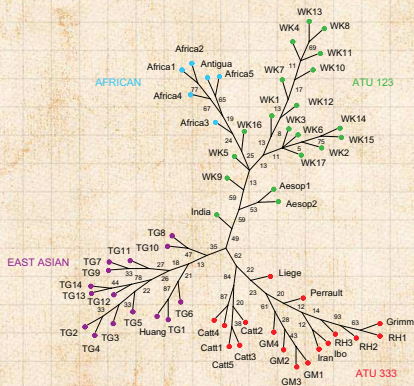
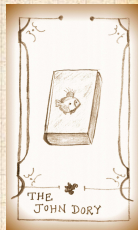


Figure 2. Majority-rules consensus of the most parsimonious trees returned by the cladistic analysis of the tales. Major groupings are labelled by region or ATU international type and indicated by the coloured nodes. Sub-types are indicated in the taxa labels (RH = Little Red Riding Hood; GM = Story of Grandmother; Catt = Catterinella; WK = The Wolf and the Kid; TG = Tiger Grandmother). Variants by particular authors, or from countries/ethnic groups that are discussed in the text have individual labels. Numbers beside the edges represent the level of support for individual clades returned by the bootstrap analysis.
doi:10.1371/journal.pone.0078871.g002



Famous folklore scholar:



- 🧱 Comic Book Guy (CBG). [↗](#)
- 🧱 Real name: Jeffrey "Jeff" Albertson.
- 🧱 Master's degree in Folklore and Mythology.
- 🧱 Thesis: translated Lord of the Rings into Klingon.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



The taxonomy of stories:

COcoNuTS

Fundamental arcs:

- 🧱 Kill the Monster.
- 🧱 Rags to Riches (and Riches to Rags—*Metamorphosis*).
- 🧱 The Journey: a Search or a Quest.
- 🧱 Romance.
- 🧱 Narratives in Left Nullspace: All Stories of The Many.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

What about comedies?

- 🧱 Comedies are not in themselves a story, but a way of telling stories.



Stories are algorithms for life:

Homo narrativus:

- Provide dynamic paths and trajectories.
- If this, then that.
- Convey and reinforce how to behave, how not to behave.
- Full ecology of stories =
Competing, self-defending operating system for people's minds.

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

Aphorisms as algorithms:

- Pride cometh before the fall.
- A stitch in time saves nine.
- Look before you leap.
- Anti-aphorism: The one who hesitates is lost.



The unifying theme of existence is existence:

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

The three fundamental events of (non-clone) life:



Hatchings.



Matchings.



Dispatchings.



The essence of all stories?

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

It's survival—Life and Death:

- 🧱 Kill the Monster: Bare survival.
- 🧱 Rags to Riches: Flourishing.
- 🧱 Romance: Matchings and Hatchings.
- 🧱 Journey/Odyssey: Search for a salvation, a “Holy Grail”.



A basic algorithm for your future:

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

Modern basic science in three steps:

1. Find interesting/meaningful/important phenomena, optionally involving spectacular amounts of data.
2. Describe what you see.
3. Explain it.

If you succeed at 1–3:

- 4 Create.
- 5 Share.



Narrativium

Power

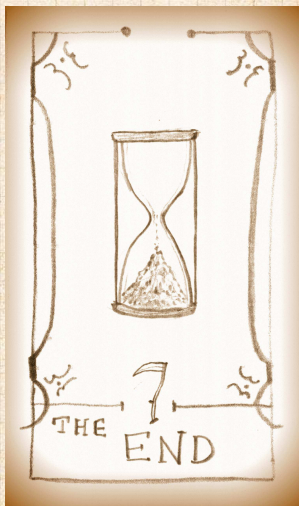
Shapes

Taxonomy



Essence

Coda

References



References I

- [1] J. Abello, P. Broadwell, and T. R. Tangherlini.
Computational folkloristics.
Communications of the ACM, 55:60–70, 2012.
[pdf](#) 
- [2] C. Booker.
The Hero with a Thousand Faces.
Continuum, 2005.
- [3] J. Campbell.
The Hero with a Thousand Faces.
New World Library, third edition, 2008.
- [4] J. Campbell and B. Moyers.
The Power of Myth.
Anchor, 1991. [pdf](#) 

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References



References II

- [5] D. P. Kiley, A. J. Reagan, L. Mitchell, C. M. Danforth, and P. S. Dodds.

The game story space of professional sports:
Australian Rules Football.

Available online at

<http://arxiv.org/abs/1507.03886>, 2016. pdf ↗

- [6] B. Snyder.
Save the Cat!

Michael Wiese Productions, 2005.

- [7] J. J. Tehrani.

The phylogeny of Little Red Riding Hood.

PLoS ONE, 8:e78871, 2013. pdf ↗

COcoNuTS

Narrativium

Power

Shapes

Taxonomy

Essence

Coda

References

