

Leverhulme Research Project Grant
Narrating Complexity:
Communication, Culture, Conceptualization and Cognition

Abstract

"Narrating Complexity" confronts the challenge that complex systems present to narrative frameworks of understanding. The issue is a vital one in science communication, and it has cultural manifestations in the efforts of narratives across media to accommodate complexity both formally and thematically; but the project will show that its roots lie deeper, with significant implications for the practice of complexity science itself and for the nature of narrative cognition. The inquiry will address the limitations of narrative for the representation of complex processes, as well as the explanatory inadequacy, in the absence of narrative, of complex systems modelling.

Why the Leverhulme

"Narrating Complexity" addresses issues of enormous consequence which elude the disciplinary frameworks of the funding councils. It brings together two fields, narrative theory and complexity science, both of which have an extensive interdisciplinary range in themselves; and in doing so reveals the limits of each with respect to the other. This confrontation of limits, which arises out of a progressive expansion in the scope and cognitive depth of the concept of narrative in my own work, is challenging and highly consequential for both research fields, as well as for the negotiations between complexity and narrative representation that pervade contemporary society and culture. We are especially well-placed to undertake such a project at York, having experienced interdisciplinary researchers and institutional research centres in both fields, so that the ambition is matched by our means; and the encounter has the capacity to animate and transform the research agenda for narrative studies across the humanities, and complex systems modelling in the sciences and social sciences. This project offers a pioneering approach to interdisciplinary research which uses complementarity on the large scale to generate reciprocal advances, in theory and practical application, for researchers in fields that are otherwise largely blind to each other. As a result, there is a direct continuity between the project's innovative address to focussed research questions at the level of conceptualization and cognition, and its concern to foster effective science communication and critical understanding of cultural narratives of complexity as vital to contemporary society.

Summary

Both complexity science and narrative theory are fundamentally concerned with the representation of processes; however the basic principles of narrative are sequence, cause and effect, agency, perspectival unity, and teleology, whereas the basic principles of complex systems are concurrency, recursiveness, systemic relations, multiplicity, and emergence. Narrative defines our native understanding of processes, yet representing the behaviour of complex systems in narrative form entirely misunderstands their complexity (Abbott 2008). It is a crucial problem not just for public engagement with complexity science but also for complexity scientists themselves, while for the narratologist it raises fundamental questions about the role of narratives in contemporary culture.

Hypotheses and objectives

We propose to address the encounter between narrative and complex systems from both sides, under four headings. Our global aim is to contribute to each of these four nodes of inquiry and to draw together the issues that unite them, to disseminate our findings across disciplinary borders and to return them to our home disciplines.

1. Communication: we shall test the idea that the challenge of communicating complexity science lies in its resistance to narrative, by comparing narrative and non-narrative cultural representations of complexity and evaluating their limitations and affordances. We shall evaluate the potential for reflexive, interactive and multi-media modes of narrative to facilitate the communication and conduct of complexity science.

2. Culture: complexity is already being incorporated, thematically and formally, by creative narratives across media (Poulaki). We shall examine the extent to which the cultural mediation of complexity in the arts (fiction, film and interactive media) is redefining the boundaries of narrative creativity and intelligibility.

3. Conceptualization: We shall test the value of a focus upon narrative sense-making in the design and interpretation of complex system simulations, and in the conceptualization of emergence. Our interdisciplinary collaboration will foster the development of mutually informing conceptual models of complex systems and narrative.

4. Cognition: narrative, in cognitive terms, is itself a product of complex processes (Polvinen). On this premise, we shall test the extent to which complexity science can illuminate the nature of narrative cognition. We shall examine the relevance of this aspect of our inquiry to the challenges of complex systems modelling, and draw out its implications for the field of cognitive narratology.

Significance

There has been useful work on the ways in which narrative form imposes upon systemic processes (such as evolution by natural selection) in popular accounts and even within scientific discourse (Abbott 2003); and on the cultural impact of systems upon narrative from a cybernetic perspective (Clarke). The distinctive contribution of this project is to use these challenges to inform research into the cognitive foundations of narrative itself, and to re-evaluate the conceptual tools of complex systems modelling; and to pursue this agenda through direct collaboration between complexity scientists and narrative theorists, linking the large interdisciplinary questions of science communication and the cultural assimilation of complexity with focussed disciplinary research on both sides. The project's significance arises from its demonstration that the barriers to the narrative understanding of complex systems are intrinsic to the work of complexity science and the nature of narrative cognition.

Methods

The PI and CI work, respectively, in the fields of narrative theory and complex systems modelling, within the York institutional formations of the Interdisciplinary Centre for Narrative Studies and the York Centre for Complex Systems Analysis. Walsh is tracing the continuity between the cognitive functions of narrative and its most elaborate cultural manifestations, while Stepney is developing

methods for engineering emergence in complex systems. The methodological heart of the project consists in establishing a formal dialogue between these specific research agendas and the conceptual paradigms they embody. The framework for this formal dialogue will be a programme of research seminars at York, alternately hosted on the narrative and complexity sides, including key researchers in both fields from outside York as guest speakers, which will be the intellectual base of our theorization of the limits of narrative cognition and communication.

Walsh and Stepney will also collaborate on a feature article on the science communication problem in consultation with project participant Will Heaven, a journalist with *New Scientist*.

The project's research assistant will be Maria Poulaki, whose previous work is on engagement with complexity theory in the narration of certain films (Poulaki). She will research the extent to which narration across media succeeds in assimilating complexity.

The associated PhD student will be co-supervised by Stepney and Walsh and receive appropriate research methods training in both the humanities and sciences, whilst being based in the ICNS. The dissertation topic will be at the narrative-complexity interface and will address an aspect of literary or cognitive narrative theory informed by complexity science.

During the second year we will host a visiting scholar, Marina Grishakova, the PI of a related Estonian Science Foundation project, "Narrative Forms and Functions in Contemporary Culture: Narrative as a Means of Cognition, Communication and Sense Making," and authority on Tartu school semiotics (Grishakova).

The main project participants will present papers on aspects of the work in progress at international conferences in narrative studies and complexity science in each year of the project.

Publication

The project will generate the following publications:

Authored book 1: Walsh, *The Sense of Stories*. On the limits and value of narrative as a model of process, from its fundamental cognitive function to its most elaborate fictional manifestations.

Authored book 2: Poulaki, on narrative and complexity in relation to cultural media.

Edited book: Walsh and Stepney, *Narrating Complexity*. Essays contributed by York project members (YCCSA, ICNS) including RA and PhD, seminar programme speakers, and the visiting scholar. For the Springer Complexity series.

Co-authored feature article: Walsh and Stepney. *New Scientist* feature article on narrating complexity.

Journal articles: Walsh, Stepney, Poulaki and PhD. Placed in refereed field-specific journals on narrative studies, complex systems, and science communication.

PhD: it is expected that the PhD will be published as a monograph, though not within the lifetime of the award.

References

Abbott, H. Porter, 2003. "Unnarratable Knowledge: the Difficulty of Understanding Evolution by Natural Selection." *Narrative Theory and the Cognitive Sciences*, ed. David Herman, 143–62. Center for the Study of Language and Information.

Abbott, H. Porter, 2008. "Narrative and Emergent Behavior." *Poetics Today* 29.2: 227–44.

Clarke, Bruce, 2008. *Posthuman Metamorphosis: Narrative and Systems*. Fordham University Press.

Grishakova, Marina, ed., 2009. *Semiotics, Communication, Cognition 1: J. Lotman. Culture and Explosion*. De Gruyter.

Polvinen, Merja, 2008. *Reading the Texture of Reality: Chaos Theory, Literature and the Humanist Perspective*. Helsinki University Press.

Poulaki, Maria, 2011. *Before or Beyond Narrative? Towards a Complex Systems Theory of Contemporary Films*. University of Amsterdam.

Publications

Walsh:

The Rhetoric of Fictionality: Narrative Theory and the Idea of Fiction. Columbus: Ohio State University Press, 2007.

Argues for a rhetorical perspective upon the fictional use of narrative and demonstrates its radical implications for narrative theory. My perspective upon fictionality responds to the changing scope of narrative theoretical inquiry; the burden of interest in narrative has shifted significantly towards other media, non-fictional forms, and disciplines beyond the humanities and social sciences. The book shows the extent to which narrative theory has taken for granted the context of fiction in which it has been developed, and by re-thinking the communicative value of fictional discourse it revises many of narrative theory's core concepts. The theoretical consequences extend beyond the fictional and the literary to much more inclusive frames of reference: to communication in general, to cognition, and to the faculty of imagination. The main point of my theorizing of fictionality is not to inform or enable the interpretation of fictional texts, or to refine the apparatus of literary study (though it does both these things); it is to articulate a more general thesis about the conditions of significance that make these activities comprehensible and of such universal cultural value.

"The Force of Fictions." *Why Study Literature?* Ed. Alber, J., S. Iversen, L. B. Jacobsen, R. A. Kraglund, H. S. Nielsen & C. M. Reestorff. Aarhus: Aarhus University Press, 2011.

This essay elaborates upon the inherently metadiscursive quality of fiction, and shows how the built-in self-consciousness of fictionality as a rhetorical orientation connects highly wrought literary fictions with the most elemental functions of human understanding. At a cognitive level, narrative sense-making is both an adaptive faculty offering unprecedented mastery over temporality and experience, and the inauguration of a reflexive cycle of representation that works both to define the

parameters of human value and to expose the contingency and limitations of its own frame of reference. Fictive rhetoric, by virtue of the self-consciousness integral to its operation, uses this cycle as the engine of the creative imagination; and literary fiction raises it to the highest degree. My argument maps out this view of fictionality, moving from a cognitive-evolutionary frame of reference, via a consideration of the grasp of narrative upon the idea of evolution by natural selection itself, to a distinction between value and force that characterizes the duality between what narrative reflexivity says and what it does.

“Emergent Narrative in Interactive Media.” *Narrative* 19(1), 2011: 72-85.

This essay argues that the concept of emergent narrative in computer game studies helps to clarify the general incommensurability of emergence and narrative, and has implications for our larger understanding of the process of narrative sense-making. It demonstrates the problematic relation between emergence and narrative, then turns to emergent narrative itself, its history and some difficulties of definition. I argue that these difficulties reflect confusions about the nature of simulation, and make a case for understanding narrative and simulation as distinct and, in certain respects, antithetical modes of representation. The argument has implications for both the concept of emergent narrative and the field of narrative theory, which I expound in terms of the relation between simulations and fictional worlds. Following this critique, I make a positive case for the possibility of genuinely emergent narrative, understood as a particular use of simulation, and situate the narrative imagination in a significant relation to the very possibility of innovation enshrined in the concept of emergence. Narrative then proves integral to the curious relation between the function of emergence as an explanatory concept and the nature of the explanation it offers.

“The Common Basis of Narrative and Music: Somatic, Social, and Affective Foundations.” *StoryWorlds: A Journal of Narrative Studies* 3, 2011: 49-71.

This essay proposes that the limits and affordances of narrative can be thrown into relief by considering the relations between narrative and music from a cognitive perspective, drawing upon research in human evolution and infant development, and current interdisciplinary discussions of the origins of music and its relation to language. It centres upon the question of temporality and rhythm, and addresses in turn the somatic, social, and affective foundations shared by narrative and music, and argues that the emergence of language from proto-communicative behaviour is bound up with the development of narrative intelligence and the subsequent divergence of narrative and music as cultural forms. This perspective upon narrative cognition helps to clarify some of the key assumptions of contemporary narrative scholarship, and in particular emphasizes that narrative is both anthropocentric and fundamentally discursive. That it is so is cause for critical scepticism about the power of narrative; that it could not be otherwise underlines the extent to which narrative matters more irreducibly as the articulation of value than as the representation of reality.

Others:

Apostolos Doxiadis and Barry Mazur, eds. *Circles Disturbed: The Interplay of Mathematics and Narrative*. Princeton University Press, 2012. This collection of essays is an exemplary interdisciplinary collaboration between mathematicians, philosophers, historians and narrative theorists to examine the relationship between mathematics and narrative. It takes the topic in the round, but includes substantial work on its theoretical dimensions, including the tension between abstraction and

particularity, the nature of models, and the narrative representation of complex systems. As such it is an almost unique methodological and topical precursor to the specific project proposed here.

David Herman. *Story Logic: Problems and Possibilities of Narrative*. University of Nebraska Press, 2002. The most comprehensive and influential attempt so far to set out a comprehensive and synoptic theoretical overview of narrative from its function at the cognitive level to its elaborate literary manifestations. The approach has a strong linguistic grounding, but more importantly establishes an important conceptual reciprocity between narrative as an object of interpretation and as a means of interpretation; story logic as a fundamental human way of making sense.