Night Parade of One Hundred Demons: Exploring Counterintuitiveness of Japanese Monstrous Beings

Yo Nakawake[1,2,*], Nanako Honda[1], and Masaki Suyama[1,3]

[1]Department of Social Psychology, Yasuda Women's University, 6-13-1 Yasuhigashi, Asaminami-ku, Hiroshima, 731-0153, Japan

[2]Centre for the Study of Social Cohesion, University of Oxford, 51-53 Banbury Road, Oxford OX2 6PE, UK

[3]Department of Economics, Meiji Gakuin University, 1-2-37 Shirokanedai Minato-ku, Tokyo, 108-8636, Japan

*Author for correspondence (yo.nakawake@gmail.com)

Minimally counterintuitive (MCI) theory has been proposed to explain common features inherent in supernatural, mythological, or religious concepts across diverse cultural traditions. According to this theory, these concepts often embody an optimal balance of counterintuitive elements, enhancing their cognitive attraction and likelihood of widespread transmission. Previous research has explored the prevalence of minimal counterintuitiveness in characters portrayed in various folkloristic and religious written materials. Here, we extend this investigation to examine the presence of minimal counterintuitiveness in *yokai*, Japanese monstrous beings. Using Barrett's MCI coding scheme, we analyzed 54 unique entities described in "*Yōkai Zukan*", a compilation of four materials written before the Westernization of Japan. Our findings, in line with previous research, demonstrate that 92.5% of the entities exhibit a minimal number of counterintuitive traits. The result highlights the applicability of the MCI theory to the analysis of Japanese monstrous beings that were recorded in Japan before Westernization.

Keywords

Introduction

Supernatural or counterintuitive concepts, or characters violating our intuitive understanding of ontological expectations, are found ubiquitously in folklore, myths, or religious texts around the world (Berezkin, 2015; Thompson, 1955; Uther, 2004). Examples range from magic objects that give the ability to fly in the air (violating intuitive physics), ghosts that can still act as if they are alive despite being dead (violating intuitive biology), to omniscient gods that have an unusual cognitive capacity (violating intuitive psychology; see Thompson motif index, D153.1, E200, A102.1, respectively; Thompson, 1955). Despite their diversity in abilities, forms, or habitats, Boyer proposed that those supernatural characters or concepts may be interpreted by one common feature: a minimal number of items violating our intuitions (Boyer, 1994, 2003). Here, intuition is defined as sets of expectations for each ontological category (see details in *Coding* in Method).

Boyer hypothesized that a concept with counterintuitive elements is cognitively attractive and mnemonically advantageous, although too many counterintuitive concepts could decrease mnemonic advantage (Boyer, 1994, 2003). As cultural epidemiology or cultural/cognitive attraction theory suggests, certain features of cultural content are more likely to spread than others, which are termed 'content biases' (Miton, 2023; Morin, 2016; Sperber & Hirschfeld, 2004). Minimally counterintuitiveness (MCI) could be listed as one of those content biases (Acerbi, 2019; Stubbersfield, 2022). This theory, known as MCI theory in cognitive science or evolutionary human science, provides a naturalistic explanation of the reason why supernatural concepts have been believed in diverse regions or documented across time and space (Barrett, 2000; Boyer & Baumard, 2016).

Empirical studies using artificial stories have shown the mnemonic advantages of MCI concepts (e.g., Barrett & Nyhof, 2001; Boyer & Ramble, 2001). In a controlled experiment, participants were more likely to recall counterintuitive items in stories (violating conceptual expectations of domains, e.g., animals, artifacts, or humans) than intuitive items (Boyer & Ramble, 2001). A transmission chain study of artificial stories (i.e., serial reproduction experiment) suggested that counterintuitive concepts have a mnemonic advantage during transmissions (Barrett & Nyhof, 2001). Further, such bias can be found in early ontogeny: 7–9-year-old children recalled counterintuitive words that included one or two violations of ontological expectations more frequently than intuitive words when they recalled both immediately and one week later (Banerjee et al., 2013). Further, by the age of 5, children showed greater curiosity in counterintuitive concepts over intuitive concepts (Lewry et al., 2023). Note that the counterintuitive effect has been replicated by other studies (Johnson et al., 2010; Norenzayan et al., 2006; Upal et al., 2007). However, also note that results can be influenced by context (e.g., contradictory context, supportive context; Gonce et al., 2006; Upal et al., 2007) and some results were not replicable (Gregory & Barrett, 2009), especially for older participants (Gregory & Greenway, 2017a, 2017b; both studies replicated in children and adolescence but not in older participant groups).

Quantitative analysis of actual textual materials (i.e., folktales, religious texts) has also been rigorously tested.

In the Grimm Brothers' tales, stories with counterintuitive elements were more popular (i.e., the number of cases found in Google) than others (Norenzayan et al., 2006). A similar result is later replicated in Aesop's fables (Upal, 2011). While those two studies did not clarify the precious details of how the counterintuitive elements were coded, Barrett (2008) formalized the coding scheme of MCI. This coding scheme was originally applied to religious texts (Barrett, 2008) and subsequently applied to folktales from several independent cultural groups as the first systematic study (Barrett et al., 2009), finding that the folktales most frequently include one or two counterintuitive elements. The coding scheme has also been applied to Japanese religious texts and demonstrated that among five texts (each was a collection of myths or folktales), characters or objects that appeared in those texts were most likely to include one or two counterintuitive elements (Kavanagh, 2011).

Applying MCI theory to cultural materials also helped museum expositions to arrange and exhibit various mysterious or monstrous beings across cultures. Although imaginary creatures were believed to take a unique form and dwell in various places (Yamanaka, 2019), MCI theory can provide an overlapping theme, thus helping arrange and classify the various imaginary creatures in museum exhibitions (Yamanaka, 2019). Further, MCI theory is applied to anthropological and folkloristic studies that analyze a conceptual framework of Japanese monstrous beings (*yokai*) focusing on naturality and supernaturality (e.g., Hirota, 2021, 2022).

Interestingly, before Barrett's classification scheme (or even before the rise of cognitive science), a similar categorization theory of Japanese monstrous beings had been proposed by Ema Tsutomu in 1923, a Japanese historian and folklorist (1884–1979) (Ema, 1923). Ema (1923) proposed five categories based on the true form of Japanese monstrous beings: human, animal, plant, artifact, and natural phenomena; these categories overlap with the basic ontological categories proposed by Barrett (2008) (i.e., persons, animate, living things, solid objects, and spatial entities, respectively).

However, Ema (1923) did not explicitly state whether Japanese monstrous beings described in many myths and folktales in Japan are indeed 'minimally' counterintuitive. To do so, we have picked up a common text that lists many monstrous beings depicted in many regions around Japan. We hypothesized that a large proportion of the list would exhibit minimally counterintuitive features similar to data collected around the world (Barrett et al., 2009).

In this paper we examine the number and the types of violations that the Japanese monstrous beings exhibit in a typical collection of monstrous beings mentioned in Japan called "*Yōkai Zukan*" (Kyogoku & Tada, 2000). The goal is to establish whether we find the same proportion of MCI features within this text and also to contribute to investigating the validity of MCI theory. The validity of applying Barrett's coding scheme on actual objects has been criticized (Purzycki & Willard, 2016). For this criticism, Kavanagh (2015) discussed the importance of 'butterfly collecting' of cultural material and welcomed more coding to assess various types of cultural materials to test the validity. Thus, the present study will explore whether a large proportion of monstrous beings in Japanese

myths and folktales are also minimally counterintuitive, which should become a contribution toward such an attempt of 'butterfly collecting'.

Methods
Materials
We coded the text of "*Yōkai Zukan*" (Kyogoku & Tada, 2000), an anthology of written materials of Japanese monstrous beings that covers four major sources produced in the Edo period (before the Meiji restoration, which is regarded as the turning point in Japanese Westernization). It covers "*Bakemonozukushi*", "*Hyakkai Zukan*", "*Bakemono Emaki*", and "*Hyakkiyagyo Emaki*"(Kyogoku & Tada, 2000). During coding, we did not use pictorial information as the source. This was because Barrett's coding scheme has been used to code textual information (Barrett, 2008; Barrett et al., 2009).

The reference contained 81 unique objects (i.e., monstrous beings) with some objects having different features depending on the original reference. We coded them as different objects if the ontological category was different. Objects that contained too little description to indicate whether they were counterintuitive or not were omitted from the analysis (*n* = 24). Additionally, objects that were hard to identify with the corresponding ontological category were also left out of the analysis (*n* = 2). A common counterintuitive creature called *kappa* was left out of the analysis due to its ontological deviance between references (*n* = 1). On this point, Ema (1923) also suggested that the *kappa* is a general or a higher dimensional categorization of several monstrous beings and that the *kappa* cannot be identified with the same ontological characteristics. The final size of the objects was 54 (see Table S1 in Supplementary Material).

Coding
In coding each object, we strictly followed Barrett's coding scheme (Barrett, 2008). Due to the space limitations, we cannot specify the full description of the coding process (the original explanation covers 31 pages). Instead, we will introduce the summary in the following paragraph.

There are several steps in the coding scheme. First, a coder identifies the ontological category of objects (see Table 1). There are five categories: Spatial Entities (i.e., natural phenomena, e.g., shadow), Solid Objects (i.e., artifacts, e.g., cups), Living Things (i.e., plants, e.g., trees), Animates (i.e., animals, e.g., cats), and Persons (i.e., human). For example, in the case of *kamaitachi*, the basic form was identified as a weasel, and its ontological category was identified as Animates.

Once an ontological category has been identified, then the counterintuitive properties of the target object are identified and listed. Here, the counterintuitive property is defined as a property violating a set of intuitive expectations of the ontology category specified in Table 1. Each ontological category is a set of intuitive sets of expectations. Descriptions that violate intuitive expectations are coded as 'counterintuitive', and the number of violations is counted. For example, in the case of *kamaitachi* (weseal-like creature), it had two violations (1) the ability to make a wind that can slash humans (i.e., such power should not be assumed in animals), (2) it can

Table 1. MCI coding scheme (expectation sets and ontological categories).

Expectation set (with coding abbreviation)	Spatial Entities (e.g., shadow, fire, cloud)	Solid Objects (e.g., cup, rock)	Living Things (e.g., tree, mushroom)	Animates (e.g., cat, ant)	Persons
Universality (u)	Assumed	Assumed	Assumed	Assumed	Assumed
Spatiality (s)	Assumed	Assumed	Assumed	Assumed	Assumed
Physicality (p)	N/A	Assumed	Assumed	Assumed	Assumed
Biology (b)	N/A	N/A	Assumed	Assumed*	Assumed*
Animacy (a)	N/A	N/A	N/A	Assumed	Assumed
Mentality (m)	N/A	N/A	N/A	N/A	Assumed

The table is created based on Barrett (2008), Barrett et al. (2009), Kavanagh (2011) and Purzycki & Willard (2016).

*Barrett (2009) considered that Animacy and Mentality could be represented without Biology. Thus, in some cases, the assumption of Biology can be optional for Animates and Persons.

use human language (i.e., animals should not be assumed mentality; and they should not understand or use human language). Descriptions that do not violate intuitive expectations were not listed. For example, there was a description that the *kamaitachi* eats humans from the head. Although one might consider it bizarre or strange to expect for weasel-like animals, it does not violate intuitive expectations in animals as some animals can attack and eat humans (e.g., tigers or wolves). The number of violations was then counted. In this example, the number of violations was two.

Barrett (2008) identified two types of violations, which are named 'transfers' and 'breaches'. The item is coded 'transfers' if the item *did* have the property that should not be expected in Table 1 (i.e., the cell labeled "N/A"). For example, the ontological category of *nekomata* is Animates, and thus Mentality is not assumed. Yet, the *nekomata* is described as a cat-formed creature that is assumed to have Mentality as it can understand and speak human language. In contrast, the item is coded as 'breaches' if the item *does* not have the property that should be expected in Table 1 (i.e., the cell labeled "Assumed"). For example, a *shiroukari* is a human-formed creature that is floating in the air. As the ontological category of *shiroukari* is Persons, it is assumed to satisfy Physicality. However, the *shiroukari* violates the physical principle of support because the object cannot levitate without physical support (Baillargeon & Hanko-Summers, 1990; Stahl & Feigenson, 2015).

Further, in coding, we also referred to specific examples of Kavanagh (2011). For example, Kavanagh (2011) coded a flaming dragon, a man made from rubber, and an invulnerable superman as counterintuitive objects violating our biological expectations. We followed those specific examples and coded similar cases as violating biological expectations.

Results

In total, 54 different objects were coded using the same scheme in Barrett et al. (2009). Two coders individually applied the coding scheme to each object's counterintuitiveness. They coded whether the object was indeed counterintuitive and when decided as such, coded what property was transferred or breached. The inter-coder reliability was moderate (Spearman's $r = .56$, $p <$

.001). Mainly, the disagreements occurred with regard to which ontological category the object was breaching (i.e. Biology or Physicality), similar to Barrett et al. (2009). For example, some objects could turn into inanimate objects. Those with this feature were either categorized as breaching Physicality or Biology depending on the coder. In this article, we categorized this breach as Biology. Other disagreements between coders were resolved by using the simplicity rule following Barrett (2000). After the discussion with the coders and authors, all disagreements were resolved.

Out of 54 unique objects, 14 objects (25.93%) were regarded as intuitive, and the rest were counterintuitive ($n = 40$, 74.07%). Out of counterintuitive objects, the majority had a counterintuitive score of 1 or 2 ($n = 37$, 92.50%) (Table 2). In Barrett et al. (2009), they described that the majority of objects containing counterintuitiveness had a score of 1 or 2 ($n = 115$, 99.0%), which corresponds to our finding.

Table 2. Number of objects per breach.

Breaches	Number of objects	Percentage
0	14	(25.9)
1	21	52.5 (38.9)
2	16	40 (29.6)
3	2	5 (3.7)
4	1	2.5 (1.9)
5	0	0 (0)

The number in brackets includes intuitive objects.

In concordance with Barrett et al. (2009), most objects were agents that were classified as either Animates or Persons (98.2% in the original article and 97.5% in our result; Table 3). Although the previous article coded most of the counterintuitive objects as breaching Mentality or Animacy (61.0%; the original paper reported the sum of both categories), our results indicated that the most breached ontological category was Physicality or Biology (Biology, 73.0%; Physicality, 7.9%) (Table 4). Animacy and Mentality were breached only 1.6% and 15.9% in our reference, respectively.

Table 3. Number of objects per type.

Types	Number of objects	Percentage
Spatial entities	0 (1)	0 (1.9)
Solid Objects	1 (1)	2.5 (1.9)
Living Things	0 (0)	0 (0)
Animates	12 (15)	30.0 (27.8)
Persons	27 (37)	67.5 (68.5)

The number in brackets includes intuitive objects.

Table 4. Number of breaches per expectations.

Expectation set	Number of Breaches	Percentage
Universality	1	1.6
Spatiality	0	0.0
Physicality	5	7.9
Biology	46	73.0
Animacy	1	1.6
Mentality	10	15.9

Discussion

The present study coded 54 Japanese monstrous beings based on Barrett's coding scheme. The results showed that the overall pattern of the MCI object matched with previous coding studies, suggesting that MCI theory can also be applied to Japanese monstrous beings that appeared in traditional folkloristic materials. The result is consistent with the minimally counterintuitive theory, and it suggests that human cognitive bias may also shape the traits of Japanese monstrous beings. Such mnemonically advantageous or cognitively attractive features of Japanese monstrous beings may also explain why they are still popular today in various media such as novels, comics, animations, or movies.

Further, consistent with Barrett et al. (2009), we classified most of the agents as either Animates (animals) or Persons (human). In our analysis, only one case was coded as Solid Objects (non-living objects; e.g., stone, umbrella). A typical Japanese monstrous being of this category is *tsukumogami*, which are material tools that acquired spirits after a long time. However, our sample did not include many of them. One possible reason for this result is the time period of the materials we used. According to Komatsu (2007), the belief in *tsukumogami* was prevalent in the medieval period, but declined as a concept afterwards. He also pointed out that they became popular as subjects of printings (*ukiyoe*) in the late Edo period, but were detached from belief. Based on these points, there was little explanation about *tsukumogami* as objects of belief, and therefore our dataset lacked textual information or description about them. Thus, fewer Solid Objects in our result could result from sampling bias. Further studies investigating materials from various time periods might find more monstrous beings that take the shape of Solid Objects.

Some inconsistency from Barrett et al. (2009) has

been found. For example, Barrett found that the larger proportion of violations was either Mentality or Animacy, on the other hand, the present study found that Physicality and Biology were violated 81.0% of the time. This may be due to selection bias or the differences in the genre of the coded material. Barrett et al. (2009) coded objects included in the traditional stories. This may lead the original article to selectively include more objects that depict descriptions of actions such as speech or behavior. On the other hand, the present study coded a pictorial book of Japanese monstrous beings which included a short description and was not in a narrative. Thus, if we coded stories of monstrous beings, the result may have coincided with Barrett et al. (2009).

Finally, it is interesting that the basic ontological category of the MCI scheme matched Ema's (1923) classification scheme of Japanese monstrous beings. In fact, our results verify Barrett's coding scheme as it could also be applied to Japanese monstrous beings and yield a consistent pattern. Ema developed the theory before the birth of cognitive science or before studies of developmental psychology testing the intuitive set of expectations known as 'core knowledge' (Spelke & Kinzler, 2007). Recently, the WEIRD (Western, Educated, Industrialized, Rich and Democratic) problem has been advocated and cast fundamental questions on the validity of 'Western' theories in cognitive science as some theories can only be applied to WEIRD participants (Blasi et al., 2022). However, Ema's classification scheme which was 'a lost and found' within the Japanese folkloristic literature may strengthen the foundations of the MCI theory. The fact that two theories developed independently within two distinct cultures and times converge to a similar conclusion might lead to the validation of both theories.

Author Contributions

Y. N., N. H. and M. S. designed and conducted the research. Y. N. and M. S. wrote the manuscript.

References

Acerbi, A. (2019). Cognitive attraction and online misinformation. *Palgrave Communications*, *5*, Article 15. https://doi.org/10.1057/s41599-019-0224-y

Baillargeon, R., & Hanko-Summers, S. (1990). Is the top object adequately supported by the bottom object? Young infants' understanding of support relations. *Cognitive Development*, *5*(1), 29–53. https://doi.org/10.1016/0885-2014(90)90011-H

Banerjee, K., Haque, O. S., & Spelke, E. S. (2013). Melting lizards and crying mailboxes: Children's preferential recall of minimally counterintuitive concepts. *Cognitive Science*, *37*(7), 1251–1289. https://doi.

org/10.1111/cogs.12037

Barrett, J. L. (2000). Exploring the natural foundations of religion. *Trends in Cognitive Sciences*, *4*(1), 29–34. https://doi.org/10.1016/S1364-6613(99)01419-9

Barrett, J. L. (2008). Coding and quantifying counterintuitiveness in religious concepts: Theoretical and methodological reflections. *Method and Theory in the Study of Religion*, *20*(4), 308–338. https://doi.org/10.1163/157006808X371806

Barrett, J. L., Burdett, E. R., & Porter, T. (2009). Counterintuitiveness in folktales: Finding the cognitive optimum. *Journal of Cognition and Culture*, *9*(3–4), 271–287. https://doi.org/10.1163/156770909X12489459066345

Barrett, J. L., & Nyhof, M. A. (2001). Spreading non-natural concepts: The role of intuitive conceptual structures in memory and transmission of cultural materials. *Journal of Cognition and Culture*, *1*(1), 69–100. https://doi.org/10.1163/156853701300063589

Berezkin, Y. E. (2015). Folklore and mythology catalogue: Its lay-out and potential for research. *The Retrospective Methods Network*, *S10*, 58–70.

Blasi, D. E., Henrich, J., Adamou, E., Kemmerer, D., & Majid, A. (2022). Over-reliance on English hinders cognitive science. *Trends in Cognitive Sciences*, *26*(12), 1153–1170. https://doi.org/10.1016/j.tics.2022.09.015

Boyer, P. (1994). *The naturalness of religious ideas: A cognitive theory of religion*. University of California Press.

Boyer, P. (2003). Religious thought and behaviour as by-products of brain function. *Trends in Cognitive Sciences*, *7*(3), 119–124. https://doi.org/10.1016/S1364-6613(03)00031-7

Boyer, P., & Baumard, N. (2016). The diversity of religious systems across history: An evolutionary cognitive approach. In J. R. Liddle & T. K. Shackelford (Eds.), *The Oxford Handbook of Evolutionary Psychology and Religion* (pp. 34–47). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199397747.013.5

Boyer, P., & Ramble, C. (2001). Cognitive templates for religious concepts: cross-cultural evidence for recall of counterintuitive representations. *Cognitive Science*, *25*(4), 535–564. https://doi.org/10.1207/s15516709cog2504_2

Ema, T. (1923). *Nihon yōkai hengeshi* [A history of Japanese yokai transformations]. Chūgai Shuppan. https://doi.org/10.11501/1266376

Gonce, L. O., Upal, M. A., Slone, D. J., & Tweney, R. D. (2006). Role of context in the recall of counterintuitive concepts. *Journal of Cognition and Culture*, *6*(3–4), 521–547. https://doi.org/10.1163/156853706778554959

Gregory, J. P., & Barrett, J. L. (2009). Epistemology and counterintuitiveness: Role and relationship in epidemiology of cultural representations. *Journal of Cognition and Culture*, *9*(3–4), 289–314. https://doi.org/10.1163/156770909X12489459066381

Gregory, J. P., & Greenway, T. S. (2017a). Is there a window of opportunity for religiosity? Children and adolescents preferentially recall religious-type cultural representations, but older adults do not. *Religion, Brain and Behavior*, *7*(2), 1–19. https://doi.org/10.1080/2153599X.2016.1196234

Gregory, J. P., & Greenway, T. S. (2017b). The mnemonic of intuitive ontology violation is not the distinctiveness effect: Evidence from a broad age spectrum of persons in the UK and China during a free-recall task. *Journal*

of Cognition and Culture*, *17*(1–2), 169–197. https://doi.org/10.1163/15685373-12342197

Hirota, R. (2021). Traversing the natural, supernatural, and paranormal: Yōkai in postwar Japan. *Japanese Journal of Religious Studies*, *48*(2), 321–339. https://doi.org/10.18874/jjrs.48.2.2021.321-339

Hirota, R. (2022). *Yōkai no tanjō. Chōshizen to kaikiteki shizen no sonzaironteki jinruigaku* [The birth of yokai: Ontological historical anthropology of the supernatural and the bizarre nature]. Seikyūsha.

Johnson, C. V. M., Kelly, S. W., & Bishop, P. (2010). Measuring the mnemonic advantage of counter-intuitive and counter-schematic concepts. *Journal of Cognition and Culture*, *10*(1–2), 109–121. https://doi.org/10.1163/156853710X497194

Kavanagh, C. M. (2011). *Counterintuitive concepts in East Asian religions: A cross-cultural comparison* [Master dissertation, University of Oxford].

Kavanagh, C. M. (2015). On the necessity of "minimal" methodological standards and religious "butterfly" collecting. *Religion, Brain & Behavior*, *6*(3), 259–261. https://doi.org/10.1080/2153599X.2015.1015048

Komatsu, K. (2007). *Nihon yōkai ibunroku* [Record of strange accounts of Japanese yokai]. Kōdansha Gakujutsu Bunko.

Kyogoku, N., & Tada, K. (2000). *Yōkai zukan* (1st ed.) [Illustrated reference book of yokai]. Kokusho Kankōkai.

Lewry, C., Gorucu, S., Liquin, E. G., & Lombrozo, T. (2023). Minimally counterintuitive stimuli trigger greater curiosity than merely improbable stimuli. *Cognition*, *230*, Article 105286. https://doi.org/10.1016/j.cognition.2022.105286

Miton, H. (2023). Cultural attraction. In J. J. Tehrani, J. Kendal, & R. Kendal (Eds.), *The Oxford Handbook of Cultural Evolution* (pp. C4S1-C4P132). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198869252.013.4

Morin, O. (2016). *How traditions live and die*. Oxford University Press.

Norenzayan, A., Atran, S., Faulkner, J., & Schaller, M. (2006). Memory and mystery: The cultural selection of minimally counterintuitive narratives. *Cognitive Science*, *30*(3), 531–553. https://doi.org/10.1207/s15516709cog0000_68

Purzycki, B. G., & Willard, A. K. (2016). MCI theory: A critical discussion. *Religion, Brain and Behavior*, *6*(3), 207–248. https://doi.org/10.1080/2153599X.2015.1024915

Spelke, E. S., & Kinzler, K. D. (2007). Core knowledge. *Developmental Science*, *10*(1), 89–96. https://doi.org/10.1111/j.1467-7687.2007.00569.x

Sperber, D., & Hirschfeld, L. A. (2004). The cognitive foundations of cultural stability and diversity. *Trends in Cognitive Sciences*, *8*(1), 40–46. https://doi.org/10.1016/j.tics.2003.11.002

Stahl, A. E., & Feigenson, L. (2015). Observing the unexpected enhances infants' learning and exploration. *Science*, *348*(6230), 91–94. https://doi.org/10.1126/science.aaa3799

Stubbersfield, J. M. (2022). Content biases in three phases of cultural transmission: A review. *Culture and Evolution*, *19*(1), 41–60. https://doi.org/10.1556/2055.2022.00024

Thompson, S. (1955). *Motif-index of folk-literature: a classification of narrative elements in folktales, ballads, myths, fables, medieval romances, exempla,*

fabliaux, jest-books, and local legends. Indiana University Press.

Upal, M. A. (2011). Memory, mystery, and coherence: Does the presence of 2–3 counterintuitive concepts predict cultural success of a narrative? *Journal of Cognition and Culture*, *11*(1–2), 23–48. https://doi.org/10.1163/156853711X568671

Upal, M. A., Gonce, L. O., Tweney, R. D., & Slone, D. J. (2007). Contextualizing counterintuitiveness: How context affects comprehension and memorability of counterintuitive concepts. *Cognitive Science*, *31*(3), 415–439. https://doi.org/10.1080/15326900701326568

Uther, H.-J. (2004). *The types of international folktales: a classification and bibliography, based on the system of Antti Aarne and Stith Thompson*. Suomalainen Tiedeakatemia, Academia Scientiarum Fennica .

Yamanaka, Y. (2019). Shizenkai to sōzōkai no awai ni aru kyōi to kaii [Marvelous and uncanny between the natural and imaginary worlds]. In Y. Yamanaka & H. Yamada (Eds.), *Konoyo no kiwa - <shizen> no uchi to soto* [The edge of this world - inside and outside of <nature>] (pp. 4–16). Kokusho Kankōkai.