

Narrative and Complex Systems: Incompatible Paradigms, Cross-Disciplinary Encounter and Public Engagement with Science

a) Objectives

This project aims to explore the potential for new research into the encounter between narrative understanding (which construes events and behaviour in storylike sequences) and complex systems (which are characterized by multiple simultaneous and recursive interactions among their elements). The main objectives of the project are to conduct a review of the research engaged with versions of this encounter across several disciplines; and to hold, in tandem with the review, three cross-disciplinary workshops exploring the encounter within three concentric frames of reference: the hard scientific core of the modelling problem it raises; the implications for cross-disciplinary methodology; and the lessons for science communication.

So, the tension between complex system simulation and narrative understanding has potentially significant consequences for conceptualizing both complex systems and narrative; this issue then becomes a methodological one of negotiation between incommensurate paradigms, with larger implications for cross-disciplinary research between the sciences and humanities; and the problem of negotiation between these two modes of understanding, one native to human cognition and the other an advanced technological extension of it, is also a problem of communication with potential implications for the representation of science to policy makers and the public.

The research review will draw together current research pertaining to the narrative/complexity borderline, which is scattered across several key disciplines, and provide a synthetic overview of this emerging research question, contributing to the development of a new research formation in cross-disciplinary narrative studies.

The first workshop will explore the potential for collaboration between researchers in narrative theory and complex systems analysis, by scrutinizing the ways in which the behaviour emerging from complex systemic interactions becomes available to narrative description; a collaboration which promises reciprocal benefits, addressing both the problems of complex system modelling and the limits of narrative cognition.

The second workshop will test the principles of a cross-disciplinary meta-methodology based upon the limiting conditions of this dialogue, subjecting it to a preliminary proof of principle and extrapolating its possible applications across the range of academic inquiry, especially for encounters between the humanities and the sciences.

The third workshop will draw out the implications for science communication of both the topical study and its methodological innovations, pioneering a new communicative approach to complexity science in particular, but also rethinking the place and limits of narrative understanding in public engagement with research across the sciences. Intrinsic to this objective is the intention of highlighting the issue, and the project's response, in science communication media.

Project researchers will also participate in the AHRC's Science in Culture theme workshop which, along with the research review and the project report, will serve the objective of contributing to discussion of the future directions of the theme and informing the practice of theme researchers.

A global objective of the project is to provide a vehicle for the development of existing research connections with other institutions nationally and internationally, and to make opportunities for new links and collaborations with interested researchers. To further this end the PI will attend the International Conference of the Narrative Society (the ISSN) to present some of the project's key ideas and to meet with leading North American and European researchers in (cognitive) narratology.

At the end of the project an internal workshop will provide a summative evaluation of the potential for further development of this research and allied research collaborations, and draw up specific plans to establish the foundations of that future work.

b) Summary

This project explores the significance and research potential of the mismatch between narrative representation and complex systems modelling. The watchwords of narrative are sequence, cause and effect, agency, perspectival unity, teleology; the watchwords of complex systems are simultaneity, recursiveness, systemic relations, multiplicity, emergence. The way that things happen in complex systems exceeds the limits of narrative cognition, which nonetheless remains, as part of our evolutionary legacy, at the core of what constitutes human understanding of temporal phenomena - how we make sense of what's going on.

There is an irreducible gulf between narrative and complex systems and yet, of necessity, the two are constantly brought into relation with each other. Complex systems characteristically produce effects (emergent behaviour) that are readily narratable, but not in terms of the unnarratable systemic interactions that actually produce them. This descriptive gap is not only integral to understanding some of the central challenges of complexity science, it also raises fundamental issues about the methodology of cross-disciplinary research collaboration, and defines one of the key challenges in communicating scientific research to policy makers and the general public.

Current research engaged with this topic is distributed widely across several disciplines: beyond narrative theory and complex systems analysis as such, the most notable of these are philosophy, cognitive psychology, social science, artificial intelligence and interactive media studies; the problem is also pervasive as a communicative issue in science journalism and the genre of popular science. One key task for this project is to conduct a literature review drawing together the threads of this widely dispersed work, to sift out the common themes, identify local insights and expose recurrent blind spots.

Work on the review will run concurrently with a series of three cross-disciplinary workshops, focussed upon three concentric circles of interest. First we propose to explore the capacity for the relation between narrative and complex systems to generate new research insights in complex systems modelling and in narrative theory. The principled incompatibility between narrative representations and complex systems models of the same phenomena throws into relief the nature of modelling, and of our understanding of phenomena beyond the scope of our native faculties. But the encounter between paradigms can also shed useful light on the phenomenon of emergent behaviour, a problematic and currently ill-defined feature of complex systems; and in the process it can help to qualify and redefine the representational and rhetorical foundations of narrative theory.

This specific frame of reference is also a telling instance of the general encounter between the humanities and the sciences, and the second workshop will seek to extrapolate an innovative methodology for cross-disciplinary research, one that makes space for reciprocal insight precisely by not assuming a synthesis of perspectives. The project has potential relevance in any genuinely cross-disciplinary research context, but is especially significant for researchers engaged in work across the “two cultures” divide, including other projects under the AHRC’s “Science in Culture” theme.

The third workshop will apply the conceptual encounter’s lessons to the communicative challenges of representing science to policy makers and the public. Beyond academia, the double bind of choosing between opaque scientific integrity and reductive narrative mediation is a fundamental obstacle to the effective communication of complex systems research on a vast range of crucial policy issues and public concerns. This project seeks to identify a third way, on the basis that a vital part of overcoming barriers to understanding is explaining the reasons of principle that establish those barriers in the first place.

c) Academic Beneficiaries

The project’s topical focus upon the relevance of narrative theory to the modelling of complex systems offers new prospects to researchers in both fields. The project will generate approaches to conceptualizing emergent behaviour in the immediate research context of the CoSMoS project (Complex Systems Modelling and Simulation infrastructure), as well as for other researchers within the interdisciplinary York Centre for Complex Systems Analysis and beyond, via workshop participation. The implications for narrative theory itself extend to a substantial reconceptualization of the cognitive foundations of narrative, and will be important to researchers working on narrative cognition across a range of disciplines, including members of the European Narratology Network, who will be directly involved in the workshops, and researchers involved in the interdisciplinary narrative research theme of York’s Centre for Modern Studies.

The specific issues addressed by the project will feed into other research in which computational modelling and narrative come together, including work by the Games, Interactive Narrative and Drama project within York’s Artificial Intelligence research group, and the RIDERS project (Research In Interactive Drama Environments, Role-Play and Storytelling), based at Heriot-Watt University; we already have relationships with both of these. The encounter between narrative and complex systems will also substantially inform the specifically literary Narratives and Worlds project currently being developed by York’s Fictionality Research Group in association with colleagues at Aarhus University and the University of Freiburg.

The project itself is cross-disciplinary not only by virtue of the specific encounter between paradigms that it seeks to stage, but also because the issue of cross-disciplinary methodology itself is a focus of inquiry. The model of engagement between disciplinary perspectives developed and tested by the project will be of practical value to researchers involved in other cross-disciplinary research formations, and of theoretical value as a meta-methodology for conceptualizing engagement across the divide between the sciences and the humanities. With respect to the wide range of current cross-disciplinary narrative research, the project’s method will be of substantial interest to members of the International Society for the Study of Narrative (to be reached via networking and presentation of project information at their annual conference); in particular, the project will benefit established connections with members of Ohio State University’s Project Narrative, who have

previously explored the interface between narrative research and the sciences. More broadly, both the topical and methodological implications of the project bear upon the work of other humanities researchers engaged with complexity science and the sciences in general; the project's findings will be disseminated to researchers interested in these aspects of the Science in Culture theme through the research review (to be made available on the project webpage, linked from the sites for the research groups and networks already mentioned), through the project report and through participation in the Science in Culture workshop.

The project also contributes to an ongoing shift towards the consolidation of cross-disciplinary narrative studies as a dynamic new research area in its own right (currently more advanced internationally than in the UK, as evidenced by the wide reach of the European Narratology Network on the continent, and the institutional success of Project Narrative at Ohio State).

The project's findings on the issue of the public communication of complexity science, and the double-edged role of narrative on such occasions, will be disseminated in the first instance through the wide disciplinary and institutional range of the workshop participants themselves, and pursued further in subsequent discussion in the online forum.

d) Impact Summary

This research provides for a direct contribution to knowledge about complex system modelling and narrative interpretation, but it is also a proof of principle for the cross-disciplinary methodology involved. The project's innovative model of cross-disciplinary encounter is itself a means to approach dialogue between academic and societal perspectives on issues involving complex systems. In the context of public engagement with science, or of scientific contribution to public policy debate, the project's first mode of societal impact is a facilitative one. Its capacity to enable the effective mediation of complexity science by academics, as well as effective interpretative scrutiny of complexity science by public bodies and interest groups, arises from its demonstration that the barriers to the narrative understanding of complex systems are not merely communicative, nor a privileging of publicly unaccountable scientific authority, but intrinsic to the work of complexity science itself.

Both the descriptive focus of the project and its methodological implications can have a substantial impact upon the ways in which scientific research, and complexity science in particular, is communicated beyond academia by science representatives, giving them the means to harness the communicative power of narrative whilst preserving the integrity of the science, by foregrounding the double aspect of the relation between the two. The same is true for third sector organizations concerned to influence public opinion and policy, most obviously in respect of environmental issues; the project suggests that better and more accountable policy arguments can be made by recognizing the descriptive gap between complex systems models and narratives of the emergent effects, thereby both respecting the scientific data and foregrounding the necessarily value-laden commitments involved in interpreting it. In these respects the project can have a substantial impact upon the capacity of informed science to influence public policy and legislation in crucial areas like sustainability. The project will present its view of the relation between complexity science and narrative in both a local news media article and a national science media feature article on the project (for *New Scientist*) in order to engage participants in and audiences of science communication, and to elicit their responses.

A prospective impact is that the conceptual and methodological results of the project, and of work arising out of the project's initial explorations, can be instrumental in significant changes to public engagement with complexity science, and to its impact upon policy debates nationally and internationally. The public understanding of science, it has been shown (for instance by Alan Irwin, and John Lawton), is not best advanced within the terms of a deficit model of general scientific knowledge, but no alternative approach has yet been successfully developed. The project will present its findings to the Science and Society policy group within the Department for Business Innovation and Skills, suggesting that we can make progress by reconsidering the mediation between scientific knowledge and the common idiom of narrative explanation in which we are all versed. The project's methodology offers a means to foreground and defamiliarize the evaluative commitments latent, for better or worse, in all narratives, and in doing so to empower non-academic publics, in the contexts of policy debate, the governance and funding of science, the use of scientific technologies and participation in the advancement of scientific knowledge, to better understand the necessary negotiation between different conceptual models, and so to better conceive what they actually want. This is a contribution both to the accountability and instrumental efficacy of scientific inquiry in society, and to the democratization of scientific knowledge.