THE EMERGENCE AND EVOLUTION OF COLLABORATIVE STORIES

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Studies in literature and narrative have begun to argue more forcefully for considering human evolution as central to understanding stories and storytelling more generally (Sugiyama, 2001; Hernadi, 2002). However, empirical studies in language evolution have focused primarily on language structure or the language faculty, leaving the evolution of stories largely unexplored (although see Von Heiseler, 2014). Stories are unique products of human culture enabled principally by human language. Given this, the dynamics of creativity in stories, and the traits which make successful stories, are of crucial interest to understanding the evolution of language in the context of human evolution more broadly.

The current work aims to illuminate how stories emerge, evolve, and change in the context of a collaborative cultural effort. We present results from a novel experimental paradigm centered around a story game where players write short continuations (between 60 and 120 characters) of existing stories. These continuations then become open to other players to continue in turn. Stories are subject to player selection, allowing for variation and 'speciation' of the resulting narratives, and evolve as a result of collaborative effort between players.

The game starts with a seed of over 60 potential stories, and players choose which stories to continue, providing a player-driven story selection mechanism. In this way, stories which are creative, intriguing, and open ended spawn more stories, and eventually lead to longer story paths as play continues. The game also introduces further limitations by constraining a players' view of the story path: players have access only to a story and its parent, meaning knowledge of the existing narrative is limited. We present data from hundreds of players and

stories, creating large 'story trees' which explore the space of different possible narratives which grow out of a confined set of starting points.

This data allows us to investigate several aspects of the growing story trees to illuminate not only what makes a story successful, but how creative stories trigger new stories, and what makes individual storytellers successful. Given the selection mechanism central to game play, we identify the most successful stories by their number of offspring. Particularly successful stories emerge measured both by how many children their stories have spawned, and also how long their story path extends. Coherent stories often emerge, despite the fact that they are authored by several different players, and any given player only sees a limited snapshot of the story path.

We contextualise the results of the game and connect it to language evolution using quantitative and qualitative analysis. We look for detectable triggers of innovation and creativity within the story trees, and identify these as expanding the 'adjacent possible' (e.g., new adaptations open the space of other possible adaptations in the future; Tria, Loreto, Servedio, & Strogatz, 2014). We argue that this concept can be extended to stories, using evidence from the game bolstered by evidence from more traditional literature (the Gutenberg Corpus). We frame a more qualitative analysis of the results in terms of recurring themes found in storytelling cross-culturally (Tehrani, 2013). We suggest that the most successful triggers of innovation in stories combine original novelty and a firm grounding in existing recurring story frameworks in human culture. This indicates that much like other cultural and biological systems, stories are subject to competing pressures for stability and conservation on the one hand, and innovation and novelty on the other.

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