

Creativity and the Recalcitrance of Narrative Cognition

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Abstract: Narrative, understood as a mode of cognition, affords a rudimentary logic through which we are able to make a certain provisional sense of our experience and each other. It is a rough and ready heuristic, however, so that our narrative sensemaking requires continual revision, qualification and complication. I want to suggest that the form of narrative both provides for such refinement and resists it, and that this double movement can be characterised in terms of the twin principles of reflexivity and the implicit that are inherent in narrative cognition. The accountability of any narrative to some kind of underpinning logic is integral to our evaluation of it, and a key concern for the most serious cultural manifestations of narrative creativity in literature, film and other media. The elaboration of narrative’s sensemaking capacity remains constrained by the limitations of this fundamental logic, however, which are particularly exposed by narrative’s incapacity to convey the systematicity of systemic processes. I have explored this circumstance with complex systems scientists in a collaborative interdisciplinary project that led to the publication of a volume of essays titled *Narrating Complexity*. It raises substantial problems of science communication, but it also helps throw into relief the specific attributes of narrative cognition. One continuing outcome of that collaboration is a speculative artificial intelligence project involving storytelling robots; my talk will use this project as the vehicle for my elaboration upon the form of narrative cognition, and in particular the reciprocal functions of reflexivity and the implicit upon which the logic of narrative depends.

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For Henry James, the novelist’s creativity must of necessity be subordinated to a prior narrative logic, and he repeatedly conceives of this inevitability (“the necessary, the precious ‘tightness’ of the place”) in terms of “the authenticity of concrete existence,” so that once he has the “hint” of his subject, “the point is not in the least what to make of it, but only, very delightfully and very damnably, where to put one’s hand on it” (1962: 311–12). James’s accounts of the creative process, with their recurrent metaphors of germs, seeds, and crucibles, consistently figure the novelistic imagination as essentially the site for a process with (biological, chemical) laws of its own: “These are the fascinations of the fabulist’s art, these lurking forces of expansion, these necessities of upspringing in the seed, these beautiful determinations, on the part of the idea entertained, to grow as tall as possible, to push into the light and the air and thickly flower there” (42). The exalted calling of the novelist resides precisely in the scrupulous discernment with which these necessities are unveiled: “he alone has the secret of the particular case, he alone can measure the truth of the direction to be taken by his developed data. There can be for him, evidently, only one logic for these things; there can be for him only one truth and one direction—the quarter in which his subject most completely expresses itself” (123). The novelist’s concern is with “the careful ascertainment of how it shall do so, and the art of guiding it with consequent authority” (123).

Yet James's own account of the origins of *The Spoils of Poynton* emphatically contrasts the artist's "sense for the subject" with "the fatal futility of Fact"—the "classic ineptitude" to which, "with the full measure of the artistic irony one could once more, and for the thousandth time, but take off one's hat" (122). James here raises a critical question which escapes the habitual frame of his sense of the novelist's obligations: "If life, presenting us the germ, and left merely to herself in such a business, gives the case away, almost always, before we can stop her, what are the signs for our guidance, what the primary laws for a saving selection, how do we know when and where to intervene, where do we place the beginnings of the wrong or the right deviation?" (120). To what authority does the novelist defer if not, after all, that of life? James excuses himself from pursuing the question, pausing only to suggest "that general conditions fail or mislead, and that even the fondest of artists need ask no wider range than the logic of the particular case" (121). It seems to me, though, that the rudiments of an answer are already there in that comment, and they connect with observations James makes elsewhere. The particularity of narrative is finally irreducible to the embodiment of general laws, of a logic anterior to itself, even as it proceeds by invoking them. Its authority finally is as story itself, which, in the preface to *The Ambassadors*, he describes as "obviously, overwhelmingly, the prime and precious thing (as other than this I have never been able to see it)"—but also as "just the spoiled child of art" (314–15). The ambivalence is a considered acknowledgment of the extent to which his own efforts to hold his fiction accountable to general criteria are overwhelmed by the way in which the story "simply makes for itself," however well it creates the illusion that its authority is well grounded: "It rejoices, none the less, at its best, to seem to offer itself in a light, to seem to know, and with the very last knowledge, what it's about—liable as it yet is at moments to be caught by us with its tongue in its cheek and absolutely no warrant but its splendid impudence" (315). It seems that "story" answers to no reason but its own, and James further recognizes that this willfulness on the part of narrative extends even beyond the novelist's conscious creative efforts: this spoilt child probably has its own way "even when we most flatter ourselves that we negotiate with it by treaty" (315).

This line of thought stands as a corrective to the idea that the imperatives determining novelists' narrative choices are essentially criteria of realistic representation, which would be to say that the mundane reason novelists find themselves constrained to develop their narratives in certain ways is that they come up against their obligations to the mimetic correspondence between their fiction and reality. James's reflections indicate that this is not the case, at least in any straightforward way: the rule of narrative derives from imperatives grounded in meaning rather than existence.

Narrative, understood as a mode of cognition, affords a rudimentary logic through which we are able to make a certain provisional sense of our experience and each other. It is a rough and ready heuristic, however, so that our narrative sensemaking requires continual revision, qualification and complication. I want to suggest that the form of narrative both provides for such refinement and resists it, and that this double movement can be characterised in terms of the twin principles of reflexiveness and the implicit that are inherent in narrative cognition.

By narrative cognition I mean something distinct, in two respects, from most of what goes by the name of cognitive narratology. In the first respect, it seizes upon the neglected side of David Herman's distinction, in *Story Logic*, between the logic that stories have, and the logic that they are (22-3); or between making sense of stories, and stories as sense-making

(“Introduction” 12-14). Herman’s own focus is avowedly upon making sense of stories, and even when he does directly address the idea of stories as sense-making, it is at the fairly high level of storytelling as a situated practice, not the basic conception of narrative logic I want to foreground, in which narrative is a constitutive part of our cognitive grasp upon experience. The predominance of theoretical interest in the other side of the distinction, in how we make sense of stories, is also a characteristic of cognitive narratology at large, where it goes along with a second asymmetry I want to redress, which is methodological. The interdisciplinary traffic between narrative theory and cognitive science is mostly one way: narratology draws upon cognitive science for models, conceptual vocabulary and empirical evidence upon which to elaborate an understanding of narrative, or indeed fiction; narrative theory rarely ventures to inform research into cognition.

Yet research in mind and brain sciences often adopts received ideas about narrative as its experimental premises, introducing a circularity into the very results that narratologists invoke as an empirical grounding for their views. This is, in my view, the most important insight to be gained from Marie-Laure Ryan’s dissenting view, in “Narratology and Cognitive Science,” which includes some broad and telling criticism of much in cognitive narratology. It points the way towards a possibility that Ryan affirms, although with some scepticism, which is that narrative theory can generate testable hypotheses that might help set the agenda for cognitive science (487). She, like Herman, conceives of this possibility very restrictively, as concerning readers’ responses to stories; but she also has an explicit reason for constraining the scope of narrative theory so tightly. She recognises a much more expansive tradition of narrative research, one including figures like Roger Schank, Mark Turner, Jerome Bruner and indeed Herman himself, that is concerned with “narrative as a mode of thinking” (481-2). However, she finds such conceptions of narrative “inflationary”; the risk is that narrative becomes a catch-all concept for all kinds of mental activity, an indiscriminately invoked prerequisite for memory, folk psychology, selfhood, reality construction, etc., etc. (483). This objection, too, is salutary, but it is not decisive; what it demands is that a notion of narrative cognition be closely delimited at a more fundamental level than storytelling. It must be conceptually distinct from other aspects of cognition, and conceptually distinct from both the objects and the products of cognition. For just such reasons I’ve been working for some time now with a formal definition of narrative cognition that I think adequately defines its boundaries and avoids unwarranted presupposition. It is therefore more abstract than most such definitions, though it allows us to arrive at the more common ideas of narrative subsequently:

Narrative cognition is, in its primary form, the semiotic articulation of linear temporal sequence.

I’ll go through this definition word by word in a moment, but to get a preliminary grasp of it we might gloss it by saying that narrative is a way of meaning – “semiotic articulation” – not a kind of occurrence (something that happens is not, as such, narrative); and that it is concerned with a certain form – “linear temporal sequence” – not a certain subject matter, or a certain purpose. The definition leaves implicit some features of narrative that are taken as definitional in many other accounts, and I’ll draw attention to some of these differences. Such features are really consequences of the nature of narrative cognition, rather than being intrinsic to it, and I’ll go on to address such consequences in the next part of my talk. The aim

here, however, is to specify what is distinctive about narrative without saying too much and prematurely restricting the concept.

The core of the definition is its final term, which all the others premodify. For the sake of clear exposition, then, it makes sense to start at the end and work backwards through it. “Sequence” is the most neutral term possible for the specific formal relation that narrative articulates. It represents a bare transition from formlessness to a specific (total) order. What matters is this sequential form, not what it is that is sequenced. Accordingly, the definition leaves out things (such as consequence, events, or agency) that are certainly general characteristics of narrative, and might be thought definitional – are indeed definitional, according to some narrative theorists. In this definition, however, these characteristics do not define narrative, but result from the kind of order that narrative imposes upon phenomena. It is important to maintain a distinction between narrative thinking itself and the effects of such thinking.

“Consequence,” for example, would have smuggled in the notion of causality, and so begged the question of whether causation is a condition for narrative representation or one of its conceptual products. This is not only a question for the philosophy of science but also a pragmatic caution: narratives frequently do impute causal connections without positively asserting them, and often in manifestly erroneous ways.

What about “events”? The event is the fundamental unit of almost every definition of narrative you’re likely to come across, but that too seems to beg the question. Such appeals to the idea of “event” treat it as both a punctual and a durational concept. Some definitions assume that it is the link between two or more events that makes a minimal narrative, but an event can also be understood as something with internal structure and duration (for a two-event definition of minimal narrative, see Prince; for a one-event definition, see Genette). Such internal structure is explicit in definitions of narrative as minimally the articulation of a single event, but even the notionally punctual events that comprise two-event examples of minimal narrative can invariably be reconceived as durational: for example, consider the two events in E.M. Forster’s minimal story, “the king died and then the queen died” (87). The narrative event is itself a product of narrative thinking, not its raw material; and it is itself an open question whether narrative thinking is adequate to the actual structure of processes, as this volume testifies.

Many narrative theorists would also want to insist that narrative is more specifically concerned with sequences of acts, that is, with agency; and I think it is, even where a particular narrative concerns entirely inanimate processes (a solar eclipse, say), for reasons that I discuss below. But if we want to consider a sequential account of a solar eclipse, for example, as a narrative—and I do—then agency too is better thought of as one of narrative’s effects rather than a constituent element. This view also applies to a related and even more restrictive criterion for some definitions of narrative, which is “experientiality” (Fludernik). The essential quality being insisted upon here is not that narrative represents the action of agents, but that it represents experiencing agents; it is about their subjective experience, not just the action in itself. Again, this can’t be literally the case unless the scope of narrative is restricted considerably. How much? Should there be no narratives without human agents? If not, how far should the criterion of experientiality extend, literally or figuratively? Narrative doesn’t always deal in the human or human-like, but it does always bring its materials into

relation with a human frame of reference, because that is what making narrative sense entails. In doing so it necessarily imposes a range of collateral ideas to some degree, including agency and experientiality.

The sequential order narrative imposes is not spatial or conceptual, but temporal. Narrative is fundamentally about time, a quality which is distinct from the fact that expressing or producing it, as well as interpreting it, happens in time. In this respect, narration may be contrasted with description. Description is like narration in that it takes place in time, but unlike narration in that its own logic is spatial. This is to say that a description of a process either *is* a narrative, or is a conceptual spatialization of its temporality (the latter being an important alternative to narrative in the case of systemic processes). Conversely, a narrative may of course include spatial information (a substantial narrative may include extended passages of description, for that matter), but this is inessential to its logic as narrative. In this sense narrative and description are complementary, antithetical conceptual dispositions towards spatiotemporality.

Narrative, then, has a dual temporality, in that it both predicates temporal sequence and is itself articulated in temporal sequence. A narrative is *about* a certain temporal sequence, and its narration has a certain temporal sequence, and the two may not directly align. This quality has been a focus of enquiry in narrative theory, not least because the relation between these two temporalities, that of the told and that of the telling, is often exploited in the elaborate literary narratives that narratological research has tended to favour. But such a circumstance is itself indicative of narrative's important capacity for reflexive elaboration. Just as it is possible to transform description into narrative simply by projecting, for example, the story of an act of looking onto its discursive movement from point to point, so it is possible for the temporality of a narrative's telling to become itself an object of narrative, giving us represented acts of narration. This reflexiveness is commonplace in more elaborate narrative forms, and it is often also recursive.

I have already rejected the idea that causal relations define the scope of narrative, but causality is often touted as a crucial feature taken to distinguish "narrative proper" from "mere" temporal sequence. According to this definition, however, causality (or a certain notion of causality) is not a foundation for narrative sense but one of its contingent products. This view accords with a famous suggestion by Roland Barthes, that narrative is characterized by a systematic application of the logical fallacy, *post hoc ergo propter hoc* (248). Accordingly, to define narrative by reference to causality would be to make one of the conceptual effects of narrative into a prerequisite for narrative. But might not a similar argument be advanced against defining narrative with reference to temporality? There is some force to this objection, and indeed approaches to narrative grounded in phenomenology have emphasized that our senses of time and narrative are dependent upon each other and mutually reinforcing. If so, it would seem illegitimate to give conceptual priority to temporality and invoke it as part of a definition of narrative. But, on the one hand, our experience of temporality is broader and more fundamental (even if less coherent) than our narrative grasp of it; nor is narrative our only resource for thinking about time. And on the other hand, it is in any case folly to expect that an even more abstract definition would deliver more solid metaphysical foundations.

The word “linear” in the definition serves to delimit the particular kind of temporal sequencing characteristic of narrative, and to exclude and contrast with the “non-linear,” despite the fact that certain kinds of narrative—especially literary narrative—are often characterized as non-linear, and celebrated for that reason. There are two distinct senses of the non-linear at stake, however. The first, which is the sense that actually applies to narratives, refers to the various ways in which the articulation of events in a narrative may not be given in a single consecutive sequence (i.e., non-linearity in narration), or the events narrated may not cohere as a sequence in principle (i.e., non-linearity of the narrated). Such narratives may simply narrate a non-chronological sequence of events or, more radically, they may fork down mutually exclusive paths, or form endless cycles or paradoxical strange loops. Even in the most extreme cases, however, “non-linear narrative” is strictly a misnomer, because these are not alternative forms of narrative so much as ways of impeding or subverting narrative. All these strategies are striking in part because they foreground the fact that narrative logic itself is always doggedly linear, requiring an inexorable progression from point to point, one by one, even when the narrative is structured in a way that exposes how pedestrian or inadequate this is.

The other sense of “non-linear” is the mathematical sense, in which the changes in two (or more) related variables are not directly proportional to each other. This sense applies only figuratively, at best, to “non-linear narratives.” However, the centrality of non-linear systems to complex systems science does bear importantly upon narrative in two respects. Firstly, narrative is inadequate to the task of representing non-linear dynamical systems because of its limited ability to model multiple, simultaneous, reciprocal and recursive relations. The limitation is not just a practical matter of our finite cognitive resources, because our reliance upon narrative sensemaking (which is itself an adapted form of cognitive efficiency) makes it into a matter of principle. The narrative conception of temporality is linear in that it is founded upon an additive procedure (this particular, and then this, and then this; one damn thing after another), which gives narrative effective attentional focus, but at the cost of its synoptic grasp. Such a procedural constraint fails to address the quality of mathematical non-linearity captured by the phrase “solutions cannot be added together,” and it therefore cannot cope with complex systemic processes. Or, to frame the problem more generally, narrative is definitionally unable to account for the quality in *processes* that corresponds to the unity of complex *substances* as Aristotle conceives it; namely, in his much quoted phrase from the *Metaphysics*, the respect in which the whole is (according to various translations) “something beside,” or “distinct from” or “over and above” the “mere heap” or “aggregate” or “sum” of the parts (Book 8, 1045a. These are the translations of, respectively, Ross, Tredennick, and Bostock).

Secondly, and antithetically, any given narrative may itself be considered to function as a system, in that its own coherence depends upon a network of significant relations within the medium in which it is told. The systemic discursive realization of a narrative may be part of a larger, prior system of meaning, such as a natural language, or it may establish its own signifying structure, as with a performative narrative. In either case, these systemic relations are internal to the narrative’s operation as a way of meaning, and distinct from the temporal relations it attributes to its referent by giving narrative form to some actual or conceptual process. Meaning is a systemic phenomenon that narrative strongly coerces into the form of a linear logic. Even as a narrative imposes this logic upon its materials, its own dynamic

production of meaning (the process of its articulation, or the process of any subsequent interpretation of it) is a manifestly non-linear process, involving a geometrical proliferation of significant relations with each meaningful unit that is introduced. This important quality is particularly evident, for any extended narrative, in the gap that opens up between denotation and connotation; between what the narrative propositionally says (as the expression of a linear logic) and what it implies (through its elaboration within a system of meanings). Narratives, intriguingly, are themselves instances of the non-linear dynamic systems they are so ill-equipped to represent. This circumstance is crucial to the potential for cultural elaborations of narrative to transcend the limitations of narrative form. Not only does it offer a powerful conception of the history of narrative, it is also highly suggestive for the further potential of emerging forms of narrative in contemporary culture.

The term “articulation,” in this definition, serves to express the idea that narrative is indeed fundamentally a process, a meaning-making activity, both in production and reception. While a narrative *text* is a thing, narrative in the sense intended by this definition is neither that text itself, nor something transmitted by that text, but the basic cognitive mode of its creation and its interpretation. The word “articulation” has specific advantages in conveying this idea. It might seem that “communication” would be a more self-explanatory alternative, but that would limit the scope of narrative to its social manifestations, whereas we are seeking to characterize a kind of cognitive process. Although the conditions in which narrative cognition originated were very probably social, and possibly communicative, and indeed some kinds of narrative thinking might appropriately be described as forms of self-communication, even an internalized notion of communication doesn’t capture the most elementary instances of narrative cognition.

Another alternative with less restrictive connotations than “communication” would be “expression,” but there is a second objection to both of these terms. The problematic implication of both words is that there is something—some content, structure, meaning or intention—that exists prior to the narrative act, and is transmitted by it. Such a transmissive model of narrative looks plausible, perhaps, when the narrative concerned is taken to be a specific recounting of some prior conception, or “story,” in the specific narratological sense of the word. In this view, a narrative’s “discourse,” the telling, is conceived as the transmission of its “story,” the told (Chatman). A distinction of this sort seems plausible when interpreting the literary narratives on which narratology has tended to focus, not least because their narration often prominently deviates from chronological order or other kinds of perspectival coherence. Even in literary contexts, though, it is a problematic and contested idea, and one that I have argued against myself (*The Rhetoric of Fictionality*, ch. 3). But in any case we are concerned here not just with the interpretation of extant narratives, but with narrative as a primary sense-making process in which meaning is created rather than merely transmitted, so we need a term with that connotation.

“Articulation” works here because it can do the work that “expression” and “communication” do, and at the same time convey the required sense of “structuring, jointing; giving form to.” To articulate, then, is both to *produce* significant form and, in doing so, to *express* it at the same time.

Finally, semiotics, as formalized by Charles Saunders Peirce in the late nineteenth century, is the study of signs, and systems of signs, and the production of meaning. The articulation of

narrative is of a semiotic kind because it belongs to the realm of meaning and the use of signs, even where these signs are percepts, functioning within the mind's native perceptual systems. Narrative does not occur in the world, unmediated by the mind; rather, it is a cognitive process by which the mind makes the world intelligible, abstracting usable sense, pattern and order from it in some semiotic form. Narrative is only constituted as narrative in this conceptual abstraction from the immediacy of embodied experience to a semiotic domain.

This definition describes narrative as a semiotic process, rather than a more narrowly linguistic process, for more fundamental reasons than the evident fact that narratives can be told in media other than language. There are certainly many non-linguistic media that serve as vehicles for narrative, notably film (including silent film), visual arts such as comics, and performance arts such as dance, drama and mime; but this fact does not in itself preclude the possibility that we make cognitive sense of such narratives in linguistic terms. The more important consideration is that to characterize narrative cognition as linguistic would be to make it a much narrower concept than this definition intends. Peirce distinguishes between three types of sign: symbols, icons and indices. While there is a loose sense in which any semiotic system can be called a language, linguistic signs in the strict sense are symbolic signs, those in which the relation between the sign's form and its meaning is purely conventional. In order to understand narrative cognition as a mental process operating most fundamentally at the level of perception, we also need to accommodate iconic signs, in which meaning involves resemblance, and indeed indexical signs in which meaning involves direct empirical connection.

It might be urged that narrative is not just semiotic but more specifically representational, and that the latter would be a more appropriate term. But it is at least plausible that the logic of narrative cognition can and should be understood in abstract terms distinct from its representational manifestations. There is, for example, some suggestive research on the connections between narrative and music (in an abstract rather than programmatic sense) that makes it worth keeping open this possibility (see Walsh "Common Basis").

Narrative cognition creates meaningful form with a specific temporal logic. It is the way in which we are cognitively disposed to discover pattern in processes, and to impose a certain kind of order upon the flux of temporal phenomena. It is important to recognize that these patterns are in some sense there to be found, but also that their status as patterns is irreducibly relative to a view, to a specific cognitive stance informed by a set of assumptions about salience and relevance. The assumptions inherent in narrative cognition don't only bear upon the form taken by specific narrative representations, but more fundamentally upon the form of narrative logic itself.

Narrative theory has always been a kind of formalism, but the drift of recent work in cognitive narratology is increasingly to locate the foundations of narrative's basic form in our cognitive architecture. The most fundamental features of narrative are evolved cognitive abilities, and no doubt adaptive to specific evolutionary pressures. The actual conditions in which narrative cognition emerged are open to speculation; what is certain is that they have little in common with the range of demands upon our narrative sense-making abilities today. It is not just that the interconnected networks of digital societies present new challenges to narrative understanding (though they do); the fact is that we have always been surrounded by

systemic phenomena resistant to the reductive heuristic of narrative, and the history of narrative culture is in some degree a continual effort to refine narrative thinking and address its limitations. But also, the resources of computation have opened up new ways of conceptualising, modelling and working with systemic phenomena, and in doing so are increasingly bringing home to us the urgency of the need to understand them. In which case, a key question is whether cultural forms of narrative, and the enculturation in narrative that is part of individual development, tend to perpetuate, or to mitigate, the constraining features of narrative cognition. Is narrative sensemaking bound by the terms of its fundamental logic, or can it transcend them? (I think both.)

One of the most basic attributes of narrative cognition is that it is perspectival, in several senses. Because cognition is situated, narrative necessarily imposes order upon phenomena from a specific spatial and temporal point, which is that of the telling or articulation (the semiotic act) rather than that of the told. This perspective is intrinsically constituted in narration, and just as intrinsically adopted in the reception of narrative. Just as a narrative may concern circumstances abstracted from immediate experience, so its perspective of narration may be abstracted from the immediate site of cognition, and may in fact be abstracted from any embodied site of cognition whatsoever. What is striking, however, is that narration always remains spatiotemporally perspectival, even where it assumes the hypothetical privileges of omniscience, as in some forms of novelistic narration.

Sophisticated forms of narrative can also foreground and manipulate its perspectival qualities by representing the narrative act itself (in character narration) or by partially aligning the narration with the perspective of a character (internal focalization). Represented narrative acts draw attention to the potential for the perspective of narration to be itself extended in space and time, and hence the potential for significant change in that perspective, which may therefore have a narrative development of its own. Such elaborate explorations of the dual temporality of narrative, often compounded with a pointedly non-chronological relation between the time of the telling and that of the told, are of course a staple of modernist literary narratives.

The perspectival interest of such narratives is rarely just spatiotemporal. In most cases it is not the physical constraints upon the narrative subject position that matter, so much as the evaluative constraints associated with that position. In literary narrative theory these constraints tend to be explored in nuanced cultural terms, regarding the ways a narrative manifests the limiting assumptions of broad ideological or ethical attitudes, or the symptoms of a narrating character's psychological or intellectual profile, or the motivational context of such a character's interpretation of events. Where there is such a narrating character, the relevant narratological concept is unreliable narration, in which the evaluative limitations or biases of the narrator are foregrounded and themselves become central to the implicit authorial point of the narrative.

The evaluative constraints upon narrative perspective run deeper than this, however. Every narrative is situated in a pragmatic context as well as a spatiotemporal context, and pragmatic considerations define its perspective because they determine criteria of relevance. Relevance is usually understood as a criterion of communicative pragmatics, so that the narrative form is influenced by circumstances of the context of telling. This context will involve broad

considerations, and often very specific ones too, that dictate the parameters of “tellability,” or what is worth saying, for a given narrative act.

In this sense, relevance may be understood as both a communicative consideration for the teller, and an assumption driving the interpretative effort of the receiver of a narrative. It is the answer to the standing question, what is the point? But a communicative context is only one aspect of the pragmatics of narrative, and not even a necessary one. In the privacy of narrative cognition, the same sense of point orients the perspective of narrative sense making in relation to the subject’s context of action, and indeed to the subject’s current framework of understanding. The criteria of relevance that apply in narrative cognition can be wholly pre-reflective, but they strongly determine the narrative’s identification of salient features in the object of its scrutiny.

Substantial implications follow in connection with a basic attribute of narrative, its intentionality regarding temporal phenomena, which is to say its “aboutness”; narrative articulates, in semiotic form, processes that are assumed to be actually or hypothetically independent of that articulation. The consequences of this intentional relation run in two directions simultaneously: from the cognizing subject towards the object, and (reflexively) back towards the subject. So, features of narrative sensemaking activity are projected onto target processes, which are themselves then taken as the empirical ground for the logic of narrative itself. The sequential singularity of the narrative line is a feature of narrative’s cognitive form, but one it attributes to its intentional object. Similarly, the mere connectedness of narrative representations themselves inevitably implies analogous causal connections in the represented processes. E. M. Forster distinguished between story and plot on the basis of explicit causal connection: it is the difference between “the king died and then the queen died” and “the king died and then the queen died of grief.” but some implicit causal connection was already latent in the former, exactly to the extent that we take it as a narrative rather than some kind of list. The causal explanation is open to interpretation: it may be natural (a contagion?), social (a plot?), or supernatural (the Fates?); it may also be reflexively disavowed (paranoia?). All these possibilities share the assumption that some intimation of causality lurks in narrative coherence itself. While we may reflectively critique these attributions of causality, we can hardly avoid making them in the first place; and critique is not always vigilant.

Other consequences of the perspectival horizons of narrative cognition work in the same way. The pragmatic finitude of cognition demands that narrative seeks temporal wholes, an imperative that gives it a drive towards closure that is apparent at every scale of narrative unit from the minimal “narreme” to apocalyptic narratives that impose closure upon the history of time itself. It is not just that closure is a representational imperative projected onto the object of representation; it is also that this imperative is driven by criteria of relevance, or point, that are values of the representational perspective itself. Among the more elaborate forms of narrative there are many that make this quality of closure especially obvious. The sense of point at the end of a literary narrative, for example, really never reduces to finding out what happened; and some such narratives deliberately divorce the two. Raymond Carver’s short stories, stereotypically, end before the end; Thomas Pynchon’s *The Crying of Lot 49* ends, pointedly, just before the crying of lot 49. Yet that doesn’t make these cases of incomplete, unresolved narrative; narrative closure is not ultimately about the resolution of an event, but the satisfaction of a semiotic demand for significance, for achieved relevance.

The semiotic basis of closure has important consequences for narrative understanding, precisely because narrative logic tends to get projected onto the represented events. As a semiotic discourse, narrative is oriented towards the end; its form, at every level, is given by the anticipation of closure, the ultimately achieved meaning that makes sense of the whole. But, inevitably, these qualities of the discursive form of narrative get attributed to its object of representation, giving narrative a strong disposition towards teleology. In fact the notion of teleology, or “final cause,” as a principle of innate orientation towards an ultimate form, is the manifestation of a fundamentally narrative way of thinking.

Teleological thinking is an effect of narrative form, and distinct from any presumption of agency inherent in narrative. But narrative does strongly attribute agency, in the sense of a capacity for goal-directed action, for reasons that are probably intrinsic to its adaptive value as a cognitive tool in a social environment. Narrative theory has become very interested in narrative’s role in theory of mind, or folk psychology, on the premise that the ability to attribute motive and intention to other people, and so anticipate their behaviour, is one of its basic affordances. The agency attributed by narrative is a more inclusive concept than this, but any narrative representation of an agent strongly connotes such folk psychological attributions of motive and intention. Most substantial narratives are preoccupied with understanding the agency of others, whether real people or fictional characters, and much of the work in this field assumes that such understanding is a projection of our understanding of ourselves. However, it is at least as plausible to hypothesize that our understanding of ourselves first arises from an internalization of our representations of others. The reflexive nature of such a move, to the extent that it also applies to other selves, means that this aspect of narrative sense-making is to some extent self-fulfilling, and its recursive nature ties it closely to the history of consciousness.

If narrative agency is understood as, at bottom, a direct consequence of narrative logic, then it helps to clarify one of the most obvious effects of narrative, which is its anthropomorphism. There are definitions of narrative that restrict its scope to the experientiality of human agents, and these definitions deal with the obvious fact that narratives often concern non-human agency by saying that they always treat their subject matter as if it had qualities of human agency. But while there are plenty of examples to support this idea, from beast fables to wildlife documentaries, they vary considerably in their degree of anthropomorphism, which suggests that it is an effect of narrative representation rather than a defining quality. On this view, human experientiality may itself be understood as contingent upon narrative sense-making. Narrative projects agency because it is the cognitive strategy of a social animal, and it does that much indiscriminately, but the more specific features associated with an experiencing human subject seem best treated as secondary effects of the development of narrative.

Another way of expressing this point is to say that narrative is not about the experiencing human agent, but for the experiencing human agent. That is, it is not in essence an anthropomorphic form of representation, but an anthropocentric form of cognition. Fundamentally, this anthropocentrism is simply a pragmatist condition for knowledge as such, in that understanding something necessarily involves bringing it into an intelligible relation with a human point of view. If we consider narrative not as a subset of knowledge but as a form of knowledge, though, the significance of such a constraint is more pointed. On the one hand, narrative imposes a horizon upon understanding within its domain in just the

way the general anthropocentrism of knowledge implies; on the other hand it is the legacy of a cognitive pre-history with imperatives quite different from the demands we place upon narrative today.

A further implication of this pragmatist view of narrative is worth bringing out. Its cognitive function, as I have formulated it, has an irreducibly heuristic character; it is good enough for current purposes. Narrative therefore always rests, not circumstantially but constitutionally, upon unexamined assumptions, so that the sense it produces remains, at its core, implicit. The limits of articulate sense in every narrative are in one respect just a pragmatic horizon to its endless capacity for elaboration, imposed by the finite resources of cognition or interpretation. But these limits are also the pragmatic limits of sense as such, in that narrative is not built upon some fundamental unit of meaning, but upon the embodied nature of cognition. The roots of narrative logic necessarily spring from an empiricism beyond semiotics. The force of narrative is therefore always more bound up with what its form implies than with what it actually expresses, and the potency of the implicit has been evident throughout this discussion of narrative's effects.

At the same time, the territory of the implicit provides for narrative's most powerful feature, which is its reflexiveness. The vast capacity for elaboration that makes narrative such a ubiquitous presence in culture and daily life is accountable, in a rudimentary sense, to the way in which the implicit borderlands of every narrative invite further explanation, and our appetite for pursuing it is apparently insatiable. The implicit in narrative is itself a prompt to narrative cognition, making it the object of and occasion for more narrative. The impulse is manifest everywhere, from the child's incessant "why?" in response to every narrative explanation, to the saturation of culture with sequels, prequels, series, spin-offs, adaptations, fan fictions and versions of all kinds. But more fundamentally, narrative's propensity for reflexiveness bears upon its own logic, not just the particulars of a given instance. Narrative sense-making's attention to itself does not only lead to its proliferation, but also its complexification. The cultural history of narrative traditions can be read as an extended series of such reflexive moves, in which the taken-for-granted becomes the focus of attention, or a particular meaning becomes a way of meaning, an instance becomes a trope. These reflexive moves occur on all scales, from local representational devices (the development of free indirect discourse, say) to global communicative purposes (such as the rhetorical possibility of fictionality). I said earlier that I think narrative is both bound by the terms of its own logic, and capable of transcending them, and this is why. Reflexiveness in one sense abstracts from given features of narrative and perpetuates them in grander form, but it can also be a critical abstraction, one that brings hidden assumptions into the light and pushes back the boundaries of narrative sense-making.

I want to pursue the possibility of generating testable hypotheses about narrative cognition, but in the arena of artificial intelligence, rather than human cognition. There are practical reasons for this, and circumstantial reasons. I'll come to the circumstantial reasons in a minute; the main practical reason is that between the complexity of human cognition and the currently limited experimental resources of cognitive science, it is very hard to isolate variables of narrative sensemaking in a controllable way. Artificial intelligence provides the opportunity for experimental designs in which both the contextual parameters and the permutations of narrative form itself are radically simplified, for example by confining the experiment to a very impoverished environment, and by implementing a narrative logic with

limited permutations. The point is not to use AI as a proxy for human cognition, but rather to throw human cognition into relief by contrast with the AI model; not just because the AI model is reductive (that is its virtue), but because it exposes the raw principles of an AI model of narrative cognition to their formal and practical limitations.

The juxtaposition of AI and cognition helps bring into focus some fundamental questions for narrative theory. One of the most general is the issue of knowledge representation, and narrative as a kind of knowledge representation. In AI, the concept of a knowledge representation (KR) has been closely scrutinised, for example in an important 1993 article by Davis, Schrobe and Szolovits called “What is a Knowledge Representation?” It can be understood in several ways with respect to several functions, but in the most elementary sense it is a surrogate for the AI system’s object of knowledge, allowing it “to determine consequences by thinking rather than acting, that is, by reasoning about the world rather than taking action in it” (17). In this sense a knowledge representation is a world model, and as such it is already implicated in consequential assumptions about both knowledge and representation. Knowledge, here, pertains to the qualities of the object of knowledge: the representation is understood to be *of* that object. But knowledge might be better conceived as a *relation* to an object of knowledge, in which case a knowledge representation ought to be a representation of that relation. As representation, though, it also reconfigures the enactive relation between mind and world, which is situated and embedded, into one between subject and object, no longer ontologically continuous, but rather a semiotic hierarchy. This representational transformation raises the issue of meta-representation, the capacity for a knowledge representation to include a representation of its own state, which has been a key concern in AI and keys in to my concern with reflexiveness. My point here is that the concept of knowledge representation exposes crucial tensions between representationalism and the broad premises of embodied cognition, tensions that go back at least as far as Hubert Dreyfus’s attack on the assumptions of AI, or of what is now known, after John Haugeland, as “good old-fashioned AI” (GOFAI), in the 1960s (*What Computers Can’t Do*). One of the central tenets of the argument advanced by Dreyfus was an anti-representationalism aligned with what would now be called enactive cognition, and which he himself would later characterise in terms of the epistemological distinction between knowing-how and knowing-that (*Mind over Machine*). It is along these lines that I am concerned to explore the emergence of narrative sensemaking in the context of embodied and environmentally situated AI agents – that is, real robots.

The circumstantial reasons for my interest in AI narrative have to do with an interdisciplinary dialogue with complex systems scientists about the incompatibility between narrative representations and systemic processes. That collaboration resulted in a volume of essays called *Narrating Complexity* (2018), which was primarily concerned with the respects in which narratives and systemic representations are forms grounded in different logics. The incompatibility, simply put, consists in the way narrative is predicated upon sequence, cause and effect, agency, perspectival unity, and teleology, whereas the basic principles of complex systems are concurrency, recursiveness, systemic networks, multiplicity, and emergence. The project centred upon the challenges this mismatch presents to understanding complexity science, and the extent to which contemporary cultural forms of narrative can accommodate and communicate systemic complexity. However, also lurking within this topic was a question about the origins of narrative: how and why such a cognitive and communicative

mode, emerging out of evidently systemic conditions, should have arisen in apparent disregard of the nature of those conditions. This question was framed in AI terms partly because computer scientists and AI specialists were part of the dialogue; and indeed the book included an essay exploring the hypothesis that robots telling each other stories might more effectively negotiate their shared environment than otherwise. This idea, that a cumulative narrative understanding might be adaptive for a group of robots with defined goals in a specific context, has gained momentum as a project in its own right.

The goal of the project is to build and test an experimental implementation of such a group of storytelling robots, but I should hasten to add that, for the moment at least, it is very much at a speculative stage. Actually implementing it would require a level of funding that boggles the mind, at least for a humble humanities scholar like me. Nonetheless, there are interesting issues to be worked out at the level of hypothetical experimental design. The one that immediately concerns me here is the problem of the narrative competence of the postulated robots, both as a communicative behaviour and a cognitive ability; because narrative competence requires a formal logic beyond mere representation of or reference to a world model. There are off-the-shelf robots available with a good range of environmental sensors and the capacity for natural language processing, and so already equipped with the means for agency within an environment, internal modelling of that environment, and semiotic exchange of information. A viable environment would need to be quite minimal, but consistent with providing some potential for discovery, hazards, objectives, rewards, encounters with other robots, etc. Likewise the range of concerns delimiting the scope of relevant storytelling would need to be as tightly restricted as permitted by the requirement for meaningful variation. Even if all that is granted, however, non-trivial issues arise at the most basic level of narrative competence. Consider the following hypothetical example of a short robot narrative:

I went around that corner yesterday. I fell into a hole.

In order not to be seduced by the idiomatic qualities of this interesting statement, we first need to recognise that its language pertains to the tightly restricted parameters of the robot's internal model, environment, and range of behavioural and communicative affordances. A "corner" is just a location at which a previously blocked direction of travel opens up; "yesterday" just indexes an arbitrary division of time periods, "falling" is just tipping over, and a "hole" is a generic trip hazard. The statement's retrospective first-person narration ties it to the encoding of a prior experience; the deictics (i.e. "that," "yesterday") situate the utterance spatially and temporally with respect to what it represents; and that fact, along with the communicative relevance of the information (as an awful warning) make this plausibly a report to another robot – though not necessarily so, since it could also be the internal articulation of currently relevant knowledge.

But what kind of knowledge is it? Even with all the foregoing caveats, I think our inclination might be to say that it is narrative knowledge. For us, it is certainly narrative; but that doesn't make it narrative for the robot. It's true that each of the two sentences is a narrative utterance in its own right, but in both cases the articulation of the event is bound up in a single verb – "went," "fell." The narrative sense is latent in the processes those verbs denote, making the temporal extension of those processes available to inference or further elaboration; but the information they convey as unitary signs reduces to just a change of state, or a status update.

More importantly, the narrative articulation between the two sentences is not encoded by anything other than their juxtaposition. Nothing positively requires us to understand them as any more than a series of two unrelated assertions. If the robots are to make narrative sense of their experiences, and of the stories they tell each other, they need to be provided with a rudimentary narrative logic distinct from their linguistic competence and distinct from their sensory engagement with their environment.

It is our own predisposition towards narrative sensemaking that makes available our inference that the two statements are to be understood sequentially; that falling in the hole *followed upon* going around the corner. Only on that basis is the further inference available, that falling in the hole was a consequence of going around the corner. Yet this last inference is what gives the utterance its main communicative relevance. Assuming that corners and holes are already known environmental features, neither the fact that a corner may be turned, nor even that a hole may be fallen into, alone constitutes significant new information, because these are definitional qualities of the features themselves. But while the need to detect and avoid holes is, likewise, a given of their status as hazards, this story – taken as a story – does make more salient information available. Firstly, it reveals that there is a specific hole located around a certain corner. That much might equally well have been communicated in a declarative sentence, but the narrative form here adds the implication that the hole, being hidden by the corner, was in this case undetected until it was too late; and that makes available a further general inference, that corners may hide holes.

There are two kinds of narrative implication involved here, on different conceptual axes. The first is sequential-causal implication, the second is particular-general implication. These are both fundamental narrative heuristics, essential to narrative's value as a form of sensemaking even while they lack logical rigour. Sequential-causal implication, as Barthes observed, courts the *post hoc ergo propter hoc* fallacy, while particular-general implication courts inductive fallacy. Generalization is of course not a uniquely narrative cognitive strategy, but the mode of its integration into narrative sensemaking is crucial to the way it works. Narrative cognition concerns the form of particular experience, and makes sense of the particular by assimilating it to the familiar shapes of the general – which are themselves, however, grounded nowhere except in extrapolation from the particular. The reciprocal dependence compounds the vulnerability of narrative to fallacy, but it also provides for a situated feedback loop that is fundamental to narrative's cognitive value.

The bare possibility of narrative sensemaking depends upon the combination of two fundamental principles that underpin everything I've said about narrative cognition so far. One, inherent in its attribution of sequential relations, is a reliance upon the implicit; the other, inherent in its cyclical negotiation between the particular and the general, is an intrinsic reflexiveness. I'll conclude by outlining why the interaction between these two principles is essential to the working of narrative cognition, and commenting upon the function of each in that process.

The implicit and the reflexive can be understood as, respectively, the pre- and post-representational faces of narrative as a cognitive "logic." Assuming that the robot of my example does indeed possess such a logic, the possibility of formulating the example narrative arises as follows: the robot, exploring its environment in pursuit of its goals, decides to turn a corner and falls into an unanticipated hole. As the principal in this action it is an

agent embedded in its environment, in a direct enactive relation with it. However, it has prior knowledge of robot interactions with corners and with holes, acquired from direct observation of other robots, or from stories told by them. It is able to recognise that the forms of that part of its narrative canon are relevant to this particular case, and applies them; in doing so it situates its recent experience spatially and temporally relative to its current position (lying face down in the hole, perhaps). By articulating this narrative it has done two key things: firstly, it has made a division between information that is explicit in the narrative representation and a much larger, *implicit* cognitive context, including unincorporated sense data, particulars of the prior narratives that provide the paradigmatic resources for this one, and assumptions that may be inferred from the narrative itself in light of the robot's narrative competence, its individual history, and the maximal cognitive context of its entire narrative inventory. The second thing it has done is to temporally and conceptually displace its subject position from that of the experience itself, producing through the *reflexive* act of representation both the characteristic dual temporality of narrative (here realised as retrospective narration) and the subject-object dyad (here realised in first-person narration, in the distinction between the narrating and experiencing "I").

The implicit is a liminal category on the cusp between cognitive adoption and oblivion. In this sense it can be related to attentional focus in cognition; but it is also a necessary part of any formal attribution inasmuch as it is integral to every operation of distinction or relation, acts which necessarily imply more than they assert.

There are broad and narrow senses of the implicit that apply to narrative. The broad sense applies just because narrative is one form of semiotic articulation; this notion of the implicit is a general condition of the intelligibility of any kind of discourse. The narrow sense that interests me more, though, is specifically integral to narrative logic. It has to do with the fact that narrative, as the articulation of temporality, or change, is essentially concerned with difference; there is no narrative object as such. Its connective logic therefore cannot be brought into full presence, or made explicit, but only followed, or pursued, within an implicit context of assumptions that are accessible only within the limits of an economy of cognitive cost and benefit. Its coherence is therefore always contingent, and an artefact of attentional horizons rather than logical completeness.

One of the things that is always implicit is the subject. That is the principle underlying interpellation, as the implicit construction of a subject position. It is also a much better approach to cognitive effects of mirroring than the reverse orientation normally assumed by cognitive narratological discussion of mirror neurons and empathy (for example), where the other is understood by analogy with the self; rather, it is an approach that frames in cognitive terms something closer to Lacan's mirror stage. The logical progression is that the act of narrative representation makes the subject available as an object of representation; in Plato's terminology, diegesis becomes mimesis. Reflexiveness in narrative sensemaking, as a turning back upon itself of the sensemaking act, seems to connect directly with basic principles of psychology, and to the extent that the temporal qualities of narrative form involve not static but dynamic reflexiveness, it seems intimately related to the possibility of consciousness in time. But narrative reflexiveness is also a basic principle of the cultural elaboration of narrative; its most general formulation in literary terms, perhaps, is the Russian Formalist concept of defamiliarization, but if we expand our concept of metafiction, and indeed of

narrative metalepsis, it can give us a more focussed idea of the role of reflexiveness in narrative.

There are obvious respects in which the reflexiveness exemplified by metafiction might be taken in a sense that extends well beyond narrative. The closely related concept of *mise en abyme*, for example, has origins in visual representation (in heraldry), and is strongly associated with the visual arts. However this example itself helps clarify what is distinctly narrative about reflexiveness; as a visual device, *mise en abyme* has the spatial qualities of a fractal pattern, but it acquires its distinctively vertiginous effects just to the extent that we pursue the logic of that pattern as a serial, hence temporal, phenomenon. That is to say, *mise en abyme* functions reflexively when our cognitive engagement with it is narrative in form. The logic of reflexiveness can be understood as a distinctive quality of narrative, rather than representation in general, at this basic cognitive level, where narrative is not a genre, or a text type, or even a form of discourse, but a mode of cognition. Reflexiveness is unique to specifically narrative cognition because narrative concerns, as a matter of formal necessity, process. Reflexiveness is always and everywhere a conceptual move, the inherent temporality of which is not merely that of thought in process (all thought takes time, after all); rather, it is an effect of its conceptual abstraction from the experiential immediacy of inhabited time. The reflexive move makes process into a representational construct; which is to say, it produces the dual temporality of narrative – the time of the telling and the time of the told. In this reflexive abstraction from experiential immediacy, clearly, it is the time of the told that is the artefact of the redoubling process.

Contrary to the assumptions of storyworld-oriented models of narrative, then, logical precedence has to be given to the temporality of the telling, not that of the told. Narrative is first of all an act, a gesture, whether physical, cognitive, or communicative; a formal grasping together, the process of which bestows a derivative temporality, and hence narrative intelligibility, upon the told. The primacy of the temporality of the telling, here, is evident in the fact that it is not itself a product of narrative; rather, it is behaviour, action. But as such it may of course itself be brought to consciousness, and within the purview of narrative, by virtue of narrative's reflexive potential.

I have outlined an abstract and formal model of narrative sensemaking, reflexiveness and the implicit, but I want to emphasise that it is predicated upon an embodied and contextual view of narrative cognition; indeed it is precisely concerned with the open interface between embodiment and semiosis. It is at this level that embodied cognition bears upon narrative, rather than being directly, representationally manifest in the elaborate, sophisticated narratives with which cognitive narratology generally concerns itself. I think the effects with which that kind of research is concerned *do* follow, if we describe them more carefully and detach them from question-begging modes of explanation.

Narrative creativity is not just creativity *in* narrative, but fundamentally the creation *of* narrative; and as narrative's vast range of cultural manifestations testify, the potential for elaboration upon its basic logic is huge, even as that logic operates as a significant constraint upon what narrative can think. The continual effort to transcend narrative's limitations is a form of creativity consequent upon the tension between that basic logic and the contexts in which we would like to apply it, and the richness of narrative culture is emergent out of that conflict. Its potential lies in the implicit, and its engine is reflexiveness.

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