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The Cultural Transmission and Evolution of Folk Narratives

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Abstract

Folk narratives – such as fairy tales, legends, and fables – are products of tradition, rather than individual authors. As they get passed on from person to person and from generation to generation new variants evolve, some of which catch on and generate new traditions, while others soon fade into extinction. Folklorists have long been interested in documenting and reconstructing these processes, but have often been stymied by the limitations of the folklore record. Cultural Evolution has brought powerful new concepts and methods to investigate the transmission histories of folk narratives, from comparative phylogenetic analyses of the relationships among similar tales from different cultures, to experimental studies of how stories mutate and evolve through oral transmission. This chapter reviews these contributions and considers prospects for future research into the cultural evolution of folk narrative traditions.

Keywords: narrative, folk tales, cultural evolution, phylomemetics, cultural transmission biases

Introduction

Folk narratives like fairy tales, myths, ballads, and legends are products of cultural 'descent with modification' par excellence. They are by definition 'traditional tales' of unknown provenance that have been shaped by generations of storytellers, rather than the creative genius of individual authors. As they get passed on from person to person some details are omitted or distorted, while others may be added and elaborated. Consequently, there is no single or definitive version of any folk narrative, just a multitude of retellings, each different from the other to some degree. However, while some mutations spawn many new variants and may even come to dominate the tradition (think of Little Red Riding Hood's eponymous hooded cloak, or Cinderella's glass slipper—both relatively recent innovations from the seventeenth century), others fail to catch on and soon vanish into extinction. In other words, folk narratives exhibit all the key properties of an evolving system: variation, selection, inheritance, and change over time.

The notion that folk narratives evolve in ways that are analogous to biological organisms is not a new idea. Indeed, these parallels have been frequently invoked by folklorists themselves. For example, the renowned American folklorist Barre Toelken observed that 'any particular traditional item may be viewed very much as an animal in the evolutionary process . . . just as there is no single cat which can be called the cat and no single dog which can be called the dog, there is no "Barbara Allen" which can be called the or "the original" ballad . . . [but rather] a cluster of characteristics which seem to be connected with a particular narrative song' (1969, p. 99). Warming to this theme, Toelken goes on to argue that 'the factors of traditional inheritance versus local adaptation, the possibility for individual items to lose their dynamism (e.g., "die") and exist only in recorded—fossilized—form, the occasional chance for a wide variation–a mutation–to occur which will in turn die out or else propagate a new line of dynamism, and the quality of geographical mobility, to mention a few, all seem analogous to common considerations in the study of evolution and ecology' (Toelken, 1969, p. 99). In similar vein, influential writers such as Stith Thompson (1977) have proposed that folklorists ought to classify their material in the same way as zoologists and botanists do, by grouping tales into hierarchically arranged categories akin to species, genera and families: 'biologists have long since labelled their flora and fauna by a universal system and by using this method have published thousands of inventories of the animal and plant life of all parts of the world . . . The need for such an arrangement of narrative has been realized for a long time' (Thompson, 1977:, p. 414). More recently, Jack Zipes (2006) has deployed Richard Dawkins' concept of the meme (Dawkins, 1976)—selfish replicators of cultural information analogous to genes—to study the literary history of fairy through an evolutionary lens. Zipes argues that, as memes, fairy tales compete for our attention and interest, often by homing in on such basic human concerns as sex and survival while adapting their core messages to suit contemporary social and political contexts (Zipes, 2006).

Following these leads, contemporary approaches to cultural evolution have brought new perspectives, concepts, and methods to the study of folk narratives. This chapter will review current research in this area, focusing on three main issues: reconstructing lineages of narrative 'descent with modification', the relationships between these traditions and other dimensions of human population history, and the selective processes that shape the stability and transformation of different types of content.

Lineages of Story Transmission

Early research into comparative folklore was often framed by non-Darwinian social evolutionary theories, which proposed all societies developed through the same set of stages from 'savagery' to 'barbarism' to 'civilization'. Common themes in myth and traditional tales were mined for evidence about each stage, since they were thought to encode 'survivals' of the ancestral lifeways of more 'advanced' cultures that were supposedly similar to those of contemporary small-scale societies (e.g. Frazer, 1900; Tylor, 1871). As these theories became increasingly discredited, new paradigms emerged that recognized the ways in which patterns of cultural diversity evolve through the dynamic flow of people and ideas within and across regions, rather than through independent, parallel developments in individual cultures (Bloch, 2005). In folklore, this approach was epitomized by the 'historic-geographic school' that emerged in the late nineteenth and twentieth centuries (e.g. Aarne & Thompson, 1961, Krohn, 1971). The historic-geographic school held that the striking similarities among tales recorded in different cultures could be best explained by the transmission of storytelling traditions across generations and societies. To analyse the distributions and development of these traditions, folklorists constructed a taxonomy of traditional narratives known as the 'international tale type index' (Aarne & Thompson, 1961; Uther, 2004). An international type is defined as an independent (i.e. self-contained) basic plot that is recognizably consistent across cultures. Over 2,000 of these international types have been codified and catalogued in more than 900 societies in the Aarne–Thompson–Uther (ATU) Index (Uther, 2004). The ATU Index assigns each tale type its own ATU number—for example, Beauty and the Beast and Cinderella are two extremely widespread tales that are classified as ATU 425C and ATU 510 respectively. By assembling all the known variants of a given international type and sorting them by region and chronology, historic-geographic folklorists hoped to locate the sources and homelands of common folktales, track how they spread around the world, reconstruct their original forms (the so-called ur tale), and discover the ways they have been adapted to suit different social and natural environments (Sydow, 1948). However, as critics have pointed out (e.g. Goldberg, 1984; Jacobs, 1966), the ATU Index has strong ethnocentric biases. This is because the majority of international types were originally defined in relation to the European corpus, which can make tales from other regions difficult to classify when they share features with more than one (or indeed, none) of the ATU type descriptions. Furthermore, since folktales have been mainly transmitted through oral tradition there is often a lack of evidence with which to construct thorough chronologies.

Cultural evolutionary approaches offer novel solutions to these problems by drawing on phylogenetic analysis from evolutionary biology. Like the historical folktale record, the fossil record is extremely patchy, with only a tiny fraction of species leaving any direct evidence of their existence. To address this challenge, phylogenetic analysis exploits information about extinct ancestral species that has been preserved via the mechanism of inheritance, namely the genetic mutations shared by their descendants. The latter are then used to sort species into hierarchically nested groups based on increasingly exclusive relationships of common ancestry. In simple phylogenetic analyses like cladistics (Kitching et al., 2017), these relationships are modelled as a branching tree-like structure of descent with modification in which the number of genetic mutations from the root to the tips are minimized (as per the principle of parsimony). More complex analyses, such as Bayesian phylogenetic inference, incorporate parameters that allow for variance in the branch lengths of the tree and mutation rates at different sites in the genome (Huelsenbeck et al., 2001). Network-based approaches, like the widely used Neighbor-Net model (Huson & Bryant, 2006), can capture processes of 'horizontal transmission' across lineages for cases where the evolution of a group of species is not strictly tree-like (e.g. hybridization).

In recent years, these various phylogenetic methods have been used to investigate a range of cultural traditions, and approach that is often referred to as 'phylomemetics' (Howe & Windram, 2011). Rather than genes, phylomemetics focuses on mutations in socially learned information ('memes'), such as word forms (Greenhill, this volume), cumulative innovations in a technological or craft tradition (Buckley, this volume), or scribal errors found in texts copied from the same exemplar (Howe & Windram, this volume). In the case of folk narratives, the appropriate units of analysis are known as 'motifs', defined in folkloristics as 'the smallest element in a tale having the power to persist in tradition' (Thompson, 1977, p. 415). Motifs typically consist of specific characters (e.g. a fairy godmother), artefacts (e.g. a magic ring), or episodes (e.g. a girl encounters a wolf in the woods). By analysing the distributions of shared motifs and their transformations in a narrative tradition, phylomemetics offers a more rigorous, quantitative means to establish groups of related tales that is less biased than classic definitions of international tale types that are based on a (typically European) reference tale. Moreover, unlike classic historic-geographic methods, phylomemetic inference does not require any a priori knowledge about the chronology of types and their variants.

The advantages of the phylomemetic approach are illustrated in Tehrani's (2013) case study of two famous and related international tales, ATU 333 Little Red Riding Hood and ATU 123 The Wolf and the Kids. Both tale types concern a dangerous predator (usually a wolf) who attacks their victim(s) by posing as a relative. In European and Middle Eastern traditions, they are differentiated by two key features: whether the protagonists(s) of the tale is (are) human (ATU 333) or animal (ATU 123), and whether the predator (usually a wolf) attacks them in their own home (ATU 123) or at their grandmother's house (ATU 333). However, there are highly similar and clearly related tales in parts of Africa and East Asia which are difficult to classify using these distinctions. In many of these tales, the victim is human (like Little Red Riding Hood) but they are attacked in their own home (as in the Wolf and the Kids). Consequently, it is not clear whether these tales are variants of ATU 333, ATU 123, or perhaps neither. To address these issues, Tehrani used cladistics, Bayesian phylogenetic inference, and phylogenetic network analysis on a dataset of 72 motifs coded from 58 versions of these tales sampled from 33 populations. The motifs included features such as character of the protagonist (single child versus group of siblings; male versus female), the character of the villain (wolf, ogre, tiger, etc.), whether the victim is devoured, escapes, or is rescued, and so on (Tehrani 2013). The results of his analyses supported the existence of ATU 333 and ATU 123 as phylogenetically distinct tale traditions in Europe and the Middle East, and were consistent with the available chronological data on the histories of both tale types. For instance, the earliest recorded versions of each tale—an eleventh-century story about a girl who encounters a wolf when she gets lost in the woods and an Aesopic fable about a wolf, a nanny goat, and her kids from 400 AD—appear at the base of their respective clades. The results also showed the African tales clearly group with ATU 123 The Wolf and the Kids, while the East Asian stories formed a separate lineage distinct from both ATU 123 and ATU 333. To better understand the relationships between the Asian tales and ATU 123 and ATU 333 Tehrani carried out a set of follow up analyses to investigate a long-standing hypothesis that the Asian tales are ancestral to Little Red Riding Hood and The Wolf and the Kids (e.g. Dundes, 1989). According to this hypothesis, the latter two tales split into separate traditions after the original Asian story spread west to Europe and the Middle East. Tehrani tested these claims using phylogenetic 'ancestral state reconstruction' to estimate the probabilities that motifs shared among the Asian and western tales were present in their last common ancestor, as the hypothesis would predict. His results failed to support this prediction, and instead suggest that the resemblances between the Asian tales and Little Red Riding Hood on one hand and The Wolf and the Kids on the other are more

likely to be the result of independent evolution or, more likely, borrowing motifs from both tale types and blending them with local folktales.

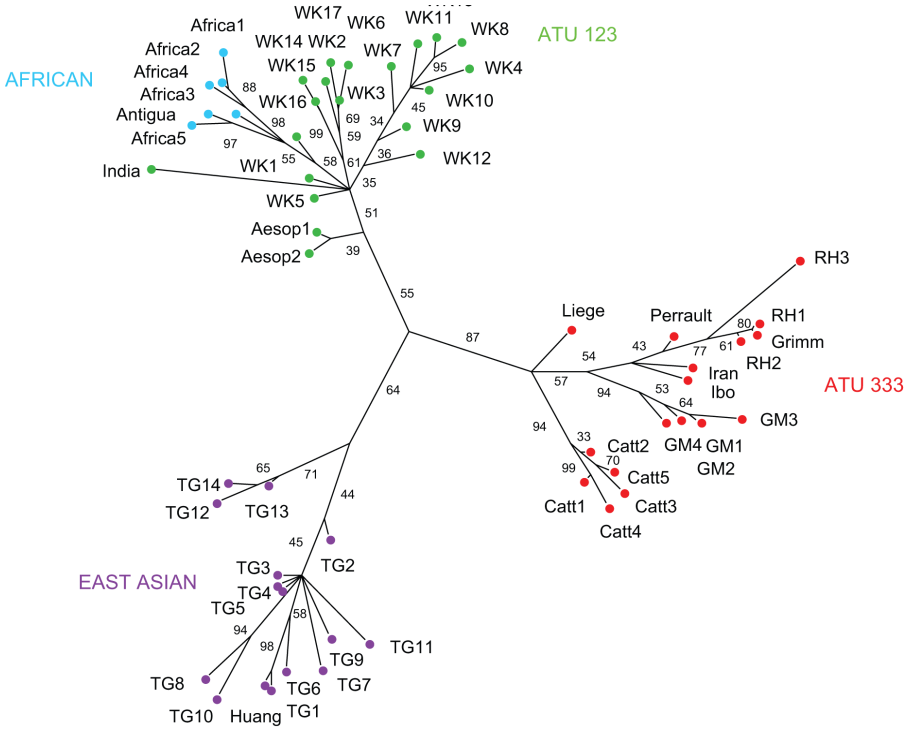

Figure 39.1: Phylomemetic relationships among Little Red Riding Hood and related tales (from Tehrani 2013). Numbers represent Bayesian posterior probabilities for each branch

Mixing among traditions appears to have been even more prominent in the evolution of Cinderella tales (ATU 510/511) studied by Martini et al. (in press). According to folklorists, Cinderella tales can be divided into five principal subtypes (following Rooth, 1951): A, B, BI, C, and AB. To test the validity of these groups and explore their origins, Martini et al. analysed 237 motifs coded from a large global sample of all five subtypes (266 tales in total) using Bayesian phylogenetic inference, phylogenetic network analysis (Neighbor-Net) and a model-based clustering method from population genetics (implemented in the program STRUCTURE (Pritchard et al. 2000)). Their results suggest that, while there is some evidence that types A, B, BI, and C may have evolved from distinct traditions, mixing among the types has been widespread. This is especially evident in the case of type AB, which appears to represent a miscellaneous collection of stories cobbled together from types A, B, and C, rather than a single, coherent tradition. Overall, Martini et al.'s findings suggest that Cinderella subtypes can be better thought of as interbreeding populations of a single species, rather than as related, but phylogenetically distinct, separate species.

Other studies have reconstructed narrative lineages to explore the development of literary folktales and their relationships to oral storytelling. Revisionist literary historians have argued that many famous fairy tales were invented by Early Modern authors rather than deriving from ancient oral traditions (e.g. Bottigheimer, 2009). To test this hypothesis, Tehrani, Nguyen, and Roos (Tehrani et al., 2016) analysed a sample of literary and oral versions of Little Red Riding Hood using a custom-built tool called 'PhyloDAG', a network-based model that is also able to estimate direct ancestor–descendent relationships between texts/tellings. Their results strongly suggest that the classic

literary version of Little Red Riding Hood published by Charles Perrault in 1697 was derived from French oral traditions, and not the other way round as claimed by revisionist theories (Bottigheimer, 2009). Karsdorp and van den Bosch (2016) offered further insights into the development of literary fairy tales by combining theory and methods from cultural evolution and Natural Language Processing (NLP). They constructed a story network for a collection of over 400 published Dutch versions of Little Red Riding Hood using a 'bag-of-words' approach (which uses correlations in the word frequencies associated with individual texts) rather than standard phylomemetics. Their results suggest that like oral traditions, literary fairy tales tend to evolve in a gradual and cumulative way, with most authors choosing a relatively recent version of the story as a 'pretext' (i.e. a model). However, a few texts—such as Perrault's and the Brothers Grimm's classic tellings—appear as key hubs in the network because they are often preferentially chosen as pretexts across the entire time span of the collection. This highlights an interesting difference with oral traditions, where storytellers typically only have access to contemporary and local versions of a given folktale.

Another group of studies have focused on the relationships between narrative traditions, language diversity, population histories, and geographical distributions. These topics were of central importance to historic-geographic studies of folklore, and are the focus of the next section of this chapter.

Narrative Traditions and Population Histories

Understanding the relationship between cultural traditions and population dispersals is a key issue for cultural evolution in general and phylomemetics in particular, as the chapters on language phylogenies (Greenhill) and craft traditions (Buckley) in this volume illustrate. Narrative traditions are no exception. Indeed, researchers have long speculated that folktales might be correlated with population histories. Wilhelm Grimm famously argued that the traditional German tales that he and his brother Jacob had compiled were remnants of an ancient Indo-European inheritance that stretched from Scandinavia to South Asia:

The outermost lines [of common heritage in stories] . . . are coterminous with those of the great race which is commonly called Indo-Germanic, and the relationship draws itself in constantly narrowing circles round the settlements of the Germans . . . It is my belief that the German stories do not belong to the northern and southern parts of our fatherland alone but that they are the absolutely common property of the nearly related Dutch, English and Scandinavians. (Grimm, 1884)

More recently, similar arguments have been advanced by comparative mythologists such as Yuri Berezkin (2017) and Michael Witzel (2013). Taking a phylomemetic approach, d'Huy reconstructed lineages of transmission for the international tale types Pygmalion (2013) and Polyphemus (2015) which he claims reflect ancient population movements in Africa (> 2,000 years ago) and the peopling of the Americas (> 15,000 years ago) respectively. However, both studies are based on small and geographically patchy tale samples, which make it difficult to map phylogenetic relationships to known migration routes reliably. Moreover, d'Huy does not address potential alternatives to migration that might explain cross-cultural relationships among these traditions, such as independent evolution, colonialism, and missionary activity, or spatial diffusion among neighbouring cultures. The latter in particular has long been proposed as a major mechanism in the spread of folk narratives, with Sir Walter Scott once claiming that 'the wide diffusion of popular fictions may be compared to the facility with which straws and feathers are dispersed abroad by the wind' (Scott, 1810).

The first systematic attempt to investigate the roles of migration versus diffusion in folktales was carried out by Ross, Greenhill, and Atkinson (Ropss et al., 2013) in their case study of ATU 480 'The Tale of the Kind and Unkind Girls'. Ross et al. used Mantel and partial Mantel tests to analyse the roles of common ancestry and diffusion in structuring variation in 700 versions of ATU 480 from 31 European populations. They used linguistic relatedness as a proxy for common ancestry and spatial proximity as a proxy for diffusion between neighbouring cultures. They found that cross-cultural similarities among versions of The Kind and Unkind Girl are correlated with geographic nearness when controlling for common linguistic heritage, but not vice-versa, which suggests that the tale mainly spread via diffusion rather than population dispersals. However, the transmission of this tradition between societies was not frictionless. Indeed, it appears that ethno-linguistic barriers have a powerful effect on the diversity of ATU 480 in Europe that is equivalent to multiplying geographic distances by a factor of 10. As Ross et al. neatly put it, 'folktales from the same culture found 100 km apart are, on average, as similar as folktales found 10 km apart in different cultures'.

Of course, ATU 480 is just a single tale type that may or may not be representative of more general patterns of folktale transmission. To investigate these issues on a larger scale, Graça da Silva and Tehrani analysed the relationships among international tales, population histories, and geographical patterns using data on 275 'Tales of Magic' (i.e. 'fairy tales') shared among 50 Indo-European-speaking populations (Graça da Silva & Tehrani, 2016). They found that the distributions of 100 of these tales are patterned by linguistic relatedness, suggesting that they may have been inherited from common ancestral populations (as Grimm had speculated). These correlations were robust when controlling for spatial diffusion among neighbouring cultures, with shared linguistic heritage exerting a stronger effect than geographic proximity in over three-quarters of these tales. To shed more light on the transmission histories of these traditions, Graça da Silva and Tehrani mapped the most phylogenetically conserved tales onto a Bayesian sample of Indo-European language trees using techniques of phylogenetic ancestral state reconstruction. These analyses revealed that many Indo-European fairy tales—including such famous stories as Beauty and the Beast (ATU 425C) and Rumplestiltskin (ATU 500, The Name of the Supernatural Helper)—can be traced back to ancestral populations that existed thousands of years ago, long before they were first written down. These findings provide further evidence against revisionist theories suggesting that these tales are modern literary inventions. They also contribute to wider debates about Indo-European prehistory. In particular, Graça da Silva and Tehrani report that one tale, ATU 330 'The Smith and the Devil', which concerns a trickster blacksmith who fools the devil (or, in some regions, a personification of Death), may have even been present in last common ancestor of all surviving Indo-European-speaking cultures ('Proto-Indo-European', or PIE). This finding is compatible with the so-called Kurgan hypothesis, which locates the origins of Indo-European in the Pontic steppe 5,000 to 6,000 years ago, during the Bronze Age. In contrast, it seems difficult to reconcile with the alternative 'Anatolian hypothesis' of Indo-European origins, which proposes a much earlier and more gradual process of demic diffusion associated with the spread of agriculture from Neolithic Anatolia 8,000 to 9,000 years ago—prior to the invention of pyrotechnic metallurgy.

In other language families and regions of the world, spatial diffusion may play a larger role in the spread of narrative traditions. For example, Ross and Atkinson (2016) found that the distributions of shared tale types among Arctic hunter-gather societies are more influenced by the geographical proximity of populations than their linguistic relationships. One possible explanation for the difference with Indo-European cultures is that Arctic forager societies are relatively fluid and highly mobile, which may have significantly expanded their opportunities to share and disseminate stories across ethno-linguistic boundaries. Bortolini and colleagues brought a new perspective to these issues by exploiting newly available whole genome sequence sssdata to obtain more direct estimates

of shared population histories (Bortolini et al., 2017). They analysed the distributions of 596 international tale types among 33 populations whose folktale traditions could be matched to available genetic samples and geographic locations. Bortolini et al. found that similarities among folktale corpora were significantly correlated with both genetic and geographic patterns, suggesting that these stories spread both through population dispersals and cultural diffusion. Echoing Ross et al.'s study of The Kind and Unkind Girls, their analyses further showed that language barriers played a significant role in both cases: stories and storytellers moved more easily between groups speaking closely related languages than between groups from separate language families. Most importantly of all, Bortolini et al. showed that the relative importance of these two modes of transmission varied at different spatial scales. Genetic relationships are better at predicting similarities among folktale traditions over ranges smaller than 4,000 kilometres (km), while between 4,000 and 8,000 km, geographic distances explain more of the variation in folktale corpora. This result probably reflects the fact that, until recently, people generally didn't travel or resettle in places far from where they were born, and population expansions also tended to be relatively gradual and localized. But cultural diffusion enabled some stories to spread across much larger areas through trade and other forms of cultural exchange.

Telling Tales: Cultural Transmission Biases in Folk Narratives

The research discussed in the previous two sections of this chapter have shown that folk narratives can be remarkably stable in their transmission over hundreds, even thousands of years and across vast geographic distances. This raises the important question of how stories are able to survive the wear-and-tear of oral transmission over so many generations. One compelling explanation is that, as they are retold again and again, tales tend to be distorted and transformed in ways that make them easier to remember and pass on (e.g. Sperber, 1996). For example, Rubin's (1995 pioneering research into the cognitive science of oral epics and ballads showed how the structure of these narrative genres exhibit a number of specific mnemonic properties that enhance the accuracy of their recital and transmission, such as alliteration, concrete imagery, rhyme, and other verbal formulae.

In the case of folktales, which are generally narrated in plain prose rather than verse, studies have focused on the stability of content rather than form. One of the first and most influential researchers in this field was the social psychologist Frederick Bartlett, who hypothesized that:

when a story is passed on from one person to another, each man repeating, as he imagines, what he has heard from the last narrator, it undergoes many successive changes before it at length arrives at that relatively fixed form in which it may become current throughout a whole community. Each event, or incident, in a narration, possesses a certain potency of reproduction. . . The under potent is omitted; the normally potent is reproduced; the over potent is not only reproduced, but may so dominate all the rest as to change the whole course of the narration.' (Bartlett, 1920, p. 31)

Bartlett developed a novel experimental approach to study these processes known as the 'serial reproduction' or 'transmission chain' design. This involves passing narratives along a chain of participants and analysing which features changed and which ones remained stable. This technique has since become a staple tool in studies of cultural transmission (see chapters by Mesoudi, and Bailes & Cuskley in this volume).

Researchers have used Bartlett's approach to investigate a range of 'content biases'1 in narratives—i.e. features that, in Bartlett's terms, are especially 'potent' in their reproduction (see chapters by Mesoudi and Stubbersfield). Two of the most important ones in the current context are 'survival information bias' and 'social information bias'. Survival information bias refers to an evolved psychological propensity to attend to and remember information about the environment and/or which has fitness consequences—for example predator behaviour, foraging opportunities, ecological hazards, etc. Social information bias, on the other hand, relates to the cognitive challenges of living in large groups, which selected for individuals who were adept at keeping track of their own and their conspecifics' social relationships. Serial reproduction experiments have shown that narratives that are rich in survival and, especially, social information are more faithfully transmitted than other types of narrative, as measured by the average proportion of propositions that are preserved across the transmission chain (Berl et al., 2021; Mesoudi et al., 2006; Stubbersfield et al., 2015).

These biases appear to be reflected in real-world folk narrative traditions. For example, the leading fairy tale researcher Jack Zipes notes that the most popular and enduring tales tend to deal with situations with high fitness stakes, such as threats from predators and outgroups, childhood neglect and abandonment, finding or losing mates, and so on. Zipes claims that 'we have been attracted to fairy tales because they are survival stories with hope' (Zipes, 2006, p. 27). Zipes also notes that the plots of these tales often revolve around social relationships and dilemmas, such as kinship and step-families, friendship, deception, reciprocity, generosity versus selfishness, etc. (Zipes, 2006, pp. 26–28). These claims are supported by quantitative evidence. Nakawake and Sato (2019) used Natural Language Processing (NLP) techniques to mine the ATU Index for information about animal species and their behaviours. They found rich folk zoological representations of prey–predator relationships that reflect real-world environments. Interestingly, they also found that the antagonistic interactions within these pairs were most commonly structured around acts of deception, reflecting a central preoccupation of human social relationships (Nakawake & Sato, 2019). Working with another narrative corpus, Stubbersfield et al. (2017) coded a large sample of English and American urban legends for various types of content and found that over three-quarters contained social information, and just over a quarter contained survival information.

Survival and social information appear to be similarly prevalent in non-western oral literatures. Ethnographic data on storytelling in diverse hunter-gatherer societies suggest that myths and folktales often encode important ecological information relevant to hunting game, gathering edible plants and avoiding dangerous carnivores, as well as norms surrounding social relationships, categories, and institutions (Sugiyama, 2001, 2017; Weissner, 2014). A quantitative survey of traditional Tsimane stories by Schniter et al. (2018) found that 74 per cent contained information about foraging and food production, 64 per cent contained information about social norms and relationships, with stories in these two categories comprising over 95 per cent of the total tales recorded. Similarly, a comparative analysis of the content of folktales told in seven hunter-gatherer societies by Smith et al. (2017) showed that the majority contained social information (69 per cent of the total sample) while a significant number contained information about natural phenomena (39 per cent) or resource use (34 per cent), both of which fall within the category of survival information. By way of comparison, content relating to spiritual and supernatural phenomena were present in

1 Content biases are similar to 'factors of attraction' in Cultural Attraction Theory (see Miton, this volume) and the two terms are sometimes used interchangeably. However, strictly speaking, factors of attraction place more emphasis on processes of transformation rather than selection. Most of the experimental results summarized here could be explained just as well by either concept.

only 28 per cent of narratives, and was less common than social and survival information in six out of the seven societies surveyed. The adaptive value of the social and ecological knowledge embodied in these narratives is underlined by evidence suggesting that storytelling brings fitness benefits to both audiences and tellers in hunter-gatherer societies. For example, Smith et al. (2017) found that among the Agta of the Philippines, the presence of highly skilled storytellers is associated with increased cooperation within communities, while the storytellers themselves gain advantages in both their reproductive success and as preferred social partners. Schniter et al.'s (2018) study of the Tsimane, meanwhile, suggests that storytellers may gain indirect, rather than direct, fitness benefits. They show that narratives are mainly transmitted from older individuals to their younger kin, especially grandchildren, enabling them to acquire important information about Tsimane subsistence and sociality (Schniter et al., 2018).

While these studies highlight the important role played by storytelling in the transmission of cumulative cultural knowledge about the natural and social world (Sugiyama, 2017), it is important to recognize that not all the features of stories are necessarily of practical value. Many traditional tales contain fantastical and supernatural elements, such as animals who can talk or transform themselves into other species, the dead coming back to life, or beings and artefacts with magical powers. It has been argued that motifs such as these are psychologically appealing and memorable because they violate our basic ontological assumptions about the physical world, living kinds, and human minds. Experimental studies suggest that narratives that include a small number of such violations (usually two to three) are recalled and transmitted with higher accuracy than narratives that do not feature any counterintuitive content, or those that contain too many counterintuitive elements to make sense of (Barrett & Nyhof, 2001; Norenzayan et al., 2006). Norenzayan et al. (2006) investigated the potential role of this bias for 'Minimally Counterintuitive Information' (MCI) in comparing the relative success of different Grimm Brothers tales. Based on an analysis of internet search engine hits for tale titles from the Grimm's famous Children's and household tales, they found that tales containing two to three counterintuitive concepts were significantly more popular than tales featuring one or no counterintuitive concepts, or ones containing four or more such concepts. In a rare field-based study of folktale transmission over multiple generations, van Beek (2017) reports that the most well preserved tales among the Kapsiki-Higi of Cameroon and Nigeria also fit the MCI template, such as witches and animals who can talk or have human-like psychology. He notes that a high proportion of MCI tales that he originally collected in the early 1970s not only remained in circulation by 2008, but had barely changed in the interim, underlining their exceptional stability (van Beek, 2017).

In addition to these content biases, it is likely that the transmission of folktales is also influenced by what cultural evolutionists call context biases (Mesoudi, 2011). Context biases concern who learners copy from, rather than what they copy. Although folktales are commonly passed down in families, there is also a broader social context to their transmission. For example, it has been well documented that individuals modify their own telling of a tale if the version they learned is at variance with the most common versions in their community, a phenomenon known as the 'law of self-correction' (Anderson, 1923). This type of context bias is known as 'conformist transmission'. While conformist transmission can help to stabilize the cross-generational transmission of stories by reducing variation within groups, it may also generate greater variation between groups, as members of different communities coalesce around distinct variants of an international type. Another important type of context bias is 'model-based transmission', where learners imitate role models based on their success in a particular domain, or more general social status and prestige. In the case of storytelling, folklorists have long pointed to the importance of highly skilled role models, or 'active bearers' of tradition (Thompson, 1977), in preserving tale traditions and popularizing innovations. So

far, context biases have received less attention than content biases in cultural evolutionary research on narratives. A notable exception is a study by Berl et al. (2021). Using a set of stories modelled on ethnographically documented creation myths, Berl et al. tested whether the prestige of a storyteller (as inferred from their accent) influenced how well individuals are able to recall a narrative. Their results indicate that prestige-biased transmission had only a minor and limited effect on how much of a story participants were able to remember, and was considerably less important than content biases for social information, survival information, and Minimally Counterintuitive concepts. In other words, according to Berl et al.'s findings, it would appear that the faithful transmission of storytelling traditions depends more on what a story is about, rather than who tells it.

Future Directions

In this chapter we have seen that cultural evolution offers a range of concepts and techniques for studying how traditional narratives evolve as they are transmitted between generations and across societies. While research in this field is still relatively young, it has already yielded significant insights into both macro-level patterns of inheritance (i.e. lineages of descent with modification and their connections to linguistic, genetic, and geographic patterns) as well as micro-level processes of selection for specific types of content (e.g. social information, survival information, and minimally counterintuitive concepts). However, a number of gaps remain, especially in connecting these two levels of analysis. For example, the results of transmission chain/serial reproduction experiments could be used to generate predictions about the types of motifs that we might expect to be best preserved in phylomemetic reconstructions of storytelling lineages. These would in turn provide 'real world' empirical support for the influence of content biases in shaping patterns of stability and change in the transmission of narratives. To date, only one study has attempted to use phylomemetic methods to investigate content biases in storytelling. Stubbersfield and Tehrani (2013) tested whether counterintuitive motifs were more conserved on a phylogeny of variants of the urban legend Bloody Mary than intuitive motifs. They found that although the overall number of counterintuitive motifs across the sample is relatively stable (between one and three, which fits the Minimally Counterintuitive template), counterintuitiveness does not confer any inherent transmission advantage to individual motifs. These findings indicate that MCI bias may function on the narrative as a whole, rather than individual concepts within it. Future work in this area could examine evidence for longer-term effects of MCI bias using older tale traditions, such as myths or fairy tales, and test for other potential content biases proposed in the literature (e.g. Stubbersfield et al., 2017), such as social information and survival information.

Similarly, there are rich opportunities to link patterns of diversification and change in narrative traditions to systematic ethnographic data on how stories are learned and passed on in real world communities. Theoretical models of cultural evolution suggest that different routes of cultural transmission can have powerful effects on the relative stability of socially learned ideas and behaviours (Cavalli-Sforza & Feldman, 1981): for example, cultural traits that are transmitted vertically from parents to children, or from one individual to another individual, are likely to mutate more quickly and be more heterogeneous in a population than traits that are exchanged horizontally among peers. In the latter case, the stability and homogeneity of a tradition may be increased further when it is transmission from many to many, or reinforced by conformist bias (as discussed previously). With the notable exception of Schniter et al. (2018), there is a lack of systematic or quantitative data on who people learn stories from and who they tell them to, and the extent to which narrative transmission is consistent across cultures remains unclear. However, qualitative evidence (e.g. Thompson, 1977) suggests that traditional narratives are shared in a variety of contexts, including family households (vertical transmission), social gatherings (many-to-many

horizontal transmission), public performances by expert narrators (one-to-many transmission), and, more recently, through literary and digital media. If different tales, or perhaps different genres of tales (e.g. jokes versus fables), are told in different ways, we may expect them to evolve and diversify at different rates–a possibility that has so far remained unexplored.

Other potentially important factors include how frequently tales are told and gender biases. To draw a parallel with language evolution, phylogenetic analyses have revealed a strong correlation between how commonly words are used in speech and their stability over time (Pagel et al., 2007). It seems reasonable to hypothesize, therefore, that tales that are narrated more often in communities and benefit from frequent reinforcement are likely to be better conserved across generations than tales that are known but rarely told. With regards to gender biases, folklorists (e.g. Holbek, 1987) have noted that male and female narrators often exhibit divergent preferences in the stories they choose to tell, with some international types being more 'male biased' and other more 'female biased'. This suggests that there may be distinct lineages of transmission and patterns of diffusion for traditions associated with women and men, which could potentially map onto sex-biased population dispersals and/or gender-specific contexts for interaction among groups (for example, trade, exogamy, post-marital residence, etc.).

Last, a key question for future research that has wide resonance in the context of this handbook is whether traditional narratives show any evidence of cumulative cultural evolution. In other domains, most notably technology, innovation combined with high fidelity social learning enables populations to develop and retain increasingly complex bodies of knowledge and skill across generations. Theoretical models and some empirical studies suggest that the potency of these cumulative evolutionary processes is magnified in larger populations because they are more likely to have both a higher number of innovators and, crucially, skilled learners who are able to reproduce behaviours at a level equivalent to (and sometimes better than) their role models. Inspired by these models, Acerbi et al. (2017) investigated whether folktale traditions exhibit any association between demography and complexity holds for folktale traditions, but found mixed results. On average, it appears that larger populations maintain a higher number of international tale types. However, when comparing versions of specific tale types in larger and smaller groups, Acerbi et al. (2017) found no relationship between population size and the number of characters, episodes, and other plot traits. It is possible that this may be because complexity does not enhance the appeal of a story, or its ability to exploit content biases. Alternatively, it may be that complexity cannot be captured by the sum of elements that make up a narrative, but rather in the way they are organized and integrated, which is more difficult to measure. It may even be better for narratives to reduce or simplify the information content of a story in some circumstances. For example, Karsdorp and Fonteyn (2019) show that, over time, literary retellings of Little Red Riding Hood increasingly exploit their audiences pre-existing knowledge and expectations about the tale (a cumulative process known as 'cultural entrenchment'). This trend is reflected in the more frequent use of linguistic devices that assume that characters are already familiar, such as a shift from definite instead of indefinite articles when introducing them ('the wolf' as opposed to 'a wolf'). Karsdorp and Fonteyn explain their findings in terms of Grice's Maxim of Quantity, whereby authors make their character introductions as informative as they need to be, but no more than that. In that sense, storytelling skill might be more geared towards efficiency than complexity.

Further progress in understanding cumulative cultural evolution in traditional narratives will depend on researchers gaining a better grasp of what storytelling is for and how it works—the functions of narrative, relevant aesthetic criteria, and the strategies that storytellers use to engage their

audiences. That is no small task, but one that promises to initiate exciting new interdisciplinary syntheses between evolutionary theory, cognitive science, and literary studies.

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