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Narrative

Hans-Joachim Backe

From the perspective of literary and media theory, the relationship between narrative and biomedicine manifests along two intimately entangled lines: narrativity and referentiality.[1] Narrativity is relevant because every account of developments will have a setting and agents, as well as a temporal structure with some unavoidable gaps. In order to illustrate complex observations about changes in state clearly and intelligibly, even a scientific text will often need to complement statistical data or a simple chronicle of events with at least some narrative devices. Referentiality becomes a central concept when dealing with the fact that biomedicine figures in popular culture mostly in the form of fictional texts referencing scientific discourses, transgressing boundaries between media, text types, demographies, popularizing a potentially dry subject matter through reducing abstractions, and complexities. These two dimensions are sides of the same coin; nonfictional narrative is a daunting subject for narratologist, because, as James Phelan notes, it requires engagement with such issues as, "(a) whether the border between fiction and nonfiction is rigid, permeable, or, for all practical purposes, nonexistent, and (b) how what we might call local referentiality in fiction, that is, the presence of historical figures or events, compares with the global referentiality implicitly claimed by nonfiction, that is, the claim that the entire narrative refers to actual people and events" (Phelan, 2007: 217). I understand, therefore, narrative as instrumental for the construction of knowledge in popular culture, in that it is a shared trait between fictional and

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[1] For comprehensive introductions to those two concepts see (Abbott, 2009), and respectively (Wolf, 2009).

nonfictional texts, and that this facilitates intricate referential structures of the kind explored in many of the contributions to this volume.

Narrative in scientific texts

Whenever science presents its reflections, hypotheses, and findings not in the formalized languages of mathematics or chemistry, it relies on the highly diversified tools of natural language. As soon as inter- or transdisciplinary work is attempted, clear, precise, and understandable writing is essential to facilitate knowledge distribution and exchange. As such, science writing is frequently more than mere semiotics, and the division between rhetoric and narrative construction of arguments is often quite blurry. There can be little doubt that Charles Darwin arranged his *Origin of Species* in a very deliberate manner: "[…] Darwin, more than most scientists, was not interested in merely publishing an abduction, a hypothesis. He saw the problem as a rhetorical one, in Aristotle's nonpejorative sense of this term. He wanted to have evidence for his hypothesis that would come as close to the irrefutable as possible" (Oatley, 1996: 138). Yet Darwin's method of recording his research was not merely rhetorical; Gillian Beer has devoted an entire book to the study of its poetic power and influence (Beer, 2000). To Marie-Laure Ryan, *The Origin of Species* is a prime example of what she calls "metaphorical narrative" (Ryan, 2004: 14). Ryan defines narrative as a phenomenon that transcends media in the strict or literal sense as "the mental or textual representation of a causally linked sequence of events involving individuated and humanlike agents" (Ryan, 2004: 14). A metaphorical narrative, then, is a text that only uses some of these defining elements; Darwin, for example, reifies evolution and treats it almost, if not quite, like an active individual. In other words, a scientific text can, just like a literary one, be more or less narrative.

Views on the nature of narrative differ widely. On the one end of the spectrum, the existential stance of Jerome Bruner assumes that human experience can only be commensurately

rendered in the form of narrative (Bruner, 1987). On the other end, there is the assumption that narrative is an alien, distorting factor in factual writing, be it academic or journalistic, a notion palpable in the self-perception of journalists (Zelizer, 2006) and, to an even greater degree, scientists. Recent discussion of a "rhetorical turn" or "narrative turn" in qualitative and quantitative research clearly shows this. Narrative devices have been identified as a means for representing multiple perspectives on an issue (Coulter and Smith, 2009). In ethnography, creative nonfiction is perceived as a model for the presentation of research (Narayan, 2007), which is one of the reasons for the recent success of guidebooks for narrative nonfiction (Hart, 2011) and creative non-fiction (Gutkind, 2012). Trends such as these might be taken to culminate in the extreme approach of "Gonzo ethnography," "a postmodern documentary style that encourages a blend of observation with participation and rationality with altered states of consciousness" (Tedlock, 2011: 332), and could easily be mistaken as evidence for an inherent relation between strong narrative impetus and a departure from traditional scientific values. Regardless of these developments, 'hard science' disciplines usually shy away from narrative. Some scholarly writing acknowledges the general usefulness of narrative devices for their ability to "establish an index of reality" (Richards, 1992: 24), yet mostly, narrative is treated as a suspicious, dangerous tool that might foster comprehension but also be used for persuasion, and therefore, might create inaccuracy (Dahlstrom and Ho, 2012). The use of the first person pronoun is taken as a marker of narrativity, because it suggests "that we have the view of a particular person, a given individual who may have a certain authority, but whose perspective is not absolute" (Richards, 1992: 28). This is perceived as a shortcoming in scientific writing, just as the temporality of narrative is portrayed as coloring otherwise objective facts and events (Richards, 1992: 31).

   The assumption that scientific writing is (or should be) inherently non-narrative ignores both traditional usage of narrative in some disciplines (like social sciences) and findings of cognitive

science. Abductive reasoning, sometimes rejected as less precise and thus unscientific, has been shown to significantly improve memory retention (Oatley, 1996: 128–129), just as the construction of arguments in natural language using tangible actors allows for easier understanding and memorization (Oatley, 1996: 127–128). This is especially apparent whenever cognitive processes themselves are part of an argument, because then, the ability to take on another individual's perspective becomes crucial (Zunshine, 2006). In linguistics, the process by which we mentally shift perspective, focus, or identification, both in simple social-linguistic circumstances, such as switching between first- and second-person pronouns in everyday dialogues, and complex cognitive processes, such as viewing the world through somebody else's eyes or imagining a different world, is called a deictic shift, a textual phenomenon closely related to narrative (Herman, 2002: 271–272). Similarly, narrative provides a robust framework for operating with non-linear concepts of time, and facilitating the management of complex temporal configurations (Harweg, 2011). Ultimately, this approach eases the challenges of conceiving the world following a different paradigm by, for example, anthropomorphizing non-human entities or even the relationships inside a system, which might be argued is the key for understanding such concepts as Actor-Network Theory (Latour, 1996).

Much of the slowly disappearing misprision of narrative can be traced back to Plato's mistrust of the "lying poet." Plato rejected mimetic art (theater) and was suspicious of epic poetry, because in both, the author hides behind his creation, lets other characters speak for himself, and creates a make-believe situation that, for Plato, could never be truthful (Schaeffer, 2009: 103). A very similar stance is found in implied hierarchies of sciences based on their assumed facticity and weight, in which historiography is (following Karl Popper) understood as a merely descriptive and rather inaccurate inferior cousin of "true science" (Richards, 1992: 20). These reservations have been equally leveled against evolutionary biology and all other disciplines whose subjects can often

elude truly experimental testing. Biomedicine has to be counted at least partially as one of these disciplines, given how many processes within the human body can only be deferred from symptoms, yet not studied in themselves, and may, therefore, rely on the explicative, rhetorical, and narrative methods traditionally associated with historiography (Richards, 1992: 22).

Narrativity and fictionality

Another important factor for the mistrust towards narrative apparent in scientific theories is the diversity of the concept, even within narrative theory. Narrativity has recently become understood as less of a category than a continuum, a soft, scalar concept. A folk tale or fairy tale is more prototypical of the idea of a narrative than a modernist or postmodernist novel, yet it is a distinction of degree and not of kind (Abbott, 2009: 310). At the same time, narrative manifests in different forms and on various levels; the most foundational distinctions of narrative theory are that between story (the "what" of a narrative), and discourse (the "how" of presentation). Marie-Laure Ryan pointed out that both levels can have different, unrelated degrees of narrativity. A story can have high narrativity in that it offers much cause for suspense, curiosity, and surprise, factors identified prominently by Meir Sternberg (Abbott, 2009: 315), and still be told in a way that is comparatively "un-narrative" by using much description, commentary, or digression (Ryan, 2007: 34 n. 25). The French-Lithuanian structuralist A. J. Greimas similarly distinguished between two levels of narrativity; the apparent, a specific kind of linguistic configuration of signs, and the immanent, a deep structure of semantic organization. When natural scientists speak out against the use of narrative, or when social scientists proclaim a turn towards narrative, they usually focus on the apparent layer of narrative as a style, a surface phenomenon, while overlooking the logically prior organization of information in a narrative fashion (Abbott, 2009: 312). This view on narrative is

closely related to Paul Ricoeur's concept of emplotment, which stresses the power of temporal reorganization of the causality of a plot (Abbott, 2009: 313).

Arguments against narrative intimately connect it to fictionality, another controversially discussed question in narrative theory. While scientific writing operates under the assumption that there can be a completely neutral, truthful depiction of things, literary theory is more occupied with the question of how literature can be non-fictional, (i.e., how the nonfiction novels of authors like Norman Mailer, Tom Wolfe, or Truman Capote can be conceptualized) (Heyne, 1987), or how nonfiction as a related text type or genre besides fiction can be categorized (Lehman, 2001).

The distinction between fact and fiction has been sometimes reduced to a question of authorial intent that needs to be explicitly communicated (Schaeffer, 2009: 109). Additional factors have been identified by the German literary theorist Monika Fludernik, who states that the differences between fiction and nonfiction "do not lie in the text-internal makeup but in the intentions of the writer (entertainment vs. information), the reception of the text (escapism vs. study of the real world), and the process of dealing with the text (interpretation vs. extraction of information) – all contextual frame conditions linked to the contextual marking of a text as either history (non-fiction) or fiction" (Fludernik, 2001: 92).

One marker for readers in judging the fictionality of texts is their degree of verisimilitude. Especially a lack thereof is a clear indicator: "Fairies, trolls, mermaids and robots that arrive from Mars immediately identify a text as fictional" (Fludernik, 2001: 96). Hard science fiction and predictive scientific nonfiction therefore move in the same precarious grey zone. Simulations and extrapolations of future states based on current scientific axioms are, by definition, not verifiable. The question becomes one of probability and verisimilitude, both of events and of actions (Riffaterre, 1993: 2).

Yet one does not need to enter the realm of future events to be confronted with questions of probability and verisimilitude. Even the discussion of contemporary biomedical knowledge may have to engage the improbable. Combinations of symptoms or coinciding factors are especially noteworthy because they are unlikely and elude statistical affirmation. That accounts of "freak occurrences" can still be processed as more or less truthful seems to indicate that verisimilitude does not rest mainly with individual elements (events or characters), but with the totality of the "storyworld," i.e., "the way interpreters of narrative reconstruct a sequence of states, events, and actions not just additively or incrementally but integratively or 'ecologically'; recipients do not just attempt to piece together bits of action into a linear timeline but furthermore try to measure the significance of the timeline that emerges against other possible courses of development in the world in which narrated occurrences take place" (Herman, 2002: 14). What makes a narrative believable, then, is not only all that happens, but everything that does significantly not happen. When Hamlet kills Polonius halfway through the play, this has the easily overlooked side effect that Polonius can no longer influence the events through his actions.

From the perspective of Theory of Mind, the fact-fiction divide becomes even less tenable, because this theory considers the human capacity for mental simulation as instrumental to all acts of understanding. The difference between "mind reading" in fact and fiction is therefore rather a praxiological one, as the results of the attempt to understand another individual's thought processes cannot be fed back into a social setting and thus verified (Schaeffer, 2009: 111). This is, however, not merely a distinguishing feature of fiction, but of most forms of formalized, mediated discourse, the one-way communication already found to be problematic by Plato.

The complexity and diversity of these issues notwithstanding, they can at least partially be reduced to the common denominator of "the ethics of referentiality, the tacit understanding

between author and audience in historical narrative that the historian's narrative is rooted in the events and facts that have an existence independent of that narrative" (Phelan, 2007: 219).

Following this line of reasoning, the difference between what is perceived as factual and as fictional involves other factors. To Fludernik, the decisive criterion of fiction is experientiality; that historical texts differ from novels insofar as the former do not privilege the subjective experience of individuals while the latter do (Fludernik, 2001: 93). A different stance is taken by David Herman, who proposes to distinguish various text types by their preferred or avoided prepositional frames. A prepositional frame is one of six possible ontological classes: temporary or permanent states; bounded or unbounded events; and bounded or unbounded actions. To Herman, every representation could be reduced to a combination of states that could be permanent or temporary, and events respectively actions that differ in whether there is agency behind the changes of state they describe, and which can be bounded (i.e., have a defined beginning and ending) or not. Herman gives the following examples: "Temporary state = Joe is in debt. Permanent state = Joe is human. Bounded event = High tide crested at 9 p.m. Unbounded event = Global warming was making ocean levels rise year by year. Bounded action = Joe paid off his debt. Unbounded action = Joe worked at extricating himself from debt" (Herman, 2002: 43). Text types and genres can be distinguished based on their preferences for a combination of prepositional frames. For example, a news item will prefer bounded events and bounded actions (e.g., a fire and the actions of firefighters), but may make use of other prepositional states as needed. A psychological novel, on the other hand, will usually prioritize a temporary state, such as a particularly important time in the life of its protagonist, and the fruitless (and thus pointless and endless) attempt to cope with it (i.e., an unbounded action). By contrast, bounded actions are comparatively rare in novels by Henry James or Virginia Woolf.

Intertextuality and referentiality

As initially stated, the fact-fiction discussion is already deeply rooted in the relationship between texts and events, a relationship identified as referentiality. The majority of sign systems, with notable exceptions such as abstract painting, refer to some kind of outside reality. Cultural references, however, are often directed at other signs or sign systems, or point towards themselves or their own sign systems. A painting showing a painter in front of an easel may depict a person (e.g., the painter of a self-portrait), yet at the same time, it draws attention to its own sign system (painting) and itself, because the painting depicted in the painting is necessarily a different painting. Such types of sign relationships have been identified as hetero-referential (pointing to some concrete other entity), self-referential (pointing to itself), and meta-referential (pointing to the conditions of its own existence) (Wolf, 2009). Such complex relationships form the basis for both intertextuality, the relationship between texts in the same medium, the prototypical case being literary allusions (Ben-Porat, 1976), and intermediality, references that transgress media borders (Rajewsky, 2005; Wolf, 2009). The question of what exactly should be considered distinct media is sometimes debated, and more specialized concepts such as multimodality (Elleström, 2010) have been proposed.

Conclusions

Biomedicine, just like other scientific discourses, mostly figures in popular culture as such intermedial references, evoking not scientific experiments or procedures themselves, but the ways in which these are communicated and displayed in other media. Watching a medical-themed television-show, viewers will necessarily understand the depiction of a certain procedure or the explanation of a symptom less in reference to reality than to similar programs they have watched

before, because for viewers who are not medical professionals themselves, this frame of reference will be much broader than their personal experience. Such references can range, systematically speaking, from individual, intra-medial references (e.g., an instance in a television-show referencing a specific other program, ideally a specific moment in it), to an intermedial system-reference, such as a computer game alluding to a film genre (Rajewsky, 2005: 52–53). The interesting particularity of references to scientific discourses like Biomedicine is that we are not only dealing, in all cases, with intermedial references, but that individual and system references go inevitably hand in hand. To portray biomedical concepts in popular culture means to both allude to the rich history of literature, films, and television dealing with the subject, and to also engage with questions of facticity and fictionality, of objectivity and narrativity. A text like the *House M.D.* (NBC Universal 2005) episode *Three Stories* (S1E21) references conventions of the medical profession, including diagnostic procedures, case study lectures, and textbooks. It does so, however, in an openly meta-referential fashion, because it exposes the protagonist's lecture first as counterfactual, only to re-contextualize it as a didactic and rhetorical tool with which ethical considerations are made more tangible than through a purportedly neutral report. Exposing the doctor's case reports as strongly narrativized, while showing his narrative as if it was the filmic reality, not only reminds viewers of the fictional nature of television drama, it also addresses the underlying question of whether factual, neutral depiction is even possible, both in popular culture and scientific writing.

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Abstract

The text discusses the importance of narrative strategies and their relationship to scientific precision in the context of biomedicine. Narrative is frequently equated with fiction and thus understood as antithetical to scientific truth. The article counters these simplifying views by unpacking both the fact/fiction discussion and the functional properties of narrativity. It presents positions ranging from narratology to philosophy of mind that identify the distinction between fact and fiction as rooted not in essential difference, but in communicative conventions and preferences for certain linguistic modes. With regard to narrativity, it discusses several approaches to (story-)telling that outline how it is a tool for cognitive accessibility, regardless of subject matter. A certain degree of narrative structuring of information has been shown to create contextualization and coherence that greatly improve comprehension and memory retention. Furthermore, the article shows how narrative allows for the production of critical distance through the use of self- and meta-referential strategies, actively provoking engagement with otherwise easily ignored contexts and discourses.