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Mind, brain, and literature: A dialogue on what the humanities might offer the cognitive sciences

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There are many obvious ways in which the cognitive sciences – disciplines such as psychology, neuroscience, cognitive linguistics, and philosophy of mind – have the potential to enrich literary studies. These disciplines can make substantial contributions to how literary scholars understand processes of textual creation and reception, as well as textually evoked cognition. What is not always so clear is what the cognitive sciences get out of such interdisciplinary exchange: is there really a two-way exchange, or do the benefits flow primarily in one direction?

We suggest that while cognitive science has already proved its value in helping us understand literature better, it should not be perceived by researchers in cognitive literary studies as a knight in shining armour with nothing to gain for itself from the encounter with literary studies. We believe that the study of literature from a cognitive perspective has the potential to be valuable to cognitive scientists in a number of ways, and that it is important that cognitive scientists start to pose research questions which make use of insights and methods from literary studies. Making this happen requires more than a passive wait-and-see attitude on the part of cognitive literary studies; it requires a proactive asking of the question "what might cognitive scientists want to get from such an exchange?"

We see a number of possibilities for answering this question. Firstly, the activities of creating and enjoying storytelling have always been part of human culture, so evolutionary literary studies has the potential to illuminate a central facet of what it means to be human, precisely through cognitive-textual analysis

(e.g. Boyd 2009). Secondly, there are important ways in which "everyday" cognition is constituted of processes usually thought of as "literary"; these include metaphor, which George Lakoff and Mark Johnson (e.g. 2003) have shown to be central to all language use, and "parable", the use of story structures to give meaning to real-life events, which is one of the principles explored in Mark Turner's *The Literary Mind* (1996). Thirdly, literary structures can be understood as manifestations of cognitive structures, such that analysis of the former can contribute to resolving questions about the latter, as in Patrick Colm Hogan's *The Mind and Its Stories* (2003), which uses a large literary corpus in order to enrich the cognitive-scientific debate on emotional universals. Fourthly, literary texts may yield specific hypotheses concerning, for example, the interaction of variables in cognitive processing and its experiential manifestations (can Emma Bovary's state of mind after her marriage (Troscianko 2012) alert us to features of cognitive dissonance that have not yet been empirically explored), or the interaction between cognition and its representation in "folk psychology" (people's everyday intuitions about their own cognition), which Gregory Currie (2011) has argued is what literature tells us most about. Although research projects of these kinds can be successfully pursued individually, forums like the recently founded Neuro Humanities Studies Network in Catania, Italy (www.neurohumanitiestudies.eu) have the potential to consolidate them into a more coherent research agenda that may start to equalise the balance, in this emergent crossover field, both between literature and cognition as mutually illuminating objects of study, and between literary studies and cognitive science as reciprocally beneficial methods of study.

In a way, a successful flow of benefits from literary studies to cognitive science would be nothing new. In the mediaeval and Renaissance worlds the scholar of science was almost always a scholar of letters too, thanks to the dominant education of the age: a trivium of subjects made up of grammar, rhetoric and logic, followed by a quadrivium comprising geometry, arithmetic, astronomy and music, making up the seven liberal arts and sciences of classical study. The academic of the past was therefore a *homo universalis* and was just as comfortable discussing Aristotle's *Poetics* as deliberating on Euclid's *Elements*. Seen in this light, our reflections here on how the humanities might elucidate the sciences only began to acquire their current form and urgency in the nineteenth century with the rise of the modern university and the fragmentation and compartmentalisation of knowledge into principally *ad hoc* faculties and departments. Taking the long view, then, we want in a sense to turn back the clock, while looking forward to a newly integrated cognitive future.

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This special issue aims to add depth to the argument that literary studies and the study of literary language have much to offer the cognitive sciences. Each of the four contributions suggests a different way in which a certain paradigm in cognitive science may be enriched or re-envisioned by applying, questioning, and/or refining it in literary contexts. The articles take up different positions on the issue of reciprocity, with two-way benefits or benefits primarily for cognitive science being differentially emphasised, and we hope that collectively this work will help further develop a synergistic interaction between the two disciplines and raise the profile of this promising area of research.

We begin with an overarching characteristic of human cognition, the massive parallelism of its underlying distributed processing, which stands in sharp contrast to the essentially serial nature of written language but, as Patrick Colm Hogan shows, can nonetheless be illuminated by an exploration of its representation in literature. We then zoom in on an area of cognition that comes to the fore particularly in literary reading, the imagination, and focus on two of its major aspects: immersion, discussed by Merja Polvinen, and (visual) mental imagery, considered by Emily Troscianko. In the last of our main essays, Michael Burke broadens things out again with a look at the interrelations between mind, brain, and rhetoric.

In the opening article, then, Hogan shows how Joyce's *Ulysses* evokes cognitive processing as inherently parallel rather than serial, and how this might help not only readers of the novel but also cognitive (neuro)scientists think differently about cognitive and neural parallelism. Drawing a crucial distinction between the seriality of interior monologue and the parallelisms of stream of consciousness, Hogan argues that the textual evocation of cognitive parallelism develops systematically in certain sections of Joyce's novel, a development which can be partially illuminated with reference to musical structures.

In the second paper Polvinen argues that the spatial metaphors conventionally used to talk about immersion lead to the unhelpful assumption of a dichotomy between emotionally immersed and reflectively rational forms of imagining. Analysis of Dave Eggers's *A Heartbreaking Work of Staggering Genius*, and in particular of its metafictional qualities, yields a more subtle account of what can go on when we imaginatively engage with complex stimuli. Polvinen shows that joint attention, as a form of parallel processing, is one feature of responses to literature that can help us refine the scientific model of imaginative cognition more broadly.

In the third paper Troscianko suggests that scientific accounts of the imagination may benefit from considering the case of guided imagining when reading literature, and specifically that literary texts may be better than imagery questionnaires at tapping important, non-pictorial characteristics of mental

imagery. An approach to the scientific study of the imagination that incorporates literary stimuli and an understanding of the characteristics of literary language may help adjudicate between opposing accounts of mental imagery, and possibly add further support to non-pictorialist positions in the ongoing "imagery debates".

In the fourth paper, Burke investigates both whether or not literary style is always a bottom-up processing phenomenon and also whether the way literary style figures operate can shed light on how the mind and brain function. He argues that literary style elements, and in particular discretely foregrounded figures such as rhetorical schemes, can sometimes initially be in the mind and brain rather than always in the text. He grounds this hypothesis in cognitive psychological and neurobiological theories concerning the processing of images and everyday language, and then suggests that an understanding of the neural processing of literary style elements could yield specific hypotheses for neuroscience, and form part of a broader interdisciplinary investigation of rhetoric in the mind and brain.

Finally, this special issue concludes with a response or "coda" from cognitive science. Here, the neuroscientist Roel Willems critically appraises the theoretical proposals put forward in the four papers. He concludes that the four articles offer much to inspire cognitive science, especially with regard to scientists keeping closer to the original data in experiments and embracing the richness of those data as an asset rather than a hindrance. He also sees opportunities for cross-fertilisation with regard to terminological richness and precision.

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The central question motivating this special issue as a whole, including the individual contributions from literary studies and the response from a cognitive scientist, is whether the traffic in this interdisciplinary exchange is ultimately destined to be primarily one-way, from the sciences to the humanities, or whether literary studies is able and likely to bring lasting and valuable insights to cognitive science. This question matters, because it will determine what kind of discipline cognitive literary studies becomes. If, like philosophy of mind, it can grow into a field vibrantly and productively interconnected with experimental cognitive sciences, both using empirical findings to fuel developments in literary studies and critiquing, refining, and elaborating that empirical cognitive-scientific research and its theoretical underpinnings, then cognitive literary studies will take its place amongst the ranks of the cognitive sciences, and flourish. If it doesn't, it risks remaining the poor sister to those which do mutually enrich each

other, with all the problems for disciplinary identity and hence institutional status that this would entail.

As briefly outlined above, there are many factors that make cognitive literary studies capable of taking on a fully integrated role in cognitive science. Language and storytelling are inherent to human cognition and culture, and literary studies is the oldest discipline devoted to their study: it has at its disposal millennia of rich textual instantiations of human cognition, and nearly as long a history of scholarly inquiry into such texts. The question then arises why relatively little work has been done in the direction we propose here: reflecting back on the cognitive architecture and processes from which literature derives and which it has shaped. The most obvious reason is that (good) interdisciplinary research is difficult. Even within the sciences or the humanities, it is difficult, and between the sciences and the humanities, there are such significant differences in how we learn to think and reason, in epistemology more generally (what counts as evidence, for example, or in what terms truth or truths are conceived of), in technical language, and in the practicalities of research training, that it is unsurprising if we fear being misunderstood or judged by the other community, and often do not manage to overcome these numerous hurdles to collaboration. The insecurity with which the humanities often confront the sciences may also be a factor here: given their far greater command of funding and other resources, and the greater ease with which their research can be explained (at a basic level) and justified to government and the public, it can be easy to forget that the humanities offer things of value that are not simply overshadowed by all that the sciences can achieve – and furthermore offer them specifically back to the sciences, as we hope to demonstrate in this special issue. More specifically, those literary scholars who, like our contributors here, adopt cognitive approaches tend to do so because we are excited by the potential for cognitive science to help us understand the texts we care about better, and may not stop to think about the converse.

There may also be a methodological barrier here: humanities scholars may, because of hesitation as to the epistemological validity of importing the scientific method wholesale into the study of aesthetic phenomena, or a simple lack of experience in empirical methods, be resistant to espousing the scientific method relatively strictly conceived, while conversely, experimental psychologists and other researchers trained in empirical investigation of a certain well-demarcated kind may well be reluctant to acknowledge the possibility of arriving at valid answers to cognitive questions by any other method. These matters pose undoubted challenges to cognitive literary studies, but they need not be insurmountable: a variety of solutions, such as combining qualitative and quantitative measures in laboratory settings (e.g. Miall and Kuiken 2001) or opting for a more

anthropological approach in real-world contexts (e.g. Allington 2011), have been successfully developed.

Another issue relevant to the two-way potential of cognitive literary studies may be the primary disciplinary origin of researchers in this new discipline. Despite some notable long-term collaborations between literary scholars and psychologists, such as David Miall with Don Kuiken (e.g. 2001), and Marisa Bortolussi with Peter Dixon (e.g. 2001), and a good number of cognitive linguists working in the sub-field of cognitive poetics, researchers in this field are overwhelmingly literary scholars, and this may contribute to the fact that the focus tends to be on illuminating literature rather than also feeding back into psychology or linguistics. Notable exceptions include the collaboration between the literary scholar Catherine Emmott and the cognitive psychologist Anthony J. Sanford (http://www.gla.ac.uk/schools/critical/research/fundedresearchprojects/stacsproject/#d.en.53663; see also Sanford and Emmott 2012), which has added depth and detail to our understanding of how people read narrative texts, as a key aspect of language processing more generally, through experiments using naturalistic textual examples – but this is very much an exception rather than the rule. In other arts-sciences crossover fields, the ratio of scientists to humanities scholars can be quite different: "empirical aesthetics" with visual art as its object of study, for example, attracts as many psychologists, physiologists, and neuroscientists, especially those working on visual perception (e.g. Huang et al. 2011, Augustin and Wagemans 2012), as it does fine artists or art historians, if not more. But the research tends nonetheless to be configured very much as a means of generating insights about aesthetic objects and experiences rather than also as a way of reflecting back on to the cognitive faculties with which these art forms interact. Maybe, then, there is something about aesthetic entities that makes people see them more as objects of inquiry than as sources of knowledge – but that is a complex question for another time.

In any case, perhaps what it ultimately comes down to is the fact that a discipline – and especially a cross-disciplinary field – still very much in its infancy simply needs time to mature into confidence in its own position and role, and to progress from self-effacing infatuation (science can solve all our problems) to a healthier enthusiasm tempered with self-assertion (let's help each other solve problems on both sides). A different name might help here too: cognitive literary studies and cognitive poetics (as well as cognitive narratology) suggest that this is a matter of appending a cognitive adjunct to an originary field firmly located in the humanities. Maybe a better-balanced name would work better: we suggest "cognitive literary science". This may too strongly imply that everything done in the area is modelled on scientific principles, but it does not, as "empirical aesthetics" does, limit this to empirical research, and if we want to found a

cognitive-scientific discipline (which is what the ambition to yield insights into cognition necessarily entails), we must not shy away from the word "science". Only time will tell whether this term sticks or another emerges to describe what we do better, but we hope that in the meantime this special issue will manage to take an initial step towards establishing cognitive literary science as a grown-up cognitive science.

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Bionotes

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